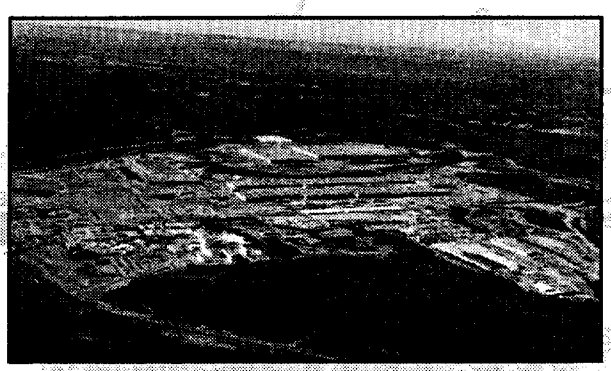
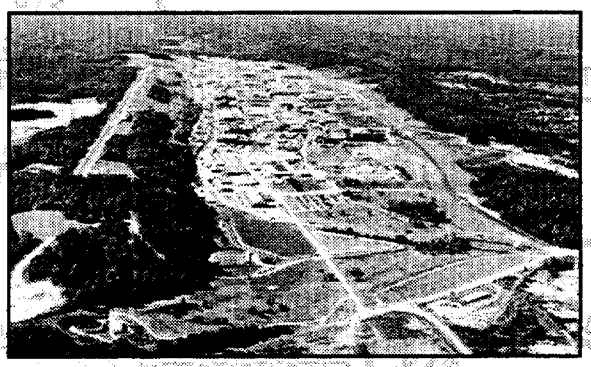
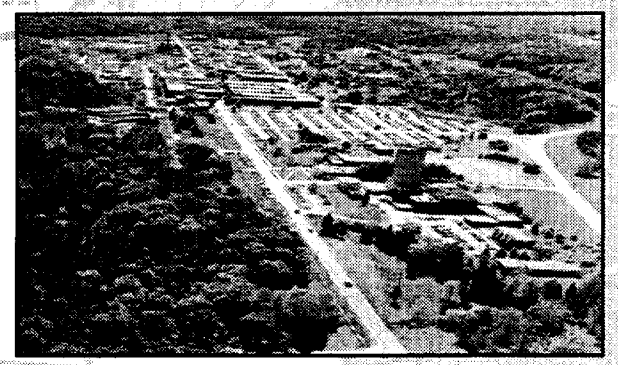
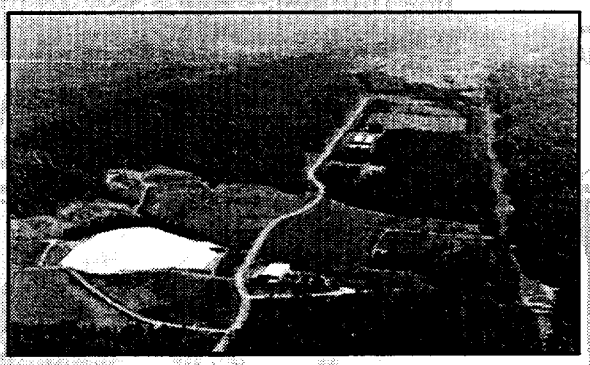
OAK RIDGE RESERVATION

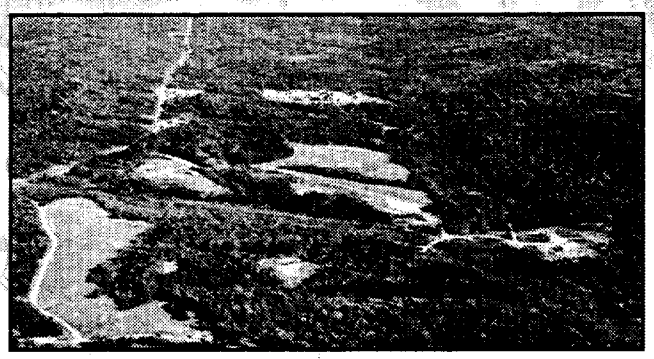
END USE WORKING GROUP











Final Report of the Oak Ridge Reservation End Use Working Group

July, 1998

This report was written and edited by the members of
the End Use Working Group with the assistance of
Phoenix Environmental Corporation
of Alexandria, Virginia.

Additional copies and information can be found on the
DOE Oak Ridge Operations site on the world wide web:
ornl.gov/doe_oro/em/emhome.html

or by calling the Information Resource Center
at 423-241-4582.

TABLE OF CONTENTS

1.0 INTRODUCTION 1

2.0 BACKGROUND 2

2.1 Description of the Oak Ridge Reservation 2

2.2 The CERCLA Process 4

2.3 Formation of the End Use Working Group 5

3.0 THE END USE WORKING GROUP PROCESS 6

3.1 Scope of the End Use Working Group 6

3.2 Membership and Structure 6

3.3 Education and Decision Processes 8

3.4 Criteria Used in Making End Use Recommendations 9

3.5 The EUWG's Relationship with DOE, Regulators, and Other Stakeholder Groups 10

4.0 END USE WORKING GROUP RECOMMENDATIONS 12

4.1 Community Guidelines 13

4.2 Recommendations for the End Use of Bethel Valley 17

4.3 Recommendation to Site a Waste Disposal Facility on the Oak Ridge Reservation 22

4.4 Recommendations for the End Use of Bear Creek Valley 27

4.5 Recommendation for the End Use of Disposal Areas in Melton Valley 32

4.6 Recommendations for the End Use of the Upper East Fork Poplar Creek Watershed 38

4.7 Recommendations for the End Use of the Former K-25 Site at the East Tennessee Technology Park 46

4.8 Recommendations for Sites Outside Existing Administrative Watersheds 54

4.9 Stewardship 56

5.0 CONCLUSIONS 58

ACKNOWLEDGMENTS 59

TABLE OF CONTENTS (continued)

Appendix A Roster of EUWG Participants
Appendix B Examples of EUWG Education Materials
Appendix C Schedule of EUWG Meetings and Topics
Appendix D Additional Issues Submitted by EUWG Participants
Appendix E Endorsements of EUWG Recommendations
Appendix F Additional Comments Received by the EUWG

LIST OF RECOMMENDATIONS

End Use Working Group Community Guidelines 16
End Use Recommendations for Bethel Valley 20
End Use Map of Bethel Valley 21
End Use Recommendations for an On-Site Waste Disposal Facility 24
Map Showing Proposed Location of an On-Site Disposal Facility 25
Minority Opinion for an On-Site Disposal Facility 26
End Use Recommendations for Bear Creek Valley 30
End Use Map of Bear Creek Valley 31
End Use Recommendations for Melton Valley 36
End Use Map of Melton Valley 37
End Use Recommendations for the Upper East Fork Poplar Creek Watershed 43
End Use Map of the Upper East Fork Poplar Creek Watershed 45
End Use Recommendations for the Former K-25 Site 50
End Use Map of the Former K-25 Site 52
Minority Opinion for the Former K-25 Site 53
End Use Recommendations for Sites
Outside Existing Administrative Watersheds 55

LIST OF FIGURES AND TABLES

Figure 2.1 Map of the Oak Ridge Reservation 3
Table 3.1 End Use Criteria 11
Figure 4.1 Aerial View of Bethel Valley Looking East 17
Figure 4.2 Aerial View of Bear Creek Valley Looking East 27
Figure 4.3 Aerial View of Melton Valley Looking East 32
Figure 4.4 Aerial View of the Y-12 Plant Looking West 38
Figure 4.5 Aerial View of the Former K-25 Site Looking West 46

LIST OF ACRONYMS

ARAR	Applicable or Relevant and Appropriate Requirements
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (Superfund)
DOE/ORO	Department of Energy/Oak Ridge Operations
DNAPL	Dense Non-Aqueous Phase Liquid
EPA	U.S. Environmental Protection Agency
ETTP	East Tennessee Technology Park
EUWG	End Use Working Group
FS	Feasibility Study
GIS	Geographic Information System
LOC	Oak Ridge Reservation Local Oversight Committee
ORNL	Oak Ridge National Laboratory
ORREMSSAB	Oak Ridge Reservation Environmental Management Site Specific Advisory Board
PCBs	Polychlorinated Biphenyls
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
ROD	Record of Decision
TCE	Trichloroethylene
TDEC DOE-O	Tennessee Department of Environment and Conservation, Department of Energy Oversight
TSCA	Toxic Substances Control Act
TRU	Transuranic
VOC	Volatile Organic Compound

1.0 INTRODUCTION

The Oak Ridge Reservation End Use Working Group (EUWG), a broadly-based voluntary citizens group, was formed in January 1997 to develop and evaluate guidelines and recommendations for future uses of contaminated areas following remediation on the Oak Ridge Reservation. The purposes of this *Final Report of the End Use Working Group* are to:

- document the history and purpose of the EUWG;
- outline the process used by the EUWG to make recommendations for end uses of contaminated areas on the Reservation;
- describe the end use recommendations; and
- briefly describe the need for a long-term stewardship program for the Reservation.

The EUWG believes it is important for the public to understand the process and rationale the Group used in developing its guidelines and recommendations. Community understanding will help to avoid future confusion or mis-interpretation, and will facilitate stakeholders' ability to ensure that the U.S. Department of Energy (DOE) carefully considers these end use recommendations during remediation efforts.

2.0 BACKGROUND

2.1 Description of the Oak Ridge Reservation

The 35,000-acre Oak Ridge Reservation includes three major DOE installations: the East Tennessee Technology Park (formerly the K-25 Site), Oak Ridge National Laboratory in Bethel Valley, and the Y-12 Plant. These installations occupy about 30 percent of the Reservation. The remainder of the Reservation is designated as a National Environmental Research Park established in 1980 to provide protected land for environmental science research and education and to demonstrate that energy technology development can coexist with a quality environment. All of the Reservation lies within Anderson and Roane Counties, and most of the property is within the city limits of Oak Ridge. The Clinch River forms the southern and western boundaries of the Reservation.

Since the early 1940s the Reservation has been the site of nuclear research and vital national security missions. These activities left a legacy of radioactive and toxic chemical wastes requiring management and/or disposal. Five to 10 percent of the Reservation is occupied by old waste 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 soils, groundwater, and surface water. Radioactive elements include 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 are also quantities of radioactive uranium (which will pose a hazard for millions of years). Other radionuclides and non-radioactive chemicals such as PCBs are also present.

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 resulting in contaminated soil, surface water, sediments, and groundwater. A complex geology provides for ready movement of groundwater on many parts of the Reservation.

In order to consolidate investigation and remediation of environmental contamination, the contaminated areas of 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 TDEC DOE-O, decided that a comprehensive watershed approach to planning remediation activities is more effective than the usual unit-by-unit approach. One or several CERCLA Records of Decision for each watershed will replace hundreds of lesser documents, potentially resulting in considerable savings in time and money. The watershed approach also 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. A map showing the remediation watersheds and political boundaries is shown in Figure 2.1.

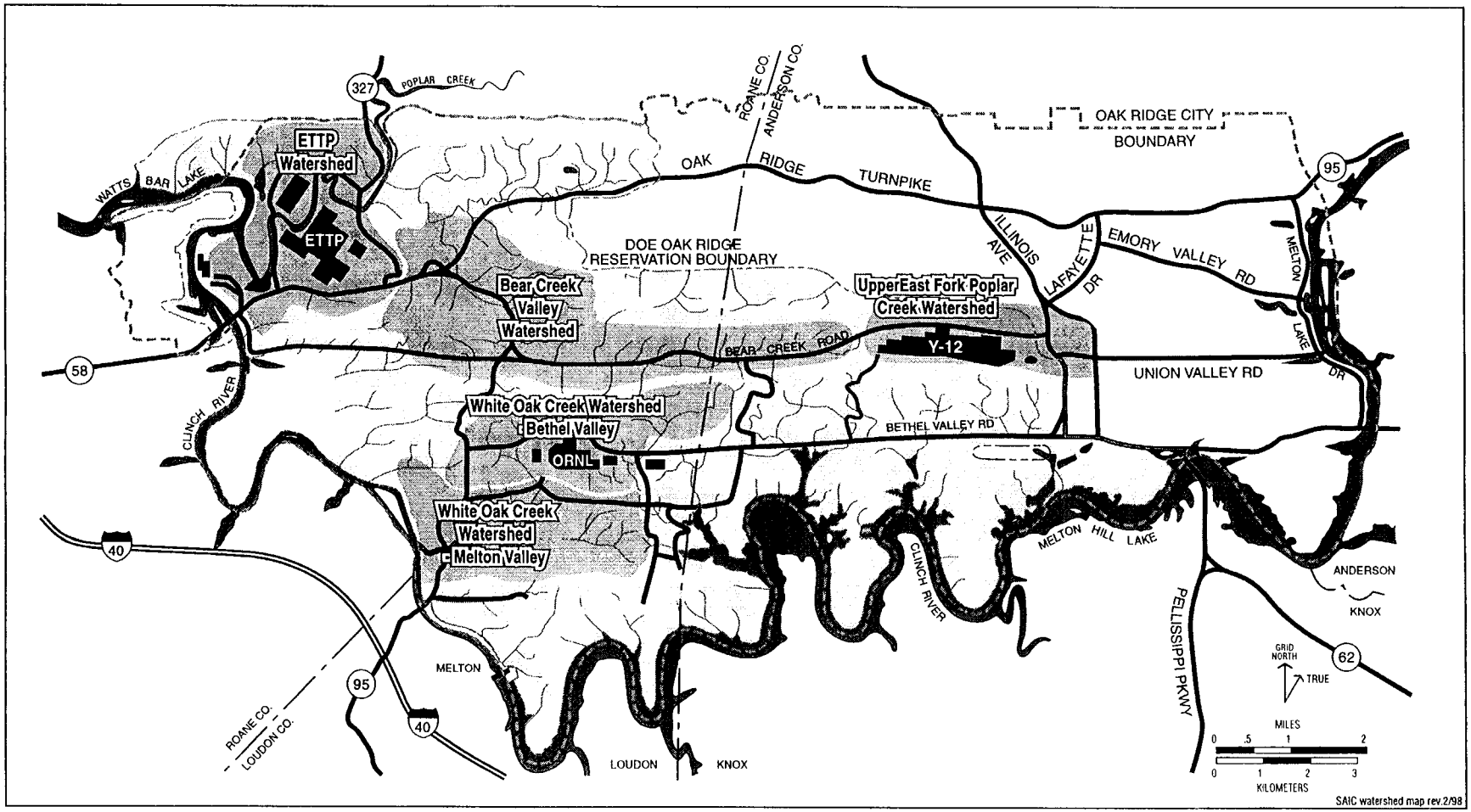


Figure 2.1 Map of the Oak Ridge Reservation

2.2 The CERCLA Process

The principal federal law governing hazardous waste cleanup is the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA). Under CERCLA, EPA evaluates federal facilities for inclusion on the National Priorities List based on the level of contamination, affected receptors (i.e., human population, ecosystems) and pathways through which contamination might reach receptors. Placement on the National Priorities List increases public awareness of contamination, involves the EPA in cleanup oversight, and aids in allocation of cleanup funds.

The Oak Ridge Reservation was placed on the National Priorities List on November 21, 1989. However, large areas of the Reservation have never been used for nuclear weapons production, research processes, or waste management. These unaffected areas of the Reservation are proposed for delisting and removal from the provisions of CERCLA. If delisting is accomplished, up to 6,000 acres of the 35,000-acre Reservation would still be subject to CERCLA.

The EPA headquarters coordinates and sets policy for environmental restoration of federal facilities. The DOE is responsible for determining the nature and extent of contamination, ensuring that remediation takes place, and funding the work at DOE facilities including the Oak Ridge Reservation.

At National Priorities List facilities, regulatory agencies oversee remediation. For the Oak Ridge Reservation, regulatory authority and oversight are vested in EPA Region 4 and TDEC DOE-O. Local government and the public play less formal roles by commenting on remediation plans, or taking political action to influence cleanup decisions.

The CERCLA requires a legally binding Federal Facility Agreement between agencies (i.e., DOE, EPA and TDEC DOE-O) to establish timetables, procedures and documentation for cleanup of federal facilities on the National Priorities List. The Federal Facility Agreement for the Oak Ridge Reservation was implemented on January 1, 1992.

Under the CERCLA process, a Record of Decision formally documents the selection of a preferred remediation method. Preceding the Record of Decision, a Remedial Investigation/Feasibility Study determines the nature and extent of contamination and evaluates feasible remediation alternatives, one of which is designated as the preferred alternative. These alternatives, including the preferred alternative, are summarized and presented to the public for review and comment in a Proposed Plan. After receiving concurrence on the Proposed Plan from EPA and TDEC, the selected alternative is published in a Record of Decision. The Record of Decision is a key milestone in the CERCLA process because it:

- Documents a legally binding decision that cannot be changed without following specific procedures, including public review;

- Provides the technical basis for the cleanup decision;
- Summarizes public comments and DOE's responses; and
- Identifies specific surveillance and monitoring actions.

Following the Record of Decision, DOE prepares a Remedial Design Work Plan and a Remedial Action Work Plan for implementation of remediation activities. After remediation is finished, a Remedial Action Report is issued, which summarizes the conduct and results of field construction and monitoring activities and documents that the remedial actions were performed in compliance with CERCLA. After five years, performance of the remediation must be reviewed and documented.

2.3 Formation of the End Use Working Group

In late 1996, DOE issued a draft proposal on its preferred remediation method for four surface impoundments at Oak Ridge National Laboratory (ORNL). This proposal included the creation of a consolidated disposal cell within the surface impoundments area. However, the State of Tennessee seemed to favor an alternative proposal involving complete excavation of the impoundments, with disposal of contaminated waste off the ORNL site. The State also believed that DOE's remediation decisions lacked community involvement. Subsequently, the State recommended that any remediation decision for the surface impoundments should include broad-based public involvement.

In response to the State's recommendation, DOE asked the Oak Ridge Reservation Environmental Management Site Specific Advisory Board (ORREMSSAB) to initiate a process to gain better understanding of community values and desired future uses for contaminated areas on the Reservation. The Board determined that a broad independent group would be needed for such an effort. A steering committee from the Board was formed to initiate the effort, and encouraged stakeholders to get involved in the effort because of its importance for remediation planning.

In January 1997, the Board sponsored a public meeting to seek volunteers for the End Use Working Group (EUWG). More than 100 attendees discussed the issues and process of the EUWG. As a result, more than 20 individuals initially participated as EUWG members, while a similar number requested to be kept informed by receiving EUWG materials. An experienced technical facilitator was hired to help the Group direct its efforts and maintain its focus. After some debate, it was determined that the name "End Use Working Group" best described the issues facing this newly formed group.

Although the EUWG operated as a separate entity, close contact was maintained with the Board. Several EUWG members served on a special Board committee, in order to keep Board members advised of EUWG activities.

3.0 THE END USE WORKING GROUP PROCESS

3.1 Scope of the End Use Working Group

The DOE asked the EUWG to develop:

- recommendations for end uses of contaminated areas on the Oak Ridge Reservation; and
- community values that could be used to guide DOE's remedial action decision-making process.

These end use recommendations will help DOE identify objectives for remediation. However, if remediated land is released from DOE ownership, uses for that land will be determined by local government planning commissions and landowner decisions, within relevant deed and zoning restrictions.

The EUWG process preceded CERCLA cleanup decisions for the watersheds, with the result that the EUWG's end use recommendations and Community Guidelines will be factored into overall remediation planning. The EUWG did not replace existing public involvement opportunities, nor did it make recommendations on specific remediation levels or technologies. As additional data are generated during the CERCLA process, the context of end use recommendations could change. Recognizing this possibility, each EUWG recommendation contains the statement that "if DOE cannot meet the EUWG recommendations, then exceptions must be discussed in a public forum as part of the decision-making process."

As EUWG deliberations progressed, it became apparent that additional issues related to end use recommendations needed to be evaluated:

- the relationship of the use of contaminated groundwater and surface water to recommended end uses for contaminated areas;
- the need for a long-term stewardship program to protect human health and the environment when an end use recommendation results in residual contamination; and
- the need for an on-site waste disposal facility somewhere on the Oak Ridge Reservation.

3.2 Membership and Structure

Approximately 20 EUWG members met almost every two weeks from February 1997 through June 1998. In addition, a volunteer steering committee of four to six members met before and after each meeting to help direct the content, scope, and format of information and presentations for each meeting.

EUWG membership was diverse and included members from most area stakeholder organizations, including the Oak Ridge Environmental Peace Alliance, both the Citizens' Advisory Panel and the Board of the Oak Ridge Reservation Local Oversight Committee, the Oak Ridge Reservation Environmental Management Site

Specific Advisory Board, Friends of Oak Ridge National Laboratory, Oak Ridge Environmental Quality Advisory Board, League of Women Voters, and Coalition For a Healthy Environment. Oak Ridge City government also participated through members of the Oak Ridge City Council and the Oak Ridge Regional Planning Commission. Participation by individuals with different perspectives enhanced the quality of discussions and the development and evaluation of alternative end uses for contaminated areas within each watershed. Appendix A contains a list and brief background of individuals who participated in the EUWG.

Oak Ridge citizens and area stakeholders have a deserved reputation for involvement in local issues. This long-standing community activism was evident within the EUWG. Most members regularly participated in meetings, and several thousand hours of volunteer time were devoted to a quality process and outcome.

Membership was open to all stakeholders interested in the future of the Oak Ridge Reservation, and visitors regularly attended and contributed to discussions. Steering committee meetings were also open to anyone who wished to attend. No formalized registration procedures or prerequisites for membership existed. The EUWG asked only that its members attend and actively participate in meetings. Meetings were videotaped for airing on public access television; these videos also provided members who were absent from meetings the opportunity to review the Group's activities.

Open membership allowed individuals to join the EUWG at any time. Throughout the process, participation was strongly encouraged through mailings, newspaper ads, and personal contacts. Members were also free to attend only those meetings that related to recommendations that were most important to them. Schedules were advertised in advance so that individuals could track the EUWG progress and identify when specific sites and issues would be discussed.

Most of the original EUWG members participated throughout the process, but the open process did result in changing membership. However, the consistent format of information and discussions, easy access to past meeting information, and focused scope enabled the Group to make continuous progress without much need for revisiting issues.

The EUWG formed committees on an ad hoc basis to examine two issues important to the end use process. The first was the Community Guidelines committee, followed by the Stewardship Committee, which was a joint effort with the Friends of Oak Ridge National Laboratory. The committees' progress was regularly communicated to the full EUWG during its general meetings.

3.3 Education and Decision Processes

EUWG members strove to understand the key information needed to make end use decisions for each watershed. It is important to remember that the scope and timing of the end use process precedes the remedy selection process. Thus, detailed Remedial Investigation information was not yet available for all watersheds. However, the level of written information, coupled with the participation of technical experts responsible for each watershed, was considered by most members to be adequate to make end use recommendations. The EUWG presentations, information and discussion included:

- historic uses of sites and waste disposal practices,
- nature and extent of the contamination,
- current risks to human health and the environment,
- future land use projections,
- geology and hydrology of the area,
- potential remediation risks and costs,
- the practicality of achieving different end uses,
- likely near-term uses of sites,
- environmental justice and inter-site equity, and
- long-term stewardship.

The EUWG and its support staff worked to ensure that members reached a common level of understanding on issues before discussions ended or recommendations were drafted. Tours and numerous informational sessions were held for each watershed. Experts worked with the Steering Committee to develop charts, diagrams, graphs and document summaries that presented complex, abstract, and often confusing technical data in a form understandable to the layperson. These materials were assembled into reference notebooks that served as background for understanding and discussing crucial issues. These materials will be retained as a record of the process. (See Appendix B for examples of a few of these materials.) The EUWG also sponsored programs for learning about broader issues, such as a half-day workshop on nuclear criticality concepts.

Another strength of the EUWG was the use of an independent technical facilitator experienced in public participation, future use planning, and the technical aspects of remediation. He worked closely with the EUWG to encourage involvement while maintaining the Group's focus, and ensured that all sides of an issue were explored and all relevant information evaluated before recommendations were drafted. He was selected by of the Site Specific Advisory Board to facilitate the EUWG because of his background as an environmental engineer and his experience in successfully guiding stakeholder groups through similar processes.

The EUWG members were urged to discuss information openly. Members were free to request additional information or discuss problems with the available experts. While most members were satisfied with the level of information presented by DOE and its contractors, some members were not. It was a constant

challenge to decide how much information was needed to make end use recommendations within the time constraints of the Group. (See Appendix C for a list of meetings and topics addressed.)

Recommendations were developed only after all information was presented. Draft recommendations were developed based on the key issues identified by the Group and then debated and amended until key issues were addressed and general agreement was reached. Then, recommendations were finalized and signed by those members who chose to support a recommendation; no formal votes were taken. (Signed recommendations are in Section 4.)

Toward the end of the process, several members felt there were some outstanding issues to be addressed. The Group asked its members to submit such issues, and two members submitted a total of 25 issues. A survey of then-current members was taken of the importance of these issues to completing the end use process. Survey results showed that, while some issues were considered generally important, their resolution was not believed to be necessary to complete the end use process. The EUWG forwarded these issues to DOE requesting appropriate action. (See Appendix D.)

3.4 Criteria Used in Making End Use Recommendations

A hierarchy of end uses was developed to illustrate how increasingly stringent cleanup levels allow for less restrictive end uses. Table 3.1 identifies the end use categories and the criteria used by the EUWG in evaluating contaminated areas on the Reservation and making end use recommendations. Each land use alternative has its own unique set of criteria which describe how the land and water are expected to be used following remediation. For example, each category has an allowable excavation depth. These excavation depths were considered typical for the given end use and were used to determine relative volumes of wastes and associated costs for end use discussions. However, the criteria and resulting estimates were in no way intended to represent legal or other requirements, or the actual remedial alternatives that will be developed for sites. The EUWG recognizes that environmental laws and regulations ultimately determine the remedial actions that occur on the Reservation. Thus, actual remediation will be based on more detailed information, analysis, and design than this simple end use scheme developed by the EUWG.

Table 3.1 End Use Working Group End Use Criteria

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

3.5 The EUWG's Relationship with DOE, Regulators, and Other Stakeholder Groups

Department of Energy

The EUWG received administrative, technical, and financial support from DOE Oak Ridge Operations Environmental Management Program and its contractors. DOE's watershed team leaders were involved throughout the EUWG process and made themselves available to provide information about their watersheds. They participated in the preparation and presentation of data and worked to understand the impact of the EUWG recommendations on their watersheds. Countless hours were provided by DOE and its contractors responding to information requests. The DOE senior management provided continuous support and participated in most meetings. The DOE is committed to using the EUWG recommendations in its decision-making process for remediation of contaminated areas on the Reservation.

Regulators

The EUWG members met with EPA Region 4 and TDEC DOE-O to ensure that EUWG activities were serving the regulators' environmental decision-making expectations. In addition, TDEC DOE-O staff attended almost every meeting, and EPA staff attended meetings in the early months of the process. The EUWG also held a meeting with Justin Wilson, Deputy to the Governor for Policy, to discuss the State's position on long-term waste disposal and stewardship.

Other Stakeholder Groups

EUWG members met with the following stakeholders and local government groups interested in remediation of the Reservation to discuss the EUWG process and its results:

- Oak Ridge Reservation Environmental Management Site Specific Advisory Board (ORREMSSAB),
- Oak Ridge Reservation Local Oversight Committee (LOC),
- Citizens' Advisory Panel of the LOC,
- Friends of Oak Ridge National Laboratory,
- League of Women Voters of Oak Ridge,
- Oak Ridge City Council,
- Oak Ridge Regional Planning Commission and Community Development staff,
- Oak Ridge Environmental Quality Advisory Board,
- Oak Ridge Chamber of Commerce,
- Roane-Anderson Professional Society, and
- Oak Ridge High School Advanced Placement Environmental Sciences class.

Of these, the first four groups subsequently endorsed most or all EUWG recommendations and Community Guidelines (see Appendix E for examples). In the case of ORREMSSAB, EUWG recommendations were reformatted and modified slightly in some cases before being formally presented to the DOE.

4.0 END USE WORKING GROUP RECOMMENDATIONS

This section presents each of the End Use Working Group recommendations. It briefly summarizes the Group's discussion of issues in reaching these recommendations, and identifies minority opinions where applicable. More detailed meeting summaries and videotapes of each meeting are also available.

Overall, the EUWG also developed four types of recommendations:

- Community Guidelines for contaminated land and water on the Oak Ridge Reservation;
- Recommendations for end uses of each of the five watersheds on the Oak Ridge Reservation as well as for several sites not currently included in the watersheds;
- Recommendations for siting an on-site disposal facility on the Oak Ridge Reservation; and
- Recommendations on long-term stewardship of contaminated land which are summarized in this section and presented in full in a separate *Stakeholder Report on Stewardship.*

It is important to reiterate that the purpose of EUWG recommendations is to identify stakeholder preferences for the future use of currently contaminated areas on the Reservation following remediation. These recommendations were developed for each of the five watersheds to guide the cleanup decision-making process, but they are in no way meant to identify specific remediation levels or technology, or to contradict existing cleanup laws or regulations.

As the EUWG progressed, it improved its decision processes and the language of its recommendations. The EUWG wished to preserve the original signed versions of its earlier recommendations, while recognizing that the precision of language and completeness of recommendations improved over time. One improvement was the use of a final paragraph in each recommendation that clarifies its implementation:

> *Implementation of these recommendations by the DOE must be consistent with the End Use Working Group Community Guidelines and its recommendations for stewardship. If DOE cannot meet these recommendations, exceptions must be discussed in a public forum as part of the decision-making process.*

As the preciseness of terms used by the Group was improved and end use categories were refined, changes were made in the end use criteria. Table 3.1 in Section 3 presents the final end use categories and their descriptions. Where the term "restricted" is used, it means a restricted waste disposal area as described in Table 3.1. Also, residential uses would only be allowed in lands remediated to unrestricted use as reflected in Table 3.1.

4.1 Community Guidelines

The final Community Guidelines for Determining End Uses of Contaminated Land and Water on the Oak Ridge Reservation were approved on June 11, 1998. The final version is presented on page 15.

Background

The Community Guidelines were developed through a cooperative effort among EUWG members. Membership of the EUWG was diverse, and members came to the Group with their own values and beliefs on how DOE should act with respect to remediation decisions on the Reservation.

The Group examined the following documents to identify ideas that were important to other citizen groups:

- Vision, Critical Success Factors, and Principles of the Oak Ridge Reservation Environmental Management Site Specific Advisory Board,
- Consensus Values of the Fernald Citizens Advisory Board,
- Values of the Hanford Future Site Uses Working Group, and
- Values of the Hanford Advisory Board.

Members presented their individual values to the Group. Similar values were combined and grouped in the following categories:

- General values;
- Making end use recommendations;
- Institutional and long-term controls;
- Environmental values;
- Social and human values;
- Economic values; and
- Other community values.

Once the values were grouped, several common underlying principles became evident. Thus, the original values were separated into principles and values. Eventually, the principles became the preamble of the Community Guidelines. Members also realized that the "values" were better described as "guidelines." Thus, community values became the "Community Guidelines."

A volunteer Community Guidelines committee worked to clarify sentiments within each statement to limit the likelihood of misinterpretation. The committee consisted of members of the EUWG and several other citizen groups. Using the following criteria, the committee evaluated the guidelines for their applicability to the EUWG process:

- All remediation will be performed in accordance with the nine CERCLA criteria; therefore, guidelines that merely restated these legal requirements were eliminated.

- Guidelines should focus on making end use decisions; therefore, most guidelines not directly relevant to end use decisions were eliminated.
- Guidelines portraying identical concepts were combined.
- Guidelines with multiple concepts were separated.
- The EUWG would prioritize the guidelines; therefore, qualifying language was eliminated, and all statements were made equal in strength.

Using these criteria, final guidelines were selected and a prioritization process was used by members to rank the guidelines. This prioritization provided an overall sense of the most important issues. Guidelines receiving few votes in the prioritization process were still important, but did not carry the weight of guidelines that received more votes.

The Community Guidelines were considered a living document throughout the EUWG process. Two additional guidelines were added during deliberations of the individual end use recommendations. Guidelines for the end use of groundwater and surface water were also developed and added to the overall Community Guidelines.

The Group prefaces the Community Guidelines with principles developed as part of the guidelines process. These principles include the need for an open and honest relationship among DOE and stakeholders; the need for remediation activities to be protective of human health and the environment; and several other broad cultural, economic, and social considerations.

COMMUNITY GUIDELINES FOR DETERMINING END USES OF CONTAMINATED LAND AND WATER ON THE OAK RIDGE RESERVATION

The End Use Working Group believes end use decisions for the Oak Ridge Reservation, and associated remedial activities, must include consideration of the community's values. The public and the Department of Energy (DOE) have a mutual responsibility to deal with each other openly and honestly. To enable stakeholders to comment responsibly on end use and remediation options, DOE must provide accurate and timely information.

DOE's Environmental Management Program should be guided by end use recommendations that are provided by the stakeholder community, are endorsed by the City of Oak Ridge and can accommodate changing circumstances. Once end use recommendations are provided by the community, the federal government should commit to completing all remediation to meet recommended end uses and should provide opportunities for meaningful public involvement. The federal government's goal should always be the protection of human health and the environment. In its decision making, the federal government should use the best available science and technology, while taking into account cultural, social and economic factors, environmental justice and risks to workers.

The End Use Working Group developed the following guidelines for DOE to use in making future use decisions for contaminated land and water. The guidelines for contaminated land are presented in order of priority. Each guideline for contaminated water carries equal weight. DOE should explain how the guidelines are incorporated or cannot be incorporated into each of its decisions.

Guidelines for Contaminated Land

1. All owners and operators of property must, at a minimum, comply with applicable state and federal regulations to provide safe working conditions and to protect nearby residents and the environment.
2. Contaminated material left on site, regardless of the site's end use, must be controlled to prevent further spread.
3. The federal government should work with state and local governments, in consultation with the public, to establish and fund a long-term stewardship program for contaminated lands.
4. DOE and its contractors should minimize impacts on the environment during remediation and maximize restoration of the environment after remediation.
5. End uses for lands containing residual contamination should include buffer zones that protect current and future nearby populations.
6. End use decisions for contaminated lands should allow for the safe use and development of Oak Ridge Reservation lands, future employment, and research opportunities.
7. When siting additional facilities, DOE should use brownfield sites instead of greenfield sites.
8. Structures unsuitable for future uses should be demolished expeditiously.
9. Waste should be relocated only to reduce total risks to human population and the environment.

**COMMUNITY GUIDELINES FOR DETERMINING END USES
OF CONTAMINATED LAND AND WATER
ON THE OAK RIDGE RESERVATION**

10. Institutional controls in lieu of remedial actions should be used only in cases where DOE has satisfied the community that further restoration is not feasible.
11. DOE's program offices must coordinate their activities and end use decisions and should provide for meaningful, broad-based public involvement.
12. End use decisions should be reevaluated as better technologies become available.
13. End use decisions should strive to reduce the amount of land requiring long-term control.
14. End use of contaminated sites should be compatible with projected uses of adjacent properties.

Guidelines for Contaminated Water

1. The federal government must assure the unrestricted use of groundwater exiting the boundaries of the Oak Ridge Reservation.
2. The federal government must control contaminated groundwater resulting from Oak Ridge Reservation activities such that the use of currently uncontaminated groundwater is not impacted. Where it is necessary to restrict the use of uncontaminated groundwater to prevent the expansion of contaminant plumes, the goal of remediation should be to expeditiously eliminate those restrictions.
3. If contaminated groundwater remains after remediation, the federal government must restrict its use and prevent the contamination from spreading.
4. Where contaminated groundwater exists beneath otherwise uncontaminated land, the goal should be to restore that groundwater to health-based standards.
5. Surface waters on the Oak Ridge Reservation must eventually meet State water quality standards. In the interim, water quality must not pose an unacceptable risk under actual current use.

It should be noted that these Community Guidelines complement, but do not alter, the nine CERCLA (Comprehensive Response, Compensation and Liability Act) criteria that must be considered by DOE, the U.S. Environmental Protection Agency and the Tennessee Department of Environment and Conservation. These CERCLA criteria are:

Overall protection of human health and the environment
Compliance with ARARs
Long-term effectiveness and permanence
Reduction of toxicity, mobility or volume
Short-term effectiveness
Implementability
Cost
Regulatory acceptance
Community acceptance

4.2 Recommendations for the End Use of Bethel Valley

The end use recommendations for Bethel Valley were approved on May 29, 1997. The signed recommendations and an end use map are presented on pages 20 and 21.

Physical Description

The Oak Ridge National Laboratory (ORNL) dominates the Bethel Valley watershed (see Figure 4.1). The ORNL began processing plutonium and fission products for the Manhattan Project during World War II and, after the war, it was established as a national laboratory. The ORNL conducts basic and applied research and development in physical, chemical, and materials sciences; biological, environmental, and social sciences; and computational sciences in order to advance the nation's energy resources, environmental quality, and scientific knowledge and to contribute to educational foundations and national economic competitiveness. The Bethel Valley watershed is bounded to the south by the Melton Valley watershed and to the north by the Bear Creek Valley watershed.

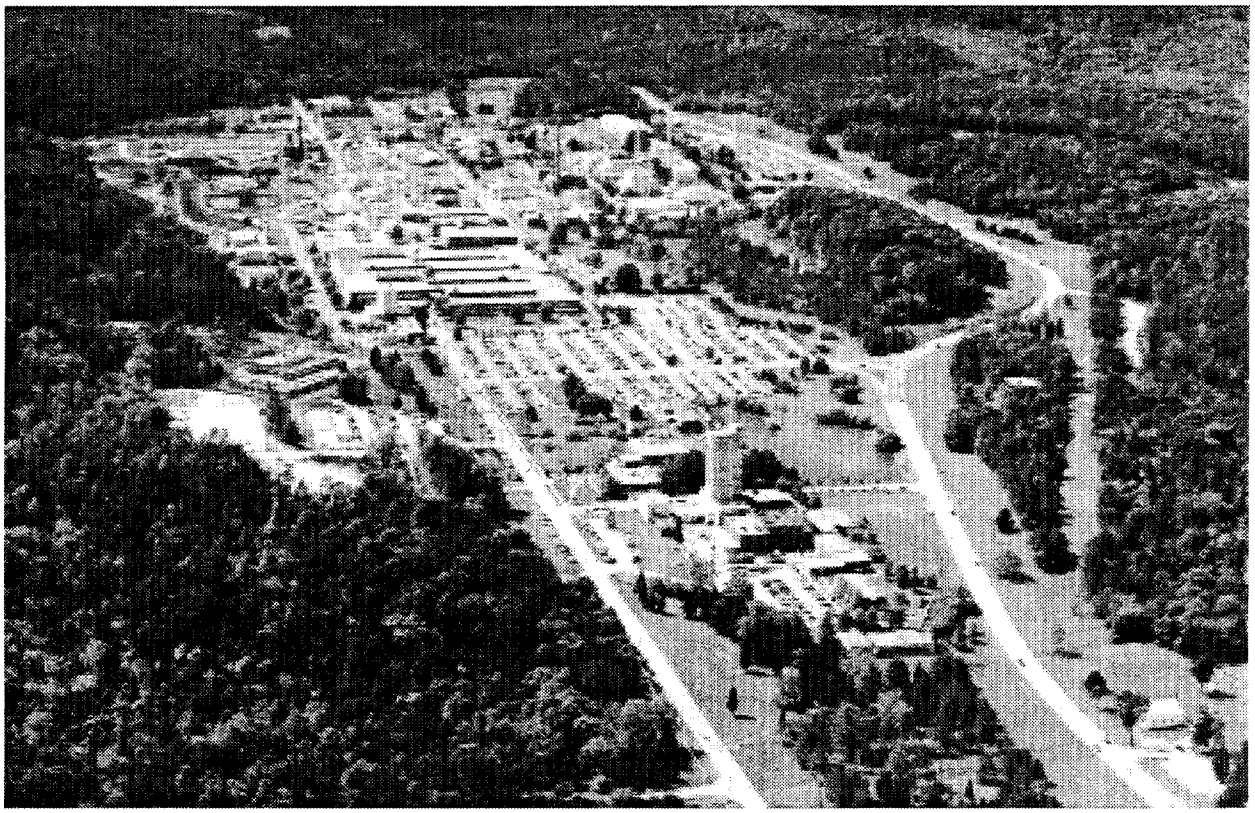


Figure 4.1 Aerial View of Bethel Valley Looking East

Major Areas of Contamination

Wastes in Bethel Valley resulted from nuclear reactors; radioisotope operations; particle accelerators; hot cell operations; physical, chemical and biological research; fuel chemical reprocessing research; and analytical laboratories. The end use

recommendation addresses the three main areas of contamination within the watershed: the ORNL main plant area, the areas known as Waste Area Grouping 3, and Waste Area Grouping 17.

The **ORNL Main Plant Area** includes active and inactive facilities, four inactive research reactors, underground waste tanks, many miles of associated pipeline, surface impoundments and contaminated soils. Strontium-90 is a major contaminant associated with releases from the surface impoundments. Sediments in the impoundments are contaminated with cesium-137. Contaminated soils result from liquid waste transfer pipeline leaks or spills. Pipeline and tank leaks also have contributed to groundwater contamination. The Corehole 8 groundwater plume is contaminated with strontium-90 and uranium, which resulted from a broken pipe in the North Tank Farm. A major challenge for remediation of the Main Plant Area is the extensive underground network of tanks and pipelines used for radionuclide processing and waste treatment.

The area known as **Waste Area Grouping 3,** to the west of ORNL, includes:

- Solid Waste Storage Area 3, which was used for disposal of low-level and transuranic wastes. Seepage from this area flows into groundwater, which empties into the Northwest Tributary and Raccoon Creek;
- the Closed Scrap Metal Area, which was used for disposal of contaminated metal; and
- the Contractors Landfill, which was used for disposal of uncontaminated construction debris.

Contaminants of concern for Waste Area Grouping 3 include cesium and strontium.

The area known as **Waste Area Grouping 17,** to the east of ORNL, contains most of ORNL's craft and machine shops, shipping and receiving activities, automobile service center and material storage areas. This area contains three sites subject to CERCLA investigations: waste oil storage tanks 7002A and 7002W and the tritium target preparation facility. Groundwater in this area is contaminated with volatile organic compounds (VOCs).

Discussion Related to the Bethel Valley End Use Recommendation

In discussing overall end use for the Main Plant Area, four surface impoundments prompted the most debate because remediation objectives for the ponds were a current public discussion topic. Two end use categories were considered for the impoundments: controlled industrial/commercial, and restricted access. Cost estimates for a controlled industrial/commercial end use were between $15 to $23 million. Cost estimates for the restricted access option ranged from $10 to $14 million. Most members believed remediating the surface impoundments to allow for a controlled industrial end use would be worth the somewhat increased costs.

Other Issues Discussed

- the importance of maintaining ORNL as a viable resource;
- comparisons of costs, remediation activities, and waste volumes, for the two possible end uses;
- the importance of ensuring that all surface areas are safe for industrial workers; and
- the close proximity of Waste Area Grouping 3 to the ORNL Main Plant Area, which mandated a controlled industrial end use for this area.

A few members did not support the Bethel Valley end use recommendation because the EUWG did not present the detailed information necessary to address groundwater or surface water issues at that time. Groundwater and surface water issues were explored at a later date, and recommendations were incorporated into the Community Guidelines. A member believed the Bethel Valley end use recommendation was vague and could easily be misinterpreted. Another member believes a Sentinel Health Evaluation should be conducted at ORNL because of the possible impacts of contaminants on worker's and public health.

RECOMMENDATIONS FOR THE END USE OF CONTAMINATED LANDS IN THE BETHEL VALLEY AREA OF THE OAK RIDGE NATIONAL LABORATORY

Oak Ridge National Laboratory (ORNL) is a national and local resource, whose preservation and growth are an important part of the long-term vitality of the Oak Ridge community. ORNL needs to remain attractive to both current and new uses. Therefore, it is essential that Department of Energy (DOE) remediation decisions achieve, at a minimum, a controlled industrial end use for the entire ORNL Bethel Valley area.

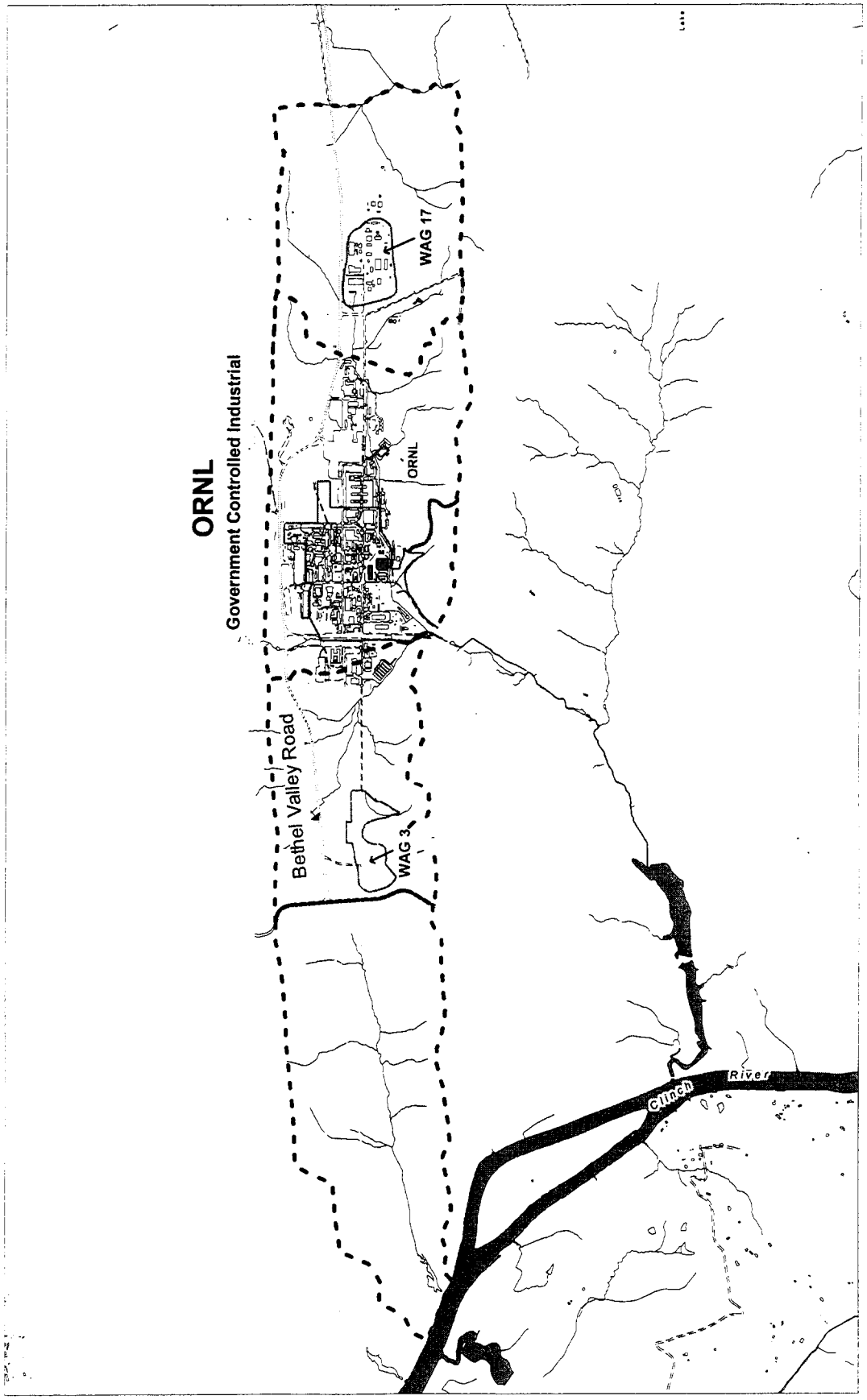
A controlled industrial end use should at least provide for surface use of contaminated lands. Currently, there are areas where contamination results in the need for controlled access. Reducing such areas would enhance the overall viability of the laboratory. Remediation should result in lands that are safe for surface use by laboratory employees.

In making its decision, DOE needs to consider the overall utility of ORNL, recognize the variety of uses needed to support an active and vital laboratory environment and use remediation resources wisely. DOE should make the best practical use of existing brownfields while recognizing that not all land needs to be available for every use. If situations occur where DOE cannot meet the surface use criteria due to excessive risks or costs, these exceptions need to be discussed openly in a public forum.

We the undersigned members to the Oak Ridge Reservation End Use Working Group, have participated in the development of and endorse the above recommendations.

May 29, 1997

End Use Recommendations for Bethel Valley



End Use Map of Bethel Valley

4.3 Recommendation to Site a Waste Disposal Facility on the Oak Ridge Reservation

The end use recommendations to site a waste disposal facility on the Oak Ridge Reservation were approved on September 19, 1997. The signed recommendations and conceptual contour map of an on-site disposal facility are presented on pages 24 and 25. The minority opinion for this recommendation is presented on page 26.

Background

The issue of an on-site waste disposal facility for the Oak Ridge Reservation remediation wastes was raised early in the EUWG process. Discussion arose during the Bear Creek Valley watershed deliberations, since two of the possible sites are located in Bear Creek Valley. The DOE and the Site Specific Advisory Board considered Bear Creek Valley the most likely area for siting a waste disposal facility. Thus, EUWG members decided that an end use recommendation for Bear Creek Valley could not be made without first addressing the issue of whether an on-site waste disposal facility might be located there.

Furthermore, the EUWG believed a waste disposal decision had to be made before cleanup decisions could be finalized, since waste volumes and costs associated with each remedial action were needed to evaluate alternatives.

As represented by DOE and its contractors, remediation wastes represent about two-thirds of all wastes that will be generated on the Reservation over the next 10 years. DOE has three alternatives for managing this waste:

- manage in place;
- consolidate and dispose in an on-site disposal facility; or
- dispose at off-site facilities.

Each alternative offers advantages and disadvantages. For example, managing waste in place may be the least costly in the short run, but may result in increased risk of groundwater contamination and higher long-term costs. Off-site disposal is favored by citizens who want to remove wastes from the Reservation; however, the EUWG recognized that this increases worker risks due to construction and transportation accidents. Both off-site and on-site disposal can be politically difficult options; other sites in the DOE complex have found a "balanced" waste disposal approach to be the only feasible alternative. A "balanced" approach includes maintenance of large volumes of lower risk waste in an on-site disposal facility, while smaller volumes of higher risk waste are shipped off site.

In planning for the design of a possible disposal facility, DOE used a low-end to high-end waste volume range. The low-end volume was estimated at 200,000 cubic yards of contaminated material, requiring a facility with a 50-60 acre footprint. A high-end volume was estimated to be 1 million cubic yards of material, requiring a disposal facility with a 100-120 acre footprint. If an on-site disposal facility is built, it would

consist of an above-ground earthen disposal cell with support facilities, would have a multi-layered 15-foot cap, and a RCRA-compliant bottom liner with a leachate collection system and a geologic buffer.

Location of an On-site Disposal Facility

Initial sites proposed by DOE for an on-site waste disposal facility included West Bear Creek Valley, East Bear Creek Valley, and a site adjacent to the White Wing Scrapyard. West Bear Creek Valley has not been used for waste disposal and is not contaminated. East Bear Creek Valley has been used extensively for waste disposal. Because the White Wing Scrapyard is surrounded by uncontaminated lands, the EUWG did not believe this site was a suitable location for a disposal facility.

Of the proposed sites, the EUWG believes the East Bear Creek Valley site is the most compatible with future land uses, since the area is already used for waste disposal.

Discussion Related to the On-site Waste Disposal Facility

The first issue the Group had to address was whether a recommendation for an on-site waste disposal facility and a recommended location for that facility were within the scope of the EUWG. Most members believed the issue was relevant, since the presence of an on-site disposal facility would result in restricted waste disposal end use wherever it was located. The use of an on-site disposal facility also would have significant impacts on cost and risk estimates for end uses of other contaminated areas on the Reservation.

The Group felt that it was very important that DOE ensure that any on-site disposal facility would not adversely affect human health or the environment. This requirement would require protective Waste Acceptance Criteria, and wastes not meeting the criteria would be disposed elsewhere.

Other Issues Discussed

- concern over cell size, since volume estimates did not include non-CERCLA wastes or wastes outside DOE's Environmental Management Program;
- concerns about the possibility of waste shipments from other sites;
- concerns about facility design;
- impacts on the "borrow area" that would provide clay for construction;
- concerns over the long-term requirement for institutional controls;
- concerns that disposal facility construction costs would mean less money for remediation activities (it was pointed out that the disposal facility would be funded as a separate project, and therefore might not impact the remediation budget, and that sites with disposal facilities generally receive more funding, since sites with cleanup facilities are viewed as having a strategy for remediation); and
- concerns about endorsing on-site disposal before waste acceptance criteria have been determined.

Recommendation to Site A Waste Disposal Facility on the Oak Ridge Reservation

Remediation of the Oak Ridge Reservation (ORR) will generate large volumes of material containing varying degrees of contamination. The End Use Working Group believes that DOE should take a balanced* approach to the disposal of contaminated materials from the ORR. A balanced approach will require construction of an on-site waste disposal facility to manage contaminated materials meeting site-specific waste acceptance criteria. Material not meeting waste acceptance criteria for an ORR waste disposal facility should be disposed of off site.

DOE should consider the following criteria when planning an ORR waste disposal facility:

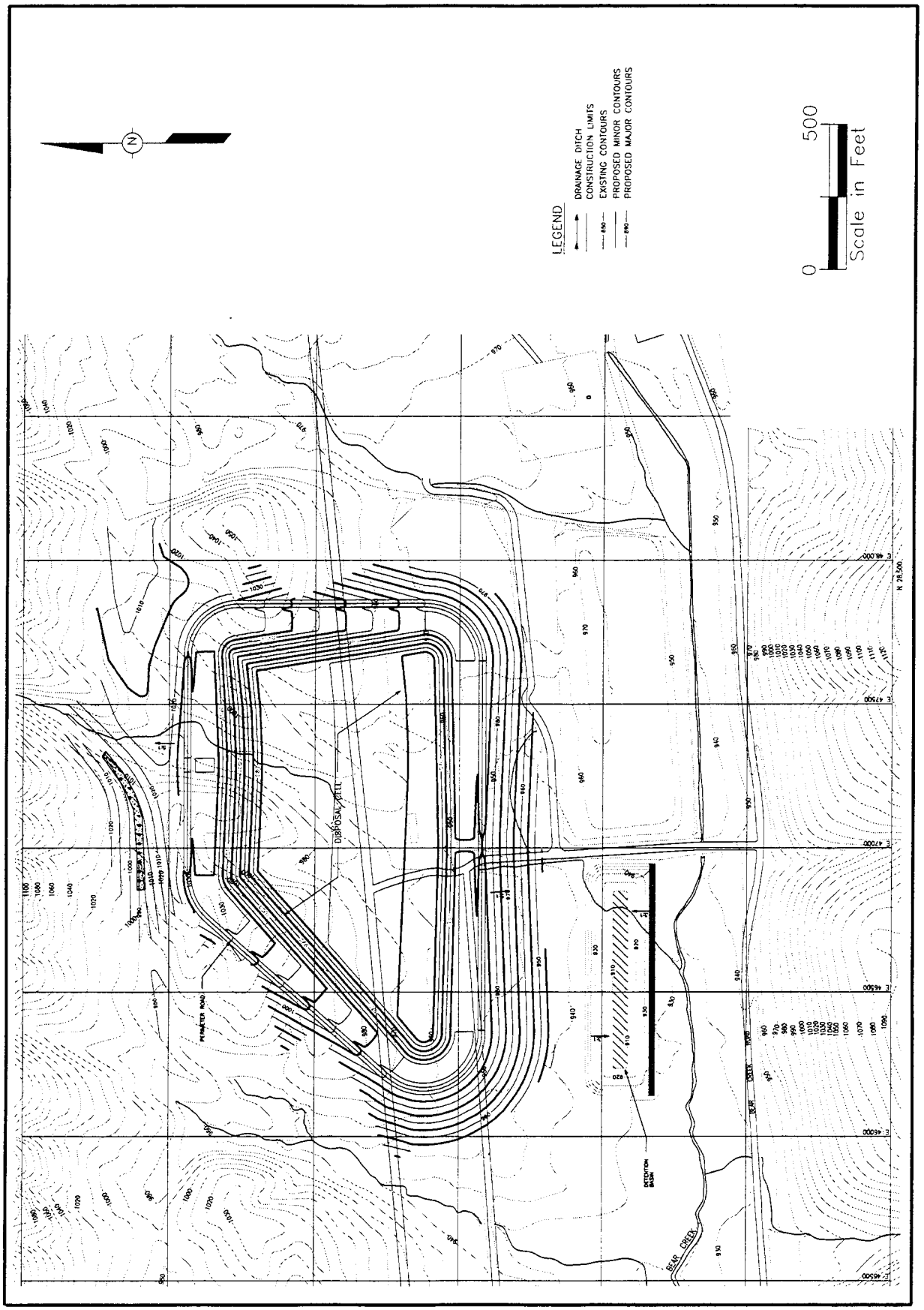
1. The facility should be located on or adjacent to an area that is contaminated and previously used for long-term waste disposal. After consideration of the End Use Working Group's Community Guidelines, the End Use Working Group believes that the East Bear Creek Valley site is the most appropriate location of the three sites proposed by DOE.
2. Facility design must safely isolate contaminated materials from the environment.
3. For materials with very low levels of contamination, options for safely managing these materials without elaborate disposal requirements should be given meaningful consideration.
4. Waste disposal capacity should accommodate both current and future volumes of ORR remediation waste.
5. Consideration should also be given to creating disposal capacity for non-remediation wastes. If on-site waste disposal capacity is limited for any reason, the first priority should be given to remediation wastes.
6. Perpetual stewardship of the disposal facility and surrounding property must be assured.
7. Focused stakeholder input should be solicited prior to making decisions regarding facility design, waste acceptance criteria, and acceptance of waste from outside ORR.

*A balanced approach is one which recognizes that Oak Ridge's environmental problems should not be solved by shipping all of its waste elsewhere. DOE must take into account the concerns of stakeholders at potential receiving facilities and along transportation routes. DOE must also take into account the total costs and risks associated with managing wastes on site *vs.* off site.

We the undersigned members to the Oak Ridge Reservation End Use Working Group, have participated in the development of and endorse the above recommendations.

September 19, 1997

End Use Recommendations for an On-Site Disposal Facility



Map Showing Proposed Location of an On-Site Disposal Facility

OAK RIDGE RESERVATION
END USE
WORKING GROUP

MINORITY OPINION REGARDING THE RECOMMENDATION TO SITE A WASTE DISPOSAL FACILITY ON THE OAK RIDGE RESERVATION

While understanding the need and convenience of a Waste Disposal Facility on the Oak Ridge Reservation, it is believed that there will be management problems with DOE. Oak Ridge could become a dump site for other States, and future generations will be facing cleanup again. Part of the EUWG guidelines is to clean it up and keep it clean.

We the undersigned members to the Oak Ridge Reservation End Use Working Group, have participated in the development of and endorse the above minority opinion.

Jane Humphrey _____ _____

Sandra Reid _____ _____

Mary Bryan _____ _____

Wolf Vogel _____ _____

Jean Gamz _____ _____

_____ _____ _____

_____ _____ _____

June 25, 1998

4.4. Recommendations for the End Use of Bear Creek Valley

The end use recommendations for Bear Creek Valley were approved on October 2, 1997. The signed recommendations and an end use map are presented on pages 30 and 31.

Physical Description

The Bear Creek Valley watershed covers approximately 1,000 acres; about 20% of Bear Creek Valley lands have been used for waste disposal. Figure 4.2 shows an aerial view of the valley. The watershed is bounded on the west by the East Tennessee Technology Park watershed, on the south by the Bethel Valley watershed, to the north by Pine Ridge and the City of Oak Ridge, and on the east by the Upper East Fork Poplar Creek watershed. Water from the waste areas flows into Bear Creek. A groundwater divide exists at the S-3 Ponds, where surface and groundwater flow east into the Upper East Fork Poplar Creek watershed and west into the Bear Creek Valley watershed. The flow of Bear Creek is closely related to groundwater flow, and during rain events groundwater discharges to the creek and its tributaries.

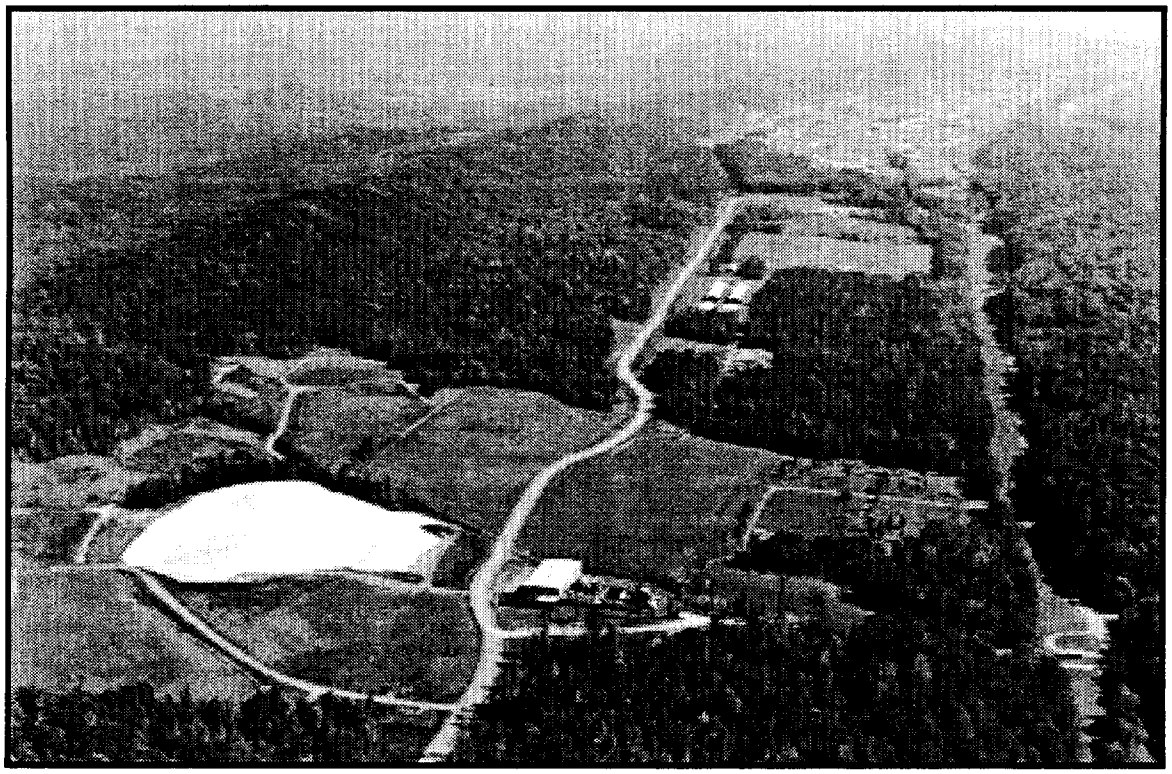


Figure 4.2 Aerial View of Bear Creek Valley Looking East

Major Contaminants

A Remedial Investigation (RI) had been conducted for Bear Creek Valley. One goal for the RI was to understand how contaminants move from waste units into streams. The contaminant sources in Bear Creek Valley are located in the eastern most sector. The main areas of concern in the Bear Creek Valley watershed are discussed below:

The **S-3 Ponds** were used from the 1950s to 1980s for disposal of more than 2 million gallons of nitric acid solution per year. This solution reacted with the carbonate rock to precipitate uranium and other contaminants under the ponds, which has resulted in a nitrate- and uranium-contaminated groundwater plume that has migrated about 3000 feet from the ponds and impacts Bear Creek. The S-3 Ponds were closed under RCRA.

The **Oil Landfarm Area** consists of the Oil Landfarm, Sanitary Landfill 1, and the Boneyard/Burnyard, with the Hazardous Chemicals Disposal Area located on top of the Boneyard/Burnyard. The Oil Landfarm was used to dispose of organic wastes; main current contaminants are uranium, beryllium, and PCBs. The RI found virtually no soil contamination around the partially remediated Oil Landfarm. However, groundwater is contaminated with low levels of volatile organic compounds (VOCs).

Little information exists about the types of waste disposed of at the Sanitary Landfill, which has been closed and covered with a clay and soil cap. At the Boneyard/Burnyard, contaminated debris and wastes were buried in trenches. Only the Hazardous Chemicals Disposal Area of the Boneyard/Burnyard has been capped. Contaminants, primarily uranium and to a lesser extent VOCs, flow from the Boneyard/Burnyard into North Tributary 3.

The **Bear Creek Burial Grounds** were used from the 1950s to the 1980s as the main solid waste disposal area for the Y-12 Plant. Wastes were buried in trenches and covered with dirt. The main contaminants are uranium, thorium, beryllium and VOCs. The Walk-In Pits area was used for disposal of shock-sensitive and pyrophoric materials. Several areas in the Burial Grounds, including the Walk-In Pits, have been closed under RCRA.

Shallow groundwater in the eastern end of Bear Creek Valley is contaminated with uranium and dense non-aqueous phase liquids (DNAPLs). Deep groundwater is also contaminated with DNAPLs. This groundwater contamination impacts surface water in the valley.

Contaminants have also migrated into surface water including:

- nitrates and uranium from the S-3 Ponds area;
- uranium and VOCs from the Oil Landfarm Area; and
- VOCs from the Burial Grounds.

Discussion Related to the Bear Creek Valley End Use Recommendation

Members noted that almost all contamination within the Bear Creek Valley watershed is concentrated at the valley's eastern end. Therefore, the Group took the approach that various zones within the watershed should have different end use scenarios.

Since Zone I is uncontaminated, the majority of EUWG members believed it should be designated as unrestricted end use and should be protected from any future contamination posed by disposal sites in other zones in Bear Creek Valley.

Developing an end use recommendation for Zone II was more complicated and generated more discussion. Members generally agreed that Zone II should act as a buffer between the uncontaminated Zone I and contaminated areas in Zone III. An industrial end use for Zone II did not fit some members' concept of a buffer zone. Since Zone II is heavily forested, it was reasonable to consider a recreational end use to prevent further industrial development even though zoning laws do not typically allow for recreational use in an industrialized area. Most of the Group eventually agreed that Zone II should remain under DOE control as a green space or recreational end use, until groundwater and surface water contaminants can be reduced to acceptable levels for unrestricted use.

End use considerations for Zone III, which contains the S-3 Ponds Area, the Oil Landfarm and the Burial Grounds, ranged from industrial/commercial to restricted access waste disposal. Remediating this area to an industrial/commercial end use is technically possible, but would require excavation of massive amounts of contaminant sources and treatment of secondary contamination. Costs for achieving an industrial/commercial end use range between $1.2 to $7 billion (a cost of at least $6 million per acre). Because of the nature and extent of contamination in this area, worker risks, costs, and uncertainties associated with extensive excavation, transport, and disposal, most members agreed that Zone III should have a restricted waste disposal end use.

Other Issues Discussed

- the difficulty of isolating DNAPLs from groundwater;
- the need to allow future generations enough flexibility to decide how they want to use the land.

OAK RIDGE RESERVATION
END USE
WORKING GROUP

END USE RECOMMENDATIONS FOR BEAR CREEK VALLEY

Bear Creek Valley is divided into three zones (see attached map). Zone III begins with the S-3 Ponds at the western edge of the Y-12 Plant and continues west past the Bear Creek Burial Grounds. It includes approximately 1,000 acres of which 200 acres were used for waste disposal from 1943 to 1993. Most of the contaminated areas are north of Bear Creek Road. In this zone, the nature of the contamination, and the costs, worker risks, and uncertainties associated with its excavation, transport, and disposal lead the End Use Working Group to recommend that Zone III lands be safely maintained under restricted use. Remediation in Zone III must reduce the migration of contamination sufficient to bring contaminants in Zone II to within acceptable levels for unrestricted use and protect Zone I for unrestricted use in perpetuity.

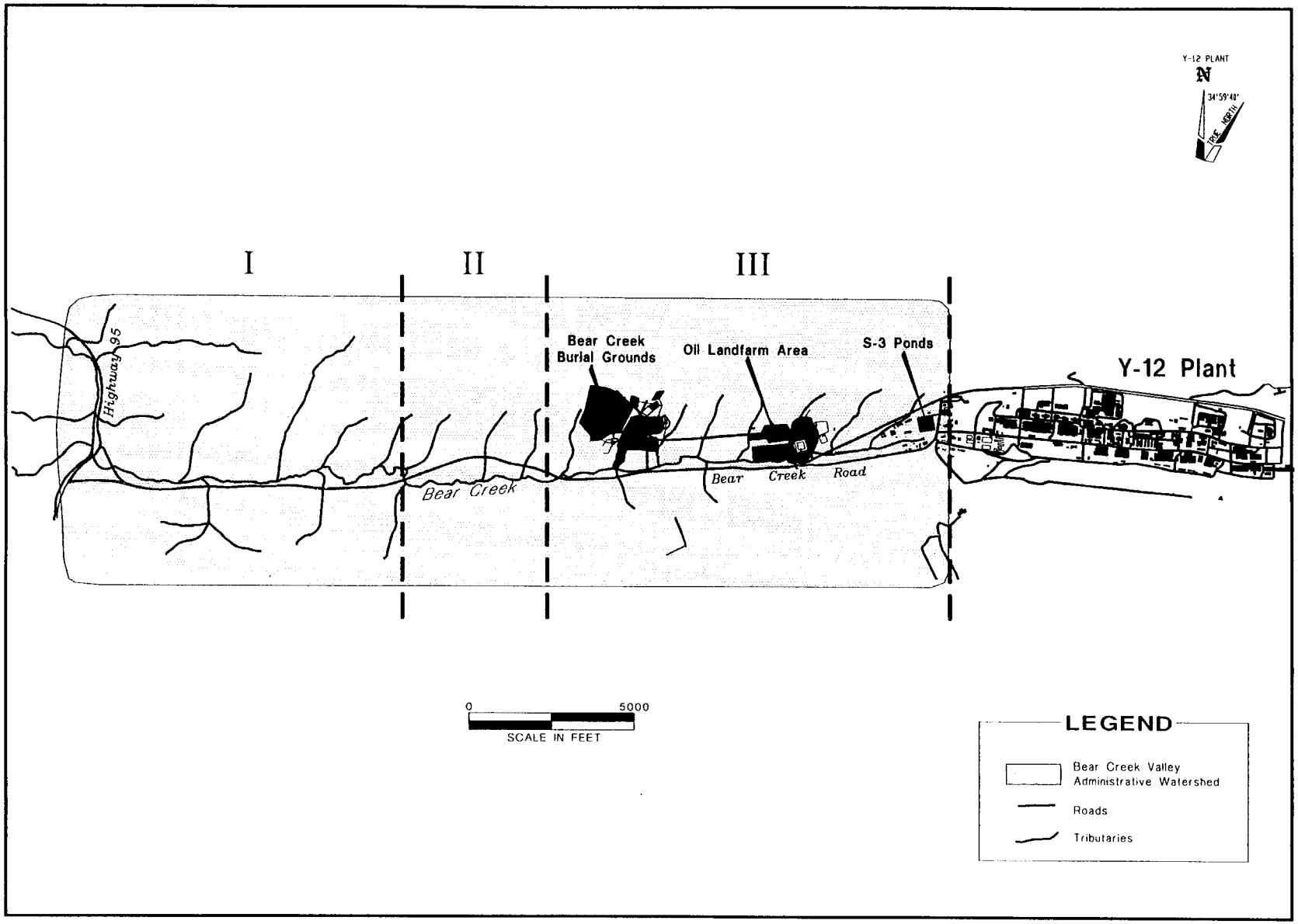
Zone II includes the land west of the Bear Creek Burial Grounds for a distance of approximately one mile. Contaminants in ground and surface water in this zone exceed naturally-occurring levels. Thus, Zone II must be restricted to DOE controlled or recreational end uses until contaminants in ground and surface waters are within acceptable levels.

Zone I is immediately adjacent to and west of Zone II. Land and water in this zone are free from contamination and available for unrestricted use.

Implementation of these recommendations by DOE must be consistent with the End Use Working Group Community Guidelines. If DOE cannot meet these end uses for Bear Creek Valley, exceptions must be discussed in a public forum as part of the decision-making process.

We, the undersigned members to the Oak Ridge Reservation End Use Working Group, have participated in the development of and endorse the above recommendations.

October 2, 1997



35H830 0134 98 / 97-14725.DWG / 10JUN98 TG

End Use Map of Bear Creek Valley

4.5 Recommendation for the End Use of Disposal Areas in Melton Valley

The end use recommendations for Melton Valley were approved on November 13, 1997. The signed recommendations and an end use map are presented on pages 36 and 37.

Physical Description

The Melton Valley watershed is a 1,000-acre area bounded on the north by the Bethel Valley watershed and on the west by the Clinch River (see Figure 4.3). It is separated from Bethel Valley by Haw Ridge.

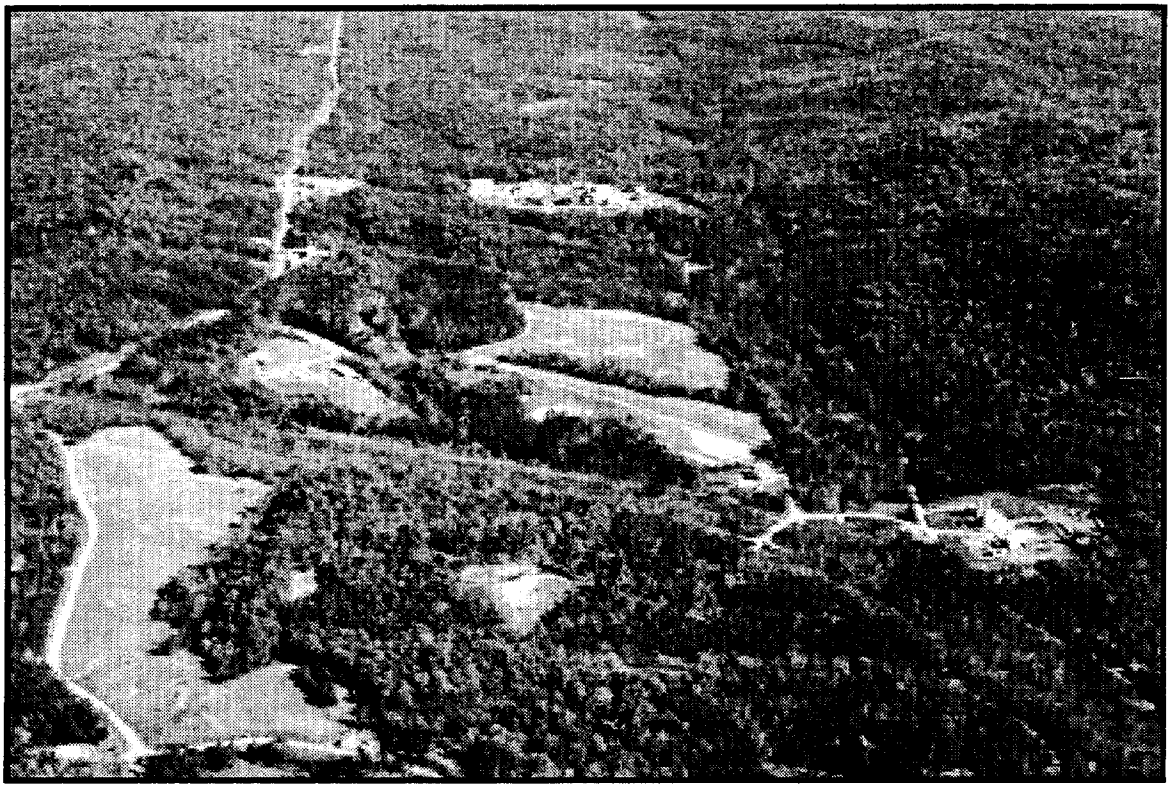


Figure 4.3 Aerial View of Melton Valley Looking East

Major Areas of Contamination

Melton Valley contains more than 1000 acres of burial grounds, seepage pits, contaminated floodplains and hydrofracture wastes. These wastes originated both from local operations and from other sites. The bulk of disposal activities involved shallow land burial. In some cases, wastes are in constant contact with groundwater, resulting in shallow groundwater contamination.

From 1955 to 1963, ORNL's solid waste storage areas were designated by the Atomic Energy Commission as the Southern Regional Burial Ground. About one million cubic feet of solid waste from various off-site installations was buried in Solid Waste

Storage Areas 4 and 5. During this period, ORNL served as a major disposal site for wastes from such facilities as Argonne National Laboratory, Knolls Atomic Power Laboratory, Mound Laboratories, Battelle Memorial Institute, General Electric Company in Evendale, Ohio, and about 50 other off-site installations.

The major areas of contamination in Melton Valley are described below:

Waste Area Grouping 2 includes White Oak Creek, White Oak Lake, their tributaries and adjacent lands. In this area, sediments are contaminated with cesium-137 and cobalt-60.

Waste Area Grouping 4 was used for disposal of solid low-level wastes in trenches and auger holes. This area is a significant source of strontium 90 levels at White Oak dam where surface water from Melton Valley is released toward the Clinch River from White Oak Lake. Groundwater contaminants are strontium-90, tritium and transuranic elements.

Waste Area Grouping 5 was used for disposal of low-level radioactive wastes in trenches and auger holes. Approximately 1800 curies of tritium are released annually from this area to the Clinch River via the White Oak Dam. The most heavily contaminated groundwater wells in Melton Valley are located in this area. Groundwater contaminants are transuranic elements, strontium-90, tritium, and volatile organic compounds.

Waste Area Grouping 6 was used for low-level waste disposal into trenches, auger holes and silos. Groundwater contaminants are organic solvents and tritium.

Waste Area Grouping 7 contains seven waste pits and trenches used from 1951 to 1966 for disposal of liquid low-level radioactive wastes. Wastes were piped into these seepage pits, resulting in extensive soil contamination. Seven Homogeneous Reactor Experiment fuel wells are also located in this area. Groundwater contaminants are strontium-90, cobalt-60, and transuranic elements.

Waste Area Grouping 8 includes both active facilities and CERCLA sites. Active facilities are the High Flux Isotope Reactor, Transuranium Processing Plant, and the Transuranium Research Facility. CERCLA sites include surface impoundments, low-level waste storage tanks, waste storage facilities, a backfilled impoundment, and the Molten Salt Reactor Experiment facility. (These reactors were not discussed in detail by the EUWG and are not included in the recommendation for Melton Valley. They are discussed in the recommendations for sites outside the existing administrative watersheds in Section 4.8.)

Waste Area Grouping 9 contains the Homogeneous Reactor Experiment and support facilities. The primary releases are associated with the Homogeneous Reactor Experiment ponds, leaks from tanks, pits and/or pipelines, and leachate from decontamination ponds. (The Homogeneous Reactor Experiment was not

discussed in detail by the EUWG and is not included in the recommendation for Melton Valley. It is discussed in the recommendations for sites outside the existing administrative watersheds in Section 4.8.)

Waste Area Grouping 10 consists of hydrofracture injection sites. In the hydrofracture process, waste containing up to one million curies was mixed with cement grout. This mixture was pumped under pressure via injection wells into the Pumpkin Valley Shale geologic formation, located 700 to 1000 feet below the surface, where groundwater is 10 times more saline than seawater and is not part of an active groundwater flow system. There are no known releases to surface water, sediments, or surface soils from the hydrofracture process. There is some speculation that pressure below the hydrofracture zone may cause water to flow up boreholes or wells. Hydrofracture material is not believed to be migrating from the injection sites, and no practical way exists to remediate this material.

Waste Area Grouping 13 includes the former experimental cesium plots. This site was not included in the Melton Valley recommendation because some remediation had already occurred. This site is addressed in the recommendation for sites outside existing watersheds in section 4.8.

Discussion Related to the Melton Valley End Use Recommendation

The DOE provided the Group with information on two end uses:

- an unrestricted end use with complete removal of contaminated material (except for the grout sheets) but without groundwater use (estimated costs of $3 to $6 billion); and
- a restricted waste disposal end use with a focus on in-place management and removal of some "hot spots" (estimated costs of $200 to $700 million).

Because this area contains some of the most highly radioactive waste materials (though with half lives of only 7 to 30 years) on the Reservation, near-term excavation would be risky and expensive, and because better technology might someday become available, members believed that Melton Valley should have a restricted waste disposal end use and that stewardship requirements for the area should be addressed.

The contamination in Melton Valley is extensive and complex. The Group was evaluated a great deal of information about the waste present throughout the valley and how some of it is migrating toward the Clinch River. In much of this information, the White Oak Dam was used as an integration point where to show how waste leakage from each disposal area contributed to the entire problem. The White Oak Dam was ultimately used by the group as an integration point in framing its recommendation to ensure that waste would be contained within Melton Valley. It was not intended to be a point of compliance for groundwater and surface water requirements.

Most members believed that, while only limited excavation of wastes is feasible at this time, many contaminants will decay to manageable levels over the next two to three centuries. EUWG members preferred that remediation occur eventually.

Other Issues Discussed

- concern that end use recommendations for Melton Valley are premature, since disposal areas have not yet been fully characterized;
- concern over vague meaning of restricted end use;
- concern about the spread of contamination by animals; and
- concern about the ecological health of the valley.

OAK RIDGE RESERVATION
END USE
WORKING GROUP

END USE RECOMMENDATIONS FOR THE DISPOSAL AREAS IN MELTON VALLEY

Some of the most highly radioactive waste materials on the Oak Ridge Reservation are buried in Melton Valley disposal areas. Consideration of any near-term land use other than "restricted" for contaminated Melton Valley lands would require removal of more than 3 million cubic yards of material. The resulting disposal requirements and ecological devastation make such an option unacceptable. Thus, the End Use Working Group recommends restricted end use for the disposal areas in Melton Valley. Because contaminated areas in Melton Valley are not contiguous, some areas of Melton Valley are usable for DOE-controlled activities.

For this end use, DOE must, at a minimum, ensure worker safety and control further migration of contamination in Melton Valley to ensure that levels of contaminants released to the Clinch River via White Oak Dam do not exceed standards protective of human health and the environment.

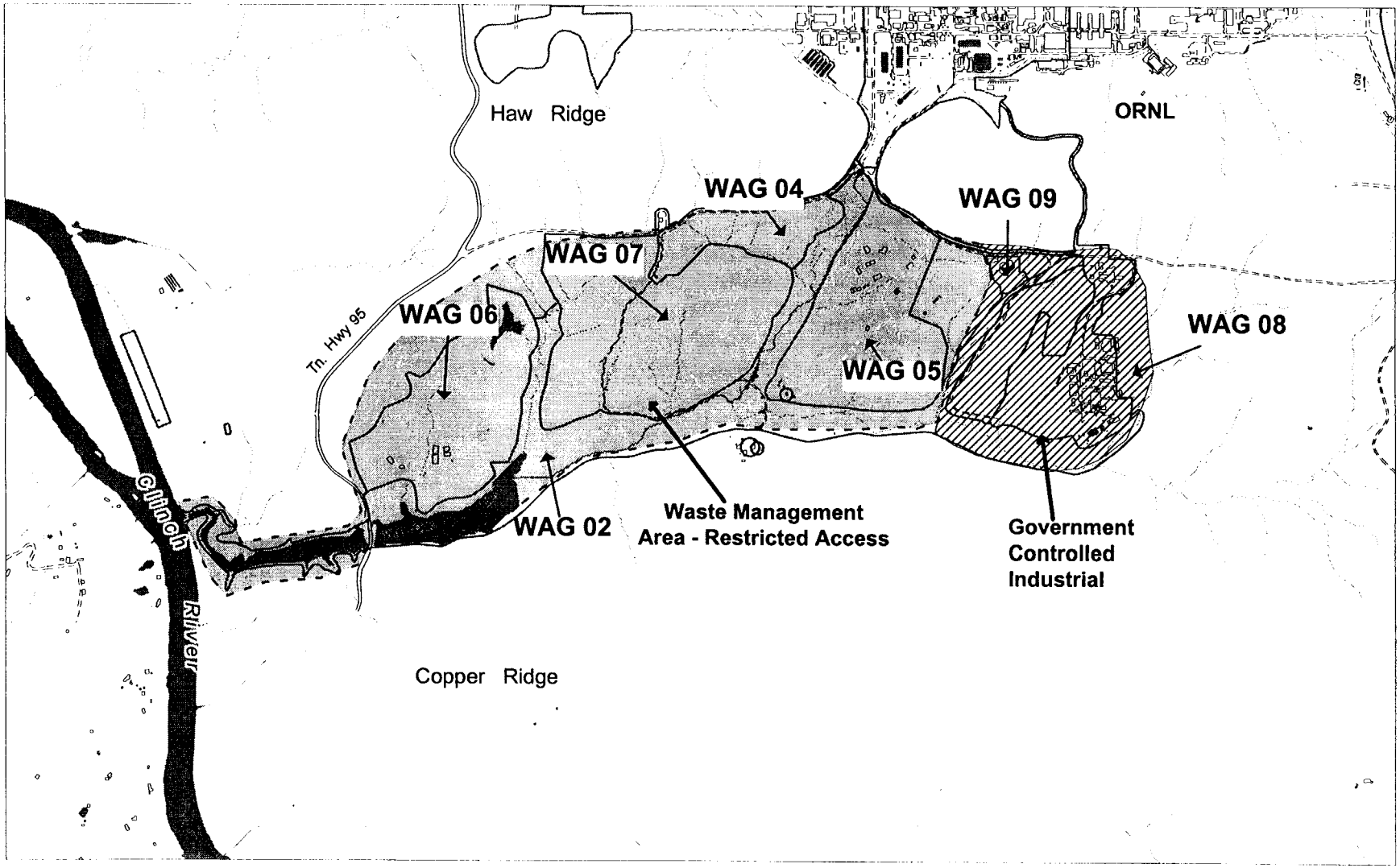
DOE should continue to monitor the major sources of radiological risk in Melton Valley. Such monitoring will indicate when the contaminants have decayed to levels at which additional remediation is feasible. Radionuclides with half lives of several years to decades, such as tritium, strontium, and cesium, are the major sources of risk in parts of the disposal areas. Within 100 to 300 years, such areas may be candidates for land uses other than restricted.

Implementation of these recommendations by DOE must be consistent with the End Use Working Group Community Guidelines and its recommendations on stewardship. If DOE cannot meet these recommendations for Melton Valley, exceptions must be discussed in a public forum as part of the decision-making process.

We, the undersigned members to the Oak Ridge Reservation End Use Working Group, have participated in the development of and endorse the above recommendations.

November 13, 1997

End Use Recommendations for Melton Valley



End Use Map of Melton Valley

4.6 Recommendations for the End Use of the Upper East Fork Poplar Creek Watershed

The end use recommendations for the Upper East Fork Poplar Creek Watershed were approved on May 7, 1998. The signed recommendations and an end use map are presented on pages 43 through 45.

Physical Description

The Upper East Fork Poplar Creek watershed (see Figure 4.4), which includes the main Y-12 Plant area, is located between Pine Ridge and Chestnut Ridge. The headwaters of Upper East Fork Poplar Creek are near the S-3 Ponds. When the Y-12 Plant was built, the creek was rerouted through storm drains and its original tributaries were backfilled.

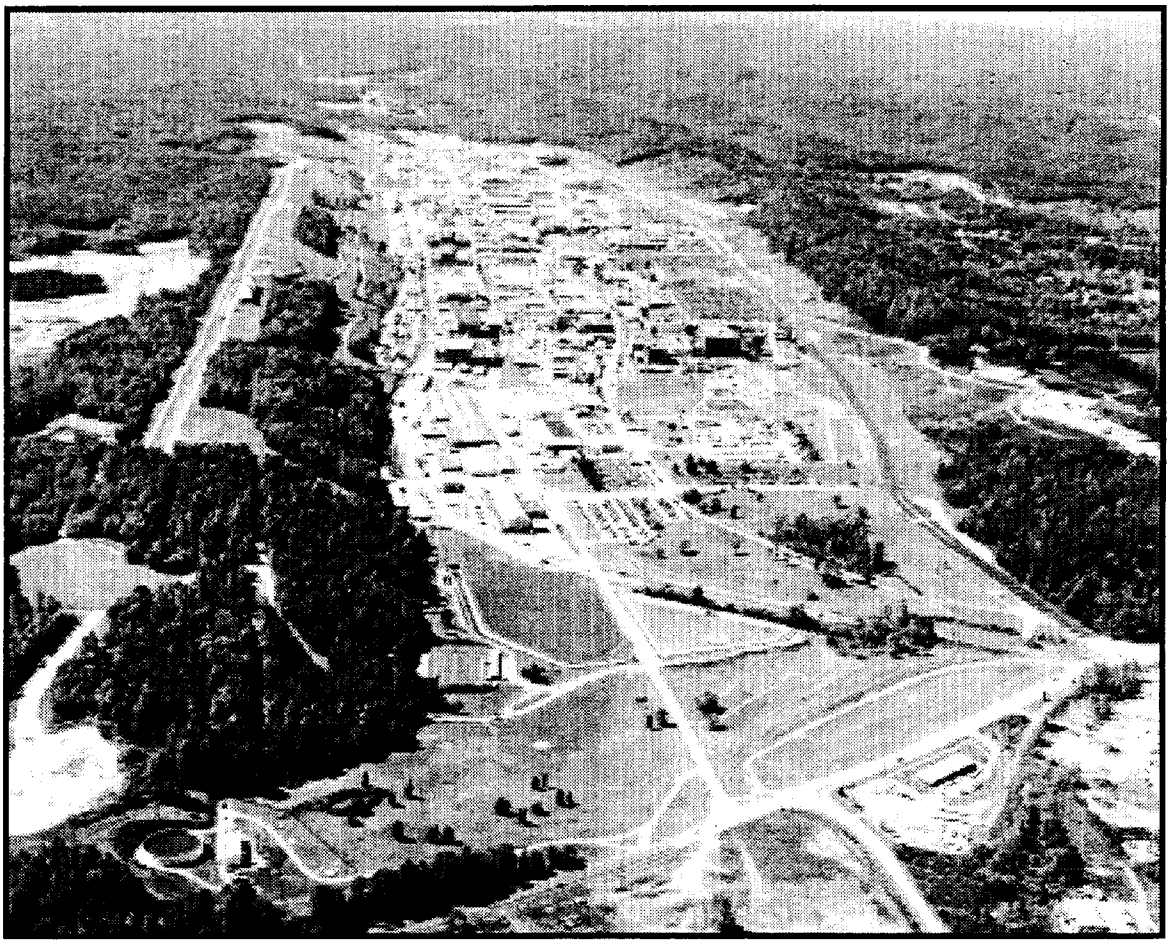


Figure 4.4 Aerial View of The Y-12 Plant Looking West

The original mission of the Y-12 Plant was to produce enriched uranium by an electromagnetic process. Y-12's current missions include stockpile stewardship for uranium and lithium materials; drawdown and disposition of special nuclear materials; and other complementary missions. Y-12 will continue to be used by

DOE's Defense Programs into the 21st century. Many of these activities are classified as national security issues by the federal government. Thus, the reuse of this part of theY-12 Plant for other purposes is not likely.

Currently, the DOE Defense Programs office "owns" about 5 million square feet of the total 7 million square feet of floor space at the 800 acre Y-12 Plant. Over the next 10 years, Defense Programs intends to surplus 1.3 million square feet, most of which is located in the high security area.

Major Areas of Contamination in the Upper East Fork Poplar Creek Watershed

More than 70 sources of contamination lie within the Upper East Fork Poplar Creek watershed. The area contains an almost continuous nitrate- and uranium-238 contaminated groundwater plume, which originates from the S-3 Ponds and other sources within the plant. This plume, located deep in bedrock (300 to 400 feet), has migrated 400 feet down and 4000 feet laterally from its sources. It also contains other radionuclides and metals. Because of their mobility and the acidic environment, the nitrates and uranium extend into the central plant area, but other contaminants are fairly localized.

A carbon tetrachloride-contaminated groundwater plume exists in the east end of the Plant and extends off site under the Union Valley Industrial Park. The source of this plume is unknown; however, carbon tetrachloride was used in large amounts from 1943 to 1946 in processing source material for the electromagnetic separation process.

Three monitoring stations (8, 17, and the North/South Pipe) are used to measure mercury releases to Upper East Fork Poplar Creek. Over time, mercury levels have steadily decreased in the creek. The highest concentrations of contaminants are seen during rainy months. Mercury from historic releases is also a contaminant in soils.

Over time, two ponds have been used to handle contaminated surface water exiting the Y-12 Plant to the east prior to entering Lower East Fork Poplar Creek. These ponds concentrated mercury and other contaminants in sediments. The first of these, New Hope Pond, was closed under RCRA but may still be contributing to groundwater contamination. The replacement, Lake Reality, is still in operation.

Physical Description of Chestnut Ridge

Chestnut Ridge lies south of the Y-12 Plant and extends to the northern edge of Bethel Valley Road. This area consists of more than 2,000 acres and has as many as five different watersheds, all draining south into the Clinch River.

Chestnut Ridge contains a variety of disposal sites that are regulated by CERCLA or RCRA (or both), depending on the type of contamination.

CERCLA sites include the United Nuclear Corporation site, the Filled Coal Ash Pond, Rogers Quarry, the Chestnut Ridge Borrow Area Waste Pile, the Mercury-Contaminated Gully Soil Pile, the Criticality Testing Facility, and the Uranium Oxide Vaults. These sites contain a wide variety of contaminants including nitrate contaminated sludges fixed in cement, arsenic, copper, lead, zinc, mercury, uranium, and fly ash. All of these sites are being addressed under CERCLA; several are closed and many have Records of Decision.

RCRA/CERCLA integrated units on Chestnut Ridge include the Chestnut Ridge Security Pits, the Kerr Hollow Quarry site, and the Chestnut Ridge Sediment Disposal Basin. Contaminants in these sites include cadmium, chromium, lead, nickel, mercury, uranium, carbon tetrachloride, and chloroform.

RCRA Regulated Units in Chestnut Ridge include the East Chestnut Ridge Waste Pile, and the Contaminated Soils Storage Area and Storm Sewer Sediment Drying Facility which contain mercury, uranium, and PCBs.

Several industrial landfills are also located on Chestnut Ridge. The Class 2 (industrial) permitted facilities include Landfills II, IV, and V. Landfill II was closed in 1996. Landfill IV is still active and has a 72-year remaining life. Class 4 (construction/demolition) permitted facilities include Landfills VI and VII. Landfill VII has a 5-year remaining life. Landfill VII has not received any waste.

Discussion Related to the Upper East Fork Poplar Creek Recommendation

Members believed that the reuse of the Y-12 Plant following remediation could provide a significant benefit to the local economy. Concerns were raised about what types of future industrial use should occur at the facility. The EUWG wanted to avoid harm to workers and resources from both future DOE activities and new industries. Members believed new industries moving into the Y-12 Plant should not pose an unacceptable risk to human health or the environment. Special concerns were expressed regarding the nearby Scarboro and Woodland communities.

Two alternatives were evaluated for the Y-12 Plant: controlled industrial and uncontrolled commercial/industrial. Uncontrolled industrial would require removal of about 4 million cubic yards of soil, with costs ranging from $700 million to $3 billion. The Group noted that the eastern area of the Y-12 Plant has only a few areas requiring remediation. The central plant area would require more extensive remediation to allow for an uncontrolled industrial end use, while end uses in the west would be limited by national security considerations.

Members recognized that New Hope Pond is a RCRA-closed area, but does not meet the criteria for uncontrolled industrial and that residual contamination may continue to contribute to groundwater contamination. The Group decided to

include New Hope Pond in the recommendation, but recognize that it will require continued federal government control and may have limited use.

In dealing with groundwater issues, members agreed that the federal government should maintain responsibility for groundwater. Many members believed the recommendation should state that groundwater contamination sources be contained, since contaminants are currently moving off site under privately owned land. Overall, members believed treatment options could not make groundwater in the Y-12 Plant area suitable for use in the foreseeable future. Although members realized the challenge this presents, it was felt that DOE should do whatever it can to minimize the spread of the off-site Union Valley groundwater plume. This groundwater plume restricts the use of nearby uncontaminated water because of concerns that such use will alter the contaminated groundwater flow. Members agreed that DOE should control groundwater to allow for unrestricted use of off-site uncontaminated groundwater.

Many members were also concerned with the quality of surface water since Upper East Fork Poplar Creek feeds Lower East Fork Poplar Creek. At present, the water quality is maintained in part by augmenting flow with water pumped from the Clinch River. EUWG members believe water quality in Upper East Fork Poplar Creek must be maintained so that Lower East Fork Poplar Creek is safe for commercial and residential uses.

The EUWG felt that the DOE Defense Programs national security facilities should eventually be consolidated within the security fence in the west end of the Y-12 Plant, and only those DOE missions that could co-exist with non-DOE activities and private industry remain in the eastern area. Current plans show that the majority of floor square footage now planned for surplus lies within the security area and not in relatively uncontaminated areas. Many ORNL missions and operations that support Defense Programs will remain outside the security fence in the eastern plant area. When Defense Programs finally vacates the western area, it also should be released for controlled industrial end use, which allows for use by private industry.

Recognizing that DOE's Defense Programs will continue to use the site for the foreseeable future, members believe it is important that ongoing efforts to clean up soils, sources, and releases continue no matter which DOE program is responsible for the facility. Releases within the high security area also need to be addressed.

Members believed Chestnut Ridge was within the Group's scope, since it is a contaminated area. Because nothing can be placed on closed hazardous waste landfills, most of the land in Chestnut Ridge cannot be used for other purposes.

As a result of the discussions on Upper East Fork Poplar Creek, two new Community Guidelines were developed: (1) DOE should not abandon buildings in

place, and (2) the need for future tenants to ensure the protection of workers' health, the public and the environment.

Other Issues Discussed

- One member felt that because the Remedial Investigation did not fully characterize contaminated groundwater plumes, DOE's ability to make a remedial decision would be limited.
- Some concerns were expressed that DOE will not be able to deal with contamination at Y- 12 without removing buildings. Mercury is present inside and under some building foundations.

OAK RIDGE RESERVATION
END USE
WORKING GROUP

END USE RECOMMENDATIONS FOR THE Y-12 PLANT, CHESTNUT RIDGE, AND UPPER EAST FORK POPLAR CREEK

Using the industrial complex at the Y-12 Plant in a manner that is safe and protective of human health and the environment is important to the long-term vitality of the Oak Ridge community. For the foreseeable future, ongoing missions for the Y-12 Plant and Chestnut Ridge dictate the use for much of this property.

For purposes of end use recommendations, the EUWG has divided the Y-12 Plant into two areas (see map). In the eastern area of the plant, surface soils contain relatively low levels of contamination and this area can be made suitable for uncontrolled industrial development. This area is bounded by residential and commercial property.

In the western area of the plant, surface soils are more heavily contaminated and would require significant excavation for uncontrolled industrial use. In addition, ongoing national security missions are located in the western area of the plant, which requires that it remain under federal government control. This area of the plant is bounded to the west by the Bear Creek Valley waste disposal areas.

The Chestnut Ridge area, adjacent to the Y-12 Plant to the south, is used for a variety of waste management activities and contains closed and active landfills.

Contaminated groundwater plumes flow beneath much of the Y-12 property and off-site into Union Valley to the east. Recognition of the impacts of contamination from the Y-12 Plant and Chestnut Ridge on surface water and groundwater resources is essential to planning overall remediation.

The End Use Working Group makes the following recommendations (numbers do not imply priority):

1) The western area of the Y-12 Plant is expected to remain controlled industrial property. As opportunity arises, national security activities should be concentrated in the western area to allow for the broadest possible use of the rest of the plant.

2) The eastern area of the Y-12 Plant should be made suitable for uncontrolled industrial use.

3) Lake Reality and the RCRA-closed New Hope Pond will require continued federal government control. Use of these sites should be consistent with end uses for the eastern area of the Y-12 Plant (i.e., for parking or other non-intrusive uses).

4) The Chestnut Ridge property should continue to be used and safely maintained for regulated waste disposal for the Oak Ridge Reservation.

End Use Recommendations for the Upper East Fork Poplar Creek Watershed

OAK RIDGE RESERVATION
END USE
WORKING GROUP

END USE RECOMMENDATIONS FOR THE Y-12 PLANT, CHESTNUT RIDGE, AND UPPER EAST FORK POPLAR CREEK

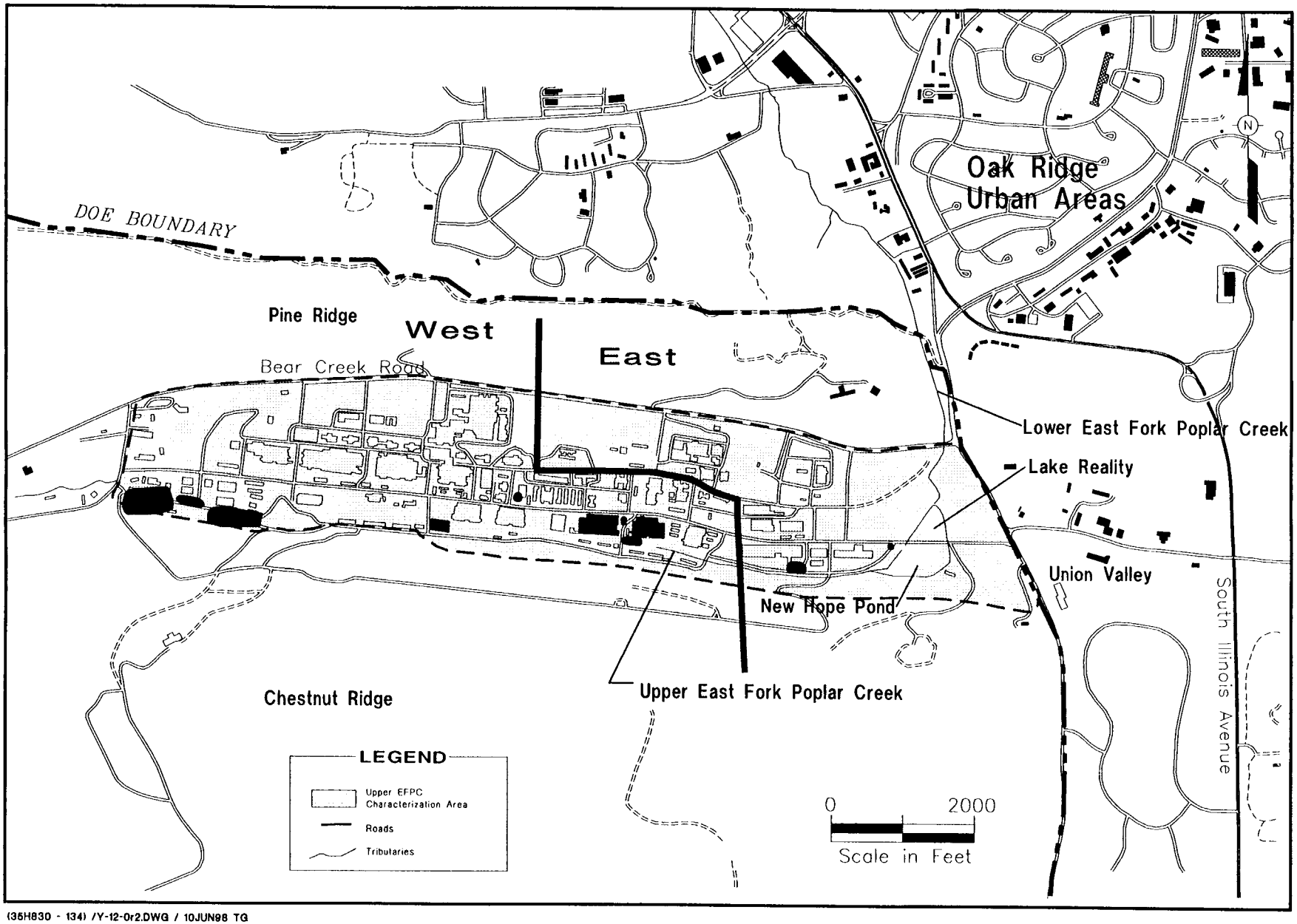
5) The Upper East Fork Poplar Creek, its tributaries, and surface waters on Chestnut Ridge must eventually meet State water quality standards. In the interim, water quality must not pose an unacceptable risk to: a) industrial workers at the Y-12 Plant, and b) residential and commercial users surrounding the Lower East Fork Poplar Creek and its tributaries.

6) Contaminated groundwater from the Y-12 Plant and Chestnut Ridge must be controlled by the federal government such that it does not permanently impact the use of currently uncontaminated groundwater.

Short-term control and long-term remediation of contaminated source areas must be assured regardless of who is responsible for the facility. Implementation of these recommendations by the DOE must be consistent with the End Use Working Group Community Guidelines and its recommendations for stewardship. If DOE cannot meet these recommendations for the Upper East Fork Poplar Creek Watershed, exceptions must be discussed in a public forum as part of the decision-making process.

We, the undersigned members to the Oak Ridge Reservation End Use Working Group, have participated in the development of and endorse the above recommendations.

May 7, 1998



(35H830 - 134) /Y-12-0r2.DWG / 10JUN98 TG

End Use Map of the Upper East Fork Poplar Creek Watershed

4.7 Recommendations for the End Use of the Former K-25 Site at the East Tennessee Technology Park

The end use recommendations for the former K-25 Site at the East Tennessee Technology Park were approved on June 11, 1998. The signed recommendations and an end use map are presented on pages 50 through 52. The minority opinion is present on page 53.

Physical Description

Of the 4,600 acres that lie within the administrative watershed of the East Tennessee Technology Park (see Figure 4.5), only about 1,000 acres have been impacted by operations at the former K-25 Site. Natural topography of the site has been radically altered since operations began in 1941.

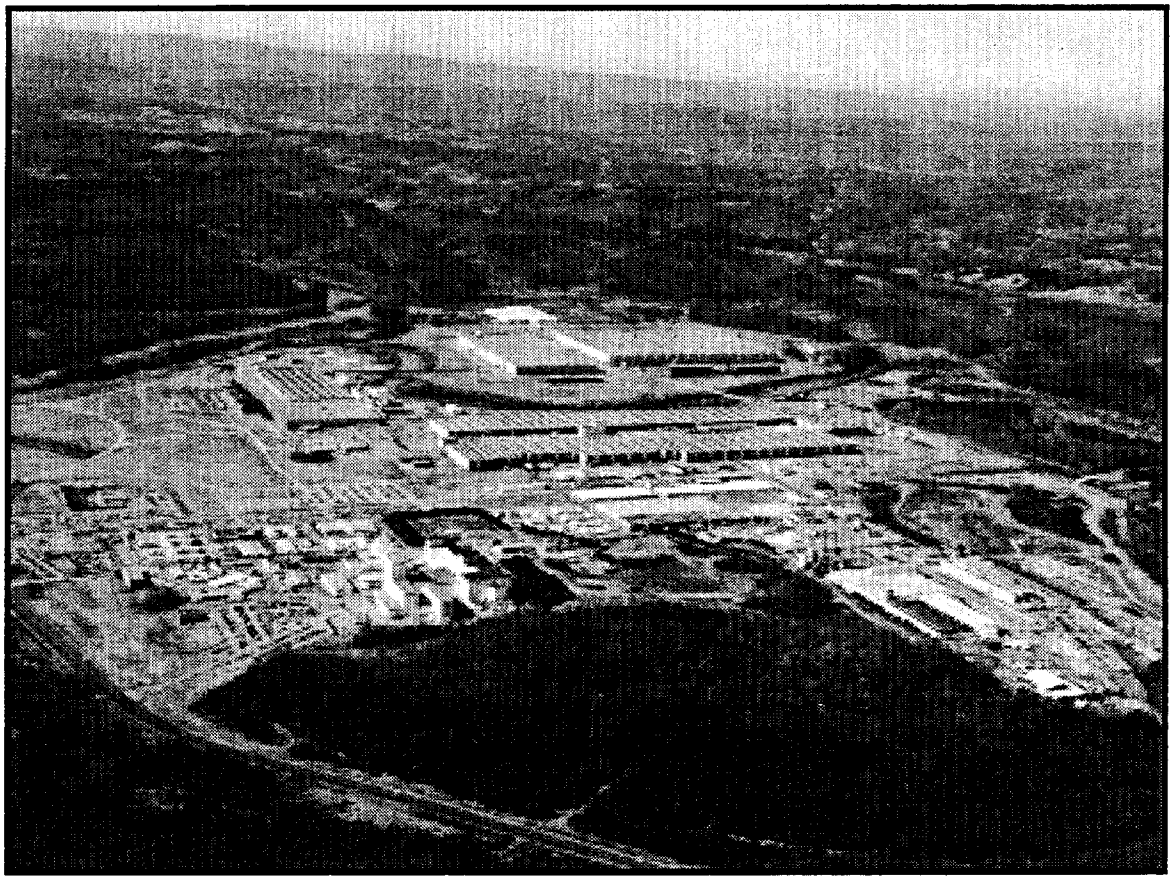


Figure 4.5 Aerial View of the Former K-25 Site Looking West

Over time, many operations were conducted at the former K-25 Site, formally also known as the Oak Ridge Gaseous Diffusion Plant. Enrichment by the S-50 thermal diffusion process took place from 1944-1945 in a part of the site near the Powerhouse area; this process proved ineffective and was discontinued. From 1945-1964, the K-25 Site was a gaseous diffusion enrichment facility for weapons-grade uranium. From 1965-1985, the site produced commercial grade uranium. Uranium

hexafluoride was used as feed for this enrichment process. A centrifuge enrichment process occurred in the K-1200 Buildings from the 1960s until 1985. The Atomic Vapor Laser Isotope Separation process was operated in 1985.

The East Tennessee Technology Park (ETTP) also contains many support buildings, including laboratories, maintenance shops, garages, holding ponds/cooling towers, warehouses, disposal areas, power and utilities, waste treatment plants, and decontamination facilities.

The site is partially bordered by the Clinch River and its tributary Poplar Creek. Groundwater flows into Mitchell Branch, Poplar Creek, and the Clinch River. The Tennessee Valley Authority (TVA) controls water levels in the river, and this impacts groundwater flow. During the winter, when the river is dropped, the highest contaminated groundwater flux is seen. Storm drains also affect groundwater movement. Several of these storm drains lie below the water table, so they serve as pathways for groundwater flow to surface water. In addition, karst features, including sinkholes and subsurface cavities, are found at ETTP. Building sumps affect groundwater flow by creating drawdown conditions that restrict contaminated groundwater plumes. If the sumps were not in place, the groundwater table would rise and the distribution of contaminants would change. The site also has an intricate network of water supply lines that sometimes leak. As these lines are repaired, groundwater flow paths will change.

Major Areas of Contamination

Characterization of the ETTP watershed is still at an early stage in the CERCLA process. The nature and extent of contamination is not fully known. However, data exists from past surveillance and maintenance activities, environmental investigations, operational history, and employee interviews. Through the CERCLA process, DOE will examine those areas that are known or suspected to be contaminated. The Remedial Investigation is not due to regulators until January of 1999. Several areas on the site have already undergone preliminary remedial actions.

The gaseous diffusion process operations area has more than 500 buildings with more than 15 million square feet of floor area. The K-25 and K-27 buildings contain high-enrichment process facilities, and the K-29, K-31, and K-33 buildings contain low-enrichment process equipment. Contaminants in the process buildings are radiological (enriched uranium with trace amounts of highly soluble technetium-99 and transuranic elements) and non-radiological (asbestos, PCBs, and RCRA materials).

More than 270 auxiliary facilities contain more than 2.5 million square feet of floor area. Auxiliary buildings housed support operations including feed/withdrawal, product, tails, testing, maintenance, plating, decontamination, and storage. Site

contamination is not universal but is related to specific operations and facilities and is both radiological and non-radiological in nature.

There are about 290 other buildings and trailers on the site that house offices, labs, storage areas, containerized waste management, change-houses, and infrastructure. Very few of these buildings are contaminated.

Principal contaminants in groundwater are volatile organic compounds and some radionuclides, and metals. The most ubiquitous contaminants are TCE and technetium-99. These groundwater contaminants are associated with support facilities and not with process buildings. Many groundwater plumes are now captured and treated at the Central Neutralization Facility. Groundwater contaminated with technetium-99 is limited to two areas, the K-1070-A Burial Ground and Mitchell Branch. The source for the primary contamination problem in Mitchell Branch is probably the 1407-B Pond. Outfall 760 into Mitchell Branch shows elevated levels of radionuclides, and Outfall 780 shows elevated levels of metals. For the most part, contamination levels are below benchmark values in surface water and ecological improvements are occurring in Mitchell Branch.

Characterization of soil contamination has examined only certain types of contaminants, but sitewide radiological walkovers and sampling have been performed. This soil characterization information will be reviewed in preparation for the Remedial Investigation. Overall, there is a difference in the types of contaminants found in shallow soils and deeper soils. Contaminants in shallow soils include radionuclides, metals, and organics. Sources of this contamination include spills, overflows, building runoff, atmospheric releases, and process line leaks. Contaminants in deeper soils include volatile organic compounds, fuel products, and some radionuclides. The sources are waste line leaks, tank leaks, and burial grounds.

The site was divided into three areas for end use: The K-901/Duct Island/ Powerhouse Area; K-27/29/31/33 and the Administration Area; and the Main Plant.

The **K-901/Duct Island/Powerhouse Area** has limited industrial development and considerable ecological habitat. Sites of potential concern in this area are the K-1070-A Burial Ground, the K-895 Cylinder Destruct Facility, the K-770 scrapyard, the K-901 disposal areas, and the Powerhouse Area. A Record of Decision is expected to be signed for the K-1070-A Burial Ground, calling for excavation. Contaminants at the K-895 Cylinder Destruct Facility include cesium, thorium, uranium, and technetium. The K-770 scrapyard consists of 30 acres with about 40,000 tons of scrap metal. Contaminants in the scrapyard include uranium, asbestos, PCBs, and metals. The K-901 disposal areas were used for construction debris and is not expected to be highly contaminated. Early actions at the K-901-A Holding Pond have included removal of cylinders and PCB-contaminated fish. Most of the Powerhouse facilities have been demolished but the remaining soil contamination must be addressed.

The **K-27/29/31/33 and the Administration Area** has considerable industrial development, limited hot spots of shallow and deep soil contamination, limited access, and few ecological habitats. One potential hot spot is a laundry pit with uranium contamination, and another is cesium-contaminated soil in the southwest corner of K-1004-J. The K-1007-P Pond has PCB-contaminated fish and may also contain debris.

The **Main Plant Area** is an area with heavy industrial activity, active waste management units, very limited ecological habitat, and limited access. Sites with potential contamination are K-1401 Acid Line; K-1420 Process Lines; K-1414 Diesel Tank; K-1064 Drum Storage/Burn Areas; K-1407-B/C Ponds; the K-25 building; K-1410 neutralization pit; and the K-1070-B and K-1070-C/D Classified Burial Grounds. K-1410 is to be demolished. Both the K-1407-B/C Ponds and K-1070-C/D G-Pit have Records of Decision. The K-1070-C/D Burial Ground received classified materials, low-level radioactive and non-hazardous materials. Contaminants are mostly uranium isotopes, technetium-99, and organics. Several early groundwater actions have occurred in the Main Plant Area.

Discussion Related to the Former K-25 Site End Use Recommendation

The EUWG decided that contamination in the Powerhouse Area could be reasonably excavated and disposed. Although they did not want to see the area used for residential purposes, an uncontrolled industrial use that focused on natural resource conservation was satisfactory to most members. Members felt that K-27/29/31/33 and the Administrative area could be cleaned to an uncontrolled industrial use, but that the Main Plant Area would require a controlled industrial use except for the K-1070-B and K-1070-C/D Burial Grounds, which would require a restricted waste disposal end use.

Because the EUWG focused on end uses following remediation, the current reindustrialization process and the TSCA Incinerator were not considered to be within the EUWG scope.

Other Issues Discussed

- concerns about the lack of complete characterization of the site, which impacts end use recommendations;
- concerns about the presence of uranium hexaflouride cylinders at the site;
- concerns about the impacts of contamination on workers' health;
- concerns about the current reindustrialization approach;
- concerns about beryllium levels at the site; and
- the lack of monitoring wells in certain areas at the site.

OAK RIDGE RESERVATION
END USE
WORKING GROUP

END USE RECOMMENDATIONS FOR THE FORMER K-25 SITE AT THE EAST TENNESSEE TECHNOLOGY PARK

Using the former K-25 Site at the East Tennessee Technology Park (ETTP) in a manner that is safe and protective of human health and the environment is important to the long-term vitality of the Oak Ridge community. The End Use Working Group (EUWG) discussed but did not evaluate and is not commenting on the current reindustrialization process or the Toxic Substances Control Act (TSCA) Incinerator. The EUWG recommendations apply to the former K-25 Site following remediation.

The EUWG recognizes that the federal government will maintain ownership of the property and will be responsible for managing all residual contamination and other stewardship actions.

The Remedial Investigation for ETTP has not been completed, and these end use recommendations are based on preliminary information regarding the scope and extent of contamination.

For purposes of end use recommendations, the EUWG has divided the former K-25 Site into three zones (see map). Zone 1 constitutes property along the Clinch River including the former power plant area; this area is the least developed and least contaminated of the former K-25 Site considered by the EUWG. Zone 2 consists of the former gaseous diffusion process and administration areas. Zone 3 consists of the former support area.

The End Use Working Group makes the following recommendations (numbers do not imply priority):

1. Zone 1 should be remediated to allow for uncontrolled industrial end use, with a focus on natural resource conservation.
2. Zone 2 should be remediated to provide for uncontrolled industrial end use.
3. Zone 3 should be remediated to provide for controlled industrial end use. If the existing K-1070 B and K-1070 C/D waste disposal areas in Zone 3 cannot be fully remediated to controlled industrial end use, then these areas should be maintained as restricted access waste disposal properties and should be managed to ensure the safety of surrounding populations and the environment.
4. The continued storage of UF_6 is not compatible with these recommended end uses. This incompatibility should be resolved on a schedule that coincides with the planned remediation of the site.

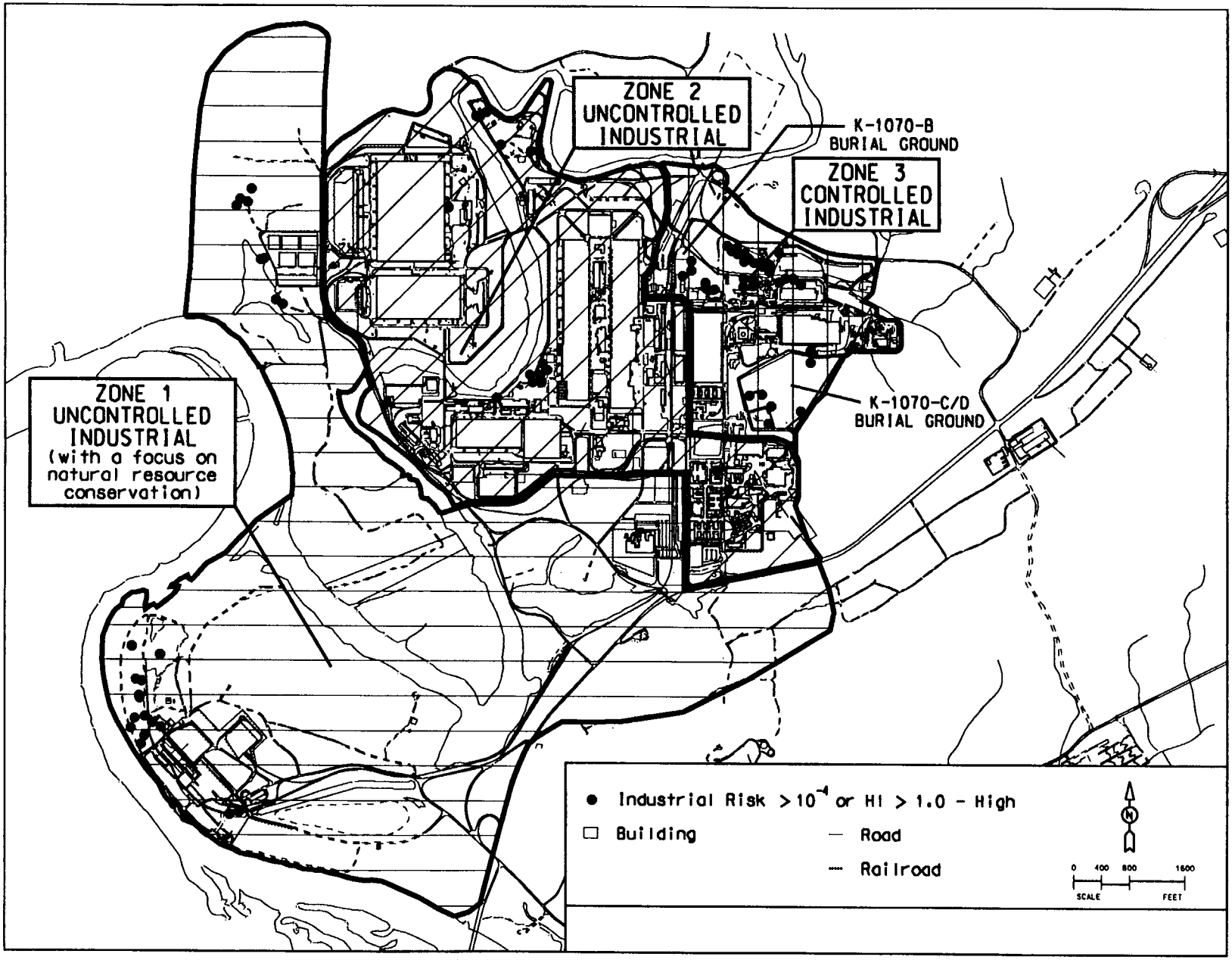
Implementation of these recommendations by DOE must be consistent with the End Use Working Group Community Guidelines and its recommendations for stewardship. If DOE cannot meet these recommendations for the former K-25 Site, exceptions must be discussed in a public forum as part of the decision-making process.

End Use Recommendations for the Former K-25 Plant

END USE RECOMMENDATIONS FOR THE FORMER K-25 SITE
AT THE EAST TENNESSEE TECHNOLOGY PARK

We, the undersigned members to the Oak Ridge Reservation End Use Working Group, have participated in the development of and endorse the above recommendations.

June 11, 1998



End Use Map of the Former K-25 Site

OAK RIDGE RESERVATION
END USE
WORKING GROUP

MINORITY OPINION REGARDING THE END USE RECOMMENDATIONS FOR THE FORMER K-25 SITE AT THE EAST TENNESSEE TECHNOLOGY PARK

Presentations of preliminary risk assessment results conducted by DOE's contractors were made to the End Use Working Group. Of note were areas of unacceptable risk in surface soils under the industrial exposure scenario at locations where buildings are being leased or planned to be leased under current reindustrialization plans. As noted in the recommendation, the Remedial Investigation for ETTP is just beginning; it is possible that other areas of unacceptable risk will be identified over the course of the Remedial Investigation. In addition, a number of workers from the former K-25 site are sick. The cause(s) of their illnesses has not been identified, but the TSCA incinerator has the potential to be at least one source of contaminants that could be causing illness.

Under the CERCLA process, areas of unacceptable risk must be cleaned up to safe levels for current and future use exposure scenarios. The EUWG chose not to comment on the current reindustrialization plans for ETTP or the use of the TSCA incinerator. However, we must go on record as saying that it is unconscionable for the Department of Energy to lease buildings to new industries in an area when their own risk assessments indicate that risks are unacceptable under current conditions. The number of sick workers from the site corroborate their assessment. Reindustrialization of the former K-25 site should not occur until the Remedial Investigation is completed, areas of unacceptable risk are identified and controlled until they can be remediated, and the cause(s) of the illnesses are identified and corrected.

We the undersigned members to the Oak Ridge Reservation End Use Working Group, have participated in the development of and endorse the above minority opinion.

Mary Bryan _____ _____

Jane Humphrey _____ _____

Charles Reid _____ _____

Jean Ramsey _____ _____

Barbara A. Walton _____ _____

Wolf Naegele _____ _____

June 25, 1998

4.8 Recommendations for Sites Outside Existing Administrative Watersheds

The end use recommendations for sites outside existing administrative watersheds were approved on June 11, 1998. The signed recommendations are presented on page 55.

Discussion Related to the Recommendation for Sites Outside Existing Administrative Watersheds

In general, these sites included a number of reactor sites in Melton Valley and isolated sites that were not included within the scope of the watershed discussions. These sites are identified in the recommendation. While a number of these sites were briefly discussed, the EUWG did not feel that it had sufficient level of detail to make detailed end use recommendations. However, EUWG members did not want to leave these sites unaddressed. The EUWG felt strongly that opportunities should be taken wherever feasible to return the sites to unrestricted conditions.

OAK RIDGE RESERVATION
END USE
WORKING GROUP

END USE RECOMMENDATION FOR SITES NOT INCLUDED IN THE EXISTING ADMINISTRATIVE WATERSHEDS

During its deliberations, the End Use Working Group (EUWG) was unable to study a number of sites whose remediation is being considered separately from the five existing administrative watersheds. These sites include but are not limited to:

1. White Wing Scrap Yard
2. Molten Salt Reactor Experiment facility
3. High Flux Isotope Reactor
4. Homogenous Reactor Experiment facility
5. Cesium Plots

The EUWG recommends that DOE use the Community Guidelines in making future end use decisions for such sites. Particular attention should be given to selecting an end use that is consistent with end uses of adjacent property.

In particular, because the White Wing Scrap Yard is surrounded by uncontaminated land, it should be remediated to allow for unrestricted use.

Use of the reactor sites in Melton Valley should be consistent with Melton Valley recommendations for government-controlled industrial use. In addition, the Cesium Plots lend themselves to remediation that allows for an unrestricted end use.

We, the undersigned members to the Oak Ridge Reservation End Use Working Group, have participated in the development of and endorse the above recommendations.

June 11, 1998

End Use Recommendations for Sites Outside Existing Administrative Watersheds

4.9 Stewardship

The Stewardship Committee of the EUWG defined stewardship of residual contamination following remediation on the Oak Ridge Reservation 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."*

Stewardship of materials not associated with environmental remediation, such as the storage of highly enriched uranium and the uranium hexaflouride cylinders, was not considered.

If EUWG recommendations are followed, some radioactive and chemically toxic contamination present on the Oak Ridge Reservation will be managed in place or moved to a new disposal facility on the Reservation. In either case, a long-term stewardship program will be needed. These materials are persistent or long-lived and will need to be controlled in perpetuity to ensure protection of human health and the environment. Regardless of the remediation approach, contaminated material will remain on the Oak Ridge Reservation.

Returning contaminated areas to pristine conditions is often risky for excavation and transportation workers; is impractical for cost, technical, and logistical reasons; and does not always result in risk reduction. In addition, citizens and governments of the affected areas often oppose the transport and off-site disposal of contaminated materials, and the EUWG believes that the citizens of Oak Ridge must be fair in approaching an equitable distribution for waste disposal.

Because some level of contamination will remain on the Oak Ridge Reservation, a stewardship program is needed to protect the public and the environment from future risks associated with the residual contamination. Developing an effective stewardship program is essential to the application of EUWG recommendations. The EUWG cannot endorse any remediation program that leaves residual contamination above health-based levels without the assurance that all necessary and appropriate actions for stewardship are in place.

During deliberations regarding future uses of contaminated areas on the Oak Ridge Reservation, the EUWG realized the need for a formal stewardship program. Recognizing the complexity of such a task, the EUWG formed a committee to develop detailed stewardship recommendations. The EUWG Stewardship Committee was joined by a group from the Friends of Oak Ridge National Laboratory to establish an even broader-based group of stakeholders to evaluate stewardship. The stewardship committee established five goals:

- Identify essential elements of effective stewardship;
- Develop long-term stewardship requirements for the Oak Ridge Reservation;

- Identify options and promote the acquisition of adequate long-term funding for stewardship on the Oak Ridge Reservation;
- 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 a separate report. The *Stakeholder Report on Stewardship* documents the efforts of the stewardship 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 Oak Ridge Reservation stewardship program, including categories of stewards, physical controls, institutional controls, information systems, research, and funding options.

The Stewardship Report calls for DOE:

- to begin immediately to include an increasingly complete stewardship section in each CERCLA decision document;
- to develop a Stewardship Implementation Plan by the end of 1999 so that stewardship requirements are included as an integral part of all CERCLA decision documents; and
- to form a volunteer citizen Stewardship Transition Team in the fall of 1998 to assist in the implementation and development of stakeholder stewardship recommendations and to monitor progress of developing stewardship programs; this transition team is to be followed by a more formal Citizens Oversight Board for Stewardship.

The EUWG's work on long-term stewardship has important ramifications for Oak Ridge and other DOE installations. Immediate attention to stewardship will help DOE and its regulators to craft remedial actions that address stakeholder concerns and offer long-term protection of human health and the environment where there is residual contamination. Development of a stewardship program by DOE would forestall program disruptions that could occur if remediated facilities were transferred to a new stewardship agency.

The *Stakeholder Report on Stewardship* contains many specific recommendations, and it should be consulted for a full understanding of stewardship issues.

5.0 CONCLUSIONS

With the completion of this report, the End Use Working Group achieved its original objectives and much more. In addition to making end use recommendations and providing Community Guidelines for the end use of contaminated lands, groundwater and surface water on the Oak Ridge Reservation, the EUWG:

- established a model for conducting open, informed, and focused public involvement;
- developed a conceptual model for a long-term stewardship program for the Oak Ridge Reservation;
- paved the way for a balanced approach to remediation through the use of limited and responsible on-site disposal of radiological and chemically hazardous wastes; and
- left a comprehensive compilation of high-quality technical information on each watershed as well as key technical information related to environmental remediation.

One of the most important aspects of the End Use Working Group is the impact it had on public involvement in Oak Ridge. Stakeholders responded positively to the open process that was used and found that cooperative relationships are possible between the public and DOE. The EUWG hopes the following principles that were essential to the success of the EUWG will continue to be used by DOE:

- stakeholder participation in identification of issues and determination of priorities to establish common goals and focus for DOE activities on the Oak Ridge Reservation;
- broad-based open participation for all interested stakeholders;
- a cooperative approach to assessment of past activities and environmental impacts in order to understand current conditions, proposed activities, and reasonable uses for all areas of the Oak Ridge Reservation;
- a focus on information and education to allow for informed public input to Reservation issues;
- open access to subject area experts and program managers to help stakeholders find answers to their questions;
- independent technical facilitation to ensure stakeholders work together and focus on relevant issues; and
- an informal process that includes DOE, TDEC DOE-O, and EPA participation to enhance stakeholder understanding of issues.

Effective public participation is expensive. However, these expenses can be viewed as an investment in the community, and a contribution to stakeholder acceptance of DOE activities on the Oak Ridge Reservation.

ACKNOWLEDGMENTS

EUWG members appreciate the dedication of DOE and its contractors in meeting our informational needs and desires. The countless hours spent by technical presenters in preparing materials and working with the EUWG were essential to the Group's success. Doug Sarno of Phoenix Environmental provided effective facilitation and technical assistance, and the role played by Karen Bowdle in organizing end use activities and coordinating among the many parties involved in making the process work was indispensable.

The EUWG effort would have been impossible without the unflagging support and attention of Margaret Wilson, leader of the local DOE Federal Facilities Agreement Program and her staff; they provided many hours of detailed discussions with EUWG members. The encouragement and support of Rod Nelson, Assistant Manager for Environmental Management at DOE, Oak Ridge Operations is also greatly appreciated. The DOE Oak Ridge Operations Environmental Management Program financed the support to the EUWG.

LIST OF APPENDICES

Appendix A	Roster of EUWG Participants
Appendix B	Examples of EUWG Education Materials
Appendix C	Schedule of EUWG Meetings and Topics
Appendix D	Additional Issues Submitted by EUWG Participants
Appendix E	Endorsements of EUWG Recommendations
Appendix F	Additional Comments Received by the EUWG

APPENDIX A

Roster of End Use Working Group Participants

Alfred A. Brooks, Oak Ridge

Affiliations:
- Oak Ridge Reservation End Use Working Group
- League of Women Voters of Oak Ridge
- ORR Local Oversight Committee/Citizens Advisory Panel
- Friends of Oak Ridge National Laboratory
- Society for Risk Analysis
- Tennessee Citizens for Wilderness Planning
- Chicago Mountaineering Club

Why I became an EUWG member: I joined the EUWG because I believe public participation can ensure some reason in the DOE Remediation Process.

Mary Bryan, Knoxville

Affiliations:
- Oak Ridge Environmental Peace Alliance
- Oak Ridge Reservation End Use Working Group
- Alliance for Nuclear Accountability
- Narrow Ridge Earth Literacy Center

Why I became an EUWG member: I joined the EUWG in an effort to ensure that the views of the environmental community be considered along with other perspectives when making recommendations about end use for the Reservation.

Other Background Information: Registered professional geologist. Served over two years on the Oak Ridge Reservation Environmental Management Site Specific Advisory Board before resigning in March, 1998.

John Byrne, Clinton

Affiliations:
- Oak Ridge Reservation End Use Working Group

Why I became an EUWG member: I am interested in cost/benefits balance to clean up activity.

Other Background Information: Retired aerospace executive

Sherrie Farver, Oak Ridge

Affiliations:
- Coalition for a Healthy Environment

Why I became an EUWG member: I became an EUWG member because of my concern for health and safety at the former Oak Ridge K-25 site now known as the East Tennessee Technology Park.

Other Background Information: I worked at the K-25 site for 8 years and left it after verifying abnormally elevated levels of blood cyanide and heavy metals in my body.

Susan Gawarecki, Anderson County

Affiliations:
- Oak Ridge Reservation End Use Working Group
- Executive Director, Oak Ridge Reservations Local Oversight Committee, Inc. (LOC) Environment Committee Chair, First Vice President, and Past President of The League of Women Voters of Oak Ridge
- East Tennessee Geological Society
- East Tennessee chapter – Society for Risk Analysis
- American Nuclear Society
- International Association for Public Participation
- Technical Requirements Working Group (stakeholder advisor to DOE's Mixed Waste Focus Area)
- Registered Professional Geologist in Tennessee, South Carolina, and Kentucky

Why I became an EUWG member: I have a deep personal and professional interest in seeing that remediation decisions made about ORR sites are based on sound scientific and technical information, and that these decision are acceptable to the community. As LOC Executive Director (and assisted by several members of the LOC's Citizens' Advisory Panel) I try to represent the concerns of the seven surrounding and downstream county governments and the City of Oak Ridge.

Other Background Information: Past hydrogeologist and project manager in the hazardous-waste consulting industry for ten years. Served on the South Carolina Hazardous Waste Policy Task Force, the Knoxville Solid Waste Task Force, TVA's Integrated Resource Planning Review Group, and the ORR Site Specific Advisory Board Steering Committee. Spent nearly 6 years as a researcher with the Earth Sciences and Resources Institute. Ph.D. in geology

Jana F. Humphrey, Oak Ridge

Affiliations:
- Oak Ridge Reservation End Use Working Group
- Past President, Tennessee Association for Family and Community Education
- President, Oak Ridge Family and Community Education
- Past President of Anderson County and District V Family and Community Education
- Appointee of the Anderson County Fair Association
- Vice Chair Traffic Safety Advisory Board for City of Oak Ridge
- Participant in Family Re-Union Conferences founded by Al Gore
- Teacher of handmade crafts to hundreds of adults across Tennessee

Why I became an EUWG member: I joined because I had heard so many stories over the years; I wanted to know if they were true.

Josh Johnson, Oak Ridge

Andy Kelsey, Knoxville

Affiliations:
- Registered Chemical Engineer, Tennessee
- Registered Environmental Manager
- Oak Ridge Reservation End Use Working Group

Why I became an EUWG member: I joined the EUWG because of both professional and personal interest.

Other Background Information: Environmental Engineer now employed by Bechtel Jacobs Company LLC. 14 years radiological and environmental cleanup experience.

Claudia Lever, Oak Ridge

Affiliations:
- Oak Ridge Reservation End Use Working Group
- Member of Oak Ridge Regional Planning Commission
- League of Women Voters

Why I became an EUWG member: I was asked to participate as a representative of the Oak Ridge Regional Planning Commission.

Roger Macklin, Oak Ridge

Affiliations:
- Oak Ridge Reservation End Use Working Group
- Local Oversight Committee Citizens' Advisory Panel
- Health Physics Society (National and East Tennessee Chapter)
- Vice President, Greenways Oak Ridge
- Smoky Mountain Hiking Club
- Appalachian Mountain Bike Club
- Smoky Mountain Wheelmen Bicycle Club
- Tennessee Tail-Trail Advisory Council

Why I became an EUWG member: Professional interest in radiological issues surrounding environmental restoration and waste management, and persoanl interest in future land uses for the Oak Ridge Reservation and the City of Oak Ridge.

Other Background Information: B.S. Physics, M.S. Nuclear Engineering. Additional post-graduate work in Health Physics. Health Physicist with Tennessee Department of Environment and Conservation, Division of Radiological Health.

Richard Mathis, Knoxville

Affiliations:
- Oak Ridge Reservation End Use Working Group
- EUWG Stewardship Committee

Why I became an EUWG member: I have an interest in the future of the Oak Ridge Reservation.

Other Background Information: Oak Ridge National Laboratory (ORNL) – Retired, worked in environmental assessment work

Norman A. Mulvenon, Oak Ridge

Affiliations:
- Oak Ridge Reservation End Use Working Group
- Citizens Advisory Panel of the Local Oversight Committee

Why I became an EUWG member: I joined the EUWG to participate in making land use suggestions for the Oak Ridge Reservation.

Wolf Naegeli, Knoxville (Oak Ridge resident from 1985 to 1997)

Affiliations:
- Oak Ridge Reservation End Use Working Group
- President, Foundation for Global Sustainability
- East Tennessee Chapter – Society for Risk Analysis
- Soil and Water Conservation Society
- American Association for the Advancement of Science
- Past President, MacClique—East Tennessee Macintosh User Group

Why I became an EUWG member: As a longtime neighbor whose backyard adjoined the Oak Ridge Reservation, I have had a strong interest in its status and future. It contains not only some of the most severely contaminated sites in the U.S. but also a very important and unique national asset in the National Environmental Research Park/Southern Appalachian Biosphere Reserve. I wanted to help assure that the pollution problems are dealt with expeditiously and in a way that reduces the total risk to human health and the environment. It would be unacceptable to me if the billion dollar cleanup activities created greater risks for the remediation workers and the residents of transportation corridors and final disposal sites than could be eliminated by the cleanup. I also am a proponent of participatory democracy. This was an opportunity to walk my talk and help the community with may professional knowledge.
Other Background Information: Ph.D., Natural Resources Policy and Planning. Senior Research Scientist, Energy Environment, and Resources Center, the University of Tennessee. Full-time consultant since 1985 to ORNL, currently working with the Energy Division's Emergency Management and Preparedness Program.

Gerry Palau, Oak Ridge

William M. Pardue, Oak Ridge

Affiliations:
- Oak Ridge Reservation End Use Working Group
- Oak Ridge Reservation Environmental Management Site Specific Advisory Board
- Oak Ridge Breakfast Rotary Club
- East Tennessee Environmental Business Association

Why I became an EUWG member: I joined to assist DOE and the regulatory agencies accomplish their mission by supplying input regarding citizen concerns and acceptable cleanup goals for the Oak Ridge Reservation.

Other Background Information: I have a long-standing involvement and interest in stakeholder interactions with DOE.

Robert Peelle, Oak Ridge

Affiliations:
- Oak Ridge Reservation End Use Working Group
- American Physical Society
- American Association for the Advancement of Science
- American Nuclear Society (fellow)
- Sierra Club
- Save Our Cumberland Mountains
- Tennessee Citizens for Wilderness Planning
- ORR Environmental Management Site Specific Advisory Board
- Oak Ridge Health Agreement Steering Panel of Tennessee Department of Health

Why I became an EUWG member: Helped to form the EUWG because of high potential impact. An unusual chance to aid "cleanup" through public involvment.

Other Background Information: Long service as member of Roane County Legislative Body.

Jim Phelps, Oak Ridge

Tammy Phillips, Oak Ridge

Jean Ramirez, Jacksboro

Stanley Reel (deceased), Oak Ridge

Sandra Reid, Oak Ridge

Affiliations:
- Oak Ridge Reservation End Use Working Group
- Coalition for a Healthy Environment
- Environmental Health Network
- Oak Ridge Health Liaison
- The Task Force for Radiation and Human Rights

Why I became an EUWG member: Because I am very concerned about the toxicants in the environment and their impact on human health and I wanted to ensure that our future decisions for land use protected employees and residents.
Other Background Information: Registered Nurse. Served for over two years on the Oak Ridge Reservation Site Specific Advisory Board (SSAB) and the Steering committee of the SSAB before resigning April 20, 1998.

Lorene Sigal, Oak Ridge

Affiliations:
- Oak Ridge Reservation End Use Working Group
- ORR Environmental Management Site Specific Advisory Board
- Friends of Oak Ridge National Laboratory
- Tennessee Native Plant Society

Why I became an EUWG member: when the opportunity to influence DOE's planning for the future of the Oak Ridge Reservation was presented, how could anyone resist?

Other Background Information: An ecologist, retired from ORNL. Her areas of expertise include air pollution effects on vegetation and the impacts of energy sources on terrestrial ecosystems. She has an undergraduate degree from Stanford University and graduate degrees from San Francisco State University and Arizona State University. She and her husband, a retired architect, recently prepared design guidelines for the City of Oak Ridge.

Sam Suffern, Oak Ridge

Barbara Walton, Oak Ridge

Affiliations:
- Oak Ridge Reservation End Use Working Group
- Member of the Citizens Advisory Panel (CAP) of the Oak Ridge Reservation Local Oversight Committee (LOC)
- Volunteer, Recording for the Blind & Dyslexic
- Member, Grace Lutheran Church.

Why I became an EUWG member: to learn more about the status of the Oak Ridge Reservation and to contribute my experience and expertise.

Other Background Information: BS, Chemical Engineering, The Pennsylvania State University, MChE, The University of Oklahoma. Worked at the Goddard Space Flight Center as an engineer on environmental satellites and their data systems from December 1962 until retiring in October 1993. Before that, I worked as a chemical engineer for Humble Oil & Refining in Baton Rouge, LA and for Sun Oil Company in Marcus Hook, PA.

Charles Washington, Oak Ridge

Affiliations:

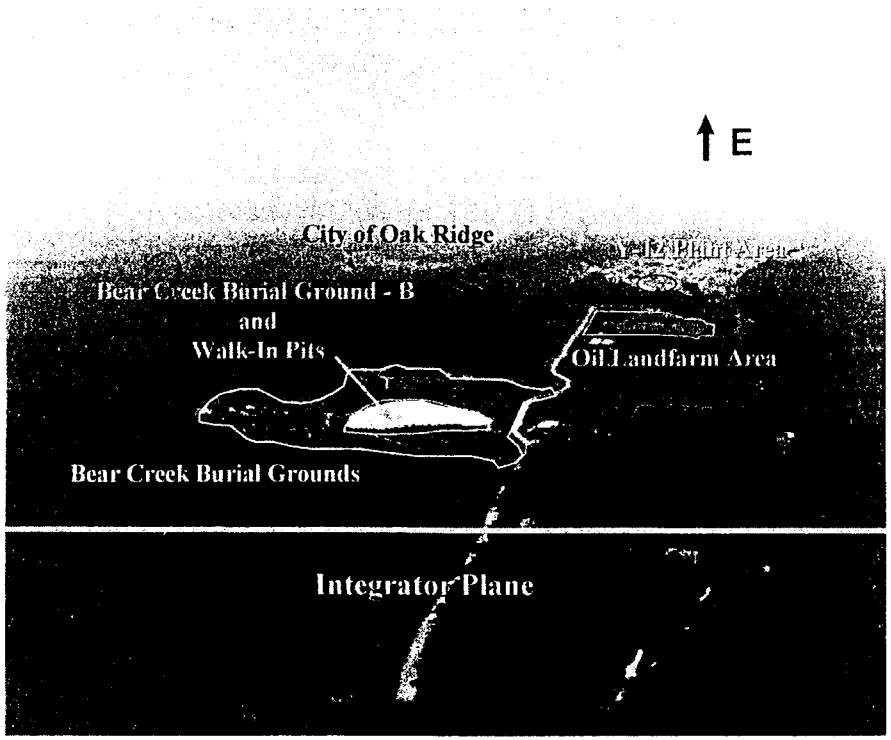
- Site Specific Advisory Board
- VP of Inventor's Forum
- President and Regional Chairman of National Organization of Black Chemist and Chemical Engineers
- Board of Directors of United Network for Organ Sharing

Other Background Information: Employed at Lockheed Martin Energy Systems, Environment, Safety and Health Organization, Air Compliance Department. Has received the Energy Systems' Inventor of the Year Award, Operations and Support Award, The President's Award, and three Y-12 Plant Awards of Excellence.

Herman Weeren, Oak Ridge

APPENDIX B
Examples of End Use Working Group Materials

This appendix includes some of the materials used in discussing Bear Creek Valley and the S-3 Ponds. Information is included on contaminant types, site history, site geology and hydrology, site risks, and costs and volumes to achieve alternative end uses. These examples are typical of information compiled for the other watersheds. Additional watershed information is available at the Information Resources Center, 105 Broadway, Oak Ridge.



Aerial view of Bear Creek Valley looking East. Bear Creek Valley contains three primary waste disposal areas: S-3 Ponds, Oil Landfarm and Bear Creek Burial Grounds. Bear Creek Valley is the first clean-up effort that will use DOE's watershed clean-up strategy. (Photo #: 318596)

References:
(1) *Feasibility Study for Bear Creek Valley at the Oak Ridge Y-12 Plant, Oak Ridge, Tennessee,* (DOE/OR/02-1525/V1 & D1), April 1997.
(2) *Report on the Remedial Investigation of Bear Creek Valley at the Oak Ridge Y-12 Plant, Oak Ridge, Tennessee* (DOE/OR/01-1455/V1 &D1), March 1997.

Thursday, June 26, 1997
File name: STEP: Bearvalleyfact

Bear Creek Valley Information Sheet

Historical Summary: When the Y-12 Plant began operations in 1943 as part of the Manhattan Project, its original mission was to electromagnetically separate uranium isotopes. This original mission, followed by evolving missions over the years, resulted in disposal of solid and liquid wastes in Bear Creek Valley. The three primary areas of waste disposal are: the **S-3 Ponds,** the **Oil Landfarm Area,** and the **Burial Grounds.**

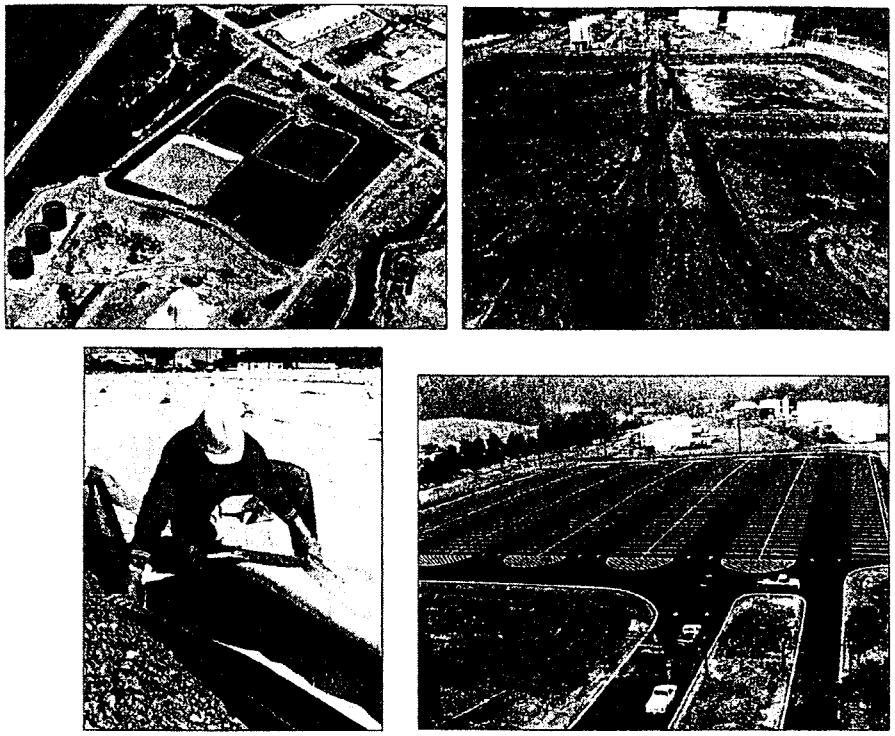
Status: Large volumes of different types of buried waste are present at each of the three areas. Some wastes are periodically inundated by shallow groundwater. Contaminants have been identified in groundwater, surface water, soils and sediments in and around the three primary disposal areas. Several areas in the three primary areas have been closed and capped under Resource Conservation and Recovery Act (RCRA) requirements. The challenge is to determine what actions are needed to address contaminated groundwater, surface water and some soils.

Impacts to Watershed: Bear Creek and northern tributaries NT-1 through NT-8 comprise the drainage system that receives contaminated runoff and contaminated groundwater discharge from the waste disposal areas. Soils, tributary sediments and Bear Creek floodplain soils and sediments east of the integrator plane have also been affected, and could potentially be transported further west down Bear Creek. More than 99% of all groundwater and surface water in the 4.34-square mile Bear Creek Valley Watershed converges at Bear Creek Kilometer 9.47. This location has been selected as the watershed's integrator plane, where the relative mass of contaminants leaving the various waste disposal areas can be measured.

Risk Summary:
- The risk assessment for Bear Creek Valley revealed that for nearly all the waste disposal areas east of the integrator plane risks for potential future residents exceed 10^{-4} and/or a Hazard Index of 1. Potential risks to future industrial workers who could possibly be exposed to buried waste or contaminated soil range between 10^{-6} and 10^{-1}.
- Chemicals of concern at the integrator plane are uranium, nitrate, boron and fluoride. Nitrate and gross alpha in groundwater exceed legal requirements.
- West of the integrator plane, contaminants in groundwater and surface water are chloride, fluoride, nitrate, boron, non-radiogenic strontium and uranium. Concentrations of these contaminants rarely exceed environmental regulations.
- Waste disposal at the Y-12 Plant impacted the ecology of the Bear Creek Valley watershed during operations. Since waste disposal operations ended and RCRA Corrective Actions were implemented, the ecology of the watershed has greatly recovered, but significant ecological risks still remain.

Half-Lives of Radioactive Contaminants in Bear Creek Valley

Site-Related Radionuclides	Half-Life (Years)
Technetium-99	210 Thousand
Thorium-228	1.9
Thorium-230	80 Thousand
Thorium-232	14.1 Billion
Thorium-234	0.066
Uranium-234	162 Thousand
Uranium-235	710 Million
Uranium-238	4.51 Billion



The S-3 Ponds during various phases of remediation/capping. Top left: S-3 Ponds during neutralization and biodenitrification process (photo#: 224500). Top right: S-3 Ponds after draining (photo#: 241762). Bottom left: Worker installs RCRA cap (photo#: ORO 88 924). Bottom right: Parking lot constructed over capped ponds in 1988 (photo#: 275704).

References:

(1) *Feasibility Study for Bear Creek Valley at the Oak Ridge Y-12 Plant, Oak Ridge, Tennessee,* (DOE/OR/02-1525/V1 & D1), April 1997.

(2) *Report on the Remedial Investigation of Bear Creek Valley at the Oak Ridge Y-12 Plant, Oak Ridge, Tennessee* (DOE/OR/01-1455/V1 &D1), March 1997.

(3) *Hydrologic Investigation of the S-3 Ponds Area at the Y-12 Plant, Oak Ridge, Tennessee,* Gereghty & Miller, Inc. (Prepared for Martin Marietta Energy Systems. Contract No. DE-AC05-84OR21400), 1987.

(4) *Contaminant Spread and Flushing in Fractural Rocks Near Oak Ridge, Tennessee,* Sheverall, L.A., G,K, Moore, and R.B. Dreier, Ground Water Monitoring and Remediation, Vol. 14, No.2, Spring 1994.

(5) *Development of Groundwater Flow Models for the S-3 Waste Management Area at the Y-12 Plant, Oak Ridge, Tennessee,* Gereghty & Miller, Inc. (Prepared for Martin Marietta Energy Systems. Y/SUB/89-00206C/1), June 1989.

Thursday, June 26, 1997
File name:STEP: S-3pondsfact

S-3 Ponds Information Sheet

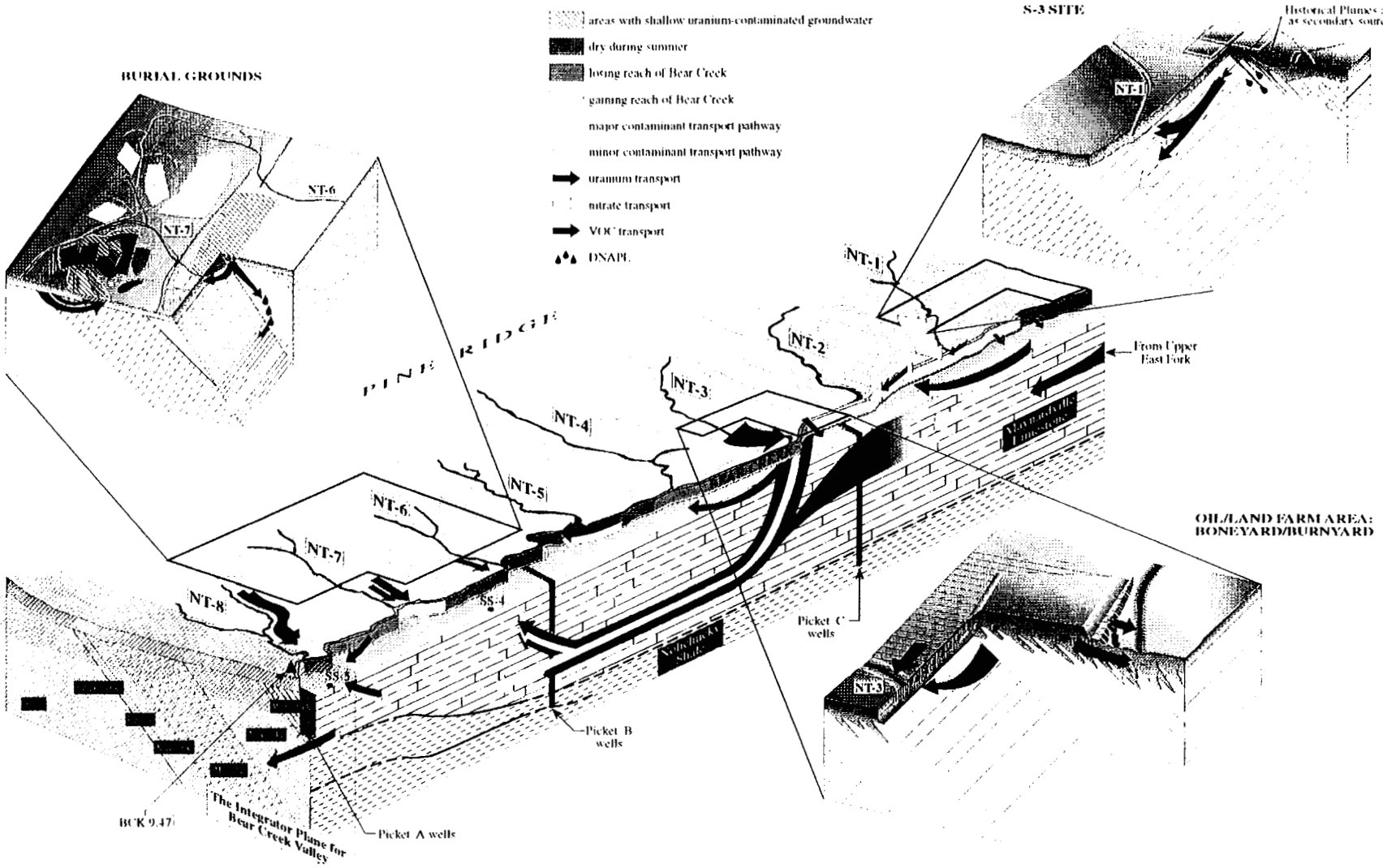
Historical Summary: From 1951 to 1984 waste solutions produced by the Y-12 Plant were disposed of in the S-3 Ponds. In addition, one time disposals of waste solutions from other DOE facilities, including ORNL, K-25, and Savannah River occurred. Located just west of the Y-12 Plant and about 200 ft north of Bear Creek's headwaters, these four unlined, one-acre ponds received about 2.5 million gallons of nitric acid solution each year for 33 years. Other waste streams include pickling and plating wastes, and machine coolants containing depleted uranium and technetium. Waste disposal to the ponds ended in 1984. In the same year, the acidic solutions remaining in the ponds were neutralized, and in situ biodenitrification began. After biodenitrification was completed, the remaining liquids were pumped off, treated, and discharged to Upper East Fork Poplar Creek under an NPDES permit, and the ponds were capped with a RCRA cap. A parking lot was constructed above the site in 1988.

Status: Although the S-3 Ponds have been capped, this site continues to release contaminants to the environment via groundwater and surface water. Elevated concentrations of uranium, nitrate, barium, volatile organic compounds (VOCs) and, to a lesser extent, technetium are found in groundwater and surface water near the site. A large portion of contaminated groundwater from the site discharges into Bear Creek tributaries NT-1 and NT- 2 and eventually flows into Bear Creek. Groundwater contaminated with at least 10 ppm nitrate extends from the former S-3 Ponds over 3,000 feet to the west along Bear Creek.

Impacts to Watershed: Of the three primary disposal areas in Bear Creek Valley, the S-3 Ponds have produced the most extensive surface water and groundwater contamination. Solutions disposed in the ponds have migrated via two pathways: (1) direct discharge to Bear Creek or to nearby tributary NT-1 or (2) infiltration into groundwater below the ponds. This migration has resulted in an east-west contaminated groundwater plume within the underlying shale unit, which is now a significant secondary contaminant source to Bear Creek and ultimately to the Bear Creek Valley groundwater aquifer in the Maynardville Limestone.

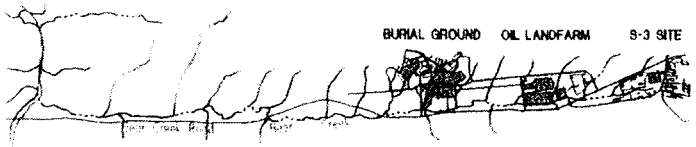
Risk Summary: The risk assessment identified a large number of contaminants of concern (COCs) for a hypothetical future resident, with uranium and nitrate in groundwater being the most significant COCs. Sources include groundwater, capped waste, and surface water. Some COCs associated with the capped waste were also identified as a potential risk for a future hypothetical industrial worker. Exposure to the soils adjacent to the S-3 Ponds represents no risk to a future hypothetical industrial worker or to a hypothetical current unprotected maintenance worker.

Discharges from the S-3 Ponds have impacted the upper reaches of Bear Creek and tributaries NT-1 and NT-2 and continue to present risks to the ecology.



CONCEPTUAL MODEL FOR CONTAMINANT MIGRATION IN BEAR CREEK VALLEY.

BC-93 rev 2



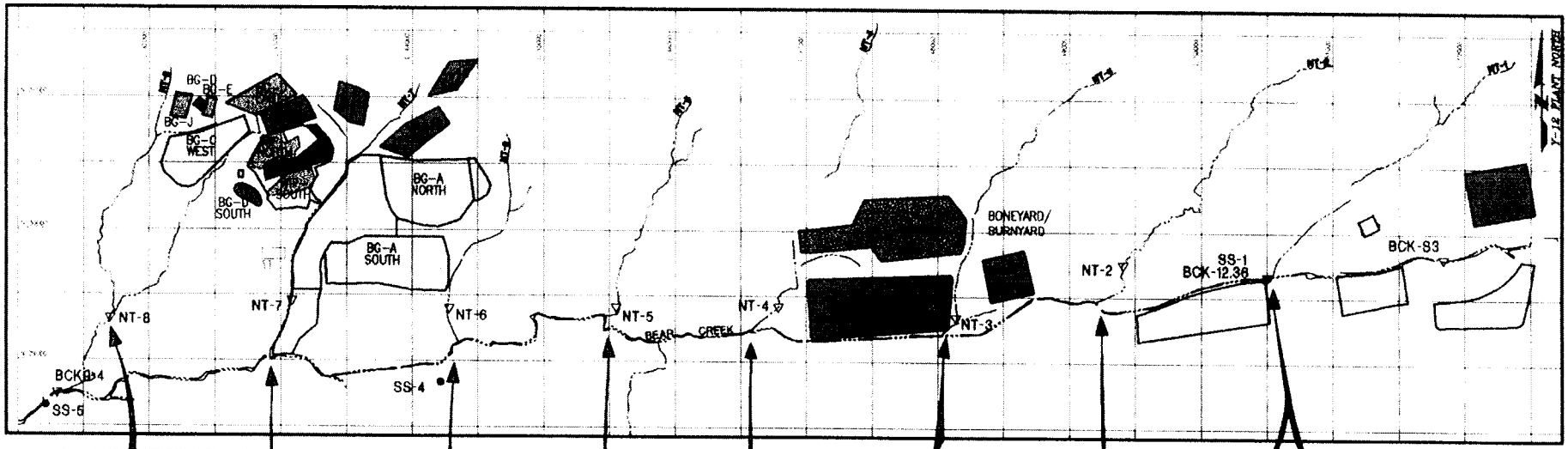
BEAR CREEK VALLEY KEY MAP

LEGEND:

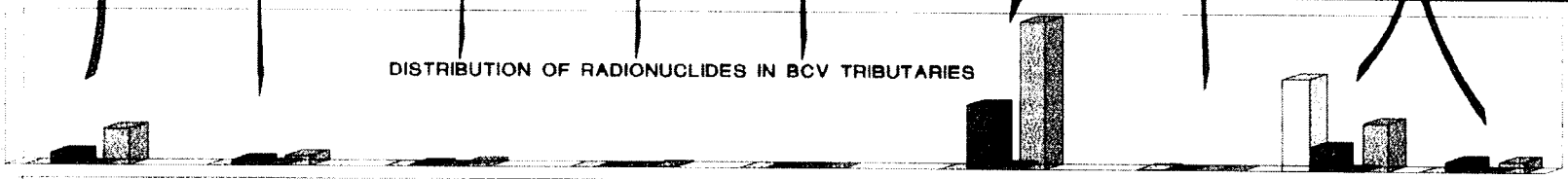
- BEAR CREEK & TRIBUTARIES
- SUBWATERSHED BOUNDARY
- ▽ NT-2 ..... SURFACE WATER SAMPLE (OU4)
- SURFACE WATER SAMPLE
- ● SS-1 ..... AT SPRINGS (OU4)

URANIUM IN SOURCE AREAS

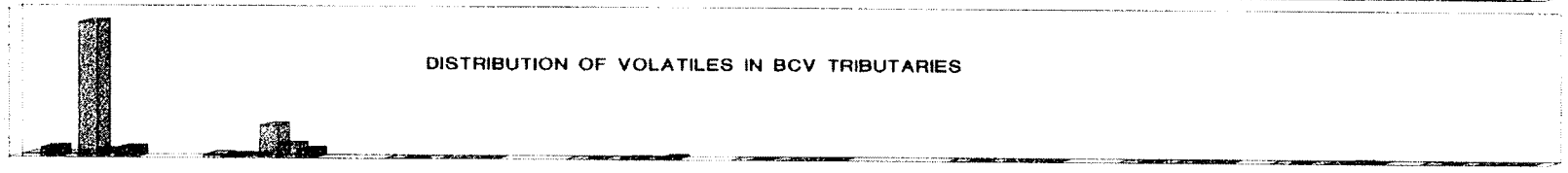
- ..... 1,000 – 5,000 Kg
- ..... > 5,000 – 10,000 Kg
- ..... > 10,000 – 50,000 Kg
- ..... > 50,000 – 100,000 Kg
- ..... > 100,000 – 500,000 Kg
- .... > 500,000 – 1,000,000 Kg
- .. > 1,000,000 – 5,000,000 Kg
- ..... > 5,000,000 Kg



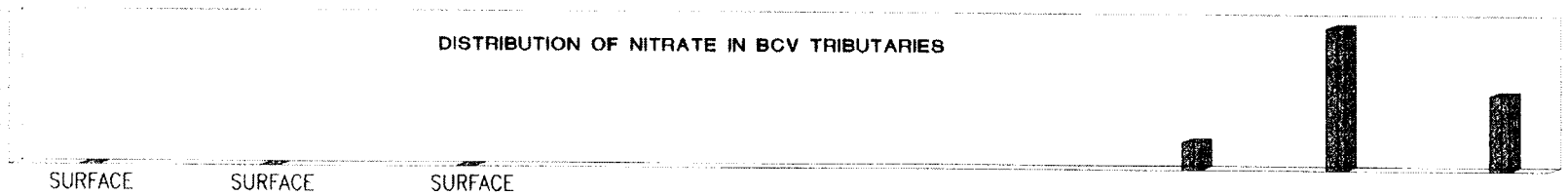
DISTRIBUTION OF RADIONUCLIDES IN BCV TRIBUTARIES



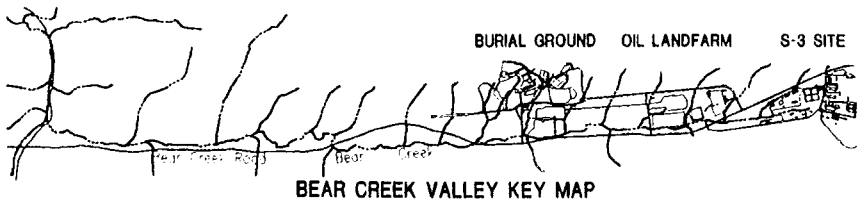
DISTRIBUTION OF VOLATILES IN BCV TRIBUTARIES



DISTRIBUTION OF NITRATE IN BCV TRIBUTARIES



SURFACE	SURFACE	SURFACE						
NT-8	NT-7	NT-6	NT-5	NT-4	NT-3	NT-2	BCK 12.3 (NT-1)	SS-01



BEAR CREEK VALLEY KEY MAP

0 600 1200

SCALE: 1" = 1200'

Y-12 PLANT NORTH

LEGEND:

28.9▲ ..... SURFACE WATER SAMPLE LOCATION

● ..... WESTBAY WELL

200⊗ ..... 1995 FOURTH QUARTER DATA ONLY

6.7■ ..... OU1 GEOPROBE GRAB SAMPLE

TRICHLOROETHENE CONTOURS (ug/L)

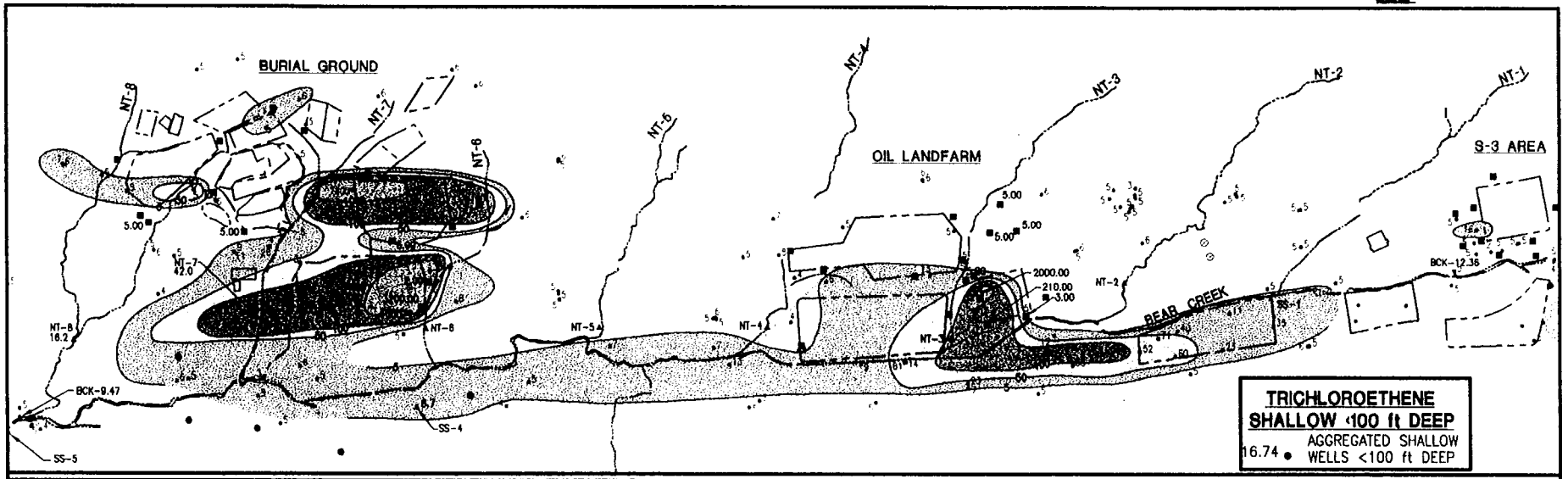
> 5

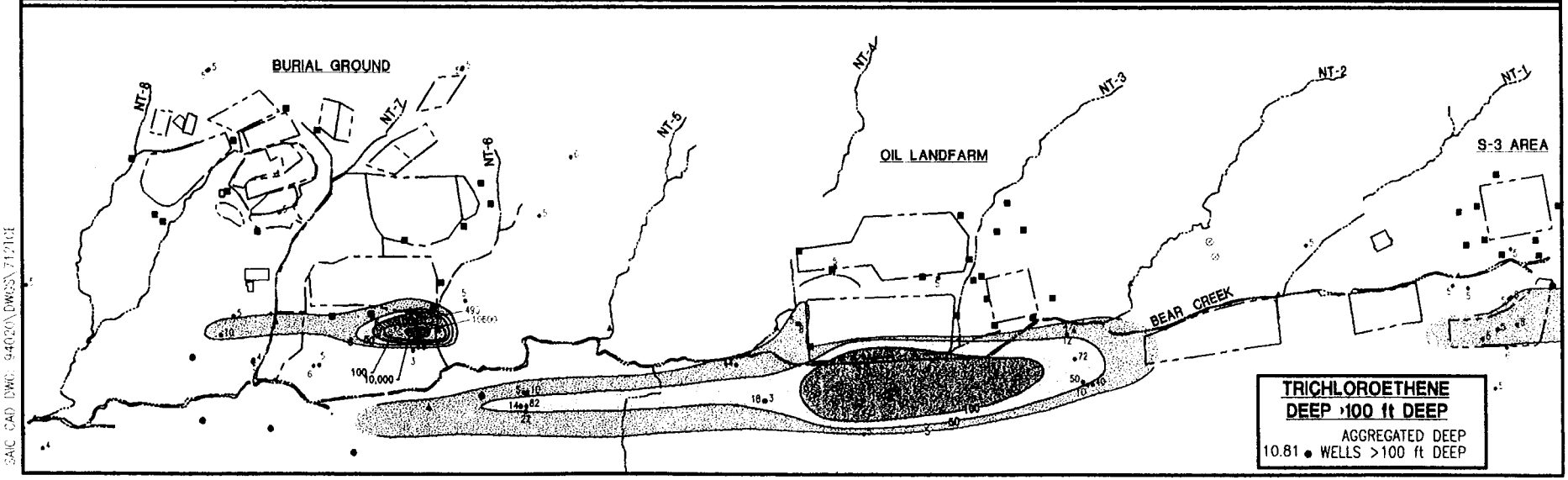
> 50

> 100

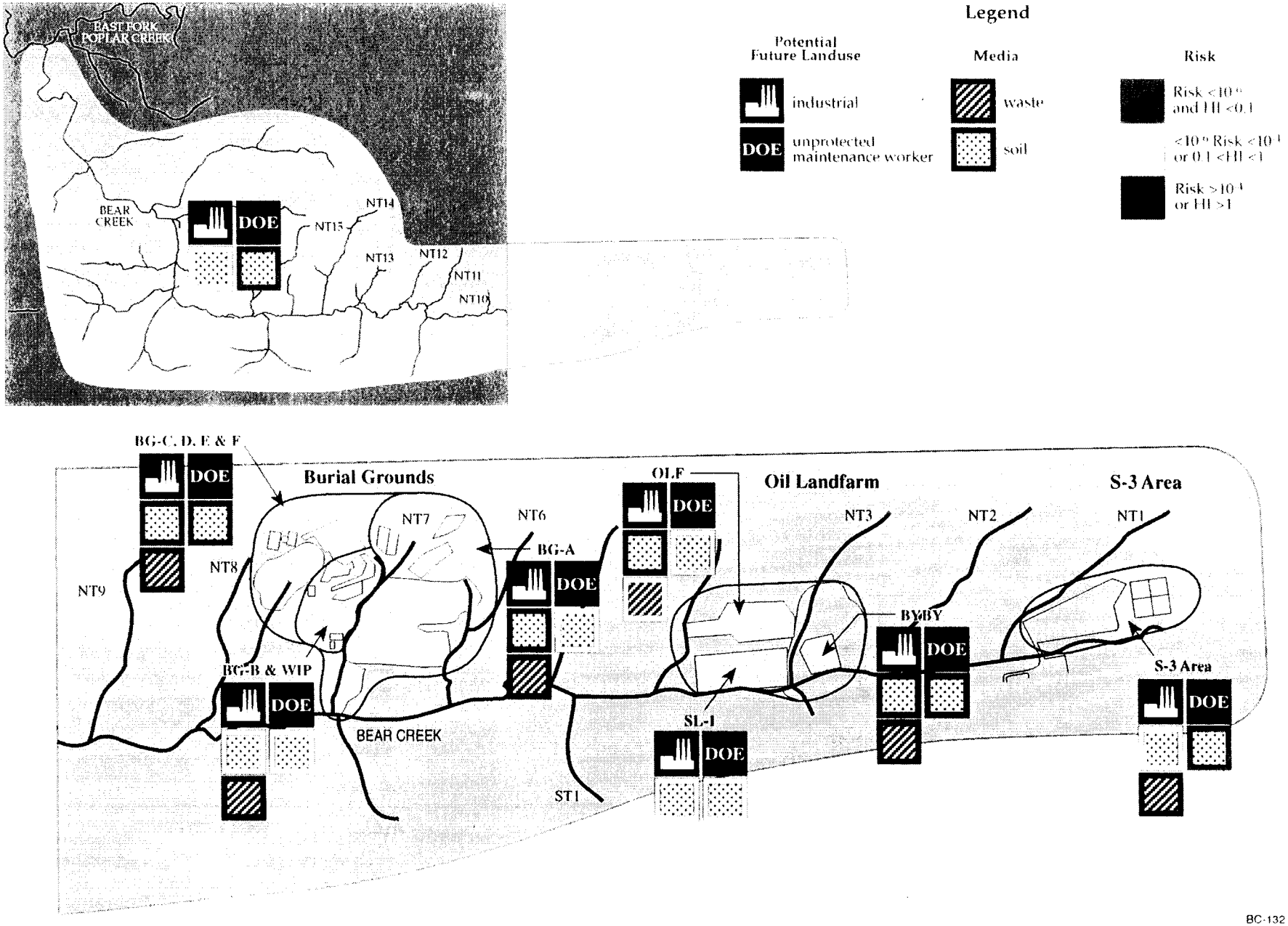
> 1000

> 10,000

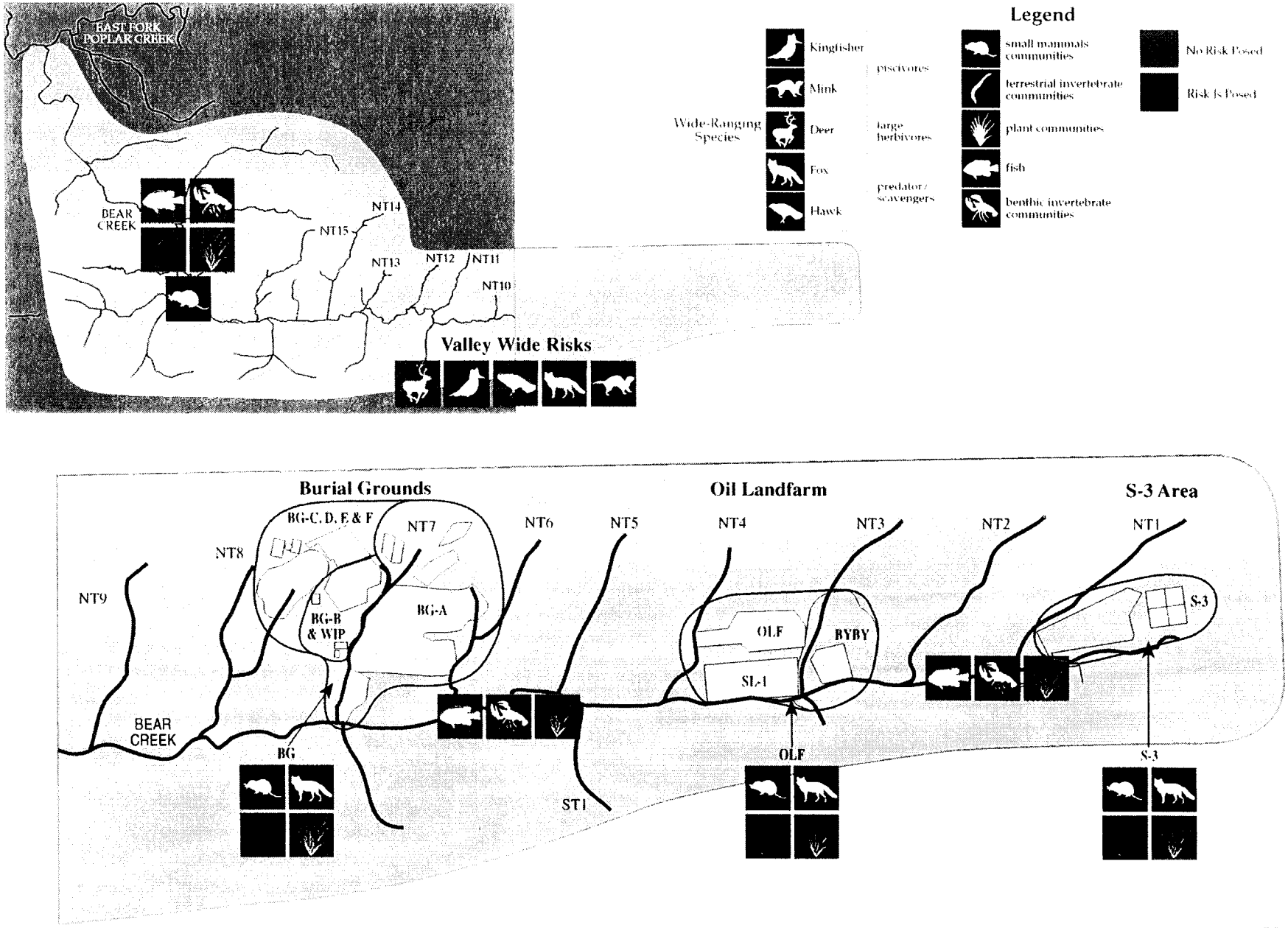




SAIC CAD DWG: 94020\DWGS\71701E

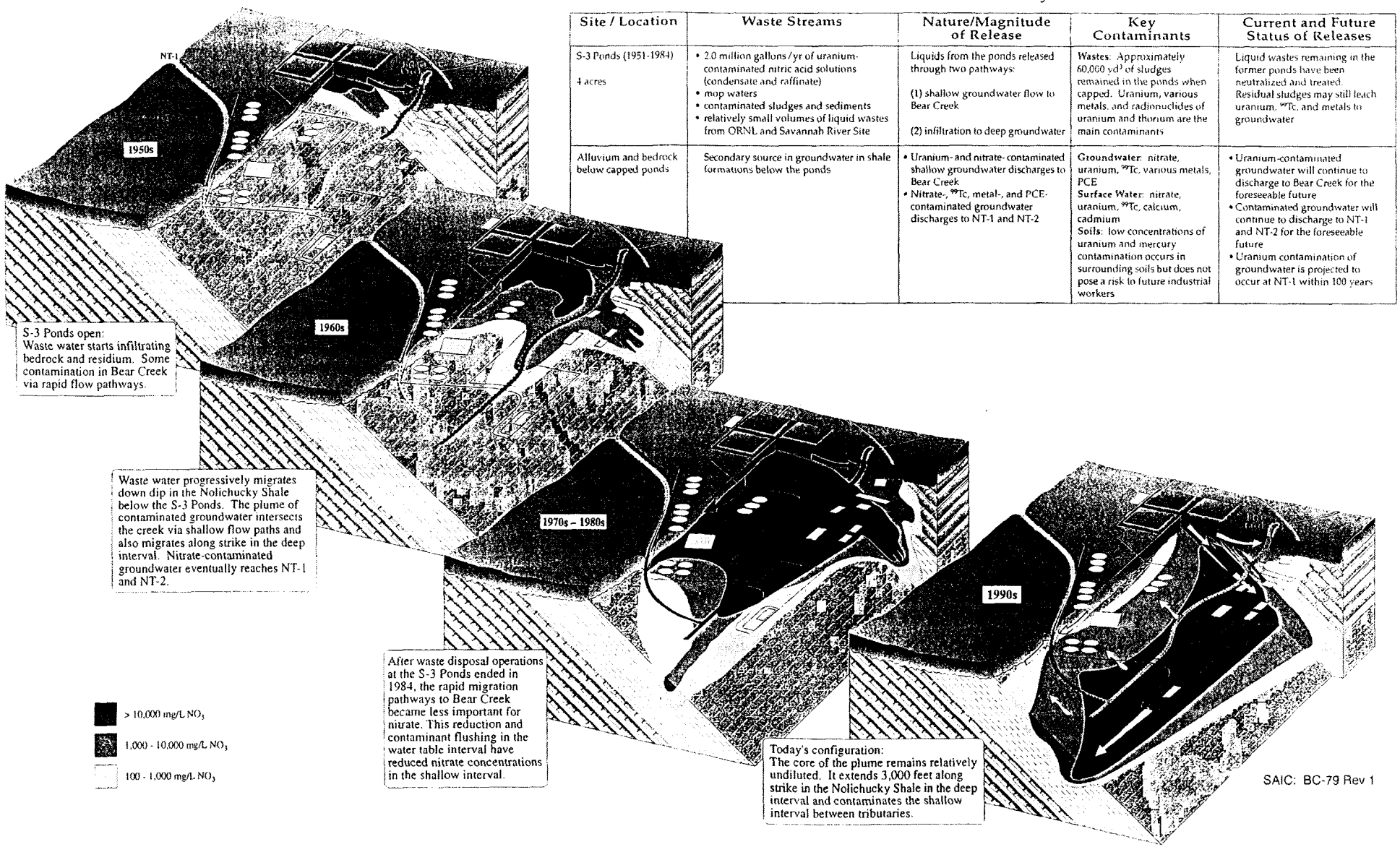

EAST FORK POPLAR CREEK
BEAR CREEK
DOE
NT14
NT15
NT13
NT12
NT11
NT10
Legend
Potential Future Landuse
industrial
DOE
unprotected maintenance worker
Media
waste
soil
Risk
Risk <10⁻⁶ and HI <0.1
<10⁻⁶ Risk <10⁻⁴ or 0.1 <HI <1
Risk >10⁻⁴ or HI >1
BG-C, D, E & F
Burial Grounds
NT7
NT6
OLF
Oil Landfarm
NT3
NT2
NT1
S-3 Area
NT9
NT8
BG-A
BY/BY
BG-B & WIP
BEAR CREEK
SL-1
ST1
S-3 Area

BC-132


EAST FORK POPLAR CREEK
BEAR CREEK
NT14
NT15
NT13
NT12
NT11
NT10
Valley Wide Risks
Legend
Wide-Ranging Species
Kingfisher
Mink
Deer
Fox
Hawk
piscivores
large herbivores
predator / scavengers
small mammals communities
terrestrial invertebrate communities
plant communities
fish
benthic invertebrate communities
No Risk Posed
Risk Is Posed
Burial Grounds
Oil Landfarm
S-3 Area
BG-C, D, E & F
NT7
NT6
NT5
NT4
NT3
NT2
NT1
NT8
NT9
BG-B & WIP
BG-A
OLF
BYBY
SL-1
S-3
BEAR CREEK
BG
ST1
OLF
S-3

S-3 Ponds Summary Table

Site / Location	Waste Streams	Nature/Magnitude of Release	Key Contaminants	Current and Future Status of Releases
S-3 Ponds (1951-1984) 4 acres	• 2.0 million gallons/yr of uranium-contaminated nitric acid solutions (condensate and raffinate) • mop waters • contaminated sludges and sediments • relatively small volumes of liquid wastes from ORNL and Savannah River Site	Liquids from the ponds released through two pathways: (1) shallow groundwater flow to Bear Creek (2) infiltration to deep groundwater	**Wastes**: Approximately 60,000 yd^3 of sludges remained in the ponds when capped. Uranium, various metals, and radionuclides of uranium and thorium are the main contaminants	Liquid wastes remaining in the former ponds have been neutralized and treated. Residual sludges may still leach uranium, ^{99}Tc, and metals to groundwater
Alluvium and bedrock below capped ponds	Secondary source in groundwater in shale formations below the ponds	• Uranium- and nitrate- contaminated shallow groundwater discharges to Bear Creek • Nitrate-, ^{99}Tc, metal-, and PCE-contaminated groundwater discharges to NT-1 and NT-2	**Groundwater**: nitrate, uranium, ^{99}Tc, various metals, PCE **Surface Water**: nitrate, uranium, ^{99}Tc, calcium, cadmium **Soils**: low concentrations of uranium and mercury contamination occurs in surrounding soils but does not pose a risk to future industrial workers	• Uranium-contaminated groundwater will continue to discharge to Bear Creek for the foreseeable future • Contaminated groundwater will continue to discharge to NT-1 and NT-2 for the foreseeable future • Uranium contamination of groundwater is projected to occur at NT-1 within 100 years



Conceptual Model for Development of Contaminated Groundwater Plumes at the S-3 Site

COMPARISON OF ALTERNATIVE END USES - BEAR CREEK VALLEY SUMMARY

END USE	REMEDIAL OPTIONS	VOLUME OF WASTE MATERIAL[a]	TOTAL CONSTRUCTION COST	ANNUAL O&M COST	TRANSPORTATION ACCIDENTS	CONSTRUCTION ACCIDENTS	VOLUME OF BORROW (CLEAN FILL)	RAIL/TRUCKLOADS	INSTITUTIONAL CONTROLS	COMMENTS
Residential/Commercial Industrial	Excavate disposal areas; on-reservation disposal; groundwater treatment	**Total - 2,300,000 cy** 900,000 cy debris 1,400,000 cy soil	**$1,200M - 5,000M**	**$1 - 4M**	**5 trucks**	**1,000 - 4,000**	**2,000,000 cy**	**Waste:** 200,000 truckloads, 10 miles each **Clean fill:** 200,000 truckloads, 10 miles each	None required at site except groundwater use restrictions and operation of groundwater collection system Significant controls required at disposal area	Eventually groundwater standards met Surface water standards met
Residential/Commercial Industrial	Excavate disposal areas; off-reservation disposal; groundwater treatment	**Total - 2,300,000 cy** 900,000 cy debris 1,400,000 cy soil	**$1,700 - 7,000M**	**$1 - 4M**	**7 trucks,** **<1 rail**	**1,000 - 4,000**	**2,000,000 cy**	**Waste:** 20,000 rail cars, 2,000 miles each 200,000 truckloads, 10 miles each **Clean fill:** 200,000 truckloads, 10 miles each	None required at site except groundwater use restrictions and operation of groundwater collection system Significant controls required at disposal area	Eventually groundwater standards met Surface water standards met
Recreational/DOE-Controlled Industrial	Excavate Bone Yard/Burn Yard, grout Burial Grounds (except A & Walk-in-Pits); on reservation disposal; cap; groundwater treatment	**Total - 375,000 cy** 265,000 cy debris 110,000 cy soil	**$260 - 800M**	**$1 - 4M**	**1 truck**	**200 - 600**	**750,000 cy**	**Waste:** 37,500 truckloads, 10 miles each **Clean fill:** 75,000 truckloads, 10 miles each	Groundwater and subsurface use restrictions required indefinitely due to low level of risk	Groundwater standards may not be met under site Surface water standards met Much of the area not suitable for building. No surface risk.
Restricted	Cap; Hot Spot Removal/treatment; groundwater treatment	**Focus on in-place management**	**$30 - 160M**	**$0.5 - 6M**	**<1 truck**	**25 - 100**	**100,000 cy**	**Waste:** None **Clean fill:** 10,000 truckloads, 10 miles each	Requires subsurface use restrictions indefinitely for high level of risk. Requires groundwater use restrictions indefinitely for low level of risk.	Groundwater standards not met under site Surface water standards may not be met

[a] All remedial options generate small volumes of waste from water treatment and miscellaneous construction activities. Transportation of these materials not included.

[b] All remedial options only restrict access to disposal areas (approximately 1,200 acres). Approximately 3,530 acres would be available for unrestricted use.

COMPARISON OF ALTERNATIVE END USES - S-3 SITE (BEAR CREEK VALLEY)

END USE	REMEDIAL OPTIONS	VOLUME OF WASTE MATERIAL[a]	TOTAL CONSTRUCTION COST	ANNUAL O&M COST	TRANSPORTATION ACCIDENTS	CONSTRUCTION ACCIDENTS	VOLUME OF BORROW (CLEAN FILL)	RAIL/TRUCKLOADS	INSTITUTIONAL CONTROLS	COMMENTS
Residential/Commercial Industrial	Excavate S-3; on-reservation disposal; groundwater treatment	**Total - 120,000 cy** 24,000 cy rocks/debris 96,000 cy soil/sediment	**$60 - 250M**	**$300,000 - 1M**	**<1 trucks**	**50 - 100**	**100,000 cy**	**Waste:** 12,000 truckloads, 10 miles each **Clean fill:** 10,000 truckloads, 10 miles each	None required at site except groundwater use restrictions and operation of groundwater collection system Significant controls required at disposal area	Eventually groundwater standards met Surface water standards met
	Excavate S-3; off-reservation disposal; groundwater treatment	**Total - 120,000 cy** 24,000 cy rocks/debris 96,000 cy soil/sediment	**$80 - 350M**	**$300,000 - 1M**	**1 truck** **<1 rail**	**50 - 100**	**100,000 cy**	**Waste:** 1,000 rail cars, 2,000 miles each 12,000 truckloads, 10 miles each **Clean fill:** 10,000 truckloads, 10 miles each	None required at site except groundwater use restrictions and operation of groundwater collection system Significant controls required at disposal area	Eventually groundwater standards met Surface water standards met
Restricted	Groundwater treatment	**No significant volume removed**	**Minimal - $5M**	**$200,000 - 2M**	**Insignificant**	**<1**	**Insignificant**	**Waste:** None **Clean fill:** None	Groundwater and subsurface use restrictions required indefinitely due to low level of risk	Groundwater standards not met under site Surface water standards may not be met

[a] All remedial options generate small volumes of waste from water treatment and miscellaneous construction activities. Transportation of these materials not included.

APPENDIX C

Schedule of End Use Working Group Meetings and Topics

Most EUWG meetings were held on Thursday evenings from 6:00 pm to 9:00 pm. Several Saturday meetings were also held for site tours and workshops.

February 20, 1997	Discussion of Goals and the EUWG process
February 22, 1997	Discussion of Overview and tour of ORNL
March 6, 1997	Approval of process and schedule Identification of draft community guidelines
March 20, 1997	Overview of risk assessment Impacts of end use assumptions on risk Overview of major contaminants at ORNL Review of draft end use hierarchy
April 5, 1997	Discussion of waste types, volumes, and conditions for all of ORNL Review full set of community guidelines
April 17, 1997	Discussion of Bethel Valley
May 3, 1997	Discussion of surface impoundments
May 15, 1997	Evaluation of end use for Bethel Valley sites, draft recommendations Review community guideline revisions.
May 29, 1997	Discussion of final recommendations for Bethel Valley
May 31, 1997	Tour of Bear Creek Valley
June 12, 1997	Discussion of Community guidelines, waste types, volumes and conditions of Bear Creek Valley sites. Prioritized Tasks
June 26, 1997	Discussion of on-reservation *vs.* off-reservation disposal: waste volumes, disposal facility requirements, and suitability of proposed sites
July 29, 1997	Discussion of disposal facility design, waste acceptance criteria and other factors important to on-reservation *vs.* off-reservation issues
July 31, 1997	Discussion and recommendations of on-reservation *vs.* off-reservation disposal, and end use discussion and recommendations for existing disposal areas in Bear Creek Valley
August 21, 1997	Discussion of long-term controls and incorporation into guidelines
September 4, 1997	Formulation of general end use recommendation for Melton Valley
September 18, 1997	Melton Valley exceptions to the general end use
October 2, 1997	Continue discussion of Melton Valley draft recommendations

October 21, 1997	Meeting with Justin Wilson to discuss State stewardship and on-site disposal, Continue discussion of Melton Valley recommendations
November 1, 1997	Discussion of Nuclear Criticality issues
November 13, 1997	Discussion of Groundwater/Surface Water issues
December 11, 1997	Discussion of Stewardship Report
January 22, 1998	Overview of Upper East Fork Poplar Creek (UEFPC) Watershed
January 24, 1998	Tour of UEFPC
February 19, 1998	Detailed discussion of UEFPC
February 26, 1998	Detailed discussion of UEFPC and Chestnut Ridge
March 12, 1998	Preliminary UEFPC End Use Recommendations
March 19, 1998	Finalize UEFPC End Use Recommendations
April 2, 1998	Overview of East Tennessee Technology Park (ETTP)
April 16, 1998	Detailed discussion of ETTP
April 18, 1998	Tour of ETTP
April 30, 1998	Preliminary ETTP End Use Recommendations
May 7, 1998	Discussion of ETTP End Use Recommendations
May 14, 1998	Discussion of Groundwater/Surface Water and Preliminary Recommendations
May 28, 1998	Finalize K-25 and Groundwater/Surface Water Guidelines
June 11, 1998	Final revision of Guidelines and Additional Sites Recommendation
June 24, 1998	Discussion of the Final End Use Report
June 25, 1998	Discussion of Stewardship Committee Report

APPENDIX D

Additional Issues Submitted by End Use Working Group Participants

OAK RIDGE RESERVATION
END USE
WORKING GROUP

June 12, 1998

Mr. Rod Nelson
Assistant Manager for Environmental Management
U. S. Department of Energy, Oak Ridge Operations
P. O. Box 2001
Oak Ridge, TN 37830

Dear Mr. Nelson:

As you know, the End Use Working Group (EUWG) will soon be completing its efforts to provide the Department of Energy (DOE) with end use recommendations for contaminated areas, community guidelines for contaminated land and water, and long-term stewardship recommendations.

In trying to complete EUWG activities, a number of issues were raised. To facilitate closure of these issues, a member survey was conducted to determine whether resolution of these issues is necessary to complete the EUWG process. While most members believe their resolution does not impact the EUWG process, some members believe they are important issues, and that appropriate future actions should be taken to address them.

We are forwarding these issues and survey results for your consideration. As responses to these issues become available, EUWG members would appreciate being informed in writing.

Sincerely,
Karen Bowdle for the EUWG
End Use Working Group

Attachments

cc: Margaret Wilson

Results of Outstanding Issues Survey
May 28, 1998

A total of 16 surveys were returned, and the results are presented below:

Category 1: The issue is relevant to End Use recommendations and additional information on this topic is essential to the completion of the EUWG process.

Category 2: The issue has already been evaluated by the EUWG to the degree necessary to make EUWG recommendations. DOE may need to address these issues in more detail in the CERCLA process.

Category 3: The issue is important but a) not within the scope of the EUWG, or b) additional information on this topic will not impact the EUWG from making its recommendations. The EUWG should identify this issue in its report as important and request that DOE find an appropriate public involvement process to deal with this issue in the near future.

Category 4: The issue was not dealt with directly by the End Use Working Group and is not within the scope of the EUWG. The EUWG is not the appropriate group to make a determination as to how DOE should deal with this issue in the future.

ISSUE	Category 1	Category 2	3A	3B	Category 4
Phelps #1	2	1	3	1	5
Phelps #2	1	6		3	5
Phelps #3	1	3	1	2	6
Phelps #4	1	3	1		7
Phelps #5	1	4	1	1	6
Phelps #6	1	5		2	5
Phelps #7	1		2	2	8
Phelps #8	2	6		2	3
Phelps #9	1	2		3	6
Phelps #10	2		1	1	9
Phelps #11	1	3		1	8
Phelps #12	1	2		1	9
Phelps #13	1	2	1	1	6
Phelps #14	2	4	2		5
Phelps #15	1	6	1	2	2
Phelps #16	1	7		1	4
Phelps #17	1	7		1	4
Phelps #18	1		2	1	9
Phelps #19	1	1	1	4	5
Phelps #20	1	4		1	6
Walton #1		2	5	2	3
Walton #2	2	3	1	4	2
Walton #3			4	1	7
Walton #4	1	1	2	2	6
Walton #5			2	3	7
Slavin #1	1		2	1	7

To: End Use Working Group
From: Barbara Walton
Date: May 12, 1998

This is to express my intent in what could be a minority opinion, but I hope the group will act on it. There are several items that have come up during the work of the EUWG that are, strictly speaking, outside the scope of our work. It is my hope that some sort of forum in Oak Ridge would be established to deal with them. Examples follow:

1. Not all DOE areas are as open as EM. In some cases, the public participation process is grossly misused. The vulnerability assessment of HEU is a prime example. Two public meetings were held but no information was provided even under questions, except for the process being used in the assessment. When the report was released, it was extremely difficult to get even a partial copy (which I eventually did with the help of LOC). In the report, the two public meetings were cited as evidence of the process validity. I have never been able to get information on how the vulnerabilities uncovered were going to be remedied or when. I still have two main areas of concern about this: the U233 at ORNL and the Y-12 vulnerabilities concerning HEU.

2. Materials that are not considered waste don't get enough attention. UF6 is a good example.

3. I would suggest that it is now time to end DOE self-regulation. This may take an act of Congress. Could the EUWG make such a recommendation?

4. Many people have expressed concerns about health and environmental impacts of DOE past and present. It appears that this will continue in the future, since new, currently clean areas are in jeopardy of contamination by new programs. The site for the Spallation Neutron Source is an example of this.

5. I'm sure there have been cover-ups in the past. I don't know how often or at what level. I have no reason to doubt the people who have made presentations to us. I do understand the frustration of people who have been directly impacted.

To: End Use Working Group
From: Jim Phelps
Date: May 13, 1998
Subject: The infamous need more information topics list for End-Use.

1. The full discussion on MSRE – gas releases, ground surveys, accident history (from all sources), number of sick employees, the fuel migration mechanism, the inadequacy of the fuel migration study being done by ORNL, explosion hazards, toxic hazards.

2. The missing and undone and "End-Use promised tape" of the Chestnut Ridge bus ride where we saw dead trees (in summer with trees in full foliage nearby) across from a burial ground on top of hill, neutron dosimeters by the road, tent blown down over fissile array storage, the big barrel burial ground, the Y-12 plant view from the hill near the water tanks, the Lake Reality pond, the input areas for the water added to Upper East fork inside the plant, the damaged lubrication building by the industrial ditch from the floods the coal pile, etc.

3. The full reasons the ground over the ORNL gunnite tanks is contaminated with Sr-90 and Cs-137. This means include the issues of a whistleblower who witnessed the release, knows the persons who caused it, and had to go to whole body counting, etc. This means do not call Whistleblowers liars – directly or indirectly – especially when the information is eye-witness in nature.

4. The full reasons why a fire in the Chestnut Ridge burials ground was hushed up, what is in these pits that is flammable, the topic of radiolytic generation of hydrogen gas, the topic of radiolytic generation of ozone, the dead trees across the road – not linked to pine beetles issues, the amount and type of HEU buried there. Surveys for Sr-90 in the area. Surveys for Sr-90 in the barrels buried on top the ridge – where did this come from?

5. The full report on the Walk-in Pit-Bear Creek burial ground and uranium chip dump. The topic of capping and radiolytic hydrogen generation and explosion hazard. The topic of what type of Y-12 waste was buried there that were reported to be from wastes in physical spaced arrays – that the salvage materials persons were told to space out in this burial area. The time and reason the Y-12 chemical reclamation of HEU process was established and why. Since M. Wilson was supposed to speak to this person – the full report should be available on this.

6. The uranium type (i.e. U-235 or U-238) and density in ponds and settling tanks at Y-12 S-3, K-25 barrier process areas, and X-10 cesium ponds and other ponds in the back country (here to include all fissiles – U233, Pu-239, Pu-241, etc). The crit safety reports should be available.

7. The topic more than "the simple health and radiation lecture" using external radiation, which we happen to have a very high tolerance to. This means include the topic of

internal – organ specific isotopes, DNA damage, hyper-oxygen radical generation that harms DNA, health effects range to be expected – immune impacts, retention times of Sr-90, Uranium, why bone seekers do more and lasting health damage. Link this to the things like the kingfisher Y-12 wildlife issues and kidney damages and what rad. Vs. chem. Effects look like.

8. The fuller list of plant problems report like the 6 inch think K-25 one Doug and Sherry Farver suggest and produced for End-Use information. Also the same documents for the other plants with that much detail should be made available.

9. The full reports on the ORNL IN-situ vitrification explosion. The concentrations o all isotopes in the pond and distribution. The other follow on reports cited in the accident investigation report should be made available.

10. The full discussion of TSCA – the open structure and lack of leaks monitoring, have they burned tritium, why is there no real time stack monitoring, the short comings of monitoring spots checks on the input, any health synergies produced by burning acetyle nitrils that produce cyanide emissions – which have been picked up in workers and area residents. Any synergy processes for operation of an electrostatic precipitator that has isotopes present making for higher ionization and ozone production rates and emissions from the TSCA incinerator. Specially, discuss the anti-viral and anti cancer issues from cyande and ozone exposures.

11. The ozone generation and emission rates for nuclear materials stored in contact with air – gunnite tanks, uranium burials grounds, TSCA. Also, hydrogen generation rates. Include all toxic and explosive release potentials.

12. The issue of dead trees at the East End of ORNL around the tritium shack and also coincident with the stack emissions touching the ground from the ORNL central stack emissions. Discussion to involve similar for TSCA – short stack height – ozone emissions in downwind pattern. Same for SEG and downwind tree damage pattern. Include the effects and long term concentration necessary to kill or damage pine trees.

13. Include the topics of using the workers and people as dosimeters. ALL this work is about keeping the toxins and isotopes from bioconcentrating in people. This is the bottom line account for all the flawed and error prone mathematics and modeling. The numbers of sick workers or residents and the diseases present are the to dosimeters for me – and everyone needs to know the health indicators and these dosimetry techniques. These are essential End-Use topics.

14. Do realistically present K-25 as a unmonitored retrievable storage site for billions of pounds of toxic, neutron producing, and dangerous UF-6. DO include unsafe things like putting workers on top of vaults that emit neutrons and have a history and two dead workers over it. There can be real problems of putting workers in contaminated areas. This is one example.

15. The inadequacy of saying "we don't know" what is in WAG 4. It is required to know exactly what is in WAG 4 in terms of all isotopes, chemical toxins, reaction potentials, reasons why tritium is emitted and reasons why Sr-990 is emitted. There is no excuse for not having the toxic inventory of any building or burial ground – it is required to know these things.

16. The rest of the critically issues needs to be completed to include hydrocarbon moderation effects for density less than water and greater than water hydrocarbons. This is in the crit. Safety reports and is important in many Oak Ridge situation. (Ask Y-12's Peter Angelo for specific examples of hydrocarbons being able to change the fissile mass needed to under that of water.) Examples being eroded drain pipes violating safe geometry at Y-12, K-25, and X-10. The topic of air emissions and collection of uranium dust from a wide surface collection area become important in drains and ponds.

17. Because of this area surveys using USRADS and not fly-over surveys of the plants is important – due to resolution and sensitivity. You did the basic job of explaining criticality for water – but the topic of density of hydrocarbons needs to be fully addressed – it is in the literature – the plant persons do know the topic. I have spoken to one such person – he knows – so why not finish the discussion – a hand out of reports will do – don't spend a fortune getting professors in here that don't know.

18. The topic of gross beta and gross alpha/beta is inadequate to determine fissile generation potentials in burial ground, plant process areas, ponds, etc. There needs to be determination of what isotopes are present in all beta and alpha measurements where criticality is even a remote possibility – unless all the tanks and process lines are able to be visibly inspected and have double containments and leak monitoring systems. This includes breaking down the uranium present by isotope – U-233, U-235, U-238 or others.

19. Uranium, and TVA emissions play a factor in uranium burdens in body or workers and residents. TVA has taken measures to change the uranium burdens by adding tall stack's and precipitators. TVA emissions were large scintered particles from coal burning less likely to lodge in lungs – Y-12 has been a long term emitter of small particles and so has K-25. These small particles do lodge in lungs and while TVA was cutting emissions – the plant had the same emissions levels. Only recently has K-25 shut down, Y-12 added HEPA filters and the effluient emissions been reduced. This is important to consider in a uranium burden and health problems. Uranium takes 500 days to migrate one half to bones. This is important to consider for Health care – mycoplasmas – GWS inclusion. DO bring up the well known topic of

radiation's ability to acticate retro-viruses from cell DNA and also weaken the immune response – this is a major disease process.

20. Respect to eye-witnesses appears to be totally lacking in End-Use – from DOE persons not trying to do thorough investigations and too much DOE team playing in not wanting to find. As if that was not enough, unknowledgeable Panel members calling eye-witnesses essentially liars adds more to the one sided nature of these proceedings. There are some folks that think they are experts on things they were not around and think DOE reports everything. I am here to say these plants have not operated above board in many instances and persons working in computers or accelerator building would have no first hand knowledge – but others that were there when incidences occurred do have eye-witness knowledge. As it stands now – I will say the End-Use process does not value or treat whistleblowers well or anywhere near respectfully – and this is against the DOE policy, common courtesy, decency, respect for sick that are trying to be helped, etc.. I also am seeing too much team player investigation – that is not looking for problems. I am seeing blatant disrespect and downplaying from DOE End-Use persons evidenced in public meeting. DOE Team Playing – cover ups – liabilities.

21. The End-Use process will be inviolate unless all information has been provided and included. DOE is playing very evidently too dumb – at the current level of knowledge I am surprised the managers can get the front gates open to contaminate the workers. Little too obvious dumb routines around.

22. My friend Ed Slavin wants to know how many workers are in contaminated buildings or work places. It was told they can get this data for him – but to date DOE has not replied. I think this is also a fair questions to ask as well as to be answered by DOE – so include that as a questions also.

APPENDIX E

Endorsements of End Use Working Group Recommendations as of June 30, 1998

Recommendations for end use based on the EUWG recommendations were sent to DOE by the Oak Ridge Reservation Environmental Management Site Specific Advisory Board. An example letter is enclosed, the total recommendations made to date include the following:

Community Guidelines, endorsed on January 7, 1998
Melton Valley, endorsed on January 7, 1998
Bethel Valley, endorsed on March 4, 1998 (letter enclosed)
Bear Creek Valley, endorsed on March 4, 1998
Siting of a Waste Disposal Facility, endorsed on March 4, 1998
Upper East Fork Poplar Creek, endorsed on June 5, 1998

The Oak Ridge Reservation Local Oversight Committee (LOC) endorsed the community guidelines. The Citizens' Advisory Panel (CAP) of the LOC endorsed the EUWG recommendations for Melton Valley, Bear Creek Valley, Bethel Valley, and the disposal facility. These letters are enclosed.

A letter of endorsement was sent to DOE by the Friends of Oak Ridge National Laboratory for the Community Guidelines, Bear Creek Valley, Bethel Valley, and the Siting of a Waste Disposal Facility. This letter is enclosed.

These and other community groups are continuing to evaluate and develop endorsements of EUWG recommendations.

AK RIDGE RESERVATION

Environmental Management

March 4, 1998

Mr. Rod Nelson
Assistant Manager for Environmental Management
DOE/ORO
P.O. Box 2001
Oak Ridge, TN 37831

Dear Mr. Nelson:

At our March 4, 1998 meeting, the Oak Ridge Reservation Environmental Management Site Specific Advisory Board (ORREMSSAB) reviewed and approved the enclosed "End Use Recommendation for Contaminated Lands in the Bethel Valley Area of the Oak Ridge National Laboratory."

This recommendation is based upon and consistent with the conclusions reached by the End Use Working Group, an independent group initiated by the ORREMSSAB.

We look forward to receiving your written response to our recommendation. Thank you for your continued support of the ORREMSSAB.

Sincerely,

William M Pardue

William M. Pardue, Chair
ORREMSSAB

WMP/sb

Enclosure

cc: Ms. Margaret Wilson, DOE/ORO
Mr. John Hankinson, USEPA Region IV
Mr. Earl Leming, TDEC
M. Heiskell, DOE/ORO
Karol Hazard, DOE/HQ
Ms. Susan Gawarecki, LOC
ORREMSSAB Members
EUWG Members

End Use Recommendation for Contaminated Lands in the Bethel Valley Area of the Oak Ridge National Laboratory

Oak Ridge National Laboratory (ORNL) is a national and local resource, whose preservation and growth are an important part of the long-term vitality of the Oak Ridge community. ORNL needs to remain attractive to both current and new uses. Therefore, it is essential that Department of Energy (DOE) remediation decisions achieve, at a minimum, a controlled industrial end use for the entire ORNL Bethel Valley area.

A controlled industrial end use should at least provide for surface use of contaminated lands. Currently, there are areas where contamination results in the need for controlled access. Reducing such areas would enhance the overall viability of the Laboratory. Remediation should result in lands that are safe for surface use by ORNL employees.

In making its decision, DOE needs to consider the overall utility of ORNL, recognize the variety of uses needed to support an active and vital laboratory environment and use remediation resources wisely. DOE should make the best practical use of existing brownfield sites, and also recognize that not all land needs to be available for every use. If situations occur where DOE cannot meet the surface use criteria due to excessive risks or costs, these exceptions need to be discussed openly in a public forum, as part of the decision-making process.

Implementation of this recommendation by the DOE must be consistent with the Community Guidelines and needs for long-term stewardship. The recommendation is based upon and consistent with the conclusions reached by the End Use Working Group for the contaminated lands in the Bethel Valley area of the Oak Ridge National Laboratory (End Use Working Group recommendation dated October 2, 1997.)

Friends of Oak Ridge National Laboratory

P.O. Box 6641
Oak Ridge, Tennessee 37831-6641

February 9.1998

Ms. Margaret Wilson
Remediation Management Branch Chief and
FFA Project Manager
U. S. Department of Energy
Oak Ridge Operations
P.O. Box 2001
55 Jefferson Circle
Oak Ridge, TN 37830

Dear Ms. Wilson:

The Friends of ORNL officially endorses the *Community Guidelines for End Uses of Contaminated Properties* (Draft 6/9/97) as developed by the End Use Working Group (EUWG). The Friends of ORNL also endorses the EUWG recommendations for future land use of disposal areas on the Oak Ridge Reservation (i.e. *End use Recommendation for Bear Creek Valley*, October 2, 1997 and *Recommendations for the End Use of Contaminated Lands in Bethel Valley Area of the Oak Ridge National Laboratory*, May 29, 1997) and the recommendation to site a waste disposal facility on the Reservation (i.e. *Recommendation to Site a Waste Disposal Facility on the Oak Ridge Reservation*, September 1997).

The Friends of ORNL is an organization of former and present staff members of Oak Ridge National Laboratory and other citizens who are interested in the welfare of the Laboratory and the community. The Friends of ORNL currently has about 200 members, several of whom serve on the End Use Working Group.

When additional EURG land use recommendations are forthcoming or if there are significant revisions to the *Community Guidelines*, we will take these under consideration at the appropriate time.

Sincerely,

William Fulkerson, President

cc: Susan Gawarecki, LOC
Steve Kopp, LOC/CAP
William Pardue, ORREMSSAB
Doug Sarno, Phoenix Environmental
Karen Bowdle, EUWG
Earl Leming, TDEC
Richard Green, USEPA Region IV
Jon Johnston, USEPA Region IV
Camilla Warren, USEPA Region IV

LOC INC
Oak Ridge Reservation
Local Oversight Committee

June 24, 1998

Ms. Margaret Wilson
Remediation Management Branch Chief
and FFA Project Manager
U.S. Department of Energy
P.O. Box 2001
55 Jefferson Circle
Oak Ridge, TN 37830

Dear Ms. Wilson:

The Citizens Advisory Committee (CAP) of the Oak Ridge Reservation (ORR) Local Oversight Committee, Inc. (LOC), has officially endorsed the following documents produced by the End Use Working Group during their deliberations regarding contaminated lands on the ORR:

- End Use Recommendations for the Disposal Areas in Melton Valley
- End Use Recommendations for Bear Creek Valley
- End Use Recommendations to Site a Waste Disposal Facility on the Oak Ridge Reservation
- Recommendations for the End Use of Contaminated Lands in the Bethel Valley Area of the Oak Ridge National Laboratory

These documents were unanimously endorsed by the CAP at their regular meeting of January 13, 1998. Several members of the CAP also serve on the End Use Working Group.

The LOC is a non-profit regional organization funded by the State of Tennessee and established to provide local government and citizen input into the environmental management and operation of DOE's Oak Ridge Reservation. The Board of Directors of the LOC is composed of the County Executives of Anderson, Knox, Loudon, Meigs, Morgan, Rhea and Roane Counties; the Mayor of the City of Oak Ridge; and the Chairs of the Roane County Environmental Review Board, the City of Oak Ridge Environmental Quality Advisory Board, and the LOC CAP. The CAP currently has 16 members with diverse backgrounds who represent the greater ORR region.

Sincerely,

Susan L. Gawarecki, Ph.D., P.G.
Executive Director

cc: LOC Board
LOC CAP
William Pardue, Chair, ORREMSSAB
Doug Sarno, Phoenix Environmental
James C. Hall, Manager, DOE ORO
Earl C. Leming, Director, TDEC DOE-O
Camilla Bond Warren, USEPA Region IV

136 S. Illinois Ave., Suite 208 • Oak Ridge, TN 37830 • Phone (423) 483-1333 • Fax (423) 482-6572 • E-mail: locinc@aol.com

LOC INC
Oak Ridge Reservation
Local Oversight Committee

November 25, 1997

Mr. James C. Hall, Manager
U.S. Department of Energy
Oak Ridge Operations Office
AD-441
P.O. Box 2001
Oak Ridge, TN 37831-8791

Dear Mr. Hall:

The Oak Ridge Reservation (ORR) Local Oversight Committee, Inc. (LOC), has officially endorsed the enclosed *Community Guidelines for End Uses of Contaminated Properties (Draft, 06/09/97)*, as produced by the End Use Working Group during their deliberations regarding contaminated lands on the ORR. This document was unanimously endorsed by both the LOC Citizens' Advisory Panel (CAP) on October 14, 1997, and by the Board of Directors on November 6, 1997. Several members of the LOC Board and CAP also serve on the End Use Working Group.

'97 DEC 2 AM 9 22

The LOC is a non-profit regional organization funded by the State of Tennessee and established to provide local government and citizen input into the environmental management and operation of DOE's Oak Ridge Reservation. The Board of Directors of the LOC is composed of the County Executives of Anderson, Knox, Loudon, Meigs, Morgan, Rhea, and Roane Counties; the Mayor of the City of Oak Ridge; and the Chairs of the Roane County Environmental Review Board, the City of Oak Ridge Environmental Quality Review Board, and the LOC CAP. The CAP currently has 20 members with diverse backgrounds who represent the greater ORR region.

If there are future significant revisions to the *Community Guidelines* document, the LOC will take it under consideration again.

Sincerely,

Susan L. Gawarecki, Ph.D., P.G.
Executive Director

Enclosure

136 S. Illinois Ave., Suite 208 • Oak Ridge, TN 37830 • Phone (423) 483-1333 • Fax (423) 482-6572 • E-mail: locinc@aol.com

97-52/053

APPENDIX F

Additional Comments Received by the End Use Working Group

The End Use Working Group received three letters with requests for inclusion in this report. In the interests of fairness and openness, the EUWG is including these letters. The first is from Mary Bryan, who was a member of the EUWG throughout. The second is from Sherrie Farver, who joined the EUWG for its final recommendation on the former K-25 site. The third is from David Hackett, who attended several meetings of the EUWG during discussions of the former K-25 site but did not participate as a member.

CONCERNS ABOUT THE END USE WORKING GROUP PROCESS

Although I have participated in the End Use Working Group since its inception and do not wish to invalidate the results of the group, I have some concerns about the process that I feel should be documented and included in the final report.

It is important to clarify how EUWG recommendations will be used. My understanding is that these recommendations are simply an expression of individuals in the community about what future land use they feel is reasonable for contaminated areas on the Reservation. When additional data is generated during the CERCLA process, the context under which these recommendations were made may well change. The Department of Energy will be bringing their cleanup alternatives for these contaminated areas before public for input during the CERCLA process, and this input will be as valid as any input that has come from individuals of the EUWG.

It should also be noted that the recommendations in the EUWG report represent some, but not all, of the individuals who participated in the EUWG. The group did not attempt to come to consensus and the recommendations are not group recommendations. It cannot be assumed that everyone is in agreement with the recommendations or the report just because a minority report was not generated stating otherwise. Only the individuals signing onto the recommendations and the report (or have in some other way indicated that they endorse them) are in agreement with them--again, it is was not a group process or opinion.

I also have concerns as to how the EUWG recommendations were approved by the Oak Ridge Reservation Environmental Management Site Specific Advisory Board (SSAB). SSAB members did not have the benefit of discussions held by the EUWG, and in particular, did not have the benefit of minority opinions when they approved the EUWG recommendations. The final report (including dissenting discussions and minority opinions) was not produced until after the SSAB had approved the EUWG recommendations. The SSAB is the mechanism under the Federal Advisory Committee Act for legally moving recommendations to the Department of Energy. At the very least, the SSAB should go through an approval process for the Final EUWG Report which contains background material and minority reports.

Finally, I am concerned that the Final EUWG Report (which documents the EUWG process and recommendations) and the Stewardship Report have been rushed by the Department of Energy. Although under pressure from stakeholders arrangements have been made for EUWG members the see the reports in final form before they are printed for distribution, the process for reviewing the reports has been cut short. Also, EUWG members were not given adequate notice to sign onto either the recommendations or the minority reports.

Mary Bryan

Mary Bryan
Oak Ridge Environmental Peace Alliance
June 29, 1998

June 23, 1998

To: End Use Working Group

Subject: Minority Opinion on Current and End Use of the East Tennessee Technology Technology Park (formerly known as the Oak Ridge K-25 Site)

From: Sherrie Graham Farver

Although I appreciate the many hours of effort and scrutiny applied in good faith by members of the End Use Working Group, I cannot with clear conscience sign the final end use recommendations for former Oak Ridge K-25 Site, now known as the East Tennessee Technology Park (ETTP). The opportunity to express my opinions and participate in this process is genuinely appreciated , and I do feel that some of my views have been considered and incorporated.

As a former worker (1987 - 1996) of the K-25 Site who has experienced unexplained and declining health, please consider my objections as follows:

1) ETTP is a superfund site with a multitude of hazardous substances, many of which reside in the bodies of former and current personnel.

2) The Environmental Protection Agency (EPA) has never been allowed to perform health studies of the site even though this has been legally mandated since designation as a superfund site several years ago.

3) The Toxic Substances Control Act Incinerator (TSCAI) is by the Department of Energy's own admission "experimental" and is the only incinerator in this nation that burns a mixture of chemically and radioactively contaminated waste with polychlorinated biphenals (PCBs).

4) Technology does not exist for continuous real-time monitoring of TSCAI emissions. Emissions are based on calculations done years ago under ideal settings when the incinerator was new and contents of the test waste were fully identified. How valid are these calculations when unpermitted and unidentified waste is incinerated?

5) Sinusitis, asthma, and respiratory problems plague many of the current personnel. Former personnel often relate how these problems improved or diminished once they were removed from the site.

6) Lou Gehrig's Disease, thyroid disorders, and thyroid cancer are extremely high in the Oak Ridge area. Rare cancers and heavy metal toxicity of many workers and nearby residents should also be a serious consideration.

7) The number of disabled workers from ETTP, many in the prime of their careers, is an issue in itself.

8) Numerous personnel have filed medicall incident reports on poisons and heavy metals which are substantiated by clinical analysis of the substances and/or metabolites after excretion from their bodies. Ironically, many workers do not report their symptoms for fear of retaliation and possible loss of employment.

9) The Department of Energy (DOE) literally put the cart before the horse with the push for reindustrialization. Full characterization and remediation should have been performed and completed prior to lease of site facilities regardless of economic consequences.

10) The DOE should be held fully accountable for what it has done to the environment and to the people of this area and correct the results stemming from years of environmental insult and poor practices. Only upon reaching that point, no matter how long it takes, should ETTP be considered safe for any sort of unrestricted use by the private sector.

These issues are very personal to me. I have watched as coworkers, friends, and acquaintances from this site have deteriorated. I have shared in and witnessed their pain, even the harassment and the retaliation that is often bestowed when health and safety concerns are expressed to management. Some of these folks are going blind, some are going deaf, and some have developed unexplained tremors and heart conditions. Most all suffer from relentless fatigue, depression, short-term memory loss, respiratory conditions, and constant pain from muscles and joints. Many have lost the joy of living and any degree of financial comfort.

This should never, never happen to another person. Health is sacred; no person or no institution has the right to rob anyone of it because it cannot be replaced. I fear that innocent and uninformed newcomers to the site will unknowingly sacrifice their health. They may trust as I and others once did until they realize the lack of true concern for health and safety and the permanence of poor health that will be with them for the rest of their existence.

My belief is that remediation goals for ETTP as recommended by the End-Use Working Group to accomodate uncontrolled industrial end use will not happen. My fear is that uncontrolled industrial use or the site will progress, regardless of the level of remediation or the subsequent risk to human health and safety. Unfortunately, DOE has already slashed funding for clean-up and remediation of ETTP. DOE has hastily leased contaminated facilities to the private sector prior to full remediation. Reindustrialization should cease until DOE remediates the grounds and the facilities of ETTP to the extent that no person's health will be compromised or damaged. Only following independent verification of this level of remediation should uncontrolled industrial use become a reality.

With Utmost Sincerity,

Sherrie G. Farver

Sherrie G. Farver

★ Center for Government Accountability ★ P.O. Box 50291 ★ Knoxville, TN 37950-0291 ★

END Use/ Minority Opinion -- D.K. Hackett, PE

While the End Use Process is very good in theory, and certainly provides a public input into what has in the past been decided without any public (stakeholder) input, the process remains flawed by a lack of forthrightness on the part of the Department of Energy and its representatives[1]. How can this august group of retired scientists, engineers and concerned citizens make informed decisions in formulating end use plans when the information provided to it by the Department of Energy and its Corporate contractors is incomplete, deceptive and dangerously misleading. Under the guise of National Security this Agency and its contractors have "sanitized," and lied to us "*so as not to scare us*" for so long that they no longer know how to tell the truth. It should not be a difficult concept for anyone to understand that when you start with inadequate information, that the results can not be of high quality -- in the vernacular: garbage in, garbage out.

Make no mistake, the efforts of the End Use Working Group have been valiant, and should be applauded. It should be noted though, that a great distrust prevents a portion of the community from participation here. As the Governor's Panel on the TSCA Incinerator noted, " This is a deeply divided community." Considering the long history of self-serving integrity on the part of DOE and its contractors, how can anyone fully trust them at this point. DOE has made a media carnival about ethics, values, openness, whistleblower friendliness and whistleblower protection – and it is all hollow words and window-dressing. There is a palpable fear among DOE workers that too often prevents the reporting of concerns. This "chilled atmosphere" often silences caring and concerned employees. Recently Former Secretary Hazel O'Leary testified that she was aware of the fear and reluctance to express concerns due to reprisals. As a case in point: DOE pays Mr. Joseph Carson, PE to improve the health and safety, but ignores his recommendations, and punishes him for making them. If they can blantantly punish their own employee for doing the "self-policing" job he was hired to do, while assuring us that this is a new, more open DOE, what kind of fools do they take Oak Ridgers for?

DOE covers up every problem with PR (propaganda reports & prevaricative response). They sing their own praises while employees die of Legionnaires, burn to death, and are poisoned by toxic levels of chemicals and radioisotopes that far exceed standards allowed by OSHA, NRC and EPA. DOE is a self-policing agency that has whiplash from turning its head to its own transgressions. Reduction of budgets for clean up, deception and lying, punishing men of integrity for raising concerns; these are not the actions of a good neighbor that can be trusted to keep its word, or to follow through in deed. Such breaches of faith as these are not conducive to building of trust with the community.

The few secrets remaining with respect to ORNL and ETTP sites do not warrant the hush that surrounds finding buckets buried along the river bank with counts of over 200,000 DPM, or the unwillingness to release information about major spills of UF6 in accidents at K-1004 Lab and the K-29 crossover pipe-cutting breach in the 1980s, or hundreds of other accidents that have been hushed and glossed over in the interest of "*smooth operation.*" Then there is the mercury release figure which seems to double every time DOE rereleases it. It is time that DOE let the EPA do the legally mandated health study for residents surrounding the ETTP Super Fund Site (it is 9 years over due now). It is time for the Agency to quit suppressing health and safety concerns by employees and area residents, by answering them with self-policing internal studies, or insider contracts. The Cold War is over, let's tend to its casualties, human and the environment. If there is a sincere effort on the part of DOE to clean up this mess that is so euphemistically called "*legacy waste,*" then lay the cards on the table so an informed discussion can be focused on the true nature of the problem. Don't use End Use window-dressing to just continue to obscure the full scope of the problem.

It is time for this Agency, and those it hires to do the job, to get some real integrity. It is time to pay the piper-- to own up to the mistakes and excesses of the past, and the **PRESENT**. It is time to honestly and with forthrightness to clean up the mess. It is time to defrost the chilled atmosphere over the free expression of concerns with in the Agency's bureaucracies. It is time for real openness. It is time to earn real trustworthiness with real integrity, and real concerns for health and safety. For assuredly, **restoring environmental integrity, requires people of integrity.** Trustworthiness is earned with real effort, not deployed with public relations media control or processes meant to appear good but lacking real substance.

(1) Note: while many people of high standards work for the Department of Energy, too often the corporate result falls to the lowest standard due to a general lack of accountability. It is this corporate self-serving integrity that too often characterizes what we as stakeholders see in DOE's actions. Too often integrity is compromised up-the-management-line to obtain some political or perceived cost-saving goal, or outright preempted by some unaccountable person of malice.

David K. Hackett

6/11/98