



Many Voices Working for the Community

Oak Ridge Site Specific Advisory Board

July 15, 2004

Mr. Steve McCracken
Assistant Manager for Environmental Management
DOE-Oak Ridge Operations
P.O. Box 2001, EM-90
Oak Ridge, TN 37831

Dear Mr. McCracken:

Annotated Outline for a Long-Term Stewardship Implementation Plan

At our July 14, 2004, meeting, the Oak Ridge Site Specific Advisory Board approved the enclosed recommendation. We offer this document for your use in crafting an Implementation Plan for Long-Term Stewardship for the Oak Ridge Reservation. Should you have any questions or need any clarification, please let us know.

We appreciate your consideration of our recommendation and look forward to receiving your written response.

Sincerely,

A handwritten signature in black ink, appearing to read "D. Mosby".

David N. Mosby, Chair

Enclosure

cc/enc: Dave Adler, DOE-ORO
Sid Garland, Bechtel Jacobs Co. LLC
Pat Halsey, DOE-ORO
Connie Jones, EPA Region 4
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**Annotated Outline
for a Long-Term Stewardship
Implementation Plan**

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FOREWORD

The objective of the Annotated Outline is to provide DOE/ORO with an outline of a Long-Term Stewardship (LTS) Implementation Plan tailored to and suitable for contaminated areas on the Oak Ridge Reservation (ORR). The resulting implementation plan (with any attachments) will provide detailed functional specifications to (1) enable the design and implementation of an ORR specific LTS system which will meet both DOE/ORO needs and post-DOE needs into the distant future and (2) which has the acceptance of stakeholders.

Furthermore, each CERCLA Record of Decision must contain detailed information regarding LTS implementation based on this plan.

The LTS Implementation Plan should encompass concepts described in the *Final Report of the Oak Ridge Reservation End Use Working Group*, July 1998; the *ORR Stakeholder Report on Stewardship*, Volume I, July 1998; and the *ORR Stakeholder Report on Stewardship*, Volume II, December 1999. Where applicable, this Annotated Outline provides references to some of the appropriate sections of the aforementioned reports. Additional references should be included as needed.

The organization of Sections 4 and 5 is based on the structure of the Remediation Effectiveness Report (RER). Details for these sections can be found in the RER.

DEFINITIONS

Long-Term Stewardship (LTS)¹: Long-term stewardship is the set of activities necessary to protect human health and the environment from physical hazards, residual contamination and wastes remaining following remediation. These activities include: establishment of the authority and funding for stewardship. Stewards must be identified and their individual roles and responsibilities defined. Subsequently, the tools of long-term stewardship must be designed and implemented. These tools include engineered, institutional, and physical controls designed to contain or to prevent exposures to residual contamination and waste, such as surveillance activities, record-keeping activities, inspections, groundwater monitoring, ongoing pump and treat activities, cap repair, maintenance of entombed buildings or facilities, maintenance of other barriers and contained structures, access control, and posting signs. And finally, systems for management of information required for LTS must be established. These include regulatory information, site management information, land use control information, and public participation and education information.

Cleanup²: For the purposes of this plan, “cleanup” refers to the process of addressing contaminated land, waters, facilities, and materials in accordance with applicable requirements. This refers not only to actions taken under CERCLA and RCRA, but also to the demolition process and the low-level waste or other radioactive waste land disposal process. Cleanup does not imply that all hazards will be removed from the site. (The term “remediation” is often used synonymously with cleanup.) Cleanup/remediation is considered complete when: demolition of all facilities is complete, excluding long-term surveillance and monitoring; releases to the environment have been cleaned up in accordance with agreed-upon standards; groundwater contamination has been contained, or long-term treatment or monitoring is in place; nuclear materials and spent fuel have been stabilized and/or placed in safe long-term storage; and “legacy” wastes (i.e., produced by past nuclear weapons production activities, with the exception or high-level waste) have been disposed of in an approved manner.

Unrestricted Use: Unrestricted use generally means that conditions are safe for any exposure scenario. However, it does not necessarily imply cleanup to pristine or background conditions. Public recommendations for future uses of the contaminated areas on the Oak Ridge Reservation are described in the Final Report of the Oak Ridge Reservation End Use Working Group; July 1998 and summarized below.

End Use Category	Surface Use	Depth of Clean Soil	Groundwater Use	Surface Water Use	Ownership
Unrestricted	Unrestricted	Unlimited	Unrestricted	Unrestricted	Government or Private
Uncontrolled Industrial	Industrial	10 feet	Not Allowed	Unrestricted	Government or Private
Recreational	Recreational	2 feet	Not Allowed	Recreational uses	Government or Private
Controlled Industrial	Industrial with restrictions	2 feet, additional excavation by permit	Not Allowed	Not Allowed	Government or Private
Restricted Waste Disposal	Limited to monitoring and maintenance	No soil disturbance allowed	Not Allowed	Not Allowed	Government

¹*Oak Ridge Reservation Stakeholder Report on Stewardship*, Volume I, July 1998, Volume II, December 1999, Oak Ridge Site Specific Advisory Board, Oak Ridge, Tenn., (<http://www.oakridge.doe.gov/em/ssab/pubs.htm>)

² *From Cleanup to Stewardship, a Companion Report to Accelerating Cleanup: Paths to Closure and Background Information to Support the Scoping Process Required for the 1990 PEIS Settlement Study*, DOE/EM-0466, U.S. Department of Energy, Office of Environmental Management, Washington, D.C., October 1999

ACRONYMS AND ABBREVIATIONS

AM	Action Memorandum
ATSDR	Agency for Toxic Substances and Disease Registry
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CROET	Community Reuse Organization of East Tennessee
DOE/ORO	U.S. Department of Energy/Oak Ridge Operations
EPA	Environmental Protection Agency
ETTP	East Tennessee Technology Park (formerly the Oak Ridge K-25 Site)
FFA	Federal Facility Agreement
GIS	geographical information system
LTS	long-term stewardship
LTSP	Long-Term Stewardship Plan
LUCIPs	Land Use Control Implementation Plans
NEPA	National Environmental Policy Act
NTIS	National Technical Information System
ORAU	Oak Ridge Associated Universities
ORNL	Oak Ridge National Laboratory
ORR	Oak Ridge Reservation
OSTI	Office of Scientific and Technical Information
RAR	remedial action report
RCRA	Resource Conservation and Recovery Act
RER	remediation effectiveness report
RI/FS	remedial investigation/feasibility study
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
SSAB	Oak Ridge Site Specific Advisory Board
TDEC	Tennessee Department of Environment and Conservation
TPMS	Tennessee Parcel Mapping System
Y-12	Y-12 National Security Complex

1. OVERVIEW OF LONG TERM STEWARDSHIP

1.1 INTRODUCTION

During the past decade, the Department of Energy (DOE) has made progress in addressing the environmental legacy of the Cold War. However, in spite of that effort, the majority of DOE sites will not be cleaned up to the point where they can be released for unrestricted use. Factors such as technical infeasibility, excessive worker risk or environmental damage, programmatic priorities, and costs dictate the extent to which sites are undergoing remediation and the consequent end-states achieved. When remediation is completed, most DOE sites will require some level of long-term stewardship (LTS) to ensure protection of human health and the environment from remaining hazards.

In addition to improving the long-term management of residual contamination, DOE's development of LTS plans will:

1. improve management before and after remediation is complete;
2. facilitate development of a baseline, schedule, and cost for LTS;
3. provide for an information management system that will retain the critical LTS information in perpetuity and make it available to the public;
4. provide for public, city, county and state participation as appropriate; and
5. provide a mechanism for demonstrating DOE's accountability to the public by clearly communicating defined end uses, maintenance requirements, performance metrics, monitoring programs, and contingencies to address the impact of changes to the end use.

The Oak Ridge Reservation (ORR) is a large, complex remediation site comprised of six major administrative watersheds containing eighty-one remediation units, seven on-site minor remediation units designated as other-location sites, and four off-site remediation units located on private property. These remediation units have had diverse past uses and equally diverse residual contamination as well as diverse future uses and stewardship requirements. It must be noted that some of these remediation units are dedicated to the perpetual disposal of radioactive elements having very long half lives as well as stable toxic metals in less-than desirable soils. Thus ORR stewardship is forever and urgently needed. The complex characteristics of these many remediation units will be reflected throughout this document. Section 2 describes the organization of the LTS Implementation Plan; Section 3 - Activity-Based LTS Requirements - describes the LTS system definition, operation and ORR general information. Sections 4, 5, and 6 - Geographic-Based Requirements and Information - describe the lands under LTS and their specific characteristics and LTS requirements. The geographic-based sections include by reference many supporting documents.

1.2 PURPOSE OF THE LTS IMPLEMENTATION PLAN

The LTS implementation plan is intended to serve as a means for organizing existing data to formulate a baseline that can be used not only to communicate necessary information to future stewards, but also provide the basis for LTS planning and budgeting. It is anticipated that more detailed information will be found in other documents and will be referenced in the LTS Plan.

The LTS Implementation Plan should at a minimum include the nine elements and their recommendations described in the LTS Strategic Plan (see Appendix A, October 2003 LTS Strategic Plan).

1.2.1 Scope

The scope of this LTS plan includes both the geographic scope to which the LTS system applies and the scope of the functional components of the LTS system itself.

1.2.2 Physical Boundaries

The ORR comprises about 35,000 acres lying in the Greater Tennessee River Valley and is almost entirely located within the incorporated City of Oak Ridge, Tennessee. The Reservation is bounded on the south and west by the Clinch River and on the east by Scarboro Road. The northern boundary comprises the top of Pine Ridge adjacent to the Scarboro Community proceeding westerly and occasionally northerly to Black Oak Ridge joining Poplar Creek above Blair road and thence down Poplar Creek to the Clinch River. Ridges and valleys house the operational units and the resulting remediation units. (Figure 1 – Map of the ORR and Its Watersheds and Figure 2 – A Summary of Remediation Units on the ORR). The detailed description of the ORR and its watersheds is found in Sections 4 and 5.

Figure 1 – ORR Map; Figure 2 Informative Summary inserted about here.

1.3 REMEDIATION PROCESS

Remedial decision-making on the ORR is a phased approach. Interim decisions are being made on specific source areas (e.g., K-1070-A Contaminated Burial Ground), for migration pathways (e.g., SWSA-4 seeps), and for the majority of a watershed (e.g., Melton Valley). The strategy is to continue phasing interim remedial decisions until all aspects of a watershed are addressed. The last remedial decision of the watershed and the preceding interim decisions will be documented in a final remedial decision for the watershed. At that time, final land use control decisions will be made. The interim and final remedial decisions assume DOE has a significant and ongoing presence and relies mostly on existing controls. The final remedial decision legally will require these existing controls to be maintained by DOE or the federal government should DOE cease to exist.

1.3.1 Remediation Actions

This section should summarize and provide references to all actions (not just those resulting in LTS requirements) taken relative to site contaminants (cleanup actions); closing, stabilizing, and decontaminating and decommissioning onsite facilities; closing waste management disposal cells onsite, thus indicating how risk has been managed and what implications may be put to future monitoring results. If applicable, identify those waste management disposal cells not yet included but anticipated to be included in the LTS plan once they stop receiving waste. It may also be necessary to describe the condition of offsite areas of contamination to the extent that they are unique to those areas versus the site-wide conditions.

If the remediation action influences stewardship decisions, it is relevant to provide a synopsis of the original exposure pathways and describe how or if pathways have been terminated. The discussion should include the level of redundancy in those actions such that future stewards can understand the implications of perceived failures and/or proposed changes in site use. The discussion should also clearly reflect uncertainties and assumptions regarding remediation process, thus alerting future stewards to those elements of the model and remedy that may be based on erroneous or missing data. A synopsis of the risk associated with residual hazards and why they prohibit unrestricted use of the site in their current state should be provided.

1.3.2 Documentation

A description of the legal authorities under which remediation, facility stabilization and decontamination and decommissioning, waste management, and LTS are or were mandated is needed.

A publicly accessible and searchable data base with electronic links to all documents should be available and also include description and physical location of important LTS documents (RI/FS, ROD or AM, RAR, Notice of Contamination, Plat Map, RER, LUCIPs, and records with the county registrar of deeds).

2. ORGANIZATION OF THE LONG TERM STEWARDSHIP IMPLEMENTATION PLAN

2.1 INTRODUCTION

The LTS Plan is intended to serve as an overall guidance document for stewardship activities. It is intended to outline the scope of LTS activities, summarize monitoring parameters and frequencies, and provide the general approach to records management during LTS. More detailed information, such as on monitoring and maintenance requirements, may be contained in other documents and referenced in the LTS Plan.

2.2 PURPOSE AND SCOPE

This section includes a brief statement of why LTS is required at the site and discusses how the plan will be used to implement LTS activities. In addition to addressing the general reasons for LTS at the site (i.e., residual hazards will remain at the site, there are potential receptors to the residual hazards, and, therefore long-term stewardship is necessary at the site to manage the residual hazards), this section should state the purpose and scope of the LTS plan itself. The intent of this section is to clearly define the boundaries to which the plan applies, the breadth of activities it encompasses, the performance objectives for the activities it specifies, roles and responsibilities, and the process for changing either the plan itself or the activities within the plan. The latter are needed so that future stewards can continually compare performance with objectives and stakeholders can see how their concerns have been addressed.

2.2.1 Objectives

Clearly state the purpose or objectives of the LTS plan and of long-term stewardship activities that will be performed at the site. For more detail, see Volume II, Section 1.1.

2.2.2 Scope

This section of the LTSP provides general information about the scope of long-term stewardship at the site. The scope includes the physical attributes of the site that will require long-term stewardship (e.g., parcels or portions) and the long-term stewardship activities required to ensure institutional and physical control of the site. Examples of long-term stewardship activities may include but are not limited to the following: inspect, maintain, and repair engineered containment systems; monitor wells and other as-built features; conduct emergency response; maintain security; monitor environmental indicators; provide reports; and perform information management tasks. Each key component of the LTS activities and each portion of the site addressed in the plan should be identified in the scope section so that the reader has a capsule look at the entirety of the plan scope. Details should be provided in subsequent sections of the plan.

2.3 ORR BACKGROUND

2.3.1 ORR Description (maps and tables)

The purpose of this section is to provide a clear record of what space and media fall under the LTS plan such that future stewards understand the full extent of the property for which activities are to be conducted.

This section should contain a description of the physical boundaries that constitute the site or portions of the site to which the LTS plan applies. This may also include activities outside the site boundary if, for example, a groundwater plume has moved offsite and groundwater use restrictions are deemed necessary. The description in this section could be supplemented with maps, GIS coordinates, survey benchmark reference points, photographs, or other means of describing the physical boundaries of the site/oration. This section could also identify the location of areas such as buffer zones, location of specific waste management areas, boundaries of groundwater plumes, and location of residual hazards to the extent that they can be physically mapped out.

This section should address characteristics of any offsite location affected by the LTS plan, including current uses, potential future use, and liens and other property rights. This includes any offsite location where residual hazards are or are anticipated to be located (e.g., offsite soil contamination or groundwater plumes) for which DOE is responsible for conducting LTS activities, if applicable, as well as potential effects that the offsite activities may have on the site (e.g., industrial, agricultural, or residential uses).

Most of the characteristics listed in this section will describe the site in its entirety. However, to the extent that portion-specific characteristics are important for LTS management, these characteristics and settings should be clearly identified in the description of the unique portions. For example, a portion of the site may border a wetland, making LTS responsibilities different for that particular portion. There may be multiple watersheds onsite, which would also require the descriptions to allow for characterization of the unique aspects of the watersheds.

Suggested topics for this section include the following:

- Physical Site Conditions.
- Regional Setting.
- Elevation/Topography.
- Climate and Weather.
- Geologic Setting.
- Demography.
- Liens and Other Property Rights.

2.3.2 ORR Operational History

This section of the LTSP summarizes the history of the site in terms of previous occupation and use. Suggestions for this section include the following:

- Former occupants and operators.
- When operations were conducted.
- Processes and products that were employed at the site.
- Waste materials and contaminants that resulted from operations.
- Historical photographs of the site, if available.
- Acquisition history; current and historical property ownership.

- References to CERCLA, RCRA, and NEPA documents and other historical documents that describe historical site conditions.

2.4 WATERSHED DESCRIPTIONS (See the RER, Section 3.1 for prototypes.) MAPS & TABLES

2.4.1 Melton Valley

2.4.2 Bethel Valley

2.4.3 Upper East Fork Poplar Creek

2.4.4 Bear Creek

2.4.5 East Tennessee Technology Park

2.4.6 Chestnut Ridge

2.5 OTHER ORR REMEDIATION SITES (See the RER.) MAPS & TABLES

2.6 OFF-SITE LOCATIONS (See the RER) MAPS & TABLES

3. LONG TERM STEWARDSHIP ACTIVITIES APPLICABLE TO ALL WATERSHEDS

3.1 INTRODUCTION

This section should begin with a general discussion of the scope of LTS at the site followed by subsections that focus on specific LTS activities. In addition, this section should include a discussion on the role of technology development and stewardship at the site. For instance, this section should describe the policy and procedures for identifying technology needs, communicating those needs to the science and technology community, and selecting and implementing technologies that fill those needs. This section should describe how new technologies will be integrated into the LTS program when appropriate. In addition, this section should reference the Public Involvement Plan for CERCLA activities that is required by the FFA.

References to Volume II in this section of the Annotated Outline are found in the *ORR Stakeholder Report on Stewardship*, Volume II, December 1999.

3.2 END USE

The end use objectives for contaminated sites on the ORR vary from watershed to watershed and across miscellaneous remediation sites. The end uses vary from unrestricted to perpetual waste storage and include continuing missions at ORNL and Y-12 as well as extensive industrial development at ETPP as recommended by the stakeholders and the End Use Working Group³. The details of end uses within watersheds are outlined in Sections 4 and 5 of this LTSP.

This section should begin with a discussion of the End Use Working Group and its conclusions.

³ *Final Report of the Oak Ridge Reservation End Use Working Group*, July 1998, Oak Ridge Site Specific Advisory Board, Oak Ridge, Tenn., <http://www.oakridge.doe.gov/em/ssab/pub.htm>

- End Use Maps. Provide maps depicting end use and end use restrictions for the contaminated areas addressed by the LTS plan. Identify potential LTS implications if the end uses change.
- End Use Definitions. Define the scope of activities intended within each end use category, so that stewards have a clear understanding of how the definitions were used when describing end use.
- End Use Policies. Present key policies impacting end uses at the contaminated areas.

3.3 INSTITUTIONAL CONTROLS

Institutional controls are widely used in this LTS system and they provide two functions: a) through several local government systems they provide for the long-term retention of information with the systems that preserve property rights, and b) they provide for some measure of legal control over land use through the local government organizations that now control land usage. Briefly, the essential LTS information is incorporated into the local and state systems that provide for the long-term retention of documents that relate to the preservation of property rights and also into the information bases that support the several land use control systems that govern the use and development of property.

This section should describe each institutional control that is being implemented and how it is being implemented and maintained, as part of the LTSP. Institutional controls on off-site properties that are required for a remedy should be included in this discussion. This section should describe the overall strategy for protectiveness should a control fail.

Many of the specific details of the maintenance and monitoring will be covered in other documents and should be referenced in the LTS Plan.

3.4 PHYSICAL CONTROLS

The physical controls selected to control access to the several remediation units are based on the varying public hazards. These barriers may range all the way from signage to monitored or patrolled fences to buffer areas. Details of these requirements are documented in Sections 4, 5 and 6 and other supporting documents. Included in the discussion about the physical controls, should be an explanation of the surveillance and maintenance activities by which effectiveness will be monitored as well as the roles and responsibilities for maintaining the physical controls.

This section should describe each physical control that is being implemented, and how it is being implemented and maintained, as part of the LTS program. This should also include a description of other use/access restrictions required to maintain protectiveness and describe the location of where these controls are in effect at the site. Controls on off-site properties that are required for a remedy should be included in this discussion. This section should describe the overall strategy for protectiveness should a control fail.

For each of the physical controls, include a description of the following:

- Types of Physical Controls.
- Types of Inspection. Describe the inspection activities required to monitor physical controls.
- Objectives of Inspection Activities. Clearly identify the objective(s) for each inspection activity.
- Frequency. Identify the frequency at which each type of inspection is required.
- Reporting Requirements. Describe all routine reporting requirements for the results of inspection activities. Also address reporting requirements when inspections find that some sort of corrective measure or emergency response is warranted.

- Emergency Response and Corrective Action. Identify the linkage between inspection observations and emergency response and/or corrective actions arising from adverse findings, including public notification. Identify the trigger criteria that would require implementation of contingencies. This includes a description of how the data will be interpreted and what the threshold criteria are for determining when contingent actions are warranted. This section should also describe the procedure for implementing emergency response, when required, and the procedure for implementing corrective actions, when required. It should also describe the contingency plans and actions identified as a part of the existing uncertainty management strategy.
- Quality Assurance. Describe the quality assurance program under which routine inspections will be conducted.

3.5 MONITORING AND SURVEILLANCE ACTIVITIES

Monitoring and surveillance are key integral parts of a LTS Plan. There are monitoring and surveillance requirements defined when necessary for each remediation unit. The frequency of surveillance is determined by a combination of public risk and the expected failure rate of engineered protection measures.

Many of the specific details of monitoring, maintenance, and surveillance will be covered in other documents and should be referenced in the LTS Plan.

If monitoring activities are part of LTS at the site, a description of each of the following for each monitoring activity:

- Medium. Identify the medium that is being monitored (or will be monitored) and the location of the monitoring.
- Method. Identify the method to be employed for monitoring activity.
- Frequency. Identify the frequency of monitoring.
- Objectives of Monitoring Activities.
- Reporting Requirements. Describe reporting requirements for the results of the monitoring activities.
- Emergency Response and Corrective Action. Identify the linkage between monitoring and inspection observations and emergency response and/or corrective actions arising from adverse findings. Identify the trigger criteria that would require implementation of contingencies. This includes a description of how the data will be interpreted and what the threshold criteria are for determining when contingent actions are warranted. This section should also describe the procedure for implementing emergency response, the procedure for implementing corrective actions, and the procedure for public notification, when required. It should also describe the contingency plans and actions identified as a part of the existing uncertainty management strategy.
- Quality Assurance. Describe the quality assurance program under which routine inspections will be conducted.

3.6 ENGINEERED CONTROLS

This section should describe each engineered control that is being implemented, and how it is being implemented and maintained, as part of the LTS Plan. Included in the discussion about the engineered controls, should be an explanation of the surveillance and maintenance activities by which effectiveness will be monitored as well as the roles and responsibilities for maintaining the engineered controls.

This section should summarize key activities necessary to maintain engineered controls, such as caps and permeable treatment walls, and provide reference to the more detailed information. This section should include a description of the following elements for all components of the engineered controls:

- Maintenance Methods. Describe how routine maintenance will be performed on LTS engineered controls.
- Maintenance Frequency. Identify the frequency for routing preventive maintenance activities and the trigger levels for determining when corrective measures are required.
- Maintenance Reporting Requirements. Identify reporting requirements for routine maintenance activities and determine the trigger levels for reporting events or maintenance needs (e.g., repairs).

3.7 ROLES & RESPONSIBILITIES

This section should identify key individuals or groups responsible for carrying out long-term stewardship activities for the site and its individual portions and should describe their roles and responsibilities. The plan should include clear identification of the steward and other involved parties as well as how those positions relate to regulators (who often comprise the team of decision makers for LTS activities at the site). These key individuals will be identified by a process that involves DOE, regulators, landlords, and stakeholders, including the City of Oak Ridge. In addition, when other parties will carry responsibility for performance of specific LTS activities, those parties and the scope of their responsibilities must be clearly identified (i.e., when the landlord will maintain use restrictions or regulators will monitor resource use). In addition to identifying the assignment of responsibilities, this section should also identify the communication requirements, especially the knowledge management activities associated with archiving information for future generations. The role of local governments should be highlighted, in addition to records management and zoning, local emergency responders/public safety need to be reflected. (The city, for example, has a mutual aid agreement with DOE for fire protection and a memo of understanding for police.) This section should include a list of points of contacts or reference a list of points of contacts. For more detail, see Volume II, Section 3.1.

3.8 REGULATORY FRAMEWORK & MANAGEMENT

This section should provide the regulatory and institutional framework for LTS. As LTS activities are discussed, the regulatory compliance requirements at the site (or portion of the site) that will impact LTS should be mentioned. For instance,

- Identification of all LTS activities that are specifically required by regulation, statutes, Federal Facility Agreements, Records of Decision, permits, compliance orders, licenses or other third-party enforceable agreements and enforceable mechanisms.
- Identification of all LTS activities that will be conducted pursuant to DOE Orders, policies, guidance.
- Identification of any other requirements addressed in the LTS plan, such as agreements with third parties (e.g., land use or access agreements).

3.8.1 Legal Authorities

CERCLA, SARA, RCRA, OR FFA, and State laws. (Note: The SSAB Stewardship Committee is compiling an Annotated Outline of laws and regulations applicable to stewardship on the Reservation).

3.8.2 Regulatory Requirements

EPA, ATSDR, TDEC, City of Oak Ridge Planning Commission, and Seller's notice. For more detail, see Vol. II, Sects. 4.2, 4.3, 4.3.1.1, and 4.3.2.4.

3.8.3 Other Stewardship Requirements

For detail, see Volume II, Section 3.3.

3.9 INFORMATION MANAGEMENT

The information management system will: a) meet the needs of long term information retention and access, b) ensure quality control of the LTS processes by a transaction data base, and c) ensure public access to appropriate information. Also included under information management is the involvement of the public libraries and public schools in the educational program. It is vital for the host community to have a 'redundant records management system' that is physically located in a secure location along with other local government records.

It is important that this section provide specifications for the information retained under section 3.9 and stipulate the procedures and responsibility for the quality assurance of this information. In as much as some of this information has already been (and is being) supplied to the County Register of Deeds, it is important that these specifications and Quality Assurance procedures be implemented as soon as possible and any errors in the past submissions be corrected. (See attachment to LTS minutes 6-14-04: Progress Report – Feasibility Test of the Anderson County Register of Deeds and Property Assessors Systems)

The several elements of the Information Management System have the purpose: a) to retain information, b) to distribute information to users, or to make information available to the public. For more detail, see Volume II, Section 3.2.4, Appendix E.

3.9.1 The Critical Information Retention Subsystem

The purpose of this subsystem is to retain information in perpetuity and to distribute it to the appropriate users and the general public. Roane and Anderson counties play a fundamental role in this endeavor and agreements must be reached with each on flagging and indexing documents as well as its entry in to the county GIS system. For more detail, see Volume II, Section 4.1.5, Appendix E3, E4.

3.9.1.1 The County Register of Deeds

In order to provide the longest possible retention of critical information akin to that provided for property deeds, the county accepts "Notices of Contamination" and "Plat Maps" from DOE for all appropriate remediation units and enters them into the ongoing document register and into the surrogate computer database under access-terms agreed to by DOE. The DOE flagged documents are forwarded into the Tax Assessors GIS system. The documents are publicly available for both traditional and computerized searches. All counties with sites that require remediation must be involved in record retention (i.e., Anderson, Roane, and Knox counties).

3.9.1.2 The County Property Assessor

The property assessor having entered the information into the GIS system routinely passes the information to the City of Oak Ridge and the State Parcel mapping System

3.9.2 The Land Use Control Subsystem

3.9.2.1 The State Parcel Mapping System

The Tennessee Parcel Mapping System (TPMS) routinely provides information to users who are contemplating new uses of land, such as, the Tennessee Department of Transportation and land developers.

3.9.2.2 The City of Oak Ridge GIS System

(See Volume II, Section 4.3.1.1, Page 53 and Section E3.1, Page E-11) Please note that an ongoing feasibility study has made small but important changes in the flow of information into the Oak Ridge GIS system. (See progress reports to ORSSAB Stewardship Committee).

The city's GIS system will receive information in routine quarterly updates. The online GIS system is accessible to the public, realtors and developers. It also serves as a land management tool for the city's planning commission as well as a control tool for the public works department. Thus, information concerning the existence of waste on federal land parcels documented in the required "Notices of Contamination" and "Plat Maps" will be widely available in a non-federal system.

3.9.2.3 The Planning Commission

The City of Oak Ridge Planning Commission with the assistance of the city staff is responsible for the use of land through the zoning process. They will be requested to create a category of land use to ensure that contaminated DOE lands are not diverted to uses involving hazards to the potential workers or public. This needs to be done even though the land is not under the jurisdiction of the commission. The information is available to the public via the city's GIS system.

3.9.2.4 The City Tax Assessor

The city tax assessor's records have a comment field into which can be placed a contamination notice where it will be observable by public search.

3.9.2.5 The Notice to Buyers Subsystem

This subsystem will require an extension of the state requirement for various Notices to Buyers to include the presence of hazardous waste and restrictions due to residual wastes. This function ensures the sellers of property fully inform buyers of the existing conditions.

3.9.3 The Information Repository Subsystem

The purpose of this subsystem is to preserve the documentation necessary for future care and operation of the remediation sites including re-engineering to new technologies, periodic maintenance and monitoring. It operates independently of and in addition to the Critical Information Retention System of Section 3.9.1 and any information saved in the Land Use Control Subsystem, Section 3.9.2. Its content is much broader than the latter.

3.9.3.1 Determination of the Document Scope and Retention Periods

See Volume II, Sections 3.2, 3.3 and Appendix F

3.9.4 The LTS Transaction Database

The purpose of the Transaction Database is to facilitate the LTS management and to ensure quality control of the LTS process. The database accepts summary information, such as, dates, transaction type, related events, etc. It automatically starts a base record for any required event including deadline information which is then used to alert personnel to required future actions. Unfulfilled actions remain open for management review and actions. For more detail, see Volume II, Section 4.1.4 and Appendix E1.1.3.

3.9.5 The Public Access/Education Subsystem

For detail, see Volume II, Section 4.3.4, Appendix E6.

3.9.5.1 The OSTI and NTIS Systems

The Office of Scientific and Technical Information abstracts and indexes reports and forwards copies to the National Technical Information System. DOE should ensure that all appropriate reports are being abstracted and indexed properly to ensure proper retrieval under the topic: stewardship. Copies of stewardship-related reports should be sent to NTIS.

3.9.5.2 The ORR Area Libraries

In the interest of adult public education about LTS, DOE should send a selected set of LTS reports to the public libraries in the ORR region. For more detail, see Volume II, Section 6.2.

3.9.5.3 The ORR Area School Libraries and Curriculum

In the interest of the education of future generations as to the necessity of LTS, DOE should supply the public school libraries with a selected set of reports. They should work with the schools to develop suitable LTS study units and supply resource personnel and materials as needed. For more detail, see Volume II, Section 6.1. Provision must be made to update the school/teaching kits that were developed for local school curriculums.

3.9.6 The Public Reporting System

Describe the reporting system to the ORR stakeholders. This section should include a commitment to an annual public meeting given in the region.

3.10 RECORDS MANAGEMENT

This section should summarize procedures for the two key types of site-related information: 1) records that document past operations and activities; and 2) monitoring data generated as a part of the LTS program. The records comprise both pre-ROD and post-ROD documents and are detailed in Section 3.9 (Information Management). This section should identify the records that will be archived in the permanent repository and include a description of the following:

- Identification of LTS-Critical Information. Identify types of records and data critical to implementing LTS at the site, and describe how these records and data will be identified as LTS-critical.
- Information Preservation. Identify the methods and means by which information will be preserved. Includes all types of data deemed necessary (e.g., maps, photos, documents, electronic files and databases, etc.).
- Storage and Archiving LTS Records. Describe how and where records will be stored, the length of time they will be stored, and for what purpose the records are being maintained.

- Records Retrieval. Describe how record access will be enabled and the measures necessary to ensure compatibility with information hardware and software at future dates in light of continual technological advances in information management. Discussion should include location of records index or taxonomy so stewards can easily identify and locate archived records or data.
- Public Access Systems. Identify the means by which the public will be afforded access to records. Identify which of the LTS records the site anticipates will be requested by the public and which records may be made accessible.

3.11 UNCERTAINTY MANAGEMENT

This section should be closely linked to the conceptual site model and assumptions provided in Section 1.3.1 (Remediation Actions). The purpose of this section is to explicitly identify that which is not known or understood (the uncertainties) so that monitoring data can be properly evaluated and contingency plans developed and maintained to help manage potential future risk. Uncertainties should be identified and communicated to stakeholders and regulators. These uncertainties should be identified in several areas, including, but not limited to: regulatory changes, land use change (both onsite and offsite), technology effectiveness (in terms of performance), changes in ambient subsurface conditions, changes in facility use, etc. This section also needs to clearly articulate assumptions that were made during end-state selection, and selection of LTS activities, etc., such that future stewards can test those assumptions to determine if they are still valid.

3.12 CONTINGENCY PLANS/EMERGENCY RESPONSE

This section should identify the criteria that would require implementation of contingencies. This includes a description of how the data will be interpreted and what the threshold criteria are for determining when contingent actions are warranted. This section should describe the procedures used to evaluate contingencies including a contingency analysis that shows the possible responses and reporting procedures including public notification requirements. This section could also include a discussion of onsite or offsite areas that are subject to a release (failure) and the contingency measures in place. This section should also describe emergency response and reporting procedures including public notification requirements.

3.13 PUBLIC PARTICIPATION

This section should also describe the plan for community involvement, including roles and responsibilities during LTS plan development, modification, and implementation. It could also include the key points at which public meetings will be held, specific activities requiring community involvement, the extent to which DOE will rely on communities to provide assistance in maintaining controls, etc. It should include a commitment to an annual public meeting to review LTS implementation on the ORR and the LTS Implementation Plan, and a commitment to include the public in the RER 5-year CERCLA review process.

This section should identify specific activities that involve the public, such as maintaining land use planning documents and records (e.g., a historical record of community activities/population changes, industry activities), and to the extent they impact LTS planning and implementation, enforcing use and access restrictions, providing maintenance and/or surveillance support (e.g., conducting visual surveys of fences, cap integrity), and communicating to stewards any changes in land use that may impact the LTS activities (e.g., rezoning for industrial).

3.13.1 The Citizens' Board for Stewardship

This section will discuss the citizen group (Citizens' Board) representing stakeholders in maintaining LTS for the ORR (see Volume II, Section 3.4). Be sure to cite any regulations for the authority of this group. If this is a local agreement, it should be stated clearly in the Public Involvement Plan.

3.14 FUNDING/RESOURCES/SCHEDULE

3.14.1 Funding/Human Resources

This section should describe the funding sources for LTS activities as well as a general explanation of the anticipated costs of the LTS activities. It should provide the basis for the anticipated costs of the LTS activities based on a technical baseline for LTS programs and activities at the site. It should include assumptions used to develop the cost estimate, as well as assumptions for determining when sites or portions of a site will start and stop LTS activities. Discussion should include a description of the cost model used and identify those activities that are provided on a site-wide basis (e.g., site-wide fence maintenance), those activities that can be provided on a unit-cost basis (e.g., cost to monitor a single well); and those costs generated for activities at a specific portion of a site (e.g., costs associated with a specific groundwater plume, disposal cell, etc.). If possible, a cost model may be developed and used in estimating site specific cost estimates to ensure consistency among the sites.

Please include discussion of funding based on the Stewardship Report Volume II. Include a statement to the effect that there is disagreement between DOE and the State (as well as many other locals) on the subject.

This section should also describe the human resource needs including all technical functions and qualifications necessary for the technical implementation and administration of LTS activities.

This section must include information about the Perpetual Care Trust Fund for the Waste Cell – how it is administered and what it will be used for.

3.14.2 Schedule

A schedule detailing the start and completion dates of stewardship should be identified and should include appraisals of storage strategies based on 10 half-lives of radioactive and hazardous materials (e.g., Appendix A of the RER).

4. WATERSHED SPECIFIC DESCRIPTIONS

4.1 INTRODUCTION

This section should identify the location and nature of residual contaminants and physical hazards. It is the presence of these residual hazards that necessitates development and implementation of the LTS Plan. Readers seeking more detailed data can be directed to the appropriate information repository. The information in this section can be presented in graphical form (i.e., annotated maps) or other forms (i.e., tables) such that the location and the characteristics and amounts of the contaminants or residual hazards can be identified.

If applicable, identify the assumptions used in developing the site's end use. Explicitly identify that which is not known or understood so that monitoring data can be properly evaluated and contingency

plans maintained where appropriate. Assumptions will be modified or removed as monitoring data are collected and a better understanding of the site is developed.

Clearly articulate assumptions that were made during end use discussions, and selection of LTS activities, such that future stewards can test those assumptions to determine if they are still valid.

The framework for this part of the LTS plan should follow the form used when communicating with regulators, stakeholders, and the general public. The relevant LTS activities should be identified and the topics addressed in Section 3 should be included.

Examples of the six watersheds comprising the ORR and their brief descriptions are shown in Table 1. Further details for each watershed follow and additional details are found in the several reports on each watershed (RI/FS, ROD, RAR and RERs). (Expand as needed.) Aside from the CROET leases at ETTP and "Notices of Contamination" there are no other known liens and property rights.

Watershed	Code	Current Organization Responsible for LTS	Past & Current Uses	End Uses
Bethel Valley	BV	Oak Ridge National Laboratory (ORNL)	Nuclear Development, Research	Nuclear Development, Research
Melton Valley	MV	ORNL	Nuclear Waste Disposal	LT Nuclear Waste Disposal
UEFPC	UE	Y-12 National Security Facility (Y12)	Nuclear Weapons Parts Research (ORNL)	Nuclear Weapons Parts, HEU Storage, Industrialization in east end
Bear Creek	BC	Y12	Nuclear Waste Disposal	LT Nuclear Disposal
ETTP	ET	East Tennessee Technology Park (ETTP)	U-235 Enrichment Waste Disposal, Reindustrialization	Reindustrialization in several zones by leases to CROET, Waste Disposal??
Chestnut Ridge				

Table 1 – Summary of Major ORR Watersheds

For each watershed detailed information on Location, Current Uses, Potential and Future Uses. Liens and Other Property Rights, End-States, Remedial Actions and Required Stewardship of Specific Watersheds are found in the following sections with appropriate references [i.e., RI/FS, ROD, RAR, Notice of Contamination (County Registrar’s reference to book/page), Plat Map (County Registrar’s reference to book/page), RER].

4.2 MELTON VALLEY

4.3 BETHEL VALLEY

4.4 UPPER EAST FORK POPLAR CREEK

4.5 BEAR CREEK

4.6 EAST TENNESSEE TECHNOLOGY PARK

4.7 CHESTNUT RIDGE

5. OTHER ORR REMEDIATION SITES

These remediation units, designated as "Other Locations" are located on the ORR but are not a logical extension of any watershed. They are summarized in the following table and the details are given below:

Name	Location	Current Use	Potential & Future Uses	Liens & OPR
White Wing Scrap Yard Surface Interim Removal		Waste Storage		
Filled Coal Ash Pond/Upper McCoy Branch		Waste Storage		
Y-12 Centralized Sanitary Landfill				
BCV White Wing Scrap Yard ROD				

Table 2 – Summary of Other Remediation Units on the ORR

5.1 WHITE WING SCRAP YARD SURFACE DEBRIS INTERIM REMEDIAL ACTION

5.2 FILLED COAL ASH POND/UPPER MCCOY BRANCH

5.3 Y-12 CENTRALIZED SANITARY LANDFILL

5.4 BCV WHITE WING SCRAP YARD ROD

6. OFF-SITE REMEDIATION SITES

These remediation units, designated as "Off-site Locations" are located off the ORR but are the responsibility of DOE. They are summarized in the following table and the details are given below:

Name	Location	Current Use	Potential & Future Use	Liens & OPR
Poplar Creek-Clinch River Surface Water		Recreation	Same	
ORAU South Campus Facility	East Bethel Valley	None	Same	
Lower East Fork Poplar Creek		Residential	Same	
Poplar Creek , Clinch River & Lower Watts Bar Reservoir		Recreation	Same	

Table 3 – Summary of ORR Off-site Remediation Units

6.1 POPLAR CREEK/CLINCH RIVER SURFACE WATERS

6.2 CLINCH RIVER/POPLAR CREEK & LOWER WATTS BAR RESERVOIR

6.3 LOWER EAST FORK POPLAR CREEK

6.4 ORAU SOUTH CAMPUS FACILITY

APPENDIX A (*need signed copy for this Appendix*)

DOE OAK RIDGE LTS STRATEGIC PLAN, OCTOBER 2003

A.1 INTRODUCTION

Over the past fifty years the production and research activities performed by the Department of Energy (DOE) in Oak Ridge, Tennessee; Paducah, Kentucky; and Portsmouth, Ohio have left a legacy of contaminated sites and facilities. In recognition of its responsibility for these legacy environmental problems, DOE created the Environmental Management Program with a mission to:

- Remediate contaminated sites and facilities
- Dispose of newly generated waste
- Dispose of stored legacy waste
- Develop and deploy innovative remediation technologies

DOE has made significant progress in addressing its environmental legacy and has reduced the risks and costs associated with maintaining protective conditions at its sites. However, most of the contaminated sites, media, and facilities never will be remediated sufficiently to permit unrestricted use of soil, groundwater, and surface water due to factors such as technical impracticability, public and worker risk and environmental damage, and costs. Since residual contamination will remain in most cases, DOE is committed to conduct activities to assure that remedies remain protective. Through long-term stewardship the requisite activities will be conducted, and stakeholders will have access to the information necessary to evaluate the protectiveness, consequences of events, and proposed changes over time.

Long-term stewardship is the set of activities necessary to protect human health and the environment from physical hazards, residual contamination, and wastes remaining following remediation. Long-term stewardship starts when required remediation, disposal, or stabilization activities are complete or, in the case of long-term remedial actions, e.g., groundwater, surface water, and sediments, the remedy is shown to be functioning properly. However, the planning for long-term stewardship must be part of remedial decision-making. Long-term stewardship ensures that remediation remains effective for an extended, or possibly indefinite, period of time until residual hazards are reduced sufficiently to permit unrestricted use and unlimited access.

DOE acknowledges and accepts its responsibility for long-term stewardship. This Strategic Plan describes this responsibility in terms of what long-term stewardship is and why long-term stewardship needs to be performed. Details on how long-term stewardship is performed will be contained in a subsequent Long-Term Stewardship Management Plan. Following is a discussion of the vision, mission, principles, elements, priorities, strategic issues, and strategies for long-term stewardship.

A.2 VISION

DOE incorporates sound stewardship practices into all aspects of program planning and implementation. This assists DOE in reducing environmental liabilities and its footprint and returning land to its most beneficial use while promoting the vitality of human, natural and cultural resources for current and future generations. Long-term stewardship helps to accomplish this vision by:

- Implementing monitoring and maintenance measures to prevent the migration and uptake of residual contamination
- Promoting public trust in DOE through a cooperative partnership with stakeholders and state and local governments
- Incorporating long-term stewardship principles into DOE's planning and operations

A.3 MISSION

The mission of the Environmental Management Program is to manage risks to human health and the environment posed by contaminated sites and facilities, legacy waste, and newly generated waste in the most cost-efficient and responsible manner possible to provide for future beneficial reuse. The supporting mission of long-term stewardship is to:

- manage residual risks and promote the reduction of future environmental liabilities associated with DOE's cleanup and continuing operations
- protect human health and the environment
- sustain natural and cultural resources
- enhance the use of DOE's land and facilities for the public good

Long-term stewardship activities are intended to prevent receptors (people, plants, and animals) from encountering the residual hazard (usually through land use controls) and to prevent the residual hazard from migrating to the receptor (generally through engineering technologies).

A.4 PRINCIPLES

- **Long-term stewardship is a DOE-wide responsibility** – DOE is committed to the protection of human health and the environment in all of its actions. To ensure success, all DOE programs must consider long-term stewardship as an integral part of the DOE's mission.
- **Long-term stewardship is a component of all aspects of DOE decision-making** – It is the responsibility of DOE to ensure that long-term stewardship is considered in each decision that impacts cleanup. This responsibility extends from the identification of remediation alternatives, remedial design, construction, and operation through all relevant decisions made over the lifetime of the hazards.
- **DOE is a Trustee of natural and cultural resources** – Residual hazards should be managed within the larger context of Federal land management, which includes trusteeship for ecologically and culturally important areas. DOE will manage these hazards in accordance with applicable regulatory requirements.
- **Long-term stewardship should be incorporated into relevant DOE policies, practices and systems** – Long-term stewardship will be most effective when integrated into existing DOE processes and management systems. As these DOE policies, practices, and systems (such as Life Cycle Asset Management, Integrated Safety Management and Environmental Management Systems) are reviewed and/or implemented, a broad range of long-term stewardship activities and needs may be incorporated. This will facilitate the establishment of long-term stewardship as an essential element of all facets of DOE missions.
- **An inter-generational approach is needed for long-term stewardship** – Long-term stewardship is an enduring commitment by the federal government. Due to the longevity of hazards, the ramifications and costs of current and future decisions and missions will be experienced by generations to come. As these generations' land use practices and local community structures change over time, current assumptions that guide DOE policy may require reevaluation and modification.
- **Long-term stewardship policy must provide a consistent framework and acknowledge the need for flexibility** – Although a consistent framework for long-term stewardship is required for complex-wide management, the framework must be responsive to site-specific requirements. Therefore, DOE long-term stewardship policy must be sufficiently flexible to enable sites to perform necessary long-term stewardship functions within their individual regulatory frameworks and communities.
- **The involvement of stakeholder and state and local governments is critical to long-term stewardship** – DOE has the responsibility to consult with these affected parties on long-term issues.

Ongoing interaction and exchange increases public awareness. In turn, heightened public awareness facilitates informed decision-making and increases the likelihood of successful implementation of long-term stewardship.

A.5 OBJECTIVES

- Execute, document, and evaluate long-term stewardship.
- Incorporate long-term stewardship into DOE's existing planning and management processes.
- Ensure the availability of adequate resources to sustain long-term stewardship.

A.6 ELEMENTS

The basic elements of a long-term stewardship program are:

- **Stewards** – Stewards are those responsible for developing, implementing, and overseeing the stewardship activities. Identifying the stewards, defining their roles and responsibilities, and defining their interactions are essential for a successful long-term stewardship program.
- **Operations** – Operations are those activities necessary to ensure the integrity of the remedy and include operations, inspection, surveillance, monitoring, enforcement, maintenance, modification, replacement, and evaluation.
- **Information Systems** – Information systems maintain records of residual contamination, associated risks, and required long-term stewardship activities. Information systems must obtain, maintain, and retrieve the information necessary as long as the residual contamination poses a risk to human health and the environment.
- **Research** – Research is needed in areas such as the long-term performance of stabilization and containment technologies and long-term migration of contaminants to reduce the cost of long-term stewardship and the risk of residual contamination.
- **Public Participation** – Public participation is required since the public is being protected and should be involved in selecting, implementing, and reviewing the performance of the remedy and long-term stewardship activities. Since many remedies do not fully define institutional controls until after the remedial decision is made, and long-term stewardship requirements are not known until after the remedial decision is made, the public should be involved throughout the remedial process so their confidence will be enhanced.
- **Public Education** – Public education is necessary to ensure that the nature and risk of residual contamination and the resultant types of land use controls are understood. This understanding will facilitate the enforcement of land use controls.

Each of these elements must work together to make long-term stewardship effective. First, stewards must be identified and their individual roles and responsibilities defined. Second, the tools of long-term stewardship, including operations, information systems, and research must be designed and implemented. Finally, the public must be involved and educated in long-term stewardship activities.

A.7 IMPLEMENTATION STRATEGY FOR THE OAK RIDGE RESERVATION

Remedial decision-making on the Oak Ridge Reservation is being phased. Interim decisions are being made on specific source areas (K-1070-A Contaminated Burial Ground), for migration pathways (SWSA-4 seeps), and for the majority of a watershed (Melton Valley). The strategy is to continue phasing interim remedial decisions until all aspects of a watershed are addressed. When sufficient scope is included in an interim decision to set an overall land use objective for the watershed, interim land use controls will be included in the remedial decision. The last element of the watershed will be documented in a final remedial decision for the watershed. At that time, final land use control decisions will be made. The interim and final remedial decisions assume DOE has a significant and ongoing presence and relies mostly on existing controls. The final remedial decision legally will require these existing controls to be maintained by DOE.

Land use controls are described in several documents. First, Records of Decision state the land use controls that are required as part of the remedial action. A Land Use Control Action Plan describes in more detail the land use controls required by the Records of Decision. Since a single Record of Decision may include several actions sequenced over time, a Land Use Control Implementation Plan is prepared for each Record of Decision that describes how the land use controls will be maintained. Finally, Surveillance & Maintenance Plans and monitoring plans are prepared that describe in detail how the land use controls will be operated, inspected, surveyed, monitored, enforced, maintained, modified, replaced, and evaluated. The annual Remedial Effectiveness Report includes the performance of the Land Use Controls.