

STAKEHOLDER REPORT ON STEWARDSHIP FOR THE OAK RIDGE RESERVATION

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ABSTRACT

In January 1997, at the request of the U.S. Department of Energy (DOE), the Oak Ridge Reservation Environmental Management Site Specific Advisory Board (ORREMSSAB) sponsored the initial meeting of the End Use Working Group (EUWG). For 18 months, the EUWG met biweekly to learn about radioactive and chemically hazardous contamination on the Oak Ridge Reservation (ORR); gain a better understanding of community values related to cleanup of the Reservation; and develop future use recommendations for the contaminated areas on the Reservation.

As end use deliberations progressed, it was apparent that some level of radioactive and chemically hazardous contamination would remain on the Reservation and that a stewardship program would be needed to protect human health and the environment from future risks associated with contamination. Furthermore, the EUWG could not endorse any remediation program that left contaminants above health-based levels without the assurance that necessary and appropriate actions for stewardship would be in place.

Recognizing the complexity of such a task, the EUWG formed a committee to develop stewardship recommendations. The EUWG committee was soon joined by the Stewardship Committee from Friends of Oak Ridge National Laboratory and members of the Local Oversight Committee's Citizens' Advisory Panel who had worked on similar issues for the Tennessee Department of Environment and Conservation.

The Stewardship Committee established the following goals:

- identify essential elements of effective stewardship;
- develop long-term stewardship requirements for the ORR;
- identify options and promote the acquisition of adequate long-term funding for stewardship on the ORR;
- promote public understanding of stewardship; and
- promote interaction concerning stewardship among individuals and appropriate local, state, and federal organizations.

The Stewardship Committee's results and recommendations are presented in the July 1998 Stakeholder Report on Stewardship, which documents the efforts of the committee; presents the attributes and basic elements of a long-term stewardship program; describes the current and proposed statutory provisions for stewardship and institutional controls; and presents recommendations for an ORR stewardship program, including categories of stewards, physical controls, institutional controls, information systems, research, and funding options.

The Stakeholder Report on Stewardship was endorsed by the ORREMSSAB at its September 1998 meeting and was formally submitted to DOE. The report contains many

specific recommendations and it should be consulted for a full understanding of stewardship issues. (Available on the world wide web: ornl.gov/doe_oro/em/emhome.html or by calling the Information Resource Center at 423-241-4582.)

INTRODUCTION

The End Use Working Group (EUWG) Stewardship Committee defines “stewardship” of remediated sites with residual contamination as:

“Acceptance of the responsibility and the implementation of activities necessary to maintain long-term protection of human health and of the environment from hazards posed by residual radioactive and chemically hazardous materials.”

At present, the stewardship program applies to the DOE Oak Ridge Operation’s Environmental Management Program. However, the concepts are applicable to other DOE facilities with radioactive and chemically toxic contamination resulting from years of nuclear research and weapons production. Returning all contaminated areas to pristine conditions is often not feasible; it is risky for excavation and transportation workers; impractical for cost, technical, and logistical reasons; it does not always result in risk reduction; and citizens and governments of the affected areas often oppose the transport and off-site disposal of contaminated materials. Furthermore, when contaminated materials are disposed off-site, the responsibility for stewardship is merely transferred from the waste-shipping facility to the waste-receiving facility.

It has become increasingly apparent that some level of contamination will remain on the Oak Ridge Reservation and that a stewardship program is essential for protection of the public and the environment from future risks associated with residual contamination. However, long-term stewardship is not a substitute for remediation that is technologically possible and currently feasible. Neither is stewardship to be used as a shield to avoid the costs of risk reduction in the near term. Stakeholders expect the federal government to fulfill its moral, legal and financial obligations for remediation and long-term stewardship and the DOE to clean up contaminated areas to the extent practical. Oak Ridge stakeholders cannot support decisions that result in residual contamination unless a legally binding stewardship program is developed. To that end, stakeholders can insist that stewardship and institutional control requirements, for which DOE is responsible, are included in CERCLA Records of Decision and other remedial action documents.

UNDERSTANDING STEWARDSHIP

Once the Stewardship Committee decided on a definition of stewardship, it turned its attention to the attributes, elements and focus of a stewardship program. In contrast to a recent report on stewardship which has a broad national perspective (1), the Oak Ridge Stakeholder Report on Stewardship emphasizes concurrent planning for remediation and stewardship; incorporation of stewardship requirements in CERCLA Records of Decision and other CERCLA documents; integration of stewardship requirements into existing government systems; and a local stakeholder focus.

Attributes of Successful Stewardship

The Stewardship Committee decided that a stewardship program must possess the following basic attributes: *responsibility*, *long-term effectiveness*, and *adaptability*.

To be successful, stewardship requires that society accept *responsibility* for providing a safe and healthy environment for current and future generations. The President and Congress, as protectors of the public interest, must recognize and accept this responsibility and provide long-term funding to minimize the risks associated with contaminated federal facilities. Stakeholders, local governments, regulators, and other decision-makers must work together to develop and implement stewardship programs aimed at reducing risks that may result from residual contamination. Each of these groups must accept responsibility for stewardship.

Successful stewardship also depends on programs designed to protect human health and the environment even when contamination is expected to be hazardous for thousands of years. If stewardship fails, so does remediation. To increase the probability of *effectiveness* over the long term, a stewardship program must employ redundant systems and controls, contingency plans for unanticipated events, stable funding, and a legal basis.

Furthermore, a successful stewardship program must be *adaptable* to changing conditions and political demands. Advances in technology, changes in contaminant and environmental conditions, and demographics will necessitate periodic evaluation and refinement of stewardship activities. Stewardship programs must be flexible enough to accommodate such adjustments.

Although statutory requirements for stewardship are lacking at the federal level, on April 21, 1998, EPA Region 4 issued a policy that will help to institutionalize stewardship provisions at federal facilities in the southeast United States. The new policy, entitled Assuring Land Use Controls at Federal Facilities (2), contains some of the stewardship provisions found in our report. It requires preparation of a Land Use Control Assurance Plan to assure the long-term effectiveness of land use controls being relied upon to protect human health and the environment at contaminated federal facilities undergoing remediation.

Elements of Stewardship

The Stewardship Committee decided on a hierarchy of seven basic elements for effective stewardship. At the highest level, the *authority and funding* for stewardship must be established. Next, *stewards* must be identified and their individual roles and responsibilities for carrying out the *operations* of stewardship must be defined. Finally, there are the tools of stewardship which include *institutional controls*, *physical controls*, *information systems* and *research*. Ultimately, all of these elements must work together. Figure 1 illustrates the relationship of the elements of stewardship.

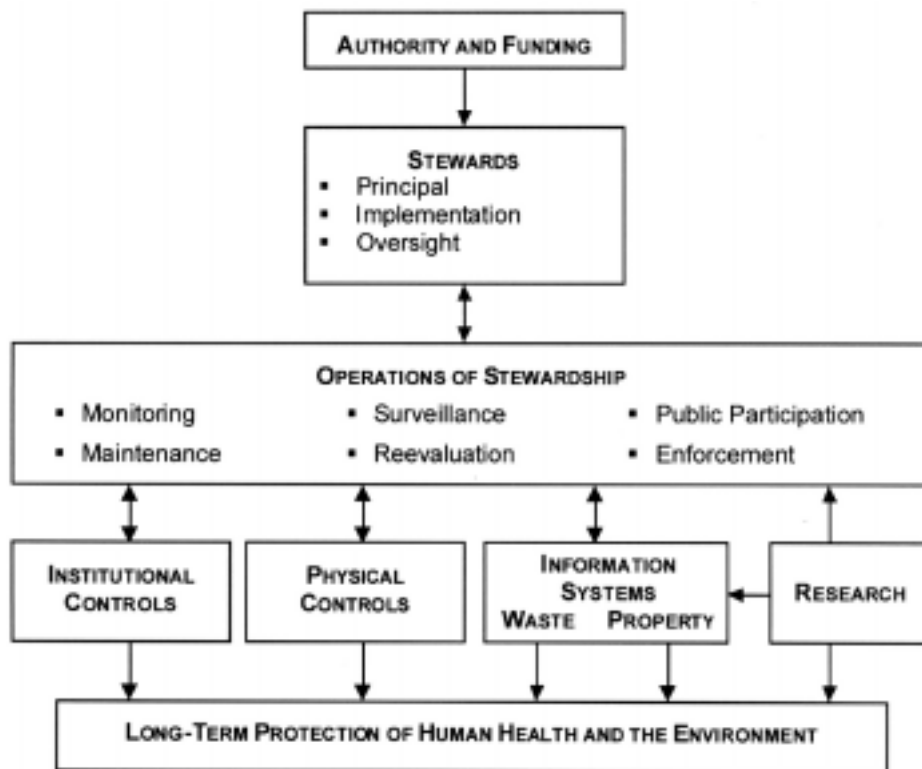


Figure 1 Organization of Stewardship Elements

THE OAK RIDGE RESERVATION

Since the early 1940, the Oak Ridge Reservation has been the site of vital national security missions. These activities left a legacy of radioactive and toxic chemical wastes, requiring management and/or disposal. Between 5 and 10 percent of the 35,000 acre Reservation is occupied by old waste disposal sites, most of which lack engineered containment structures. Radioactive and toxic chemical pollutants present in mixed-waste burial grounds, settlement ponds, seepage pits and trenches, inactive tanks, abandoned underground pipelines, and surplus facilities have contaminated soil, groundwater, and surface water in their vicinity. The radioactivity is dominated by tritium (with a half-life of approximately 12 years) and strontium and cesium (with half-lives of approximately 30 years). Hazards from these three radionuclides will markedly diminish in about 300 years. There also are quantities of radioactive uranium (which will pose a hazard for millions of years) and some PCBs and other toxic chemicals that contain small amounts of radioactivity.

Abundant rainfall (annual average of 55 inches) and high water tables (e.g., 0 to 20 feet below the surface) contribute to leaching of contaminants from the waste areas. The leaching results in contaminated soil, surface water, sediments, and groundwater. The underlying geology is complex and migration of contaminants in groundwater is difficult to monitor on many parts of the Reservation.

In order to consolidate investigation and remediation of contaminated areas, the Reservation has been divided into five large tracts of land roughly equivalent to the major hydrologic watersheds. The DOE, with the knowledge of the public and concurrence of EPA Region 4 and the Tennessee Department of Environment and Conservation (TDEC), decided that a comprehensive watershed approach to planning remediation activities is more effective than the usual unit-by-unit approach. Instead of hundreds of decision documents, one or several CERCLA Records of Decision for each watershed will be produced which should result in considerable savings in time and money. In addition, the watershed approach provides the public with a roadmap of proposed remediation actions, facilitates public oversight of DOE's progress, and allows comprehensive stewardship planning for the Reservation. The extent of the five watersheds is illustrated in Figure 2.



Figure 2 Administrative Watersheds on the Oak Ridge Reservation

End Uses of the Oak Ridge Reservation

At the request of DOE, the End Use Working Group (EUWG) was formed by the Oak Ridge Reservation Environmental Management Site Specific Advisory Board (ORREMSSAB). The EUWG was a broadly-based volunteer stakeholder's group whose challenge was to understand contamination problems and to develop community guidelines and end use recommendations to aid DOE and its regulators in decision making for remediation activities on the Reservation. The Final Report of the Oak Ridge Reservation End Use Working Group, July 1998, is available on the world wide web at ornl.gov/doe_oro/em/emhome.html or by calling the Information Resource Center at 423-241-4582.

The Group developed a hierarchy of five possible end uses with associated criteria. The end uses for the contaminated areas ranged from unrestricted to restricted waste disposal.

As deliberations progressed, the EUWG recognized that removal of millions of cubic yards of waste to drier, more isolated sites is unlikely due to risk, cost, politics, and equity and that some contamination and associated end use restrictions will remain following remediation of the five watersheds. As a result, Oak Ridge stakeholders declared that they could not endorse any remediation program for the Reservation that would result in residual contamination above health-based levels without the assurance that necessary and appropriate actions for stewardship will be implemented. Thus, a stewardship committee was formed.

STEWARDSHIP FOR THE OAK RIDGE RESERVATION

Following development of the basic attributes and elements of stewardship, the Stewardship Committee applied the concepts to the Oak Ridge Reservation. The following principles were decided upon as starting points for a comprehensive, integrated stewardship program:

- use of existing systems and organizations to the maximum extent possible;
- development of stewardship plans and designation of stewards during remedial decision-making; and
- involvement of stakeholders in planning for and implementation of stewardship.

Committee members then went into the community to identify existing organizations that could be responsible for supporting functions and activities necessary for effective stewardship. Interviews with city and county staff convinced us that local government involvement is basic to the development, implementation, and oversight of stewardship activities.

Stewards for the Oak Ridge Reservation

Roles for three types of stewards (i.e., *principal, implementation, and oversight*) developed as the Committee sorted through the information that was gathered during its interviews. In addition, it became clear that stewards must be designated while remediation is in the planning stages so that stewardship responsibilities and activities are defined and included in each Record of Decision.

As required by CERCLA, the federal government is fiscally and legally responsible for remediation. Thus, DOE is the *principal* steward for the Oak Ridge Reservation.

Implementation stewards are responsible for operations (e.g., maintenance, monitoring, and information activities; please refer to Figure 1). However, we found that many groups from all levels of government would have some role in the implementation of stewardship on the Reservation. Establishing the relationship among implementation stewards and between the principal steward and the implementation stewards is critical to the success of a stewardship program. Potential implementation stewards and their responsibilities are shown in Table 1. These are currently functioning organizations and require only the addition of specific new stewardship duties (some of which are noted in the Functions column of Table 1.)

The *oversight* stewards ensure that stewardship is implemented as planned, that remediation performs as intended, and that the best interests of the public are met. Table 2 shows existing organizations expected to have an oversight role for the Oak Ridge Reservation.

The use of existing local organizations to meet the stewardship needs of the Reservation has the following distinct advantages. It:

- establishes long-term stability for the stewardship program;
- creates a minimal number of new duties to be authorized and funded;
- allows the use of current local government enforcement capabilities;
- promotes immediate acceptance of the stewardship program.

Table 1 Potential Implementation Stewards for the Oak Ridge Reservation

Category	Organization	Functions
Federal Government (DOE)	Various contractor(s) to DOE (or the federal government)	Monitoring, maintenance, security, signage, surveillance
	Document Management Center	Working report repository
	Information Resource Center	Public access to CERCLA and other remediation documents
	Office of Scientific and Technical Information	Report literature, indexing and abstracting
	American Museum of Science and Energy	Permanent stewardship exhibits, public outreach
Federal Government (not DOE)	Tennessee Valley Authority, U.S. Army Corps of Engineers	River environmental quality, river navigation, floor plains and wetlands, dredging
	National Oceanographic and Atmospheric Administration	Atmospheric monitoring
	National Technical Information Service	Long-term archiving
State Government	Office of Information Resources	State Parcel Maps and public access to the Geographic Information System (GIS)
Local Government	Register of Deeds (Anderson and Roane Counties)	Preservation of deeds, easements, parcel maps (e.g., plat, block, subdivision)
	Oak Ridge Regional Planning Commission, Community Development Office	Parcel maps, zoning and use approvals, building permits, and enforcement
	County Property Assessors Office; Oak Ridge Finance Department-Tax Office	Annotated tax records (to include contamination data)
	Public Schools	Education
	Public Library	Public awareness
Board of Realtors	Local realtors	Notices to Buyers (required by State law), addition of contamination to the notice list

Table 2 Existing Oversight Stewards for the Oak Ridge Reservation

Category	Organization	Functions
Federal Government	Department of Energy	Compliance with DOE Orders
	Environmental Protection Agency	Compliance with federal regulations
	Occupational Safety and Health Administration	Workplace safety
	National Institutes for Occupational Safety and Health	Worker exposure
	Nuclear Regulatory Commission ¹	Radiation safety
	Centers for Disease Control and Agency for Toxic Substances and Diseases Registry	Public exposure and safety
	Tennessee Valley Authority	River environmental quality
State Government	Tennessee Department of Environment and Conservation	Compliance with State regulations, advisories for contaminated fish/waters
	Tennessee Wildlife Resources Agency	Use of wildlife resources; aquatic contamination information
	Tennessee Department of Health	Public Health
County Government	Roane County Environmental Review Board	Roane County oversight
City of Oak Ridge	Environmental Quality Advisory Board	Environmental quality oversight
Other	Local Oversight Committee and its Citizens' Advisory Panel	Local government oversight
	Environmental Management Site Specific Advisory Board	Citizen input to DOE activities on the Oak Ridge Reservation

¹Projected

A Stewardship Coordinating Committee

The Stewardship Committee quickly realized that coordination of the stewards and their activities is necessary to ensure the success of a stewardship program. Thus, a Stewardship Coordinating Committee is proposed, to include representatives of the principal, implementation and oversight organizations, and the public. The point-of-contact required by EPA Region 4 for monitoring, maintaining, and enforcing the Land Use Control Implementation Plan(s) for the Oak Ridge Reservation also would sit on the Coordinating Committee. The Committee would meet periodically to ensure that all stewards are cooperating effectively, to review new information and technologies, to evaluate changing contamination and environmental conditions on the Reservation, and to recommend revisions to the stewardship plan. The Committee also may contribute to public awareness through a newsletter and periodic or ad hoc meetings when appropriate. The DOE should provide financial and administrative support for the Stewardship Coordinating Committee. Should the federal government cease to function as the principal steward and fail to designate a credible replacement, then responsibility for coordination of stewardship would fall to the local governments.

The Public Role in Stewardship – A Citizen's Oversight Board

The DOE has found that public participation enhances credibility and contributes to understanding of and progress for environmental remediation on the Oak Ridge Reservation. Thus, a Citizen's Oversight Board for Stewardship is proposed to provide an effective interface between the public and the stewardship program. The Board will

review stewardship activities and documents; provide advice and recommendations to DOE, EPA and TDEC based on citizen input; act as an ombudsman for the public; and participate in the preparation of an annual report describing the progress (and shortcomings) of the stewardship program and its milestones for the coming year. The annual report will be a roadmap for citizens to judge the effectiveness and adequacy of the DOE stewardship program for the Oak Ridge Reservation. The formation and administrative support of such a group could be assigned to an existing citizens' organization but its membership must be broadly representative of local stakeholders.

Physical and Institutional Controls on the Oak Ridge Reservation

The physical and institutional controls for the Oak Ridge Reservation are similar to those expected for any site with contamination that might affect human health and the environment. The Stakeholder Report on Stewardship describes the physical controls (i.e., barriers to limit public access and exposure to contaminants) and the institutional controls (i.e., legally binding provisions, such as local ordinances and state and federal laws, designed to control future uses of land or resources by limiting development and/or restricting public access.)

The report also contains three case studies that illustrate the challenges associated with physical and institutional controls. The first shows that controls/activities might be eliminated or reduced in scope as a result of decreasing risk from radioactive decay. The second highlights the failure of signage when responsibility for stewardship is unclear and existing data that could contribute to removal of unnecessary signs and advisories are either unknown or ignored by decision-makers. The third highlights the value of research to stewardship. New site-specific information revealed that initial assumptions were more conservative than need be and that institutional controls (in this case, advisories) could be eliminated or relaxed.

A Stewardship Information System for the Oak Ridge Reservation

Because there will be a legacy of contamination on the Oak Ridge Reservation, it is vital to establish a system that preserves information, ensures its accessibility, and educates future generations. Furthermore, a stewardship information system must withstand future political and fiscal uncertainties. Stand-alone systems are known to be vulnerable to shifting priorities. Thus, the Stewardship Committee believes that the best system is, for the most part, an integral extension of existing systems whose purposes meet essential, long-term societal needs that cannot be abandoned.

Components of the proposed Stewardship Information System are summarized in Table 3. Functional descriptions of each component are found in the Stakeholder Report on Stewardship. In general, implementation stewards are custodians of the system and the sources of most information are DOE and subsequent land-owners. The system is intended to be consistent with CERCLA Section 120 (h) (3), which requires that a warranty deed with associated contaminant information accompany the transfer of contaminated federal land. Establishment of a stewardship information system is both expensive and time consuming. Readers are referred to a recent draft publication on Managing Data for Long-Term Stewardship (3) prepared by ICF Kaiser for the DOE.

It is important that an information system is functional during remediation so that sufficient information and references are included and integrated with existing property transfer and use systems. The nature and location of residual contamination must become part of permanent land use records. The first step is to parcel and register Reservation land according to the expected contamination profile and end uses following remediation.

Table 3 Components of a Stewardship Information System

Component	Content	Custodian	Primary Users	Comments
Stewardship Repository	All relevant DOE/contractor reports	Environmental Management Data Management Center	All	Documents reports of all types
Abstracts & Indexing	Report & literature abstracts	Office of Science and Technology Information or other service	All	Comprehensive coverage of Oak Ridge stewardship literature including on-line retrieval
Archives	Archived reports	National Technical Information Service	All	Microfiche & hard copy archive
Record of Site Access & Activity Controls	Hunting, fishing, and recreation controls	Tennessee Wildlife and Recreation Agency & City Parks Department	Site recreational users	Current rules and limitations
Stewardship Web Site	Graphics, report summaries, links	Environmental Management Data Management Center	Web users	Also indexing & abstracting
Public Library	Public interest information	Local libraries	Public	Non-technical, public interest documents, ORR videos
School Library	Teaching Aids	Local schools	Teachers, students	Documents, videos, books
Public Awareness	Legal notices, meetings, other	DOE & others	Public	General public awareness program
County Records	Land deeds, subdivision plats	Register of Deeds	Realtors, developers, lawyers	Both Roane and Anderson, includes easements and restrictions
	Reports	Register of Deeds	All	Detailed documentation of residual waste & restrictions
	Parcel maps	Property Assessor	All	Showing waste location with key to DOE documentation
City Records	Parcel maps	Planning Office	Planners, Regional Planning, Environmental Quality Advisory Board	Zoning and use restriction information Waste locations plus supporting information
	Annotated tax records	Oak Ridge Tax Office	All	Redundancy to alert title searchers
State Parcel Maps	Parcel maps	State Office of Information Resources (Finance and Administration)	Planners, realtors, developers public	Part of the new State Parcel Mapping System with a waste overlay, input from DOE, redundancy and public access
State Notices to Buyers	Waste descriptions	Realtors, sellers	Realtors, sellers, buyers	Kept by realtors for three years, these are now required by law

FUNDING OAK RIDGE RESERVATION STEWARDSHIP

Expected annual funding requirements for the Oak Ridge Reservation stewardship program must be established. Initial estimates place the costs at approximately \$17 million per year (4). While the most reliable form of funding and the preference of the

Stewardship Committee is the development of a privately-held trust, the difficulty of creating an endowment large enough to provide this level of funding is recognized.

The Stewardship Committee recommends an incremental and cooperative approach to creating a stable source of funding necessary for long-term stewardship. While many details must be worked out, the following recommendations would help the process begin in earnest.

1. Develop an Administrative Focus

Until such time as independent funding is established, DOE should request stewardship funding from annual appropriations. These costs should be carried in the annual DOE budget as a separate line item to ensure visibility. Prioritization of this request by DOE and its active advocacy by DOE-Headquarters in annual budget requests are expected to alleviate concerns the State of Tennessee currently has about stewardship funding (5).

2. Develop a Stewardship Fund

The federal government should establish a fund that will generate the annual income needed for stewardship. A recognized financial authority should calculate the dollars required for a stewardship fund, taking into account inflation and restrictions on modes of investment. As each remediation project is budgeted in a CERCLA Record of Decision, a line item would be entered for its pro-rated share of the stewardship fund and DOE would request these funds in conjunction with future budget requests. To ensure appropriate control of expenditures for stewardship, Congress would specify that the principal steward has control over the income derived from the fund, without any additional congressional approval or authorization. Congress would maintain the authority to audit expenditures to assure that the fund is used appropriately. As an alternative, especially after remediation is complete, an endowment could be established to be managed by a non-profit corporation.

3. Augment Fund as Necessary

If funds are insufficient to cover stewardship expenses, the principal steward is responsible for incremental funding through annual appropriations. Long-term stewardship funding is not expected to cover the costs of a future major failure of a remedial action. Should such an event occur, the federal government is obligated under CERCLA to fund whatever cleanup actions are determined necessary by regulatory authority.

SUMMARY OF KEY RECOMMENDATIONS FOR STEWARDSHIP ON THE OAK RIDGE RESERVATION

- DOE (acting as an agent of the federal government) must acknowledge and accept its responsibility as principal steward of the ORR.
- By the end of 1999, DOE should develop a stewardship plan with the cooperation of the implementation and oversight stewards.
- DOE must make stewardship requirements an integral part of all CERCLA decision documents.
- DOE should establish an annual budget for stewardship.
- DOE should request stewardship funding, until such time as independent funding is established, as a line item in annual appropriations.
- Congress should establish a fund that will generate the required annual budget for stewardship.
- DOE should establish a Stewardship Transition Team in 1998 and a Citizens' Oversight Board for Stewardship for long-term public involvement in stewardship.
- DOE should identify the stewards required for implementation of the stewardship plan.
- DOE should ensure that all potential stewards accept responsibility for implementation of their portions of the stewardship plan.
- DOE should initiate a Stewardship Coordinating Committee by the end of 1999 with representatives from each organization that has stewardship responsibility.
- DOE should establish a Stewardship Information System.
- DOE should establish a stewardship research program that contributes to better assessments of the exposure and risks of contamination, remedial technologies, and stewardship requirements.
- The Oak Ridge City Council should assign responsibility for the City's oversight of the stewardship program to the Environmental Quality Advisory Board or a similar group.
- The Oak Ridge City Council should establish any additional land use category(ies) required for land used for long-term disposal of "hazardous" wastes.
- The State should add long-term waste disposal and residual waste categories to the list of required "Notices to Buyers."

REFERENCES

1. K. PROBST and M. McGOVERN, "Long-Term Stewardship and the Nuclear Weapons Complex: The Challenge Ahead," Center for Risk Management, Resources for the Future (1998).

2. U.S. ENVIRONMENT PROTECTION AGENCY REGION 4, “Assuring Land Use Controls at Federal Facilities,” Memorandum from J. D. Johnston, Chief, to Federal Facilities Branch (1998).
3. ICF KAISER, “Managing Data for Long-Term Stewardship,” Working Draft (1998).
4. U.S. DOE OAK RIDGE OPERATIONS OFFICE, “Accelerating Cleanup: Paths to Closure,” DOE/OR/01-1746 (1998).
5. STATE OF TENNESSEE, “State of Tennessee Guidance Policy on ‘Perpetual Institutional Controls’ at the Oak Ridge Reservation,” Letter from Justin Wilson, Deputy to the Governor for Policy, to James Hall, Manager, U.S. Department of Energy, Oak Ridge Operations (August 21, 1997).