

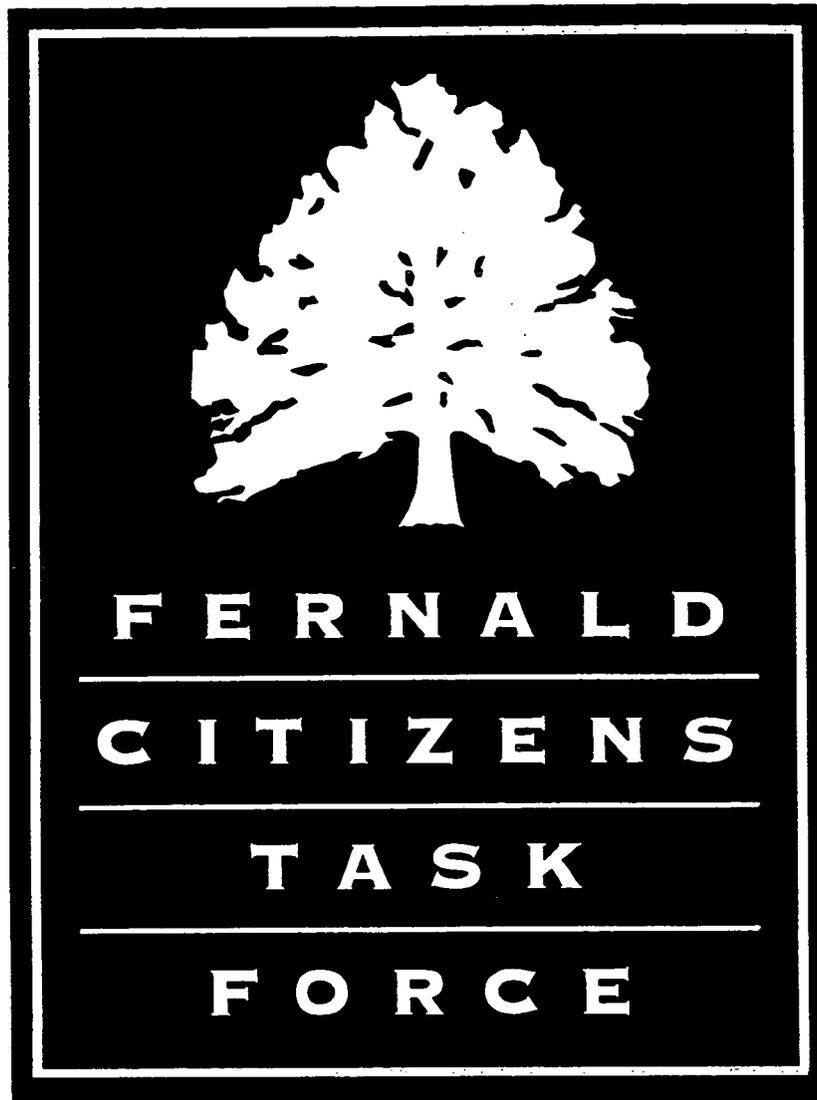
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**FERNALD CITIZENS TASK FORCE INTERIM REPORT PRELIMINARY  
RECOMMENDATIONS ON FUTURE USE AND CLEANUP LEVELS FOR  
THE FERNALD SITE - NOVEMBER, 1994**

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**TASK FORCE      PUBLIC**  
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**REPORT**



# INTERIM REPORT

PRELIMINARY RECOMMENDATIONS ON FUTURE USE AND  
CLEANUP LEVELS FOR THE FERNALD SITE

NOVEMBER, 1994

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## I. TASK FORCE BACKGROUND

The Fernald Citizens Task Force was established in August 1993 to provide the U.S. Department of Energy (DOE) with stakeholder recommendations regarding remediation of the Fernald Environmental Management Project. The Task Force is the site specific advisory board for the Fernald facility.

The Fernald Citizens Task Force consists of fourteen stakeholders selected from communities in the vicinity of the Fernald facility to represent the broad spectrum of interests and backgrounds that are critical to the cleanup decisions at Fernald. In addition, there are three *ex officio* members representing DOE, the U.S. Environmental Protection Agency (EPA), and the Ohio Environmental Protection Agency (OEPA). The Task Force holds regular meetings on the second Saturday of each month and all of these meetings are open to the public. The Task Force Charter is provided in Appendix A and profiles of members are provided in Appendix B.

The Task Force was created in response to the Federal Facilities Environmental Restoration Dialogue Committee Interim Report of February 1993. The Task Force reports to the Assistant Secretary for Environmental Management for DOE, The Regional Administrator of EPA Region V, and the Director of the Ohio EPA. The Task Force was chartered to develop recommendations on the following issues: future use(s) of the Fernald property; cleanup levels; cleanup priorities; and waste management options.

### Significance of This Report

This interim report has been developed to transmit the first phase of recommendations from the Fernald Citizens Task Force to DOE, EPA, and OEPA. It covers the first two of the four areas in which the Task Force will develop recommendations: future use of the Fernald property following cleanup and cleanup levels. As such, the report is focused on presenting the Task Force vision for the ultimate condition of the Fernald property: the level of contaminant remediation to be achieved and the best uses of land and natural resources.

This report presents the consensus recommendations of the Task Force. It is not meant to replace additional input from the general public surrounding the Fernald site; the Task Force recognizes that it does not and cannot replace a vigorous outreach program by DOE to the broadest possible public. Nevertheless, the Task Force has taken active measures to ensure that a broad cross-section of public opinion is heard in the Task Force process and is reflected in its recommendations. These measures are described in Section II and a summary of comments received from the broader public have been included as Appendix D. All recommendations presented in this report are preliminary and subject to change as new information

becomes available. This Interim Report is intended to stimulate additional interest and comment from the broader public. Such comments will be fully considered by the Task Force before issuing its final report.

## **Next Steps**

Between December 1994 and July 1995, the Task Force will refine its recommendations for future use and will address the final two areas of its mission, cleanup priorities and waste management options. A final report will be issued in July 1995. The final report will include consideration of the full range of issues relating to on-site and off-site disposal of the waste materials and contaminated media presently at the site and that will be generated during cleanup activities. The Task Force will continue to work to achieve consensus in all of its recommendations. However, in accordance with its Charter, the final report will reflect all viewpoints where consensus could not be reached.

## **Report Organization**

Section II provides an overview of the process taken by the Task Force in developing its recommendations. Section III presents consensus values developed by the Task Force in order to identify important considerations for all current and future activities at the site. Specific recommendations of the Task Force are presented in Section IV. These recommendations represent consensus positions of the Task Force regarding groundwater protection and cleanup, allowable risk, and future use of the Fernald property.

## II. APPROACH

The Fernald Citizens Task Force's primary role is to create a vision of the appropriate future use of the property at Fernald. This includes the expected use or uses of the land and natural resources, and the level of residual contamination that those uses permit. In January 1994, the Task Force approved a work plan that identified important issues, a decisionmaking process, and milestones for developing recommendations on each of the issues. The process outlined in the Work Plan was followed in developing the recommendations identified in this report. The Task Force Work Plan is included in Appendix C.

In addition to the activities outlined in the Work Plan, the Task Force has emphasized the need to obtain broader public input. Specific activities conducted to ensure public understanding of and comment on the Task Force's process and recommendations have included:

- open monthly meetings with time set aside for public input and discussion,
- a June 9, 1994 public workshop on the FutureSite exercise,
- presentations at the February, June, and October DOE community meetings,
- a Task Force mailing address and message line for public comment,
- disseminating information through community channels,
- news releases,
- advertisement of all meetings in local papers.

As the summary of public comments in Appendix D shows, the interested public was aware of the Task Force's activities and provided input. Minutes of the Task Force meetings reflect comments at public meetings. Early on, members of the Task Force realized that decisionmaking could not proceed until some vision of the future use of the Fernald property was established. The work plan and the entire Task Force approach was built upon this understanding. Therefore, the future use of land and natural resources on and surrounding Fernald have been the first order of business for the Task Force. In essence, the Task Force began by identifying a broad range of plausible uses for the Fernald facility following cleanup, and then narrowed these options through application of known financial and technical constraints and through development of criteria relating to the concerns and needs identified by members as important. The criteria were later refined and now stand as the Consensus Values identified in Section III.

In trying to determine future use, it was determined that cleanup levels and risk are necessarily tied to land use and must be evaluated simultaneously by understanding the impact that each has on the other and the total impact on issues of importance to local communities. These issues emerged over the course of evaluation and as a result of developing the Consensus Values. We organized these

issues into the discrete evaluation criteria listed below, most of which are directly reflected in the Consensus Values.

**Long-term Safety:** effectiveness of available technologies over time, long-term monitoring, and ownership of the Fernald property are seen as crucial to the long-term acceptability of any cleanup scenario.

**Short-term Risks:** risks to workers and residents resulting from the cleanup activities themselves are of paramount concern.

**On-Site Disposal Requirements:** the volume of soil that will be excavated and the ultimate size of any on-site disposal facility will greatly determine the overall impact of the cleanup on local communities during and after construction.

**Impact on Natural Resources:** excavation of the large quantities of contaminated soil present at Fernald will have a significant impact on the flora, fauna, sensitive habitats, farmlands, and wetlands that comprise the Fernald site and surrounding properties.

**Transportation and Off-Site Disposal Requirements:** the Task Force is sensitive to the impacts on and potential risks to communities along transportation routes and at the ultimate disposal facility.

**Community Impacts and Benefits:** disruption of adjacent lands and the long-term economic, social, and aesthetic impacts on local communities and work force of the Fernald cleanup are likewise of significant importance.

**Cost:** as a taxpayer-funded project, the total cost of cleanup is important. While Task Force members repeatedly expressed their unwillingness to trade lives for dollars, the Task Force recognizes that DOE budget projections indicate real limitations on available resources in the future.

The constant weighing of the costs and benefits of available approaches against these criteria was the basis for narrowing options and ultimately reaching consensus. The Task Force did not use any formal quantitative models to conduct these analyses, and, other than short-term health and safety, no one criterion was clearly ranked as more important than another. Instead, a number of tools were developed to help create an overall understanding of the opportunities, constraints, costs, and benefits.

In order to understand baseline information and keep track of issues and their impacts on decisions, the Task Force relied on information presented as maps, graphs, and charts for their accessibility and completeness. These materials were

developed by Task Force staff and collected in an overall volume, referred to as the "Tool Box," which was organized by different topics for easy reference. In some cases, this information was readily available in existing site documents and modified for use by the Task Force. In other cases, Task Force staff worked directly with DOE and its contractor to develop the information required.

All of the information in the Tool Box is geared to providing the knowledge needed to understand the risk presented by the Fernald site and the various costs and benefits of different cleanup approaches and levels of cleanup. Key information in the Tool Box includes physical and chemical characteristics of Fernald and surrounding lands, current land and natural resource uses, information on risk and risk analysis, alternative cleanup levels, waste management options, and detailed descriptions of alternative future use scenarios. The future use descriptions are supplemented by charts and maps showing volume, cost, disposal cell size, and off-site transportation requirements for different options. Also included are color-coded maps that identify the scope and depth of excavation of soil required for each alternative. Figures and tables used in this report are typical of Tool Box contents and the table of contents for the Tool Box is included in Appendix E.

One important tool developed for use by the Task Force is a three-dimensional exercise called FutureSite. This exercise allowed participants to visualize the volume of contaminated soil requiring management in order to achieve alternative land uses and residual risks on the site, and to understand the physical differences of achieving different risk cleanup levels. FutureSite was instrumental in developing the future use alternatives which the Task Force ultimately evaluated. Appendix F provides a detailed description of the FutureSite exercise.

In working through scenarios, the Task Force also used a magnetic white board to picture different land use configurations and excavation impacts on the property. The board itself is a permanent map of the site that can be modified with wipe-off markers to reflect different scenarios for discussion and comparison. Other elements, such as scale-sized disposal cells, can be magnetically attached to the board and moved around to evaluate alternative locations and their impacts. The board can be modified for specific discussions with vinyl tape to identify temporary items of importance to that discussion. Like FutureSite, this visual aid has been instrumental in understanding the impacts of different alternatives on the issues that are most important to the different members of the Task Force.

Each Task Force meeting focuses on a specific set of issues as laid out in the Work Plan. Following Task Force administrative business, members spend time working through the information that has been prepared that month. This information is then placed directly in the Tool Box for reference. The second part of the meeting is generally used for discussion and decisionmaking. Public input is formally invited and there are frequent exchanges between Task Force members and members of the public. There is also regular dialogue between Task Force members,

DOE, and contractor staff members familiar with particular issues. An effort has been made to keep meetings informal and accessible, while maintaining focus on specific issues. Consensus is achieved by hearing direct motions from the group and unanimous vote.

### III. FERNALD CITIZENS TASK FORCE CONSENSUS VALUES

The Task Force believes that the future use of the Fernald property should protect human health and the environment, affirmatively benefit the communities impacted while the site was operational, and eliminate the potential for activities similar to those which generated the current situation. In an effort to promote this vision, the Task Force identified a number of values that are important to the evaluation of alternative courses of action for the future of Fernald. These values are used by the Task Force in guiding our decisionmaking and are embodied in our recommendations. In addition, the Task Force hopes that future decisionmakers at the Fernald site will use these values. While we recognize that not every single value can be fully achieved, we hope that the overall intent of these values as a whole can be maintained.

#### Environmental Values

- Identify and preserve significant natural ecosystems with a special emphasis on naturally occurring wetlands, Paddys Run, and threatened and endangered species.
- Minimize impacts on the environment during remediation and maximize restoration of the environment after remediation.
- Ensure that any waste left on the site be controlled to prevent further contamination of the Great Miami Aquifer, air, and soils on- and off-site.
- Any future site use must be protective of the environment.

#### Economic Values

- Emphasis should be placed on future uses that provide some level of continuing employment for area residents, but not necessarily in categories that have traditionally been present at the site.
- Future uses and ownership should be structured so that local tax revenues or payments in lieu of taxes are provided.
- Where practical, infrastructure should be used to enhance the suitability of the property for future use subject to environmental and health values.
- The cleanup of the Fernald facility should be done in such a way as to reduce the stigma of past practices at the site and assist in the continuing use and development of surrounding properties.

## Social and Human Values

Future uses must have a positive impact on the surrounding communities, including:

- Acceptable risks to the current and future residents and workers of the Fernald community, with a special emphasis on the effects on children and future generations.
- Input and involvement from the public at large.
- Compatible with current and projected off-site uses.
- Special emphasis on promoting history, research, and education.
- Demonstrating how a negative situation can be turned into a positive by not repeating the mistakes of the past which resulted in the current conditions at Fernald.

## Long Term Management Values

- A long-term control mechanism for the site must be established to ensure the perpetual moral and financial responsibility of the Federal government for the continued management, monitoring, and emergency response capability regarding all wastes left on the facility.
- Long-term uses and institutional control mechanisms must be reconciled with local zoning and planning.
- All selected uses resulting in waste being left on site must have the built-in flexibility to provide for future changes in use and for more complete cleanup should financial, technical, or demographic changes warrant.
- A long-term mechanism must be established to ensure citizen involvement in the control, management, and future decisions at the site

## General Use Values

- Any future use plan must recognize that a mixed use strategy may be the most effective for the long-term use of the site.
- Emphasis should be placed on reducing the physical barriers and physical evidence of the past use of the site and focus on ways that Fernald can be a better neighbor to the surrounding community
- Under no circumstances should a post-remediation future use be permitted at the facility which requires the importing of hazardous, radioactive, mixed or solid waste for any reason.
- All uses and cleanup plans for all waste, shipments, and treatments must explicitly recognize all political, safety and health impacts.
- Future uses of the site must be focused on non-hazardous activities.

#### IV. PRELIMINARY RECOMMENDATIONS OF THE TASK FORCE

The primary goal of the Task Force in making recommendations is to ensure a safe cleanup of the Fernald property. Minimizing both short and long-term risks to local residents, site workers, and residents of the distant communities that would be impacted by off-site transport and disposal of Fernald wastes is paramount in our minds. Secondly, we want to recommend an approach to cleanup that maximizes reduction in contamination while minimizing the disruption of remediation activities on the local community. In keeping with this overall approach and our Consensus Values, the Task Force has reached consensus recommendations in the areas of aquifer protection and cleanup, allowable risk and cleanup levels for soils, and future land uses. Specific recommendations and a discussion of the Task Force rationale for each of these issues is presented below.

Our focus throughout the process of developing these recommendations was on the uranium contamination found at the site, particularly in site soils and groundwater. We used uranium as a benchmark for our recommendations because it is by far the most significant contaminant in the soils and groundwater both by mass and hazard. The overall volume and risks represented by the uranium contamination dwarfs that presented by other contaminants of concern. Accordingly, with a few exceptions, it is appropriate to assume that the cleanup of soil and groundwater based on uranium concentrations will result in the removal of all other contaminants as well. Where this is not the case, the Task Force has been careful to present our recommendations so that safe levels of other contaminants can be clearly derived.

##### Specific Recommendations of the Task Force

- Past impacts of the Fernald site on the Great Miami Aquifer must be remediated and any future impacts controlled so that groundwater quality meets the standards of the Safe Drinking Water Act.
- The excess risk of contracting cancer posed by exposure to Fernald contamination under any use of land on and off the Fernald property shall never exceed one in ten thousand ( $1 \times 10^{-4}$ ). This recommendation is intended to establish a maximum level of allowable risk, not a target; recommendations of the Task Force regarding aquifer protection and hazard index must also be considered and the most stringent cleanup levels applied. Additionally, the Task Force recommends limiting land use even in cases where the concentrations achieved in the soil would allow for less restrictive uses, to provide for an additional margin of safety.

- All contaminated soils and other waste sources both on and off the Fernald property must be reduced to levels that will provide safety from non-cancer toxicological effects at a level equivalent to a hazard index of one.
- All contaminated soils and other waste sources both on and off the Fernald property must be reduced to levels that will prevent contaminants from reaching the aquifer at levels that would result in groundwater concentrations exceeding Safe Drinking Water Act levels.
- For the purpose of evaluating risks, all off-property land is to be considered at the resident farmer scenario to provide for the most stringent cleanup levels.
- The best use of the land on the Fernald property itself does not necessarily include agricultural or residential uses.
- There should be no new agricultural or residential uses on the Fernald property following remediation.

### Discussion of Aquifer Protection and Cleanup Levels

- Past impacts of the Fernald site on the Great Miami Aquifer must be remediated and any future impacts controlled so that groundwater quality meets the standards of the Safe Drinking Water Act.

Because protection of the aquifer was one of the consensus values, The Task Force took an in-depth look at the options for dealing with groundwater contamination. We evaluated three distinct endpoints: cleaning to the  $1 \times 10^{-6}$  drinking water risk, which is 3 parts per billion (ppb) for uranium, cleaning to the EPA maximum contaminant level (MCL), which is proposed at 20 ppb for uranium (equivalent to a risk of  $2 \times 10^{-5}$ ), and not cleaning at all but letting the aquifer flush itself over time.

In comparing these alternatives, the Task Force evaluated a wide range of issues as identified in Figure 1. Due to the prevailing groundwater flow through the Fernald site, all contamination would ultimately reach the Great Miami River where the volume of water would dilute the contamination to low levels. The primary threat of the contamination to drinking water sources has been largely checked by homeowners seeking alternate sources and a new water line currently being installed. On the surface, it appeared that dilution might be a viable approach to dealing with groundwater contamination. However, if left unchecked, as much as four thousand surface acres and 32 billion gallons of water would ultimately be

FIGURE 1. GROUNDWATER ISSUES CONSIDERED

ISSUE		Max. Contaminant Levels (20 ppb)	1x10 <sup>-6</sup> Risk (3 ppb)
Current Impact of Fernald on GMA	Gallons	1.7 billion	5.8 billion
	% of Total GMA	0.018 %	0.062%
Projected aquifer impact if source soils are removed but no groundwater treated	10 years	2.1 billion gallons	6.8 billion gallons
	25 years	2.5 billion gallons	8.1 billion gallons
	50 years	2.7 billion gallons	9.9 billion gallons
Projected aquifer impact if <u>no</u> source soils are removed and no groundwater treated	10 years	2.1 billion gallons	6.8 billion gallons
	25 years	2.6 billion gallons	8.1 billion gallons
	50 years	3.4 billion gallons	11 billion gallons
	1000 years	23 billion gallons	32 billion gallons
Current area impacted by contamination	acres	not available	1,500
	residential wells	not available	9
	industrial wells	not available	8
	total households	not available	19
	total businesses	not available	7
Projected maximum area impacted by contamination	acres	not available	4,200
	residential wells	not available	58
	industrial wells	not available	26
	total households	not available	403
	total businesses	not available	25
Time to reach cleanup levels if source soils are removed	Full pump & treat	35 years	70 years
	South plume wells	90 years	350 years
	No pumping	160 years	500 years
Time to reach cleanup levels if source soils are not removed		thousands of years	thousands of years
Time until contamination reaches the Great Miami river without pumping		140 years	40 years
Cost of Groundwater Cleanup (assumes source soils are removed)	Begin today	\$396 million	\$800 million
	Begin in 10 years	\$485 million	\$952 million
	Begin in 25 years	\$590 million	\$1.12 billion
	Begin in 50 years	\$644 million	\$1.4 billion
	Property purchase	\$750 million	\$750 million

impacted requiring widespread condemnation of the aquifer for many generations according to current projections. The Task Force views the social, environmental, and potential legal and administrative costs of such an approach as unacceptable.

The Task Force also evaluated measures to contain the contaminated groundwater within the site boundaries. The current pumping wells appear to have successfully stopped migration of the south plume. However, any such interim or containment measure would only result in the need for virtually perpetual action due to the long half-life of uranium. Thus, interim or containment measures would require repeated replacement of water treatment facilities at the end of their useful lives, approximately every thirty to forty years. With the constant risk of losing funding for new construction activities, the Task Force was not willing to take such an approach. Ultimately, such approaches would result in higher costs than for a total and rapid cleanup today. Decisive action now will be able to provide cleanup to MCLs within the life span of a single treatment plant.

The Task Force concluded that Fernald's impact on the Great Miami Aquifer is a significant concern and the only viable course of action is to seek a complete and rapid cleanup of the groundwater. The Task Force opted to recommend using MCLs as a cleanup goal. MCLs are widely accepted, protective of human health and the environment, and both technologically and practically achievable. The Task Force believes that attempts to clean up the aquifer to  $1 \times 10^{-6}$  levels would likely result in a great deal of expense to chase very little contamination, would require much longer periods of time to achieve results, and offer little ultimate benefit in the overall protection of human health and the environment.

## Discussion of Risk and Cleanup Levels for Soils

- The excess risk of contracting cancer posed by exposure to Fernald contamination under any use of land on and off the Fernald property shall never exceed one in ten thousand ( $1 \times 10^{-4}$ ). This recommendation is intended to establish a maximum level of allowable risk, not a target; recommendations of the Task Force regarding aquifer protection and hazard index must also be considered and the most stringent cleanup levels applied. Additionally, the Task Force recommends limiting land use even in cases where the concentrations achieved in the soil would allow for less restrictive uses, to provide for an additional margin of safety.
- All contaminated soils and other waste sources both on and off the Fernald property must be reduced to levels that will provide safety from non-cancer toxicological effects at a level equivalent to a hazard index of one.
- All contaminated soils and other waste sources both on and off the Fernald property must be reduced to levels that will prevent contaminants from reaching the aquifer at levels that would result in groundwater concentrations exceeding Safe Drinking Water Act levels.

The Task Force evaluated risks throughout the range of risks considered acceptable by EPA for Superfund cleanups of  $1 \times 10^{-4}$  (1 in 10,000) to  $1 \times 10^{-6}$  (1 in 1,000,000) excess chance of contracting cancer in a lifetime. We evaluated this range of risks across a broad spectrum of land uses in evaluating the overall level of cleanup that should be required at Fernald. A table showing the cleanup levels used in this evaluation is shown in Figure 2. These cleanup levels were provided to the Task Force by DOE and have been accepted by EPA and the Ohio EPA. However, the Task Force has not evaluated the underlying assumptions for these cleanup levels and plans to look closely at these assumptions over the coming months.

Evaluating the impacts of applying different risks across different land uses allowed the Task Force to compare numerous factors including total soil volumes requiring excavation; off-site disposal requirements; on-site disposal requirements and disposal cell size; total cost; environmental impacts; and technical, legal, economic, and social implementability. The most striking concern in making this decision was the volume of soil that would require excavation beyond the Fernald property boundary if a  $1 \times 10^{-6}$  risk for a residential scenario were chosen. At this risk level, a total of 5,200,000 cubic yards of soil would be removed from off property alone. Disposal of this amount of material combined with the on-site volumes would require a disposal cell of approximately 400 acres, or, if shipped off site, approximately 430,000 truckloads or 1,350 trainloads.

**FIGURE 2. FUTURE USE SCENARIOS AND CLEANUP LEVELS\***

FUTURE USE CATEGORY	EXPOSURE ASSUMPTIONS	SOIL LEVELS AT 10 <sup>-4</sup> RISK	SOIL LEVELS AT 10 <sup>-5</sup> RISK	SOIL LEVELS AT 10 <sup>-6</sup> RISK	SOIL LEVELS AT HI=1
Resident Farmer	Assumes full-time life-long resident growing crops for human consumption and grazing livestock.	130 ppm	15 ppm	5 ppm	50 ppm (Child)
Industrial	Assumes maximum exposure to on-site groundskeeper.	1200 ppm	125 ppm	15 ppm	250 ppm
Developed Park	Assumes free access recreational facility with developed sports, picnic, and rest room facilities.	3490 ppm	350 ppm	40 ppm	1080 ppm
Green Space	Assumes unlimited access to nature trails, but with no developed facilities.	8820 ppm	885 ppm	90 ppm	1470 ppm
Protection of Aquifer in Zone I: Production Area	Soil concentrations required to prevent contamination leaching into aquifer above MCLs. Higher solubility uranium in Zone I drives lower cleanup levels.	10 <sup>-4</sup> levels do not protect GMA to at least MCLs	20 ppm	5 ppm	--
Protection of Aquifer in Zone II: Site Border	Soil concentrations required to prevent contamination leaching into aquifer above MCLs. Zone II contains lower solubility uranium but also thinner clays. Most stringent level used for entire zone.	10 <sup>-4</sup> levels do not protect GMA to at least MCLs	100 ppm	10 ppm	--

\* Cleanup levels were provided by DOE. Use of these levels for decisionmaking by the Task Force does not imply acceptance of all assumptions and procedures used in setting these levels.

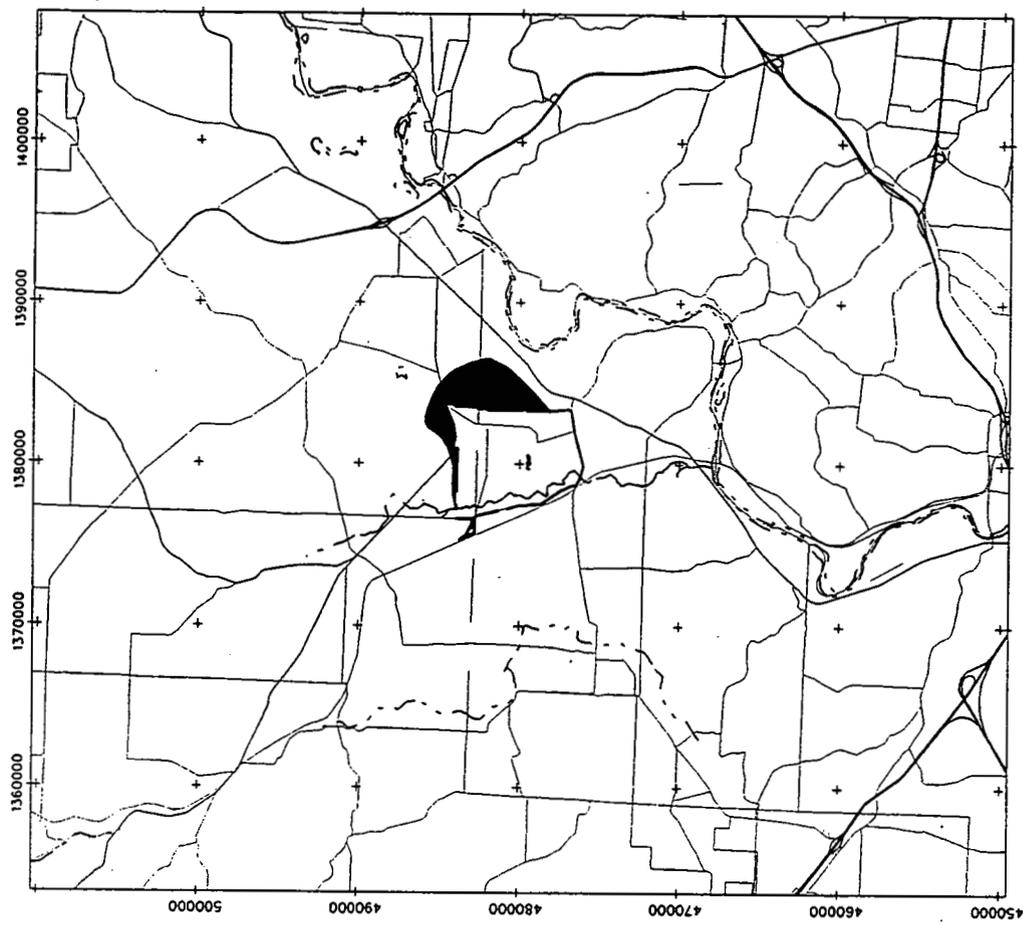
The Task Force is also concerned about the serious ecological damage that would occur from widespread excavation. At  $1 \times 10^{-6}$  cleanup levels, the required excavation would rob 11 square miles of surrounding homes and farmlands of vital top soil, mature trees, and vegetation and would cause enormous disruption to lives and livelihoods during construction. Though ultimately the top soil would be replaced and vegetation replanted, it would be generations before the ecosystems fully recovered. The short-term risks to current residents and workers due to disturbance and resuspension of contamination and construction accidents far outweigh the very small reductions in long-term risk that would be achieved. Moreover, because the cleanup level for resident farmer at  $1 \times 10^{-6}$  of 5 parts per million (ppm) is so close to background levels of uranium of 3.7 ppm, it would be difficult to even distinguish where this contamination occurs. Finally, it is important to the Task Force that risk criteria be consistently applied across the site and  $1 \times 10^{-6}$  was rejected as an option for groundwater cleanup.

The Task Force looked carefully at the levels of contamination that have actually been found off the Fernald property. Several interim cleanup (removal) actions and the tilling action of farming on much of the off property land has resulted in eliminating much of the detectable contamination. In all cases, the contamination is well below the cleanup requirements to protect for a resident farmer exposure at  $1 \times 10^{-4}$  (130 ppm), and only marginally above the resident farmer requirements at  $1 \times 10^{-5}$  (15 ppm). It is only as we approach background (3.7 ppm) that uncertainty would drive high volumes of soil removal. Figure 3 shows the excavation areas required off the Fernald property to achieve  $1 \times 10^{-5}$  and  $1 \times 10^{-6}$  risk levels. Taking into consideration the existing low levels of contamination found off the Fernald property and the desire to limit the disruption of off-site homes and farms, the Task Force decided on a maximum residual risk from Fernald soils of  $1 \times 10^{-4}$ .

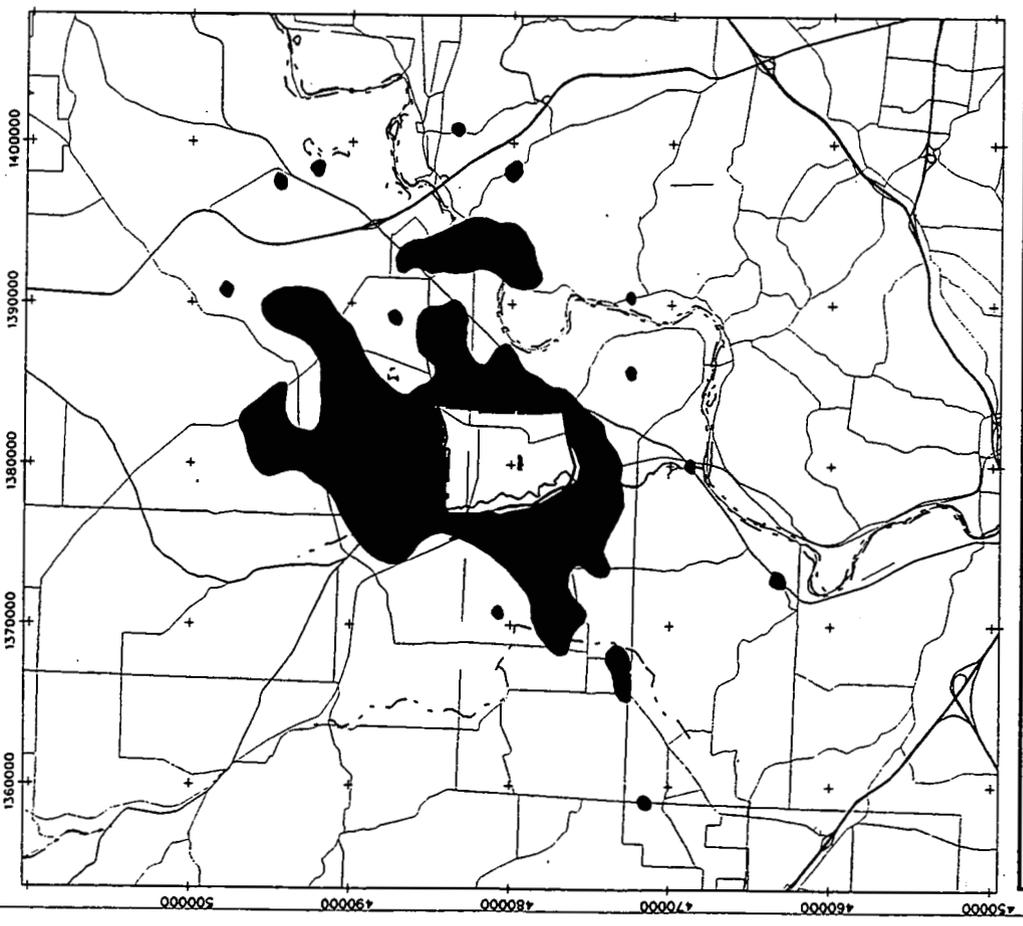
The Task Force selected the  $1 \times 10^{-4}$  risk, however, with the full understanding that uranium concentrations in soil necessary to meet the goal of fully protecting the aquifer to MCLs over the long term are even more stringent. Using current calculations, most locations both on and off the Fernald property must achieve a total uranium concentration of 100 ppm in soils to prevent groundwater concentrations from exceeding MCLs. This level is lower than the 130 ppm concentration necessary to support a resident farmer at a risk of  $1 \times 10^{-4}$ . The high solubility of uranium found in the former production and sewage treatment areas results in an even more stringent requirement of 20 ppm total uranium in order to protect the aquifer. In choosing to remediate soils to protect the aquifer, the Task Force has also deliberately provided a level of protection above the stated risk maximum for surface users.

Further, the Task Force's commitment to safe cleanup levels requires the consideration of toxicological impacts in addition to carcinogenic impacts. EPA evaluates toxicity against a numerical scale called a hazard index. The total toxicity

FIGURE 3. OFF-SITE EXCAVATION AT 1x10<sup>-5</sup> AND 1x10<sup>-6</sup> RISK



OFF-SITE SOILS REQUIRING REMEDIATION AT  
1x10<sup>-5</sup> RISK



OFF-SITE SOILS REQUIRING REMEDIATION AT  
1x10<sup>-6</sup> RISK

of a compound is determined from its toxic properties, concentration, and potential exposure. A hazard index of 1 is considered the threshold where health effects could potentially be observed. For total uranium in a resident farmer scenario, a cleanup level of 50 ppm is required in order not to exceed a hazard index of 1. This 50 ppm concentration would apply at all off-property locations, but not on the Fernald property as the Task Force does not recommend allowing such intensive uses of Fernald. However, sampling results to date indicate that there are actually few places outside the former production area where concentrations currently exceed 50 ppm.

As noted above, we understand that, for the most part, using total uranium as a benchmark will result in the excavation and safe disposal of all of the contaminants of concern found at the Fernald site. There will be exceptions, however, and for them our general clean-up criteria apply:

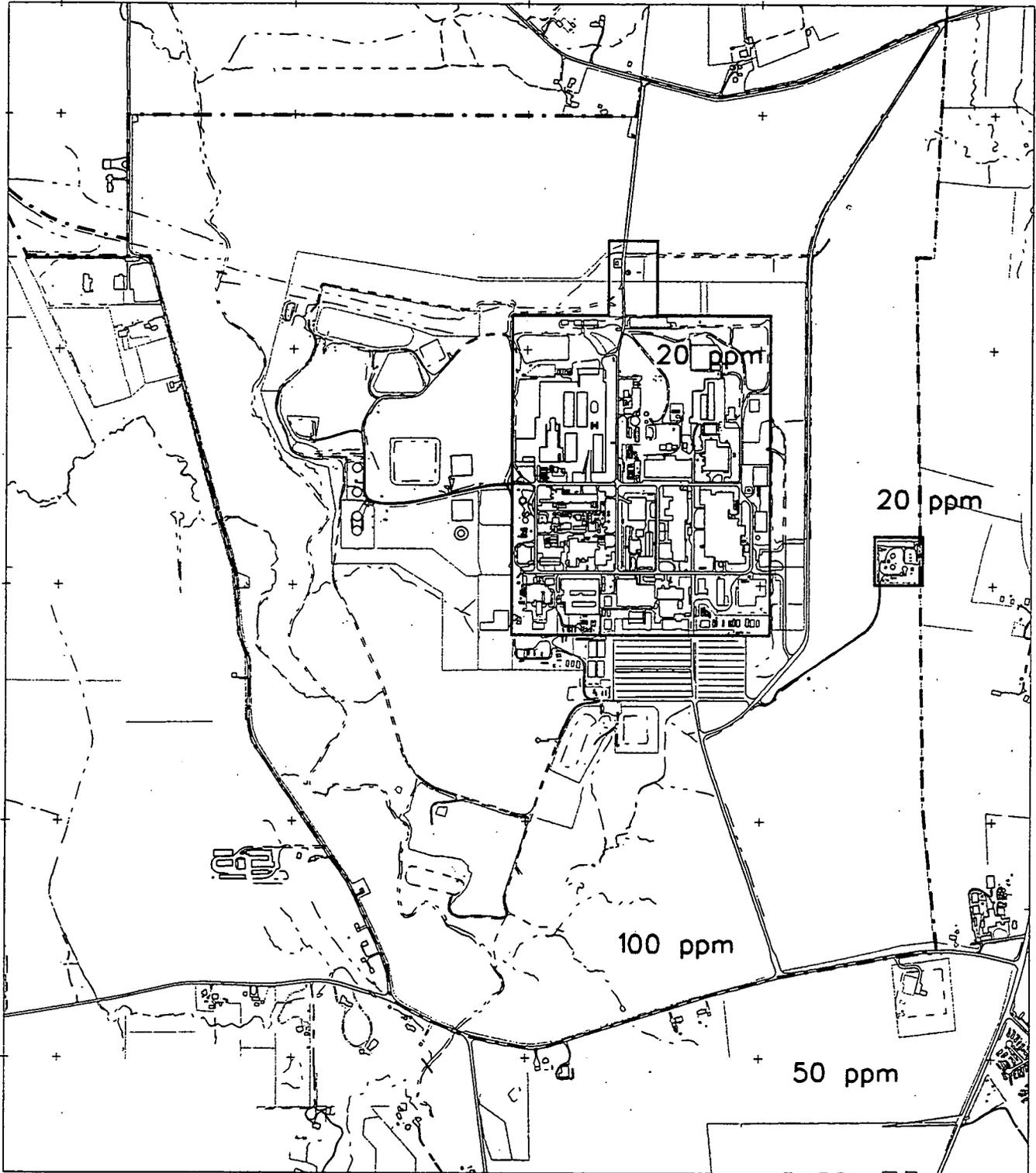
- cancer risks not to exceed  $1 \times 10^{-4}$ ,
- protection of aquifer to MCLs,
- non-cancer risks not to exceed a hazard index of 1.

The resulting cleanup levels for total uranium using these recommendations and currently available risk analyses are as follows:

- 20 ppm within the former production and sewage treatment areas,
- 100 ppm within all other points on the Fernald property,
- 50 ppm for all locations off the Fernald property.

Figure 4 identifies the location of these cleanup levels on the property. Using these cleanup levels, a total of 1,616,000 cubic yards of contaminated soil would have to be excavated from the Fernald property. Figure 5 identifies the projected extent and depth of this excavation.

FIGURE 4. PRELIMINARY CLEANUP LEVELS



--- FEMP PROPERTY BOUNDARY

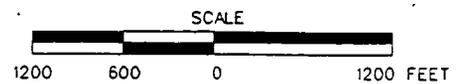
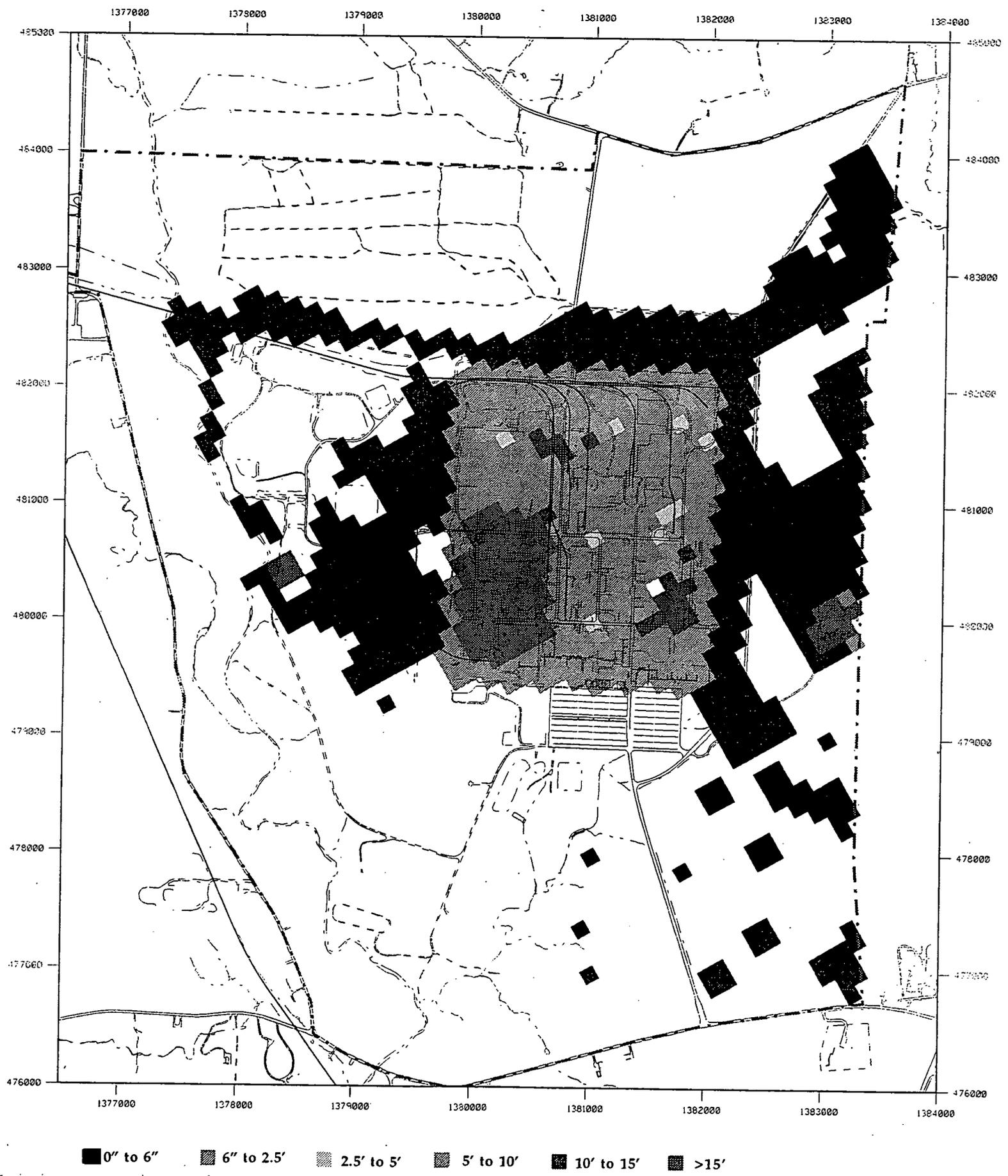


FIGURE 5. EXCAVATION REQUIRED TO ACHIEVE 6273 - -  
PRELIMINARY CLEANUP LEVELS



## Discussion of Future Land Uses

- For the purpose of evaluating risks, all off-property land is to be considered at the resident farmer scenario to provide for the most stringent cleanup levels.
- The best use of the land on the Fernald property itself does not necessarily include agricultural or residential uses.
- There should be no new agricultural or residential uses on the Fernald property following remediation.

After safety, the Task Force is concerned with the ability of area residents to maintain their homes and livelihoods in a safe and continuous manner. The Task Force is seeking to minimize negative impacts on area residents from the cleanup activities and ultimate use of the Fernald property, while still protecting public health and the environment. In the opinion of the Task Force, on-site property is least suitable for residential or agricultural uses, even if residual levels of contamination are achieved which allow for such uses.

The Task Force has not yet determined the specific use or uses for which the site is best suited. We recognize that some use of the site is desirable. Local communities should see some ultimate benefit from the cleaned up site. However, the Task Force is also aware that DOE has recommended that some portion of the site be dedicated to the long-term disposal of the contaminated materials present at Fernald. The Task Force must first fully evaluate the viability of on-site waste disposal and develop our own recommendations with regard to waste disposition before coming to detailed conclusions regarding land uses. The proximity to a long-term disposal facility and the Task Force's desire for a margin of safety make it unlikely that we would recommend uses which allow for intensive activities at a high level of exposure.

Our goal is to develop recommendations as to the best overall use of the Fernald property following remediation. In doing this, we will look closely at the prospect of on-site waste disposal and a suitable location for such disposal, if any, within the site borders. In developing our final recommendations, we will also take into consideration the real and perceived dangers of residual wastes and disposed wastes on site, economic viability and potential for return, ecosystem protection, and overall impact on the community. Formal recommendations on waste disposition and land use will be presented in the final report scheduled for July 1995.

**Appendix A**  
Task Force Charter

# FERNALD CITIZENS TASK FORCE

Chair:

John S. Applegate

Members:

James Bierer  
 Marvin Clawson  
 Lisa Crawford  
 Pam Dunn  
 Dr. Constance Fox  
 Guy Guckenberger  
 Darryl Huff  
 Jerry Monahan  
 Tom B. Rentschler  
 Robert Tabor  
 Warren E. Strunk  
 Thomas Wagner  
 Dr. Gene Willeke

Alternates:

Russ Beckner  
 Jackie Embry

Ex Officio:

J. Phillip Hamric  
 Graham Mitchell  
 Jim Saric

A U.S. DEPARTMENT OF ENERGY SITE-SPECIFIC ADVISORY BOARD

## TASK FORCE CHARTER

Citizens of Ohio have expressed an interest in providing a local viewpoint to guide the federal and state governments as critical decisions are made in the restoration and future uses of Fernald. The Department of Energy, U.S. Environmental Protection Agency, the Ohio Environmental Protection Agency are committed to the concept that a Citizens Advisory Task Force will serve the public interest and provide useful information and ideas. Because environmental restoration activities are at a pivotal juncture in the decision-making process, the Task Force's contributions are critical to the successful remediation of the Fernald site. There is a mutual understanding that stakeholders desire and deserve a role in the process that will influence their future for generations.

### Scope

The focus of the Task Force is the future of the Fernald site. The Task Force will make recommendations regarding the potential uses of the Fernald site and the criteria for cleanup to ensure an environmental restoration that is appropriate for current and future generations. The Task Force recommendations will be made to the Assistant Secretary for Environmental Restoration and Waste Management (hereafter "Assistant Secretary"), the U.S. EPA Region 5 Administrator and the Director of Ohio EPA.

### Membership

The Task Force is to be composed of no more than 15 Ohio residents, who are interested in the future of this site and who bring knowledge, views, technical expertise, and other skills to bear on a complicated technical and social problem: Fernald Cleanup. The members are appointed by the Assistant Secretary, with the concurrence of U.S. EPA Region 5 Administrator and the Director of Ohio EPA. Appointment of half of the original members of the Task Force shall be for 3-year terms and half for 2-year terms. Subsequent appointments will be for 2-year terms. No one is eligible for more than 2 terms. Two non-voting alternate members may be appointed and participate in the deliberations.

In the future, new members shall be appointed by the Assistant Secretary with the concurrence of U.S. EPA Region 5 Administrator and the Director of Ohio EPA, from a list of interested citizens that has been prepared by a subcommittee of the Task Force. Ex-officio members (non-voting) shall consist of one responsible person from each of the interested governmental agencies, U.S. DOE, U.S. EPA, and Ohio EPA. A quorum is 3/5ths of the voting members, and shall be required for decision-making.

## **Responsibilities Of The Chair**

The Assistant Secretary with the concurrence of U.S. EPA Region 5 Administrator and the Director of Ohio EPA shall appoint one voting member of the Task Force to be its Chair. The Chair represents the Task Force in all official communications; presides at meetings; sets the times, places, and agenda for meeting; appoints committees; and retains consultants and is otherwise responsible for the administration of the Task Force.

## **Termination Of Task Force**

The Task Force shall evaluate its work at 3 year intervals and decide whether to continue. The decision to discontinue must be agreed to by at least 2/3rds of the full voting membership of the Task Force.

## **Funding And Support**

The Assistant Secretary shall provide adequate funding for administrative support (including staff), travel and other expenses of the members, and technical assistance (including research, honorarium and travel of experts) that the Task Force deems is necessary.

## **Work Product**

The Task Force shall be guided by the deadlines under the Consent Agreement so that their advice is timely, and by the Interim Report of the Federal Facilities Environmental Restoration Dialogue Committee (February 1993). Recommendations from the Task Force to the agencies shall be in the form of written reports as deemed appropriate and shall respond to the following questions: 1) What should be the future use of the site? 2) Determinations of cleanup levels (How clean is clean?) 3) Where should radioactive and hazardous waste be disposed that is generated as a result of restoration activities? and 4) What should be the cleanup priorities?

Response to these questions depend on a set of conditions including but not limited to: 1) State of Ohio regulations and disposal criteria; 2) other state regulations regarding acceptance of waste; 3) available data on health effects and risks from the specific contaminants at the site; and 4) monies appropriated for cleanup. It is desirable that the Task Force set priorities for responding to questions and provide as much guidance as possible regarding their assessments.

## Decision Making

The Task Force shall work toward consensus reports regarding recommendations on various issues, however, on certain issues a minority report may be necessary. In these rare instances it is necessary to articulate in writing both the areas of agreement and disagreement and the reasons why there continues to be differences. Remedies recommended should be consistent with CERCLA.

## Agency Collaboration

The agencies participating as ex-officio members of the Task Force shall assist the Task Force by providing technical expertise and assuring that all information necessary for Task Force deliberations is made available in a timely manner.

## Meetings

The Task Force shall have regular public meetings in addition to working group meetings which will be announced in advance with an agenda. Such meetings shall be open to the public and opportunities for public comment shall be designated. The Task Force may vote to meet in executive session and formally vote during these sessions. Minutes of these meetings shall be available.

Adopted October 14, 1993

**Appendix B**  
Task Force Member Profiles

## FERNALD CITIZENS TASK FORCE

### MEMBERS

<b>John Applegate</b>	Professor of environmental law at the University of Cincinnati College of Law; he is the chair of the Task Force (1996).
<b>James Bierer</b>	seventh grade science teacher in the Ross School District (1995).
<b>Marvin Clawson</b>	long-time area resident and property owner (1995).
<b>Lisa Crawford</b>	President of Fernald Residents for Environmental Safety and Health (FRESH) (1996).
<b>Pam Dunn</b>	auditor with the state and Treasurer of FRESH (1996).
<b>Dr. Constance Fox</b>	physician and a member of Physicians for Social Responsibility (1995).
<b>Guy Guckenberger</b>	Hamilton County Commissioner (1995).
<b>Darryl Huff</b>	Vice Chairman of the Morgan Township Zoning Board (1996).
<b>Jerry Monahan</b>	Secretary/Treasurer of the Greater Cincinnati Building and Construction Trades Council (1996).
<b>Tom Rentschler</b>	member of the Miami Conservancy District and area businessman (1995).
<b>Warren Strunk</b>	Crosby Township Trustee (1995).
<b>Robert Tabor</b>	Safety Chairman, Fernald Atomic Trades and Labor Council (FATLC). He is representing President Robert Schwab (1996).
<b>Thomas Wagner</b>	Professor of community planning at the University of Cincinnati and an expert in dispute resolution (1995).
<b>Gene Willeke</b>	Professor, Institute of Environmental Sciences at Miami University (1996).

### EX OFFICIO MEMBERS

<b>Jim Saric</b>	the remedial project manager for U.S. EPA Region 5.
<b>Graham Mitchell</b>	the project coordinator for Ohio EPA.
<b>J. Phillip Hamric</b>	DOE Site Manager.

### ALTERNATE MEMBERS

<b>Russell Beckner</b>	area resident (1995).
<b>Jackie Embry</b>	public health nurse (1996).

*(year in parentheses indicates end of term)*

**Appendix C**  
Task Force Work Plan

# FERNALD CITIZENS TASK FORCE

Chair:

John S. Applegate

Members:

James Bierer  
 Marvin Clawson  
 Lisa Crawford  
 Pam Dunn  
 Dr. Constance Fox  
 Guy Guckenberger  
 Darryl Huff  
 Jerry Monahan  
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 Robert Tabor  
 Warren E. Strunk  
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 Dr. Gene Willeke

Alternates:

Russ Beckner  
 Jackie Embry

Ex Officio:

J. Phillip Hamric  
 Graham Mitchell  
 Jim Saric

A U.S. DEPARTMENT OF ENERGY SITE-SPECIFIC ADVISORY BOARD

## ACTIVITIES AND PROCESS WORKPLAN February, 1994

### OVERVIEW

It is proposed that the process for involvement of the Fernald Citizens Task Force in the cleanup of the Fernald facility will include five phases. The first two phases, Convening and Orientation and Approach, are complete. Phases III and IV of the process are designed to encompass the development of recommendations for the future use of the Fernald property, corresponding cleanup levels, and the prioritization of cleanup activities. This work will begin with an identification of the unconstrained future use options for the facility, i.e. asking the question "what would you like to see happen with this property?" This "wish list" of sorts will be pared down by then asking "what is likely to happen in this area in the future?" and "what is feasible given the problems at Fernald and current technological capabilities?" The Task Force will look at this smaller set of options in more detail to identify the corresponding cleanup levels, volumes of materials requiring treatment, likely cleanup technologies, and costs. Using this information, the Task Force will make recommendations as to the desired future uses of the Fernald facility and the corresponding cleanup levels. It is important to be clear that the cleanup of the Fernald facility will not create a specific future use, but rather clean up to a level that will provide for the development of some uses while restricting the ability to develop others. The Task Force recommendations will be developed to reflect this distinction. Phase V of the process will focus on monitoring progress of cleanup and will be developed in detail at a later date.

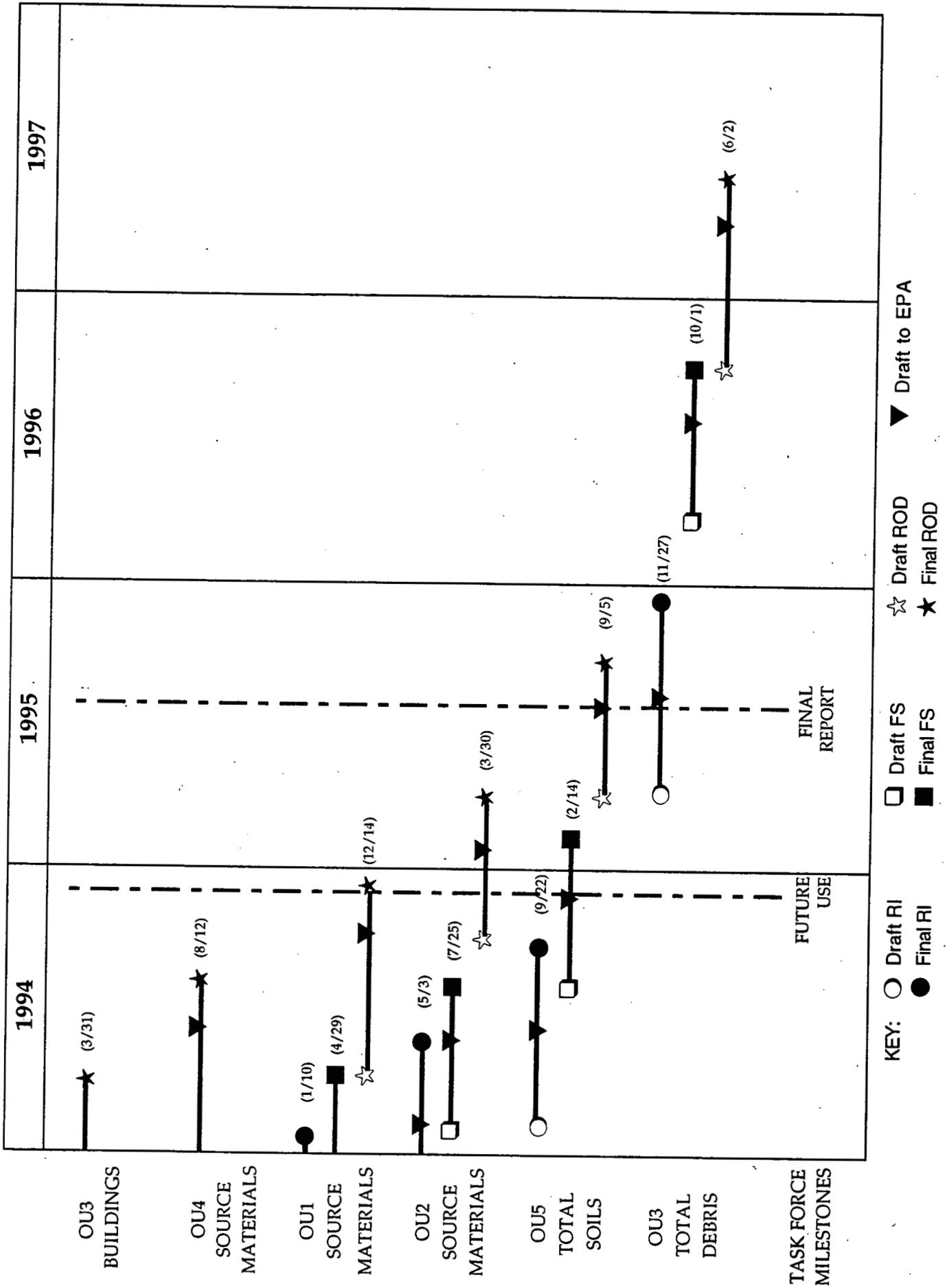
### SCHEDULE

The Task Force schedule for phases III and IV have been designed to coincide with the current decision making activities of the Department of Energy and the Environmental Protection Agency. Key decisions with regard to the final disposition of all site soils will be made in conjunction with the final Record of Decision for Operable Unit 5. This Record of Decision is scheduled to be final in September of 1995. The Task Force Final Report is scheduled to be complete in July 1995 coincident with the draft Record of Decision from the Department of Energy, but in reality many of the most important recommendations of the Task Force will be available well before that time. An outline of the key activities of the Task Force with the corresponding timeframes is presented in Figure 1. Figure 2 shows how this process correlates to the activities at Fernald as currently planned.

**Figure 1.**  
**ACTIVITY TIMELINE FOR THE FERNALD CITIZENS TASK FORCE**

<u>Key Activities</u>	<u>Meetings Covered</u>
<b>PHASE I: CONVENING TASK FORCE (Completed)</b>	<i>June - August 1993</i>
<b>PHASE II: ORIENTATION AND APPROACH (Completed)</b>	
SITE ORIENTATION	<i>September 1993</i>
DEFINE MISSION	<i>October 1993</i>
WASTE DISPOSAL AND LAND USE ORIENTATION	<i>November 1993</i>
DEVELOP FUTURE USE APPROACH	<i>December 1993</i>
<b>PHASE III: CLEANUP PARAMETERS</b>	
IDENTIFY OPTIONS FOR FUTURE USE	<i>January 1994</i>
UNDERSTAND SITE CONDITIONS	<i>February/March 1994</i>
TECHNOLOGY AND DEMOGRAPHIC SCREENING OF OPTIONS	<i>April/May 1994</i>
DESCRIPTIONS OF "REASONABLE" OPTIONS	<i>June 1994</i>
CLEANUP LEVELS ANALYSIS	<i>July/August 1994</i>
VOLUME AND COST COMPARISONS	<i>September 1994</i>
PREFERRED FUTURE USES AND CLEANUP LEVELS	<i>October/November 1994</i>
<b>PHASE IV: IMPLEMENTATION AND PRIORITIES</b>	
VISIONING 10, 25, 50 YEARS INTO FUTURE	<i>December 1994</i>
INSTITUTIONAL CONTROLS/USE AND OWNERSHIP CHANGES	<i>January/February 1995</i>
CLEANUP PRIORITIES AND TIMING	<i>March/April 1995</i>
TASK FORCE FINAL REPORT	<i>May/June /July 1995</i>
<b>PHASE V: MONITORING PROGRESS</b>	<i>To Be Determined</i>

Figure 2. SCHEDULE OF FERNALD DECISIONS AND KEY TASK FORCE MILESTONES



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## DESCRIPTION OF ACTIVITIES

This section is designed to provide a brief description of the outcome, process, and input to each of the key activities of the Task Force Process. The prospective activities described for Phases III and IV are meant to describe only those activities that correspond to future use, cleanup levels, and cleanup priorities. In addition the Task Force will address ongoing issues of importance to the site and a portion of each meeting will be devoted to such activities. These items will include, but not be limited to, comments on proposed plans, local issues relevant to the Fernald site, and other activities within the Department of Energy cleanup program. Specific agendas and detailed plans will be developed and distributed prior to each meeting.

### **PHASE I: CONVENING TASK FORCE (Completed)**

*June - August 1993*

The Department of Energy engaged Dr. Eula Bingham to select a representative group of stakeholders in the cleanup of the Fernald site to be members of the Task Force. Dr. Bingham also drafted, in consultation with the Department of Energy, the Environmental Protection Agency and the Ohio Environmental Protection Agency, a charter for the Task Force. This phase concluded with the official appointment of the Task Force Members and a Chairperson.

### **PHASE II: ORIENTATION AND APPROACH (Completed)**

#### **SITE ORIENTATION**

*September 1993*

The Task Force met twice for a tour of the site and a day-long retreat. The retreat covered introduction of stakeholders and their interests, the context of the Task Force in the cleanup program, introductions of key individuals, the legal context of the decision making process, physical characteristics of the site, and risk assessment fundamentals.

#### **DEFINE MISSION**

*October 1993*

The Task Force approved its charter, approved ground rules regarding membership, and discussed other organizational issues. The Task Force determined its basic approach to making its recommendations regarding waste disposal, cleanup levels, and cleanup priorities in light of future use.

#### **WASTE DISPOSAL AND LAND USE ORIENTATION**

*November 1993*

The Task Force developed a process and criteria for selecting a coordinator to direct the group's work in Phase II and beyond. Presentations on land use planning and basic waste disposal techniques were made.

## DEVELOP FUTURE USE APPROACH

*December 1993*

A Task Force Coordinator was selected by a selection subcommittee of the Task Force through a competitive bidding process. The Task Force Coordinator was introduced to the Task Force and presented the future use approach that will be pursued. The Task Force also considered the Department of Energy's Site Development Plan as a first step in applying stakeholder interests and goals to land use issues.

## PHASE III: CLEANUP PARAMETERS

### IDENTIFY OPTIONS FOR FUTURE USE

*January 1994*

#### **Decisions/Outcome:**

A full spectrum of future use options based on what the Task Force envisions would be productive and desirable uses of the property unconstrained by what is seen as feasible at this point in the process. These future use options set the stage for understanding and evaluating future use and cleanup levels for the facility. Keeping these potential future uses in mind, the Task Force will identify the items of information most needed in selecting the ultimate future use and cleanup levels for Fernald.

#### **Process:**

The Task Force will "brainstorm" all of the potential future uses of the site. Maps and aerial photographs will be used to help visualize both current and future land uses. Options for future use will be general in scope and may encompass the entire site or provide for different uses for different areas of the site. The cleanup of the facility will not actually create a specific use but will allow for a range of uses tied to the cleanup levels that are achieved. Highly detailed uses are therefore not necessary at this point. These general future use options will be used to set the stage for the information needs of the Task Force over the course of its decision making.

#### **Information Provided to Task Force:**

Physical and natural description of Fernald and surrounding areas.

Maps and photographs of Fernald and surrounding areas.

Current Land uses at Fernald and surrounding areas.

### UNDERSTAND SITE CONDITIONS

*February/March 1994*

#### **Decisions/Outcome:**

Develop a working understanding of the physical, cultural, economic, demographic, and environmental characteristics of the Fernald facility and surrounding areas.

Develop a working understanding of the contamination of structures, soils, air, surface water, and groundwater and the associated risks both current and future.

Identify all applicable and emerging remediation technologies and associated costs and risks.

**Process:**

Through presentation and discussion, a complete conceptual model of the site will be established for the Task Force. Information will be developed by FERMCO and the Task Force coordinator and in light of the types of information the Task Force desires relevant to its specific concerns.

**Information Provided to Task Force:**

Contamination profile, 3D representations, and volumes  
 Descriptions of significant risks from contamination over time  
 Environmental profile of all significant receptors  
 Demographic profile and trends for surrounding area  
 Description, costs, and effectiveness of most applicable technologies

## TECHNOLOGY AND DEMOGRAPHIC SCREENING OF OPTIONS

*April/May 1994*

**Decisions/Outcome:**

Identification of the future use options that are considered reasonable in light of the condition of the site and surrounding areas.

**Process:**

A screening of each of the possible options identified in the first step to determine which are most reasonable in light of the baseline information presented. The Task Force will discuss the potential benefits and limitations of pursuing each of the future use options and try to narrow the number of options that will be developed in detail. This evaluation will be conducted qualitatively and acceptable criteria for long-term solutions to Fernald will be developed by the Task Force to guide in this process.

**Information Provided to Task Force:**

Baseline information previously generated.

## DESCRIPTIONS OF "REASONABLE" OPTIONS

*June 1994*

**Decisions/Outcome:**

Descriptions of each of the future use options in sufficient detail to allow for the development of corresponding exposure assumptions for the development of cleanup levels.

**Process:**

The Task Force will discuss each of the reasonable options identified in the previous step and will develop detailed assumptions regarding the future use scenarios of each so that relative cost comparisons can be developed. These assumptions will be developed in conjunction with risk assessment staff to ensure that sufficient information exists to develop cleanup levels for each option. At this time, all of the ramifications of each option will be explored including, but not limited to, the long-term effectiveness of the technologies employed, risks and concerns of implementation, off-site impacts and considerations, technical feasibility, and the economic, cultural, environmental, and social impacts of the cleanup process and the ultimate condition of the site. If desired by the Task Force, the assistance of outside planning professionals will be elicited.

**Information Provided to Task Force:**

Detailed information on the technologies associated with each option including long-term effectiveness and implementation parameters.

Description of the parameters that must be taken into consideration in conducting long-term land use planning.

**CLEANUP LEVELS ANALYSIS**

*July/August 1994*

**Decisions/Outcome:**

Develop an understanding of all the variables and processes that go into setting actual cleanup levels. Establish a preferred approach for setting cleanup levels and have calculations performed to identify cleanup levels associated with each future use option.

**Process:**

Through presentation and discussion, the Task Force will be given an overview of the risk assessment process and all relevant laws and regulations that impact the setting of cleanup levels at Fernald. The task will work directly with risk assessment staff to identify important criteria in conducting the risk assessments to set cleanup levels. If desired by the Task Force, the assistance of outside risk analysis professionals will be elicited.

**Information Provided to Task Force:**

Descriptions of the risk assessment and ARARs processes.

Identification of the cleanup levels generated according to the specifications of the Task Force.

**VOLUME AND COST COMPARISONS**

*September 1994*

**Decisions/Outcome:**

A summary of the volumes, costs, likely technologies, time frames, and ramifications of implementation of each future use option. At this point, different options may look sufficiently similar in the cleanup levels required that future use "ranges" might be created to encompass a variety of uses available under a given set of cleanup standards.

**Process:**

Using the risk information identified in the previous step, cost and volume estimates will be prepared by FERMCO in conjunction with the Task Force coordinator to identify the relative costs of each of the options. These costs will then be evaluated by the Task Force versus the expected benefits and other ramifications of each option.

**Information Provided to Task Force:**

Cost and volume estimates for each option.

Three dimensional representations of cleanup volumes and on-site disposal patterns for each of the options.

Visual representations of the Fernald site following remediation under the various options.

**PREFERRED FUTURE USES AND CLEANUP LEVELS***October/November 1994***Decisions/Outcome:**

Identification of preferred future uses of land and natural resources at Fernald and the corresponding cleanup levels. An interim report will be prepared at this time to present the recommendations and all corresponding assumptions and observations.

**Process:**

The Task Force will evaluate the costs and benefits of each future use option or range of options to identify the most acceptable scenario for Fernald.

**Information Provided to Task Force:**

Summaries of all information gathered to date.

**PHASE II: IMPLEMENTATION AND PRIORITIES****VISIONING 10, 25, 50 YEARS INTO FUTURE***December 1994***Decisions/Outcome:**

An understanding of how Fernald will change over time during and after remediation and how any future use of the property can be phased in as remediation is completed.

**Process:**

Presentation and discussion of the timing of the activities involved in achieving the ultimate remediation of Fernald.

**Information Provided to Task Force:**

Timelines of key activities.  
Conceptual site models at 10, 25, and 50 years.

**INSTITUTIONAL CONTROLS/USE AND OWNERSHIP CHANGES***January/February 1995***Decisions/Outcome:**

Options for ensuring the long-term effectiveness of the remedy and responsibilities and contingencies for the long-term management of the property.

**Process:**

The Task Force will discuss all of the long-term ramifications of the site cleanup strategy and identify the long-term issues that must be planned for in the implementation and management of the remedy. These issues will include, but not be limited to, ownership of property, management of all long-term waste management units, remedy maintenance and replacement, and desires of future generations in changing land use.

**Information Provided to Task Force:**

Currently available options for long-term control of land uses.  
Planned DOE ownership strategy.

**CLEANUP PRIORITIES AND TIMING**

*March/April 1995*

**Decisions/Outcome:**

Identification of the key concerns of the Task Force for prioritization in the cleanup process and an overall view of cleanup timing from the Task Force's perspective.

**Process:**

Discussion of the key areas of concern and feasibility of different scheduling approaches for remediation.

**Information Provided to Task Force:**

Key time and logistical constraints.

**TASK FORCE FINAL REPORT**

*May/June/July 1995*

**Decisions/Outcome:**

A final report of all Task Force observations and recommendations.

**Process:**

The Task Force will outline the key sections of the final report during the May meeting. The Task Force coordinator will then produce a draft report for review at the June meeting, which will be revised again for ultimate approval at the July meeting.

**Information Provided to Task Force:**

Draft reports.

**PHASE V: MONITORING PROGRESS**

The specific timing and activities of this phase will be determined at a later date.

**Appendix D**  
Summary of Public Comments

## FERNALD CITIZENS TASK FORCE

### Summary of Public Comments

#### Introduction

The Fernald Citizens Task Force is committed to public involvement. To that end, it invites the public to comment on all of its activities. The public can comment by:

- Speaking at Task Force meetings, when time is set aside for public comment
- Mailing correspondence to the Task Force post office box
- Calling the Task Force message line

The Task Force staff monitors the post office box and message line, and forwards comments to the Task Force chair. Copies of transcribed messages and correspondence also are placed in the Task Force files.

#### Message Line Comments

*Call(s) on September 7, 1994:*

Unidentified Man -- I think Fernald should be a future wildlife sanctuary because there is about nine creeks and streams nearby, and it's right next to Miami Whitewater Park. There is Dry Fork Creek, Hard Creek, Lee Creek, Indian Creek, Great Miami River, and Paddys Run and they all empty into the Ohio. And also that CSX line, you could make a bike trail and connect it out at Oxford and then Heuston Woods Park. Because in the future, there is going to be more and more houses.

And that CSX line was all chopped up in the Cincinnati part. And the Fernald is beautiful. The deer and animals can cross over that farm in between. It can made an easement land. And Fernald should be a park, a future wildlife sanctuary, cleaned up. And the real bad stuff should go to Nevada.

Unidentified Man -- Fernald ought to be a hardwood preserve with trees and that because it sits right next to Miami Whitewater Forest. And the farm in between there should be made into easement that it will always be a farm or else it will revert to sanctuary land. Nine-tenths of Ohio used to be hardwood forest and southwestern Ohio by the Indiana border is beautiful and it should be preserved.

Unidentified Woman -- I won't be at the Task Force meeting, but believe that Fernald should be saved as a future wildlife sanctuary or a forest nature preserve. The farms between Fernald and Miami Whitewater Forest should be protected as farmland or eventually connected as a preserve. CSX right-a-way should be a future bike trail connected to Oxford and Hueston Woods and also Miami Whitewater Forest.

Unidentified Woman -- I won't be at the Task Force meeting, but believe that the farms between Fernald and Miami Whitewater Forest should be protected as farmland or eventually connected as a preserve. CSX right-a-way should be a future bike trail connected to Oxford and Hueston Woods and also Miami Whitewater Forest.

Unidentified Man -- I think they should keep those pine trees at the Fernald site and make them go all the way around the site and clean up the worst of the nuclear waste and ship it to Nevada and then use that new technology to make glass beads and try to contain the rest of the waste so it doesn't go in the aquifer and make the site a preserve. Then connect the CSX line to the north to Shaker Trace and make it a bike trail, and then maybe extend the bike trail to Hueston Woods and Oxford instead of cutting the line into little pieces like they did every where else.

The idea is that in 20, 30, 50, 100 years from now the population will grow and so many people will find this a beautiful preserve. I think that maybe Miami Whitewater is afraid of the uranium and stuff, so maybe the Fernald area should be a state sanctuary, but Fernald should be connected to Miami Whitewater Forest.

*Call(s) on September 8, 1994:*

Unidentified Man -- It would be a good idea to connect Fernald with Miami Whitewater Park and with Shaker Trace, would solidly the area as a wildlife area. Would keep the peace and keep the pace of life slow; that's the way it should be.

*Call(s) on September 13, 1994:*

Unidentified Man -- I have a question for Guy Guckenberger. After his plans of sewer lines and housing development around Fernald and the river bottom, lands and hillsides between Fernald and the [unintelligible; sounded like Oxboro], if he plans to retire out-of-state in a quiet area with less air pollution and read as a hobby about wildlife habitat and biodiversity.

Unidentified Man -- I have a question for Jerry Monahan Building trades representative. If after they build their last house by Fernald, if they next plan to build a corporate park on the south side of Rumpke dumps mountain off of Colerain Road.

*Call(s) on September 14, 1994:*

Unidentified Man -- Did you know that 124 species of neo-tropical migratory birds travel from Ohio to Guatemala every year? Having Fernald be turned into a sanctuary with trees would help these birds.

*Call(s) on September 15, 1994:*

Unidentified Man -- Trees and plants absorb noise pollution. Parks are 75% more quiet than urban areas. It takes 79 trees to produce enough fresh air for one person to breath in one day. It takes 250 trees to absorb emissions from one school bus during one day. It takes 25,000 trees to absorb emissions from one jet take off.

Each forest tree provides as much cooling power as five, 10,000 BTU air conditioners. Each park acre of forest has 50,000 spiders, which consumes 93,000 insects a day. Trees are beautiful. 124 species of neo-tropical migratory birds travel from Ohio to the Mio biosphere Reserve in Guatemala and back each year. Wildlife is hurt by forest fragmentation. Wildlife quarters are roads for animals. Bridges and overpasses over rivers and streams should be large enough to help animals to move along the river banks to travel. Animals have nerves just like humans; they need our help. Fernald should be a wildlife sanctuary.

*Call(s) on November 6, 1994:*

Unidentified man -- I've been listening to the news all weekend about this woman in South Carolina who drowned her two little boys. You know, maybe if she had a quiet place to go to and get rid of her stress she might not have done such a terrible thing. Miami Whitewater Park is one of the few quiet places left around here to go when you need to be quiet. If you turn Fernald into a wildlife preserve and connect it with Miami Whitewater Park, not only will the birds and animals have a place to go, but people will have a place to go when they need to think.

[The unidentified man who advocates making the site a wildlife sanctuary/nature preserve has called numerous times to repeat this message.]

## Correspondence/Written Comments

Received at DOE's Community Meeting October 18, 1994:

Anonymous comment -- Turn the site into a nature preserve/songbird sanctuary; rest of comment summarized many of the message line comments.

Comment card -- Wildlife sanctuary; keep waste out of aquifer and rivers

## 1994 Community Assessment

DOE conducted a comprehensive community assessment in May 1994 to improve its understanding of community concerns, needs, and interests. A community assessment is a series of interviews with members of the public who are affected, or potentially affected, by activities at the Fernald site. The assessment involved 50 face-to-face interviews with community leaders, including members of the Fernald Citizens Task Force. To reach a broader cross-section of the public, the assessment also included 365 telephone interviews with residents within a 20-mile radius of the Fernald site.

The questions most relevant to Task Force activities and the responses from the assessment are summarized below.

- Do you think the Fernald site should be cleaned to a pristine condition, even if it means spending additional taxpayer money *than needed* to meet basic government cleanup regulations?

Yes = 51 percent of the respondents within the 20-mile radius; 28 percent of the 50 community leaders

No = 49 percent of the respondents within the 20-mile radius; 72 percent of the 50 community leaders

- If the decision were yours alone, what would you do with the Fernald site once cleanup is complete?

Nature/wildlife preserve = 30 percent of the 50 community leaders; 13 percent of general public respondents

Open/green space = 37 percent of general public respondents

Technology center/museum = 16 percent of the 50 community leaders

Other possibilities include commercial/light industrial, low-level radioactive waste repository, agricultural, recreational, residential, yard waste/recycling

- Where do you think wastes generated during cleanup of Fernald should be disposed?

Combination of on-site and off-site storage = 14 percent of the 50 community leaders

On-site disposal = 18 percent of the 50 community leaders; 9 percent of the general public respondents

Use existing government facilities in arid climate = 36 percent of the 50 community leaders; 95 percent of the general public respondents

## Communications Audit

In addition to the community assessment, DOE commissioned a separate internal communications audit with Fernald employees. The audit was conducted by the University of Cincinnati in July 1994. The purpose of the audit was to monitor employees' information needs, but it included several cross-over questions on future use from the community assessment.

The questions most relevant to Task Force activities and the responses from the assessment are summarized below.

- Do you think the Fernald site should be cleaned to a pristine condition, even if it means spending additional taxpayer money *than needed* to meet basic government cleanup regulations?

Yes = 30 percent of employees

No = 70 percent of employees

- If the decision were yours alone, what would you do with the Fernald site once cleanup is complete?

Nature/wildlife preserve = 29 percent of employees

Isolate/secure the waste = 21 percent of employees

Industrial use = 14 percent of employees

- Where do you think wastes generated during cleanup of Fernald should be disposed?

Combination of on-site and off-site storage = 7 percent of employees

On-site disposal = 23 percent of employees

Use existing government facilities in arid climate = 47 percent of employees

**Appendix E**  
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**Appendix F**  
Description of FutureSite Exercise

## FUTURESITE Overview and Instructions

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### Introduction

The Fernald Environmental Management Project (Fernald), formerly the Feed Materials Production Center, produced high-purity uranium metal from uranium ore for the U.S. Department of Energy's Nuclear Weapons Complex. During its years of operation from 1953 to 1989, it is estimated that 1,000,000 pounds of uranium were discharged to the environment, most of it in the form of airborne dust emissions, most of which settled on the soil around the plant. A large aquifer runs under the plant, and parts of it are severely contaminated with uranium from surface run-off and leachate from disposal pits and production processes. Other hazardous substances are present at Fernald, but uranium is by far the most significant; with a few exceptions, cleaning up the uranium will clean up everything else. Fernald is listed on the National Priorities List for Superfund cleanup, and an agreement is in place to accomplish it.

Citizens who live near Fernald have been actively encouraging cleanup since 1984, and in recent years the site management has increasingly sought the input of the public in cleanup decisionmaking. In 1993, the Department of Energy established a "site-specific advisory board" — the Fernald Citizens Task Force — comprising representatives of numerous stakeholder groups, to advise it on key cleanup decisions. *FutureSite* was developed to help members of the Task Force to visualize the complex and interrelated contamination issues at Fernald.

As is the case at many Superfund sites, cleanup at Fernald requires the removal and/or treatment and/or disposal of hazardous waste and of environmental media (soil and groundwater) contaminated by those wastes. There is little dispute over the need to remove and/or treat and/or dispose of the waste materials themselves—called source materials—though *how* to do it may generate considerable controversy. They present a clear danger unless neutralized or isolated. Rather, it is the cleanup of contaminated soil and water that presents a difficult problem because (A) there are large volumes of contaminated material, meaning high costs, (B) the risk presented by contaminated material is real but the harm is seldom imminent, (C) the technology for treating them is often imperfect and always costly, and (D) they must be disposed of somewhere and no one especially wants to host them.

*FutureSite* addresses the media contamination. At Fernald, the cleanup question can without undue distortion be simplified to: how much uranium-contaminated soil must be removed from the site to make it acceptably safe to persons on or near it? The answer to this question is, in turn, driven by two considerations: (1) protection of the groundwater under the site, and (2) risks to persons on the surface who are in contact with the soil.

(1) The relationship of soil contamination to groundwater is not obvious, but is of critical importance. The uranium in the soil reaches the groundwater from surface run-off into streams that are in direct contact with the aquifer, and from the leaching of uranium down through the soil to the aquifer. The more soil is contaminated and the greater its degree of contamination, the greater the risk to the aquifer.

(2) The relationship of soil contamination to persons who use the surface of the land is more direct: the more contact one has with the soil and the more contaminated the soil is, the greater the risk. Two variables must be considered, however. (a) First, the risk to a person on the surface will vary considerably depending on what that person is doing. A farmer who lives on the site would have a great deal of contact with the soil, while an occasional hiker through a wildlife preserve would have very little. Hence one cannot assign a level of safety without asking, "Safe for what?" (b) Second, one must also decide what level of risk constitutes an adequate degree of safety.

This version of *FutureSite* concentrates on the questions arising from surface use; a version that addresses the level of soil cleanup needed to protect the aquifer is in development. If the players decide that groundwater protection is the first priority (the use of the Safe Drinking Water Act as an ARAR [Applicable or Relevant Appropriate Requirement] under CERCLA suggests this), then they would begin by removing chips to accomplish that goal. Of course, those chips must be treated and/or disposed of just like chips removed on account of surface use. On the other hand, because this is an exercise, players may wish to ignore or modify groundwater protection to explore other possible future scenarios.

## Objective

*FutureSite* is a simulation that models the volumes of contaminated soil that must be remediated to use the Fernald property. The objective is to determine what future use (or uses) the Fernald site should have, by removing specific concentrations of contaminated material. The exercise ends when the players are satisfied that they have reached their desired level of cleanup to achieve their vision of Fernald's future use, and have accounted for all of the contaminated materials by either leaving them in place or disposing of them.

## Components

**Fernald Overview** is an introduction to the site and its contamination.

**Map** of the Fernald facility divided into a grid of 1,000 foot chips. (Each square on the grid represents about 25 acres of land.) For each square, the volume of material that must be removed to achieve alternative future uses has been calculated and indicated on a "chip."

**Chips** representing soil contaminated with various concentrations of uranium. Each chip represents a specific volume of soil containing a specific range of contaminants allowed for various future use categories based on risk: Restricted Access (pink), Undeveloped Green Space (yellow), Developed Park (green), Commercial/Industrial (blue), and Residential/Agricultural (white). The purple chips represent all materials that must be removed to achieve even restricted use; salmon chips represent the volume of waste from Operable Unit 3 (former production area) and Operable Unit 2 (active and inactive flyash piles, lime sludge ponds, sanitary landfill). There are also chips representing non-soil materials that must be disposed of: flyash, demolition debris, waste pits, and production wastes. Three sets of chips are provided so the exercise can be played at the risk levels permitted by CERCLA,  $10^{-6}$ ,  $10^{-5}$ , and  $10^{-4}$  excess cancer risk.

**Disposal Options** are limited to either on-site disposal or off-site disposal. All "chips" removed must be placed into one of these disposal options.

**Tally Sheet** allows players to calculate the consequences of their decisions and to determine the volume of material involved in their cleanup, cost of the cleanup scenario, amount of space needed for the disposal facility, and transportation impact.

## Set Up

Each grid square on the map is designated with a letter and number as indicated on the top and left side of the map (A-1, A-2, A-3, etc.). The color chips are stacked on the appropriate grid square indicated on each chip. The Aquifer Cards are inserted into the stacks as indicated on the cards. (BE SURE THAT ALL OF THE CHIPS AND CARDS ARE FROM THE SAME RISK SCENARIO:  $10^{-4}$ ,  $10^{-5}$ , OR  $10^{-6}$ . DO NOT MIX THEM.) The order of the colors is the same for each risk scenario (from bottom to top): white, blue, green, yellow, pink, purple, and salmon. Because the level of contamination varies across the site, not all of the chips will have all of the colors. Place the sheets representing the two disposal options (on-site and off-site) next to the board.

## Running The Exercise

Each chip represents soil containing the range of contaminant concentrations allowable for the future use indicated on the chip. To achieve a future land use on a given square, players must remove all of the chips representing contamination at concentrations above that required for the selected use. For example, to achieve commercial/industrial use for a given square, all chips above the blue one on that square must be removed. Players can make a square "cleaner" than its intended future use to achieve a margin of safety. The level of clean determines your range of future use options.

The players first remove the chips down to the level of cleanup desired. To remove a chip, they must place it on one of the disposal option sheets, either on-site or off-site. There is a cost and impact associated with each option.

**Off-Site Disposal** - Material placed in off-site disposal is assumed to go to a long-term disposal facility in an arid part of the western United States, thus incurring substantial transportation and disposal costs. Due to its high degree of hazard, source Material from the silos and waste pits have already been placed in this category. The volume of off-site disposal is limited to 1,000,000 cubic yards in total.

**On-Site Disposal** - Contaminated material left on site for disposal will be disposed of in an engineered facility to isolate it from the ambient environment. It is assumed that each 13,000 cubic yards of contaminated material will require one acre of land for a disposal facility, including all ancillary operations and buffer space. Space on site must be reserved for placement of disposal facilities at the completion of the exercise. Because operation of a disposal facility is considered a commercial/industrial activity, the area selected for the on-site disposal cell must first be cleaned at least to a commercial/industrial use level.

**Treatment** - For technical reasons, soil treatment was not feasible at Fernald, so it is not part of this exercise.

## FUTURE USES AND CHIP VALUES

FUTURE USE CATEGORY	CLEANUP LEVELS AND RANGES AT 10 <sup>-4</sup>	CLEANUP LEVELS AND RANGES AT 10 <sup>-5</sup>	CLEANUP LEVELS AND RANGES AT 10 <sup>-6</sup>
Restricted Access (Pink)		1,739 ppm (>1,739 ppm=purple)	180 ppm (>180 ppm=purple)
Undeveloped Green Space (Yellow)	8,820 ppm	1,259 ppm (1,259-1,739 ppm)	132 ppm (132-180 ppm)
Developed Park (Green)	3,490 ppm (3,490-8,820 ppm)	390 ppm (390-1,259 ppm)	42 ppm (42-132 ppm)
Commercial/Industrial (Blue)	1,200 ppm (1,200-3,490 ppm)	138 ppm (138-390 ppm)	18 ppm (18-42 ppm)
Residential/Agricultural (White)	130 ppm (130-1,200 ppm)	21 ppm (21-138 ppm)	6 ppm (6-18 ppm)
Background (Board)	3.6 ppm	3.6 ppm	3.6 ppm

### Finishing The Exercise

After the players have removed all the chips necessary to achieve their cleanup and future use goals, they can calculate the total volume of materials removed, dollar cost, transportation impact, and space needed (if any) for on-site disposal by adding up the appropriate values from all of the chips in each disposal option. They will also want to fix a location for on-site disposal (if any), taking the geography and infrastructure of the site into account.

### Key Assumptions

**Uncertainty in Volume and Cost Data** - Soil volumes and cost data were developed using the best available data, but are only estimates of actual values. As the concentrations of soil contaminants get lower, it becomes harder to assure the accuracy of the measurement data; consequently, confidence in the precision of the soil volumes gets lower. Approaching "background" levels of cleanup, the volume of soil represented could be several times that currently generated by the model used to calculate these volumes.

Treatment and handling costs will vary based on the type of material, volume, technology, etc. The cost estimates for *FutureSite* are based on average costs for similar activities and simplified for the purpose of this exercise. Like soil volumes, cost data should be used for relative comparisons of solutions, not as actual cost estimates.

**Risk and Cleanup Levels** - EPA guidance provides for a range of acceptable risk of excess cancer of between one in ten thousand (10<sup>-4</sup>) and one in one million (10<sup>-6</sup>). Therefore, for the purposes of this exercise, volumes for one in ten thousand (10<sup>-4</sup>), one in one hundred thousand (10<sup>-5</sup>), and one in one million (10<sup>-6</sup>) have been developed to illustrate potential cleanup requirements. Cleanup levels were calculated based upon the risks to human health and do not include ecological risk. A table showing cleanup levels for uranium under each risk target is included.

**Off-Site Disposal Limitations** - An arbitrary limit of one million cubic yards has been placed on off-site disposal to reflect realistic logistical and political considerations. At present there are only two facilities able to accept large volumes of low-level radioactive waste from Fernald. Both face significant political pressures on accepting large amounts of out-of-state wastes and one has a limited capacity for new waste. Players may choose to exceed this limit for off-site disposal for this exercise, but the ability to dispose of greater than one million cubic yards is currently considered unlikely.

**Source Material** - A number of decisions regarding disposition of source material from various operable units have already been drafted and have been incorporated into the exercise according to the potential impact on future use. Source materials from the silos and the waste pits are assumed to be completely removed and disposed of off-site. Therefore, they will not affect the use of the site, but their volume is included in off-site disposal, limiting that option. Players, however, are free to move these volumes into on-site storage if they wish. Debris from site buildings has also been designated by salmon chips in the production area, and it can be disposed of on- or off-site.

**Off-Site Contamination** - In this exercise off-site contamination has been ignored. It is not anticipated that large volumes of off-site soil will need to be excavated.