FERNALD CITIZENS ADVISORY BOARD

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FCAB UPDATE

Week of August 15, 1999

(Last briefing was dated August 2, 1999)

MEETING

STEWARDSHIP COMMITTEE — **Large Laboratory Conference Room**
Wednesday, September 8, 1999, 6:30 p.m.

REMEDIATION COMMITTEE — **Large Laboratory Conference Room**
Thursday, September 9, 1999, 6:30 p.m.

FULL BOARD — **Large Laboratory Conference Room**
Saturday, September 11, 1999, 8:30 a.m.

FERNALD MONTHLY PROGRESS BRIEFING — **Services Building Conference Room**
Tuesday, September 14, 1999, 6:30 p.m.

Reminder: if you will not be able to attend any meeting, please call the office and let us know.

ATTACHMENTS

- 7/14/99 Stewardship Committee Summary
- 7/15/99 Remediation Committee Summary
- Summary of the Oak Ridge Reservation's Stakeholder Report on Stewardship July 1998
- News Clippings, **please note:** The articles from *The Washington Post* about the Paducah site

NEWS and ANNOUNCEMENTS

Two items for the Stewardship Committee to pay special attention to this mailing:

- The Summary of the Oak Ridge Reservation Stakeholder Report on Stewardship
- Riparian Buffer Zones: Summary of Fact Sheets from various states' and universities' web pages

The FCAB's address has changed from the P.O. Box in Ross to Fluor Daniel Fernald
PO Box 538704, MS 76, Cincinnati, OH 45253-8704.

*In order for everyone to enjoy the rest of the summer, there are **no** meetings in the month of **August**.*

FOR FURTHER INFORMATION

Please contact Doug Sarno or Gwen Doddy, Phoenix Environmental
Phone: 513-648-6478 or 703-971-0058 Fax: 513-648-3629 or 703-971-0006
E-Mail: PhnxEnvir@aol.com or DJSarno@aol.com

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Stewardship committee

July 14, 1999
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Meeting Summary

Topics

- Workplan for Second Half of 1999
- Updates on: Native American Reburials
  Living History Project
  Cold War Artifacts
  Museum/Educational Center
  Paths to Closure
- Issues for 1999 - 2000

Attendees

Fernald Citizens Advisory Board
Marvin Clawson
Pam Dunn
Jane Harper
Mike Keyes
Ken Moore
Bob Tabor

Department of Energy -Fernald
Johnny Reising
Ed Skintik
Gary Stegner

Fernald Living History Project
Jim Innis

Fluor Daniel Fernald
Tisha Patton
Joe Schomaker

FRESH
Edwa Yocum

Ohio Environmental Protection Agency
Donna Bohannon

University of Cincinnati
Steve Depoe

FERNALD CITIZENS ADVISORY BOARD

Action Items

- *By August 13, 1999, committee members should give Tisha Patton any comments on the workplan. She will compile comments and forward them to Doug Sarno.*
- *Committee members should read the Oak Ridge Stewardship Report; Phoenix Environmental will supply reports to those who need them.*
- *Patton will pursue obtaining copies of any Stewardship Report issued by the Western Governors Association (WGA).*
- *Johnny Reising/Gary Stegner will tell the committee of any meetings of the full Natural Resources Working Group scheduled in the near future. Gary will also determine whether there are meeting minutes available for the weekly internal (i.e., involving DOE and FDF personnel) Natural Resources group meeting.*

Meeting Summary
Workplan for Second Half 1999

The members discussed the second half of 1999's workplan. In August, members are to read the Oak Ridge Reservation Stakeholder Report on Stewardship in preparation for the Stewardship Seminar being hosted by the Oak Ridge SSAB in late October. The following persons are interested in attending the seminar as representatives of the FCAB or of the site: Ken Moore, Marvin Clawson, Pam Dunn and Jim Bierer of the Stewardship Committee; Gary Stegner of DOE-Fernald; and Tisha Patton of FDF.

Johnny Reising informed the committee that he will attend a DOE complex-wide workshop on stewardship in Grand Junction, Colorado, in August of this year. Johnny offered to report the proceedings at the next Stewardship Committee meeting, currently scheduled for September 8, 1999.

Pam Dunn indicated that she thought the Western Governors Association (WGA) was preparing or had issued a report on some aspect of stewardship that might make interesting reading for committee members. Patton will get the report, if in existence, for the committee.

Ken Moore asked for an update regarding the Natural Resource Working Group (NRWG), to which he, Marvin Clawson and Doug Sarno are FCAB representatives. Reising stated that there is no full NRWG meeting on the calendar at this time, but internal meetings of the DOE and FDF Natural Resources personnel continue on a weekly basis.

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Meeting Summary

Updates

Dunn, Chair of the Stewardship Committee, called upon members of the various organizations represented on the committee to give updates.

Native American Reburials

Joe Schomaker and his co-workers have begun negotiations with interested tribes. He is investigating funding for the reburials. Also, he has begun discussing with the tribes possible reburial locations and a possible design of reburial areas. The actual procedure for reburials will also have to be confirmed. Several issues remain to be resolved. Some of them are: length of time the site will accept reburials, final determination of long-term site ownership, and protection of the reburial area into the future.

Schomaker briefly explained the terms:

- "Repatriation:" remains returned to Native Americans
- "Reburial:" burial of remains on Native American tribal lands or private land
- "Retention:" a sample of which is our "retention-in-ground" of remains at Fernald in 1998, a situation where DOE will retain ownership of the buried remains because they were culturally unidentifiable

Based on progress being made on potential reburials, Schomaker will want to give a full presentation to the committee at the next meeting.

Living History Project

Steve Depoe told the committee that interviews for the Living History Project (LHP) are 50% complete and are progressing on schedule. However, the preparation of interview transcripts is more laborious and time-consuming than anticipated.

Grant applications (an Ohio Educational Grant and an Ohio Environmental Education Fund Grant) have been prepared for the FLHP; Steve has copies of the applications available for those interested. Products, which would be created with grant funds, include:

- An additional 25 interviews (in addition to of the 100 already funded through October 1999)
- A teacher training workshop to be held in the summer of 2000
- Development of an educational video on Fernald's environmental history.

Notice of approval/disapproval of the applications should be available by late September 1999.

Cold War Artifacts and Museum/Educational Center

Shomaker told the committee that a collection of cold war artifacts is progressing. Schomaker and his co-workers are also beginning to examine potential sources of funding for a museum or educational center and they feel there are some viable possibilities.

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Paths to Closure

Reising told the committee that a 1999 draft of the Paths to Closure document has been prepared and is in review. Of special note is that a 13th PBS (Project Baseline Summary) category has been added to our baseline to cover post-closure costs.

In order to familiarize himself with the anticipated on-site events for the next 10 years, Ken Moore requested schedule and budget information. Reising said he will provide Moore with the 1999 draft of the Paths to Closure Fernald site narrative, as well as some milestone information.

Issues for 1999 - 2000

Committee members agreed with the issues listed, but wanted to make sure that previous suggestions for dealing with those issues were not forgotten. Examples are:

- The committee needs to have a meeting with DOE Public Affairs to make sure that future workshops are adequately publicized.
- The value of focus groups to deal with individual issues should not be forgotten.
- The committee should consider "field trips" to newly constructed educational centers at local parks, and should remember to take advantage of the expertise of local wildlife management experts and other subject matter specialists.

Prepared by Tisha Patton; July 22, 1999

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Remediation committee

July 15, 1999
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Meeting Summary

Topics

- Silos Project Proof-of-Principle Testing Final Report
- Updates and Fact Sheets
- FCAB's Cattle Grazing Recommendation
- Future Use Issue - Its Importance to the Remediation Committee
- SSAB Transportation Working Group

Attendees

Fernald Citizens Advisory Board
Lisa Crawford
Bob Tabor
Fawn Thompson
Gene Willeke

Department of Energy -Fernald
Johnny Reising
Dave Yockman

Fluor Daniel Fernald
Dennis Carr
D.A. Nixon
Tisha Patton
Michael Smith
Jeff Stone
Jeff Wagner
Eric Woods

Ohio Environmental Protection Agency
Kelly Kaletsky

Phoenix Environmental
Doug Sarno

FERNALD CITIZENS ADVISORY BOARD

Remediation Committee Action Items

- *Develop summary of proof-of-principle reports (w/DOE for September 1999 FCAB meeting)*
- *Write preliminary reactions to the proof-of-principle reports (by September 1999 FCAB meeting)*
- *In October, public workshop with Ohio EPA on the silos FS*

DOE Action Items

- *Detailed report of the outcome of the intermodal shipment pilot project (for September 1999 FCAB meeting)*
- *By October, complete analysis of proof-of-principle reports*
- *Notify FCAB two months before a cattle-grazing lease is renewed*

Silos Project Proof-of-Principle Testing Final Reports

Dave Yockman reviewed the DOE Briefing on the silos project proof-of-principle testing. The purpose of the DOE Briefing was to get the public's feedback on the proof-of-principle reports and to summarize the venders' reports for the public. Although it has summarized the reports, the DOE has not compared and contrasted the different vender's proof-of-principle reports nor has it fully analyzed the reports. In October, the DOE hopes to have a complete analysis of the proof-of-principle reports, including a comparison of each of the technologies and venders' reports and lessons learned from other DOE sites as well as from the Fernald site. Once completed, this analysis will be given to the CAT team for review. After they review it, a public workshop will be held to discuss the report and to gather public input.

Gene Willeke suggested that the Fernald Citizens Advisory Board (FCAB) write preliminary reactions to the proof-of-principle reports by September. Yockman stated the FCAB should recommend items which need to be explained further in the FS. To assist the FCAB in making their preliminary reactions, Doug Sarno will develop, with the help of Willeke and DOE, a summarization of the proof-of-principle reports.

DOE plans to hold a public workshop on silos FS in October. Lisa Crawford asked that Ohio EPA hold a workshop for FRESH as they have done on previous RODs. It was suggested that the FCAB also participate in that workshop.

Updates and Fact Sheets

Intermodal Transportation Update

Tisha Patton reviewed the fact sheet on intermodal transportation. She wanted the committee to note two items:

1) In April 1999, a *Draft Request for Proposal for Intermodal Transportation Services* was prepared and issued for review and comment. This request is to retain a third-party logistics services provider for management of intermodal arrangements for Fernald. Comments were received and are currently being evaluated.

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Meeting Summary

2) As a pilot project to validate the proposed advantages of intermodal shipment, a small population of mixed wastes (soil excavated from the Sewage Treatment Plant area), will be shipped intermodally from Fernald to Envirocare of Utah. Approximately 10 intermodal containers provided by MHF Logistical Solutions will be transported from Fernald to Pennsylvania by truck. From Pennsylvania they will be tranported by rail to Salt Lake City, Utah, and from there trucked to Envirocare. Excavation and loading of this soil is currently underway and shipment to Envirocare could begin in late August.

Johnny Reising added that the pilot project is only an evaluation of the cost effectiveness of intermodal transportation and the ability of FDF employees to preform intermodal transportation activities. Sarno asked Reising for a detailed report of the outcome of the project for the September full board meeting.

Fact Sheet on Technical and Procurement Improvements at Fernald Since the White Metal Box Incident

At the last full board meeting, on June 10, 1999, John Bradburne told the FCAB he would prepare a fact sheet regarding the technical and procurement improvements at Fernald since the white metal box incident. That fact sheet was distributed. The committee members read the fact sheet and concluded it does meet the needs of the FCAB to explain the improvements after the white metal box incident.

Waste Pits Remedial Action Project Rail Shipment Update

A total of 258 gondola cars have left Fernald for Envirocare to date. The shipments contained approximately 27,570 tons of waste, mostly contaminated soil. When the trains begin to use the new direct route to Indianapolis, the number of gondola cars per unit train will increase to 60 or more. As long as the route continues to go through Cottage Grove, an upper limit of 45-55 railcars will be in effect. There are currently 135 gondola cars on site and 35 or more are under procurement.

Low-Level Waste Shipments to Nevada Test Site (NTS)

During the week of July fifth, the first shipments to NTS occurred without incident. Last week, there were no shipments. On July 14, there were two shipments to NTS and on July 16 there will be two more.

FCAB Cattle Grazing Recommendation

Reising reviewed the response to the FCAB's cattle grazing recommendation. Johnny Reising and Jack Craig met as soon as Craig received the recommendation. DOE responded to each aspect of the FCAB recommendation and proposes to:

- Continue to have grazing in Area 8, Phase III on a year-to-year basis
- Terminate grazing in Area 1, Phase III and Area 8, Phase II
- Incorporate the FCAB's recommendations future leases

Reising and Eric Woods met with Karl Summe to discuss the recommendations of the FCAB. Summe agreed to sign a lease with the FCAB's recommendations incorporated in it. Summe also agreed to move, as soon as possible, the fences back 50 feet from Paddys Run. Reising also met with a risk assessment personnel on site, regarding the risks associated with cattle grazing on site, and with a representative of the Butler County Ohio State University Agricultural Extension, regarding the number of cows the land can sustain.

Lisa Crawford asked how much does Summe pay DOE in rent? Reising answered $2,000 per year.

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In the recommendation, the FCAB asked for quarterly updates about the cattle grazing. Sarno stated that the FCAB did not need quarterly updates; however, the FCAB does want to be notified two months before a lease is renewed.

Future Use Issue - Its Importance to the Remediation Committee

Willeke reminded the committee members that all future recommendations of the FCAB should be consistent with the original 1995 recommendations. For example, in the 1995 report, the FCAB recommended restoring the site to levels which will allow recreational activities. If the FCAB now makes a recommendation eliminating public access to the site, the board would have given a mixed message. Moreover, such a recommendation would change the goal of remediation. (Currently, remediation levels need to be suitable for public access.)

Sarno added that many community members have misconceptions about how safe the site will be after remediation. Next year, the Stewardship Committee will try to help eliminate these misconceptions, by focusing on public outreach.

SSAB Transportation Working Group

Fawn Thompson and Sarno attended the first meeting of the SSAB Transportation Working Group, which was held in conjunction with Transportation External Coordination Working Group (TEC/WG) meeting, on July 15, 1999, in Philadelphia, Pennsylvania. Representatives were present from eight SSABs, including Fernald, Hanford, Nevada Test Site, Northern New Mexico, Oak Ridge, Pantex, Sandia, and Savannah River. The participants agreed to a draft mission. The SSAB Transporation Working Group will work to share information and ideas amoung interested SSABs. The activities of the SSAB Transportation Working Group may include:

1. Track site-specific endorsements and DOE's response to statements made at the Transportation Workshop to ensure that all sites are aware of the endorsements, the status and nature of responses.
2. Provide a resource for inter-SSAB discussion and dissemination of information on complex-wide transportation issues.
3. Provide a communication link for complex-wide transportation-related issues for which SSAB's believe stakeholder involvement is important.
4. Participate in the TEC/WG and develop an ongoing SSAB communication link with DOE's National Transportation Program. Provide regular feedback about these activities to individual SSABs.

Approval of the Transportation Working Group draft mission will be placed on the agenda for the September FCAB meeting.

Meeting Summary

FERNALD CITIZENS ADVISORY BOARD

FERNALD CITIZENS ADVISORY BOARD

Summary of the Oak Ridge Reservation's Stakeholder Report on Stewardship July 1998

This report describes the need for and the basic elements of a stewardship program, its application to contaminated areas on the Department of Energy (DOE) Oak Ridge Reservation (the Reservation), and the roles and responsibilities of stakeholders. At the time of this report, this stewardship program applies to the DOE Oak Ridge Operation's Environmental Management Program. However, it is hoped that other DOE programs and facilities will recognize its value and apply the concepts of stewardship to their activities.

What is Stewardship?

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

> *"Acceptance of 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."*

This report applies stewardship to environmental remediation of contaminated areas on the Oak Ridge Reservation.

Reasons for Stewardship

Many DOE facilities have radioactive and chemically toxic contamination resulting from more than 50 years of nuclear research and weapons production. Some of the contaminants are persistent in the environment and are hazardous. Returning all contaminated areas to pristine conditions is often not feasible; it is risky for excavation and transportation workers; impractical for cost, technical, and logistical reasons; and does not always result in risk reduction.

Therefore, some DOE facilities, including Oak Ridge Reservation, will have some level of contamination after remediation. A stewardship program is essential for protection of the public and the environment from future risks associated with residual contamination.

Understanding Stewardship: Three Fundamental Attributes

Once remediation is implemented, stewardship becomes the means of ensuring long-term protection of human health and the environment. Successful stewardship programs must include three fundamental attributes:

- **Responsibility**
  Society must be willing to accept responsibility for providing a healthy and safe environment for current and future generations. The U.S. President and Congress through stakeholders and local government must take responsibility for stewardship.

- **Long-term effectiveness**
  Programs must be designed to protect human health and the environment for the lifetime of the contaminants, even when the contamination is expected to be hazardous for thousands of years. Programs must employ redundant sytems and controls, and appropriate contingency plans. There must be stable funding and a legal basis for long-term stewardship.

- **Adaptability**
  Advances in technology, changes in contaminant and environmental conditions, and demographics will necessitate periodic evaluation and refinement of stewardship activities. Stewardship programs must be flexible enough to accommodate such adjustments.

Understanding Stewardship: Seven Elements of Stewardship

There are seven basic elements of an effective stewardship program:

1. Authority and Funding

Reliable long-term funding is critical to the success of stewardship because competent sustainable stewardship is impossible without financial support. Options for long-term funding, and possible difficulties with these options, are described below.

Designated Agency: The U.S. Congress could designate a government agency or public-private partnership that would be funded by Congress to conduct stewardship activities throughout the country. This would not guarantee a stable long-term budget.

Entitlement: The federal government could design funding necessary for stewardship as an entitlement similar to Social Security benefits. Although the level of funding would be more stable, entitlements can be abandoned.

Trust Fund: Typical federal trust funds receive money from a tax or fee source, such as Social Security taxes and gasoline taxes, and the money is dedicated to specific purposes, such as pensions and transportation needs, respectively. There is no obvious tax source for stewardship, but an initial set-aside of a fund drawing enough entitled income to support stewardship over the coming years is a possibility.

The Present System: The agency responsible for the contamination, DOE in this case, retains financial responsibility for funding the stewardship program. The present system has the advantage of continuity and legal responsibility for remediation.

2. Stewards

Stewards are individuals or groups responsible for stewardship activities and protection of human health and the environment. Stewards can be categorized into one of the following:

Principal Steward: A principal steward has legal responsibility for contaminated land and facilities including the financial obligation to ensure adequate funding for stewardship and to take corrective action if the stewardship program becomes ineffective.

Implementation Stewards: Implementation stewards are responsible for stewardship activities, such as contracting for remediation, monitoring, maintenance, and record keeping.

Oversight Stewards: Oversight stewards ensure that the goals and requirements of a stewardship program are met.

3. Operations

In this report, stewardship operations include activities needed to ensure the integrity of remediation, to protect human health and the environment, and to provide information and public education. The success of stewardship depends upon at least six elements, which are described below.

Monitoring: Monitoring is the regular sampling of all contaminated and potentially contaminated media to identify the possible failure of physical controls and to provide continuous understanding of the nature and extent of contamination.

Maintenance: Maintenance is the regular upkeep of remediation systems to ensure that all necessary activities occur.

Surveillance: Surveillance is the regular oversight of remediation and institutional systems to ensure that all necessary activities occur.

Enforcement: Enforcement is the legal implementation of the constraints required maintaining the protection of human health and the environment.

Inspection and Reevaluation: Inspection and Reevaluation consist of periodic review of existing systems and activities to ensure their continued need and/or effectiveness.

Public Participation: continuous involvement of the public to ensure citizen's concerns are addressed and relevant public information is provided.

4. Physical Controls

Physical controls are barriers to limit public access to contaminants and exposure to hazards. Two types of barriers are:

Barriers to entry: Examples of barriers to entry are fencing; natural barriers, such as trees and surface water; uncontaminated buffer zones; signs and markers; and guards.

Engineered barriers to exposure: Engineered barriers limit exposure to contaminated groundwater or surface water and sediments is limited by providing alternate water supplies, pumping and treating groundwater, and controlling erosion.

5. Institutional Controls

Institutional controls are legally binding provisions (such as local ordinances and state and federal laws) designed to control future uses of land or resources by limiting development and/or restricting public access to a site with residual contamination. Institutional controls can be divided into two types:

Governmental Controls: Governmental controls use the power vested in a national, state, or local government to impose restrictions on citizens or areas under its jurisdiction.

Proprietary Controls: Proprietary Controls allow property owners to control the use of or limit access to their properties.

6. Information Systems

Stewardship information provides present and future stakeholders with records of locations, amounts, and characteristics of residual contamination. The information must be accurate, durable, complete, and current.

7. Research

When remediation activities are completed, significant data gaps and uncertainties will remain about existing and long-term hazards. In the future, new data may provide better assessments of contamination, risks, appropriate remedial technologies, management of wastes, information for decision making, and stewardship requirements. A national research program aimed at these objectives should be maintained.

Stewardship and 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, the U.S. Environmental Protection Agency (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. The CERCLA requires a legally binding Federal Facility Agreement between agencies (i.e., DOE, EPA, and Tennessee Department of Environment and Conservation (TDEC)) to establish timetables, procedures, and documentation for cleanup of federal facilities on the National Priorities List. The Federal Facility Agreement governs site characterization, interim cleanup actions, and long-term cleanup activities.

Although statutory requirements for stewardship are currently lacking, stewardship planning must be an integral part of the CERCLA process whenever radioactive or chemically hazardous materials remain on the Oak Ridge Reservation or any DOE facility after remediation. Stakeholders can insist that CERCLA documents have stewardship sections that describe site-specific requirements for implementation of a stewardship program. In particular stewardship requirements should be included in the Feasibility Study, the Proposed Plan, the Record of

Decision, the Remedial Design Work Plan, the Remedial Action Work Plan, and the Remedial Action Report.

Summary of Key Recommendations for Stewardship on the Oak Ridge Reservation

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

Conclusions

The Stewardship Committee affirms that a highly visible and active stewardship program for the Oak Ridge Reservation is necessary for the continued protection of human health and the environment following remediation. Effective stewardship serves to cope constructively with any negative community image associated with contaminated environmental media resulting from Department of Energy missions.

The Stewardship Committee concludes that a stewardship program for the Oak Ridge Reservation, based on the elements summarized above, must be established now. A range of stewards should be recognized and coordinated to continue current stewardship duties and to prepare for future activities. A Citizens' Oversight Board for Stewardship should be developed soon and charged with ensuring that stewardship activities are implemented. This group would have broad influence but little explicit power. A volunteer citizen Stewardship Transition Team should be formed in 1998 to serve until a Citizens' Oversight Board can be established.

Only when a stewardship program is in place for the Oak Ridge Reservation, can EUWG members justify support of remediation plans that result in residual contamination on the Reservation.

FY2000 Defense Authorization Act Conference Report

Excerpted from the Congressional Record, August 5, 1999; page H7855.

ITEMS OF SPECIAL INTEREST

Long-term stewardship plan

The conferees direct the Secretary of Energy to provide to the Armed Services Committees of the Senate and House of Representatives, not later than October 1, 2000, a report on existing and anticipated long-term environmental stewardship responsibilities for those Department of Energy (DOE) sites or portions of sites for which environmental restoration, waste disposal, and facility stabilization is expected to be completed by the end of calendar year 2006. The report shall include a description of what sites, whole and geographically distinct locations, as well as specific disposal cells, contained contamination areas, and entombed contaminated facilities that cannot or are not anticipated to be cleaned up to standards allowing for unrestricted use. The report shall also identify the long-term stewardship responsibilities (for example, longer that 30 years) that would be required at each site, including soil and groundwater monitoring, record keeping, and containment structure maintenance. In those cases where the Department has a reasonably reliable estimate of annual or long-term costs for stewardship activities, such costs shall be provided. The Secretary shall attempt to provide sufficient information to ensure confidence in the Department's xxx commitment to carrying out these long-term stewardship responsibilities and to undertake the necessary management responsibilities, including cost, scope, and schedule.

The conferees recognize that in many cases residual contamination will be left after cleanup or will be contained through disposal, and that such residual contamination and wastes will require long-term stewardship to ensure that human health and the environment are protected.

August 2, 1999
Inside Energy
Page 7
"Fernald community seeks $2 million from DOE to develop economy"

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FERNALD COMMUNITY SEEKS $2 MILLION FROM DOE TO DEVELOP ECONOMY

To reduce the effect of downsizing on local communities surrounding the Fernald Environmental Technology Site, the Fernald Community Reuse Organization is asking to DOE create a $2 million "revolving loan fund" to encourage business development in the area.

If DOE agrees to provide the seed money for the fund, CRO plans to create a committee to form an economic development program.

The committee, comprising four CRO members, will develop policies, procedures and decisions for the proposed loan fund to help facilitate community transition and economic development opportunities, CRO Chairman David McWilliams said in an interview last week.

According to McWilliams, the fund would be used for grants to companies starting a business or to those wanting to expand their operations in or near the three Ohio towns of Crosby, Ross and Morgan, which border the Fernald site.

The department has helped fund similar efforts in other communites where DOE facilities have been shut down, including Oak Ridge, Tenn., and Miamisburg, Ohio, McWilliams said, although the funding mechanisms may have been different.

"We hope they will create jobs in the community and facilitate the transition of former Fernald employees being displaced by the closing down of the site," said McWilliams.

DOE expects to make a decision by October on whether to adopt the proposed loan fund program outlined in the CRO's community transition plan submitted to department headquarters for review in early July.

According to site contractor Fluor Daniel Fernald, environmental cleanup of Fernald is expected to be completed by 2006, although 2008 is the current DOE projected date for closure of the facility.

The CRO plan cites a study by the University of Cincinnati's Center for Economic Education which shows the site's closure will have a severe impact on the area's economy. "From 1997 to 2008, Fernald's total annual economic impact on the greater Cincinnati economy will decline by 81% — from $735 million in 1997 to $136 million in 2008," according to CRO's transition plan.

The plan also said from 1997 to 2008, Fernald's direct and indirect employment impact on the economy will decrease by 2,765 — from 4,394 in 1997 to 1,629 in 2008.

There is no money set aside in DOE's FY-99 budget to make the revolving loan fund a reality, McWilliams said. "But we plan to be part of the FY-2000 allocations. To make it practical, we are looking at and hoping to receive several million dollars," he added.

The CRO proposes that $2 million of DOE grant funds be used to establish and "capitalize the initial year of a revolving loan fund," the transition plan said.

"If we are fully funded, we are going to try to develop a community development committee. The loan fund is the one we feel will have the greatest impact to the area surrounding Fernald. We are very much committed to stakeholder participation," McWilliams said.

According to the CRO's community transition plan, the revolving nature of the proposed loan fund "would ensure that the CRO or its successors would have a source of program funds that could extend over an indefinite future period." In addition, fees and interest payments will serve as source for CRO operational support after DOE funds are no longer available, the plan said.

"We hope it will become self-perpetuating, will be able to continue to support" the local communities, McWilliams said. — *Shawn Terry*

August 2, 1999
Cincinnati Post
Page 10A
"Fernald stays on course"

Fernald stays on course

The U.S. House voted 420-8 the other day to approve a $20.2 billion annual appropriation for federal energy and water programs.

As the lopsided margin would suggest, there wasn't much debate over the bill, even though President Clinton made a half-hearted threat to veto it because of language the administration says would threaten wetlands. The vote merited just two paragraphs at the bottom of the Associated Press's story that day about congressional spending plans.

But this bill is quite important to Greater Cincinnati, for it includes a $280 million appropriation for continued cleanup work over the next year at the former uranium processing plant at Fernald.

To put that number in perspective, $280 million would be about enough to build the Reds their new stadium. It's nearly double what the region is spending to rebuild Fort Washington Way. It would cover almost half the estimated cost of the first leg of the proposed light rail system in the I-71 corridor. It would be an awfully good start on the proposed $400 million convention center expansion.

The Fernald cleanup project was launched in 1986; to date the federal government has spent about $2.5 billion on it. The price tag is estimated to hit $4.9 billion by the time the project is finished in 2006.

The real significance of the $280 million Fernald earmark in the energy and water appropriations bill is that Congress is willing to keep the cleanup project on a fast track. (The project is getting about $274 million this year.)

As noted by Rep. Rob Portman, the Terrace Park Republican whose district takes in Fernald, the original plan anticipated the cleanup would take until 2020.

In point of fact, while there have been some big snafus and cost overruns, the Fernald job is coming along reasonably well. Fifty-nine of the 200 buildings have been torn down. One-fifth of the nearly 10 million pounds of processed uranium on site has been shipped to the Portsmouth Gaseous Diffusion Plant. Waste is being sent daily by train and truck to storage sites in Utah and Nevada.

The first two cells for the on-site disposal facility at Fernald are done, and already hold about 225,000 cubic yards of contaminated soil and debris. That's roughly 10 ten percent of the expected total. The decontamination of the aquifer beneath the plant site is running well ahead of schedule.

The thorniest problem remains the three underground silos, two of which contain the mostly highly radioactive wastes on the site. In the wake of the failure of an experimental process to encase the silo wastes in liquified glass, the Department of Energy hired a new contractor and is trying to come up with a new strategy.

The energy and water bill is now headed for a House-Senate conference committee. It's one of 13 appropriations bills that Congress must send to President Clinton before Oct. 1.

For the sake of the region, here's hoping the two chambers work out their differences with each other, and with the White House, and keep the Fernald cleanup on its accelerated pace.

August 2, 1999
Journal-News
Page B10
"Report: Privatized uranium operation faces investigation"

2450

Report: Privatized uranium operation faces investigation

The Associated Press

COLUMBUS

STATE

A congressional committee may soon hold hearings on whether privatizing the government's uranium-enrichment operation would endanger national security and cheat taxpayers, a newspaper reported.

The committee is investigating the allegations as it scrutinizes a $1.9 billion deal that privatized the United States Enrichment Corp., The Columbus Dispatch said in story published Sunday.

Proponents had said the July 1998 decision to privatize USEC would result in a good financial return for taxpayers.

They said the operation would run more efficiently as a private corporation, and would continue a historic "swords to plowshares" accord by which the United States agreed to pay Russia $8 billion over 20 years for 500 tons of uranium pulled from nuclear warheads.

That material, weapons-grade uranium that the Russians would dilute to become enriched uranium, is shipped to USEC's plants in Piketon and Paducah, Ky. for sale as fuel for nuclear power plants.

The House Commerce Committee chairman may soon initiate congressional hearings, based in part on previously confidential documents that showed some members of the board that set up the private corporation had serious misgivings about that decision, the newspaper said.

"Based on the committee's preliminary review of documents provided by the Treasury Department, I have concerns about whether our national security was compromised and the long-term viability of uranium production jeopardized as a result of USEC privatization," Rep. Tom Bliley, R-Va., told the Dispatch in a statement.

"The committee will continue to look into the significant, unresolved issues regarding USEC privatization," Bliley added.

Critics contend that a government corporation would not concern itself with profit when charged with carrying out a national security initiative, but that profit is paramount for a company with shareholders.

USEC spokesman Charles Yulish said privatization brings with it the advantages of the business world over a government operation — more flexible contracts, streamlined procurements, more competitive operation and business-minded people.

"You've got more opportunities, less bureaucracy," Yulish said. "You have faster decisions based on business considerations, not political considerations."

However, privatization also cost 600 workers their jobs as USEC tried to streamline the former government plants, the Dispatch said.

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August 3, 1999
Cincinnati Enquirer
Page B1
"DOE to spread Fernald technology"

DOE to spread Fernald technology

Tour of facility will show progress

BY RACHEL MELCER
The Cincinnati Enquirer

CROSBY TOWNSHIP — With each passing day, the former Fernald uranium processing plant is getting more of what other Department of Energy (DOE) sites want: clean soil and water.

So officials from DOE headquarters in Washington, D.C., and about 40 others are touring Fernald today to see what scientists there have learned.

They will carry the lessons and new technology to spots across the nation where there is contaminated water that cannot be consumed and fields where it is not safe for adults to walk or children to play.

There are about 5,700 separate instances of soil or ground-water contamination across the DOE complex, covering more than 200 million cubic meters of soil plus enough ground water to fill a 90-square-mile lake 30 feet deep, according to the DOE Subsurface Contaminants Focus Area.

Gerald Boyd, DOE acting deputy assistant secretary for science and technology, and other visitors are studying systems developed and tested at Fernald to clean the Great Miami Aquifer and check for radioactive "hot spots" on the ground.

Mr. Boyd will see how millions of tax dollars are spent at Fernald.

Community activists are pleased to see expensive technology being spread around for a change, so that each of about a dozen DOE cleanup sites is not forced to reinvent the wheel when faced individually with similar problems.

"We need to be doing this more often. It saves time, energy and money," said Lisa Crawford, founder of Fernald Residents for Environmental Safety and Health. "Instead of everybody working in a vacuum, it's great that they're working together."

Ms. Crawford and her family are among those who lived near the site and, for years, drank water later proven to be contaminated by leaching radioactive waste.

While a waterline installed in 1997 now brings clean Cincinnati water to area homes, more than 135 acres of the Great Miami Aquifer was damaged and local wells still cannot be used. "We should not forget that," Ms. Crawford said.

Last fall, Fernald began testing a series of reinjection wells that use clean water to help push contaminated water into a treatment facility.

The tour group will view the system that could shave 12 years off the aquifer cleanup that was originally expected to take 27 years. The eventual cost savings to the Fernald cleanup could be more than $50 million, said David Brectschneider, project manager for site management company Fluor Daniel Fernald.

August 6, 1999
Cincinnati Enquirer
Page D1
"Fernald cleanup contract up for bid"

2450

Fernald cleanup contract up for bid

BY RACHEL MELCER
The Cincinnati Enquirer

CROSBY TOWNSHIP — A billion-dollar government contract for management of the former Fernald uranium processing plant cleanup is unexpectedly up for grabs.

Fluor Daniel Environmental Management Corp., at the helm during the best and worst times of the last seven years, found out Thursday it will have to compete to finish the job.

The multifaceted, highly technical cleanup of radioactive and hazardous waste spread throughout the 1,050-acre site is expected to take between six and eight more years to complete. The site management contract in fiscal year 1999 alone is worth $270 million.

"We were hopeful that the department was going to choose to negotiate a closure contract with us. We're disappointed," said John Bradburne, president and CEO of Fluor Daniel Fernald.

But the decision to open the process to bids, announced Thursday by Energy Secretary Bill Richardson, could be good news for taxpayers.

"The value of the competition is that it makes everyone sharpen their pencil," said Ken Morgan, Department of Energy (DOE) Ohio field office spokesman. "DOE is definitely more inclined to compete projects because it saves taxpayers' money."

The parameters of the closure contract will be determined over the next few weeks, Mr. Morgan said. But it will likely seek contractors who can promise to clean up and close down the site in the shortest reasonable period of time.

Some observers say that time crunch could lead to corners being cut — a dangerous practice when dealing with the health and safety of approximately 2,000 site workers plus the surrounding community.

During the production years from 1951 through 1989, and through the cleanup that began in 1991, Fernald leaked uranium into the Great Miami Aquifer and its drinking wells, and spread cancer-causing radon gas into the atmosphere. Former workers and area residents say they were sickened by exposure to its many radioactive and chemical toxins, although the government has admitted no such liability.

Fluor Daniel won a five-year initial cleanup contract in 1992, worth $2.04 billion. It was first extended with a two-year option that runs through December, and then a final one-year option that expires in December 2000.

DOE officials say it will take up to 18 months to award the final closure contract.

Fluor Daniel Fernald oversaw a problematic first attempt to empty the highly dangerous waste contained in two crumbling silos, a project that ended in a pilot plant failure, budget overruns and sanctions from the DOE. Critics have said that failure was caused by an attempt to rush the job.

DOE officials say their decision to accept bids on the closure contract is not punitive.

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August 6, 1999
The Beacon Journal (Akron OH)
"Government to ask new round of bids"

Government to ask new round of bids

CINCINNATI (AP) -- The Department of Energy has decided to reopen bidding for the remaining cleanup work at the former Fernald uranium processing plant in southwest Ohio.

Fluor Daniel Environmental Management Corp., which has managed the cleanup for the past seven years, was told Thursday it will have to compete to finish the job.

The multifaceted, highly technical cleanup of radioactive and hazardous waste throughout the 1,050-acre site is expected to take between six and eight more years. The site management contract in fiscal year 1999 alone is worth $270 million.

``We were hopeful that the department was going to choose to negotiate a closure contract with us. We're disappointed," said John Bradburne, president and CEO of Fluor Daniel Fernald.

Energy Secretary Bill Richardson announced the new round of bidding. He said the government's goal is to complete the cleanup by the end of 2006.

``The value of the competition is that it makes everyone sharpen their pencil," said Ken Morgan, the department's Ohio field office spokesman. ``DOE is definitely more inclined to compete projects because it saves taxpayers' money."

Between 1951 and 1989, uranium was processed on the site for use in government weapons plants elsewhere. Former workers and area residents say they were sickened by exposure to radioactive and chemical toxins, although the government has admitted no liability.

Fluor Daniel won a five-year initial cleanup contract in 1992, worth $2.04 billion. It was first extended with a two-year option that runs through December, and then a final one-year option that expires in December 2000.

DOE officials say it will take up to 18 months to award the final closure contract.

2450

DOE PLANS TO HOLD CONTEST FOR NEW MANAGEMENT CONTRACT AT FERNALD

An announcement by DOE last week that it will entertain bids for a new operations contract at the Fernald Environmental Management Project surprised and disappointed Fluor Daniel Fernald, the company responsible for cleaning up the former nuclear-weapons facility for the last eight years.

On Thursday, Energy Secretary Bill Richardson disclosed that DOE plans to solicit bids on a new contract at Fernald. "We believe that competitive bidding challenges the incumbent contractor and other bidders to bring forth their best ideas for innovation and efficiencies critical to achieving the goal of accelerated closure of the Fernald Site by the end of 2006," Richardson said in a statement.

"We were surprised and we are disappointed by the announcement," an FDF spokesman said. "We think we've made great strides in bringing the cleanup to completion by 2006. We have made tremendous progress. We've really gotten tremendous support not only from DOE customers at Fernald but from labor groups, neighbors and regulators who are pleased with what we've done. I can't see [DOE's decision] it as a matter of not performing up to expectations. It's a bit puzzling with everything that's been done, that there was a decision to compete."

While FDF has indicated in the past that it was interested in continuing to manage Fernald, the company was unable to say last week whether it will respond to the DOE solicitation when it is issued, the spokesman said. "There's nothing we'd like better than to be here in 2006," he added.

DOE's statement said the FDF contract team has "performed well" and the department expects the company will bid on the new contract. FDF's team also includes Jacobs Engineering Group and Nuclear Fuel Services.

A spokesman for DOE's Ohio Field Office, which oversees environmental management activities at Fernald, said the department may issue a request for proposals by September. "I think that it will be soon, in a matter of weeks, not a matter of months," he said.

Contract competitions are the norm at DOE facilities now. "The [Fernald decision] is not be intended to show any displeasure with Fluor," the spokesman said. "It's a matter of best procurement practices for the taxpayer ... ."

Nevertheless, the Fernald decision followed by about a week an announcement by DOE that it will negotiate a new contract with Kaiser-Hill Co., its management contractor at the Rocky Flats Environmental Technology Site in Colorado. The department cited the complexity of the Rocky Flats cleanup, whose contaminants include plutonium, as one reason for keeping Kaiser-Hill on the job (*IE/FL*, 2 Aug, 6).

DOE awarded FDF a five-year contract in 1992 and extended it by three years in 1997. That contract expires Nov. 30, 2000. FDH is responsible for managing environmental cleanups, supervising engineering design efforts in support of restoration as well as processing and treating existing waste and materials produced from past operations there.

Lisa Crawford, president of Fernald Residents for Environmental Safety & Health, and members of the site's Citizen Advisory Board members met with Assistant Secretary for Environmental Management Carolyn Huntoon in Ohio Thursday to voice their concerns over DOE's decision to put the new contract up for bids. "We are appalled with this decision. No one called us for our input," Crawford said in an interview. "DOE is back to the decide-announce-defend mode."

"We have a ton of milestones that must be met," Crawford said. "We want to know are they going to meet them? The 2006 accelerated cleanup plan is working well and we are beginning to see the light at the end of the tunnel. How can this be cost-effective? Show us the numbers."

"How can this be competitive?" Crawford continued. "The data is out there. How hard is it going to be for these potential companies who want to bid on the contract to get the information. I don't see it as being a fair competition."

Fernald is a 1,050-acre former uranium metals production facility near Cincinnati. The facility operated for 37 years and produced until mid-1989 high-purity uranium metal products to support U.S. defense programs. — *Shawn Terry*

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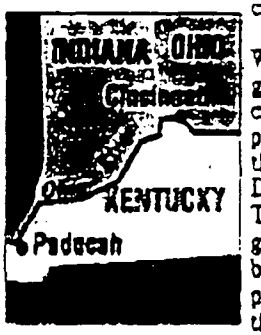
August 11, 1999
Cincinnati Enquirer
Page A14 Editorial
"Compensate workers if they were misled"

PADUCAH: Exposed to plutonium

Compensate workers if they were misled

A whistleblower lawsuit has charged that thousands of unsuspecting workers at a Cold War uranium enrichment plant in Paducah, Ky. were exposed to plutonium-laced dust and other highly radioactive materials for decades.



The suit filed in June remains under federal court seal, until the Department of Justice decides if it will launch a criminal investigation or join in suing the plant's former operators. But a *Washington Post* report has already persuaded Department of Energy Secretary Bill Richardson to order a probe to see if workers were exposed to lethal plutonium without being told. A millionth of an ounce ingested can cause cancer.

Veteran workers at the Paducah plant, 315 miles downriver from Cincinnati, tell stories of daily dust exposure similar to those at the Fernald uranium processing plant in northwest Hamilton County. Like Fernald workers, Paducah's report clusters of cancers in high numbers. The Paducah plant is still in production, employing about 1,600. Fernald ended production in 1989, and is undergoing cleanup. In 1995, Fernald workers won a $15 million class-action settlement after suing former plant contractor National Lead of Ohio.

Mr. Richardson just last month sent a $13 million-a-year proposal to Congress to compensate weapons plant workers diagnosed with chronic disease from exposure to toxic beryllium dust. He pledged to push for federal compensation for a wide range of other nuclear plant-related illnesses — including radiation-induced cancers.

If the Paducah charges prove true, the federal government and former plant operators owe compensation to those veteran workers and their families, for work-related illnesses. The government should right the wrongs without weaseling or "putting victims on trial." If independent experts establish which diseases can be expected from plutonium exposures, the benefit of the doubt should be given to workers rather than trying to shift blame to smoking or other causes.

To his credit, Mr. Richardson told the *Washington Post*: "I have long maintained that we must correct the sins of the past by compensating workers who have been medically damaged. I don't want this to be known as the Department of Excuses."

This region was a Cold War weapons plant triangle, with Fernald, Paducah, the gaseous diffusion plant near Portsmouth, the Mound plant near Dayton and Oak Ridge in Tennessee. We have grown all too familiar with belated disclosures that plant workers, starting in the early 1950s, were not fully informed of health risks nor instructed to take adequate precautions.

Workers in any industry have a right to know what materials they are exposed to, and any employer owes it to workers to equip them with the best protections known at the time. U.S. security secrets and our Cold War mission are no excuse. Nuclear workers trusted the government, and again at Paducah, they may have been betrayed.

Like Fernald, operations at Paducah also ravaged the environment: Contamination extends beyond the plant, including private wells. A plume of contaminated underground water is moving toward the Ohio River. Plutonium in recent years was found in deer killed near the plant. Cleanup of the entire complex is estimated to cost $240 billion and would take 75 years. Add Paducah to the long list of sites where it is far from clear that we can afford total cleanup.

But the worst injustice may be that plant operators at Paducah covered up high levels of plutonium and never told workers. The plant was never designed to handle highly radioactive materials. Two of the plant's health physicists and a veteran worker whose esophagus had to be removed charge in the lawsuit that they tried to call attention to the radiation danger, but were stone-walled by managers.

DOE and Justice officials need to determine if workers were exposed to plutonium and not told about it. If so, those exposed deserve compensation and medical treatment, much like military veterans, for service to the nation.

The Washington Post
2450
Sunday, August 8, 1999

Hazardous Workplace: *In this night exposure, emissions, mostly steam, rise from the Paducah Gaseous Diffusion Plant in western Kentucky, where for years workers were unwittingly exposed to plutonium and other highly radioactive metals.*

PHOTOS BY MICHAEL WILLIAMSON—THE WASHINGTON POST

In Harm's Way, And in the Dark

Workers Exposed to Plutonium at U.S. Plant

By Joby Warrick
Washington Post Staff Writer

PADUCAH, Ky.

Thousands of uranium workers were unwittingly exposed to plutonium and other highly radioactive metals here at a federally owned plant where contamination spread through work areas, locker rooms and even cafeterias, a Washington Post investigation has found.

Unsuspecting workers inhaled plutonium-laced dust brought into the plant for 23 years as part of a flawed government experiment to recycle used nuclear reactor fuel at the Paducah Gaseous Diffusion Plant, according to a review of court documents, plant records, and interviews with current and former workers. The government and its contractors did not inform workers about the hazards for decades, even as employees in the 1980s began to notice a string of cancers.

Radioactive contaminants from the plant spilled into ditches and eventually seeped into creeks, a state-owned wildlife area and private wells, documents show. Plant workers contend in sealed court documents that radioactive waste also was deliberately dumped into nearby fields, abandoned buildings and a landfill not licensed for hazardous waste.

The sprawling Kentucky plant on the Ohio River represents an unpublished chapter in the still-unfolding story of radioactive contamination and concealment in the chain of factories across the country that produced America's Cold War nuclear arsenal. Opened in 1952 in an impoverished region, the 750-acre plant built a fiercely loyal work force of more than 1,800 men and women who labored in hot, stadium-sized buildings turning trainloads of dusty uranium powder into material for bombs.

Today, the Department of Energy contends that worker exposure was minimal and that contamination is being cleaned up. A lawsuit filed under seal in June by three current plant employees alleges that radiation exposure was a problem at Paducah well into the 1990s.

The Post's investigation shows that contractors buried the facts about the plutonium contamination, which occurred from the mid-1950s to the mid-1970s, in reports filed in archives. Plutonium, a core ingredient in nuclear bombs, is a highly radioactive metal that can cause cancer if ingested in quantities as small as a millionth of an ounce. The Paducah

See PADUCAH, A14, Col. 2

Not Forgotten: *Clara Harding's husband, Joe, died of cancer he believed was caused by radiation.*

"Everything was so safe, so riskless. Today we know the truth about those promises. I can feel it in my body."

— **Joe Harding**, in an interview just before his death

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Legacies of Contamination

2450

PADUCAH, *From A1*

plant was designed to handle only uranium, a mildly radioactive metal.

"The community to this day has no idea of the kinds of contaminants they were exposed to," said James W. Owens, a Paducah lawyer representing residents whose water has been polluted by the plant.

Health consequences remain unclear. No comprehensive study of worker medical histories has been attempted at Paducah. In neighborhoods where older workers live, stories abound of cancer clusters and unusual illnesses. One 20-year veteran worker who died in 1980 compiled a list of 50 employees he worked with who had died of cancer.

"Everything was so safe, so riskless," the worker, Joe Harding, said in an interview just before his death. "Today we know the truth about those promises. I can feel it in my body."

Even though the plant's procedures and purpose have changed—Paducah's enriched uranium is now used in commercial nuclear power plants—problems have continued. Workers weave between makeshift fences that cordon off hundreds of radioactive "hot spots" scattered across the complex. In one corner of the plant, mildly radioactive runoff trickles from a nearly half-mile-long mound of rusting barrels that still contain traces of uranium.

"The situation is as close to a complete lack of health physics as I have observed outside of the former Soviet Union," Thomas Cochran, nuclear program director for the Natural Resources Defense Council, said in documents filed in the lawsuit.

The Department of Energy, which owns the plant, said it could not comment on allegations made in the suit because of the court-ordered seal. The agency is investigating the charges and dispatched a team to Paducah to determine if conditions posed an immediate threat to workers or the public.

Energy Secretary Bill Richardson said the agency's national security goals had "sent many of our workers into harm's way," but he said the agency must now live up to its responsibility to "right the wrongs of the past." Two weeks ago, Richardson pledged millions of dollars for medical monitoring of nuclear workers who were exposed to beryllium, a highly toxic metal.

"The Department of Energy will continue to take any actions that are necessary to ensure the protection of public health, the workers and the environment," he said.

Still, agency officials, in a written response to questions from The Post, strongly defended past safety practices at Paducah and said no workers are at risk today.

"The plant's monitoring data did not indicate an accumulation of [plutonium and other highly radioactive wastes] in the workplace or the environment that would be a health concern to workers or to the public," the DOE said.

That position is vigorously contested in more than 2,000 pages of documents filed in the lawsuit by two of the plant's health physicists, or radiation safety experts, and a veteran worker who had his esophagus removed after three decades of work inside contaminated buildings. Copies of the documents were obtained by The Post from government sources.

"The management line for years has been there was an insignificant amount" of plutonium at Paducah, said Mark Griffon, a health physicist at the University of Massachusetts at Lowell who is participating in a federal study of radiation conditions at nuclear weapons plants, including Paducah. Griffon reviewed plant documents provided by The Post.

"If the levels were this significant," he said, "it raises an important question: Why weren't workers ever monitored?"

The two health physicists suing the plant say in court documents they tried to call attention to the radiation problems but were confronted by a culture of unconcern.

"I was told by my superior . . . in so many words that 'this is Paducah—it doesn't matter here,' " said one of the physicists, Ronald Fowler, 50, who came to the plant in 1991.

The suit was brought under a law that allows employees to collect payment for exposing fraud against the government. It was filed under seal to give Justice Department officials an opportunity to decide whether to join the suit or begin a criminal investigation.

The suit names Lockheed Martin and Martin Marietta, which managed the uranium enrichment plant during the 1980s and 1990s. It does not name the original manager, Union Carbide, which ran the facility for a 32-year period during which the bulk of the contamination occurred. None of the companies had been served with the suit and would comment on the allegations.

The current plant operator, U.S. Enrichment Corp., a government-chartered private company that assumed management this year, concedes past problems but says safeguards are now in place. USEC, which sold shares to the public last year, says it has fully disclosed the plant's environmental problems to regulators, workers and stockholders.

"It was acknowledged by all sides that contaminated conditions existed, . . . but USEC wasn't responsible for them," said Jim Miller, USEC executive vice president.

Paducah is the latest DOE facility to be rocked by lawsuits and revelations of contamination. Cleaning up the complex is expected to cost $240 billion and take at least 75 years.

Measured by the gram, the contamination at Paducah isn't nearly as extreme as that in plutonium production plants such as Washington state's Hanford Nuclear Reservation, where vast swaths of land have been sealed off from humans. But unlike the workers at those plants, employees at Paducah did not know of the risks in the uranium dust they breathed every day.

Worker exposure to such dust has cost the government in the past. The Energy Department paid a $15 million settlement five years ago to former workers who had breathed uranium dust at the Fernald Feed Materials Production Center near Cincinnati.

The difference between the dust at Fernald and that at Paducah comes down to one word: plutonium.

For 2 Decades, Freight Cars Brought Unknown Danger

The Paducah complex was the second of three U.S. government plants designed after World War II to create enriched uranium. The plants were operated for the government by private contractors who over time were paid bonuses for running safe, efficient facilities.

In the beginning, uranium ore was scarce. The Atomic Energy Commission, forerunner of today's Energy Department, tried to fill the gap by "recycling" leftover uranium—from nuclear reactors that made plutonium for bombs—through the enrichment process at Paducah.

From 1953 to 1976, more than 103,000 metric tons of used uranium was shipped to Paducah, records show. It arrived in freight cars as a fine black powder. Unknown to workers, the powder contained dangerous substances left over from the plutonium-making process—fission byproducts such as technetium-99 and heavy metals known as "transuranics": neptunium and plutonium.

"Plutonium is roughly 100,000 times more radioactive per gram than uranium," said Arjun Makhijani, president of the Institute for Energy and Environmental Research.

Over time, through spills and waste discharges, the contaminants accumulated in the miles of pipes used to gasify and enrich uranium, around loading docks and in ditches, documents show.

Plant officials were aware of the plutonium and other contaminants as early as the mid-1950s—it made their recycled uranium less efficient. But they believed the amounts were too small to pose a health threat.

Today, the DOE is able to rely only on a contractor's estimate of the total amount of contaminants introduced in that period: 12 ounces of plutonium, 40 pounds of neptunium and 1,320 pounds of technetium-99.

The government today takes the same position as it did in the 1950s: The amounts were most likely not enough to harm workers. "The general protection provided to workers from the hazardous effects of uranium would have provided adequate protection" from the contaminants, the DOE statement said.

But documents obtained by The Post show that plant officials became increasingly concerned about the contaminants. A 1992 report by Martin Marietta concluded that they caused "significant" environmental problems and "also pose a radiation hazard to the workforce." A 1988 study done for the DOE by a private contractor said the plutonium could "represent a significant internal dose concern even at very low mass concentrations."

Plant records draw an instructive comparison that underlines the hazards posed by plutonium: The 12 ounces of plutonium in the black powder delivered more than twice as much radiation into the environment as the 61,000 pounds of uranium that flowed out of the plant in waste water into the Ohio River between 1952 and 1987.

Bosses Took Threat With a Grain of Salt

In the noisy, cavernous buildings where uranium was processed, workers did not receive the warnings. The conditions there were "extremely dusty . . . sometimes to the point where it was very difficult to see or breathe," said Garland "Bud" Jenkins, 56, a 31-year-veteran uranium worker and one of the three employees involved in the lawsuit against Lockheed Martin.

To protect their skin from the uranium dust, workers wore cotton coveralls and gloves. But respiratory protection was optional—old Army gas masks, which fit poorly and were seldom used, former and current workers said.

At lunchtime, workers brushed black powder or green uranium dust off their food. "They told us you could eat this stuff and it wouldn't hurt you," said Al Puckett, a retired union shop steward. To dramatize the point, he said, some supervisors "salted" their bread with green uranium dust.

The workers took the dust home at shift's end.

"We frequently discovered that our bed linens would be green or black in the morning, from dust that apparently absorbed into our skin," Jenkins said.

Exposure to uranium dust decreased after the late 1970s, when the plant stopped receiving the black powder and began processing a

See PADUCAH, *A15, Col. 1*

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Workers Were in Dark on Plant's Danger

2450

PADUCAH, *From A14*

more refined form of uranium. In 1989, the DOE adopted more stringent worker safety rules.

By then the plutonium had permeated the land around the plant. In the 1960s and 1970s, when the powder spilled, workers would shovel it up and wash the remnants into the nearest ditch, Jenkins said. More than a dozen ditches flow directly from the plant onto state property and private lands.

There are no nationwide limits for plutonium in soil; cleanup standards depend on modeling the degree of public access to the contaminated spot. But the DOE has set cleanup limits at nuclear blast sites in the South Pacific of 15 picocuries of plutonium per gram of soil.

Contractors measured plutonium at levels up to 47 picocuries in ditches outside the plant and 500 picocuries on plant grounds.

Those measurements were made after the first evidence of environmental problems outside the plant surfaced in 1988, when a county health inspector found technetium and chemical carcinogens from the plant in a farmer's well. The discovery of the poisoned wells prompted a multimillion-dollar ground-water cleanup under the Environmental Protection Agency's oversight.

Although plant managers posted creeks and ditches with warning signs in the early 1990s, the signs do not refer to plutonium or any other radioactive contaminants. Some warn of possible contamination with cancer-causing chemicals; others merely caution against eating local fish.

Lawsuit Alleges Deliberate Dumping

In addition to the substances that flowed or spilled out of the plant through the drainage ditches, the employees contend in their lawsuit that a wide variety of contaminated substances were deliberately dumped into the environment. Spilled black powder and empty radioactive waste containers allegedly were placed in dumpsters and trucked to a sanitary landfill on DOE property licensed only for trash and garbage. Rubble from demolished buildings and contaminated railroad ties allegedly were dumped in nearby woods and fields. Slag from uranium smelters was put in abandoned concrete bunkers in a state wildlife area outside the plant, according to the lawsuit.

"There was only one dumpster for all waste, whether radioactive, hazardous, toxic or ordinary," Jenkins said.

Plant records describe at least two dozen unlicensed radioactive debris piles on state lands outside the plant. Last year, ground-water tests turned up technetium directly beneath the sanitary landfill.

A 1990 DOE audit of Paducah found inadequate controls over waste disposal and a faulty system for tracking contamination that forced managers to rely on "word of mouth."

Charles Deuschle, 56, a health physics technician and the third employee in the lawsuit, said he was "shocked" when his surveys discovered radioactive contamination in such places as the plant's cafeteria.

"I saw conditions that would never have been tolerated in any other nuclear location where I have worked," Deuschle, who came to Paducah in 1992, said in court documents.

Internal plant surveys included in the suit found high levels of radiation on street surfaces, manhole covers and loading docks and in locker rooms as recently as 1996.

The plant's current managers maintain that all significantly contaminated areas have been addressed. "Hot" surfaces have been coated with absorbent paint, and warning signs have been posted, they said. Rope fences keep passersby away from radioactive equipment rusting in the open. Drain pipes and fire hydrants are coated with warning paint. Two dilapidated buildings where the black powder was once processed are padlocked. In 1997, regulatory oversight of the plant was transferred to the Nuclear Regulatory Commission, which declined to comment on allegations in the sealed lawsuit.

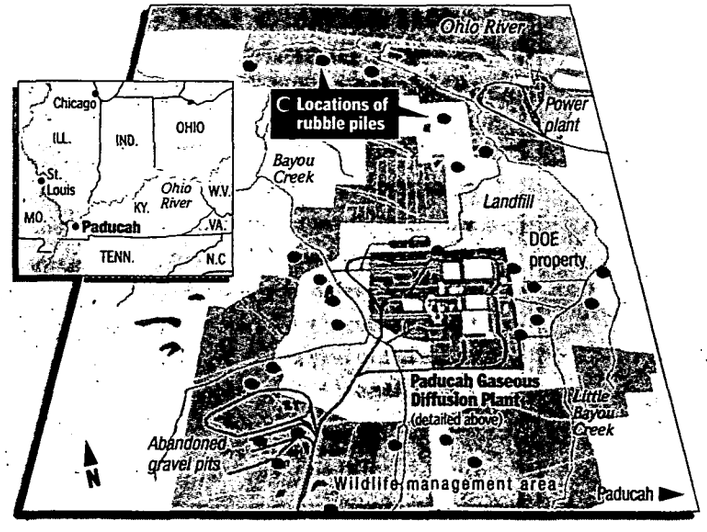
Even the employees involved in the suit concede that safeguards have improved recently. But they insist that problems remain. This spring, elevated radioactivity was found in a parking area near the administration building, plant documents show.

Soil collected from a ditch outside the plant's fence by The Post in June and analyzed at a commercial lab contained 2.6 picocuries of plutonium, slightly higher than the NRC's suggested guideline for cleaning up nuclear sites.

The Post, using two hand-held detectors, also found sharply elevated radiation levels in the debris piles on the state wildlife lands. One such area was an unmarked pile of rotting railroad timbers near fishing ponds and campgrounds.

Spreading Toxins

Radioactively contaminated slag and rubble from demolished buildings was dumped outdoors in more than two dozen places around the plant. For decades, waste water containing uranium, plutonium and cancer-causing chemicals was discharged into ditches and creeks that flow into the Ohio River, three miles away.



Public Reports Tell Only Part of the Story

Environmentalists, plant workers and neighbors claim that plant officials play down the hazards.

"They cloak it in jargon," said Mark Donham, a member of a citizens advisory board that meets monthly with plant cleanup officials. "You have to order the documents and then spend hours and hours looking at them to learn anything."

DOE officials say the facts and figures about the plutonium contamination inside the plant have been duly recorded since 1991 in thick inspection reports. But these are kept in archives rarely visited by the public.

In the annual environmental reports that circulate to the public, the contamination is described as "trace" amounts of "radionuclides," a catchall term that can include mildly radioactive uranium as well as highly radioactive plutonium.

A 1991 "site investigation" report, done by the plant's contractor and stored in the archives, shows much higher levels of plutonium than the annual environmental reports. The DOE said the reports use different methods and measure different things.

The result has been that the DOE can claim full disclosure about the contamination while plant workers and neighbors remain in the dark, said Owens, the attorney for the plant's neighbors.

"The company has engaged in a cynical disinformation campaign that centered on downplaying risks and presenting confusing and misleading information," he said.

Inside the plant, the first disclosure of plutonium to workers came around 1990 after managers summoned top union leaders to discuss the results of tests ordered after the state found the poisoned wells.

"They took it seriously," a union official, speaking on the condition of anonymity, said of Martin Marietta's presentation. But "the health effects weren't viewed as serious. We just vehemently stressed that the contamination should be cleaned up."

Plant managers insist that workers today are fully aware of the potential hazards. USEC cites worker training programs that it says include a briefing on plutonium and other radioactive hazards at the plant.

But officials with the union's Washington office contend workers still don't know a fraction of what they were exposed to. "What we're seeing now," said Daniel Guttman, former staff director of the federal Advisory Committee on Human Radiation Experiments, "is the outcropping of the glacier."

Deficient Monitoring Compounded the Risk

The health effects for Paducah workers remain an open question.

The DOE said 442 Paducah workers were tested in 1997 and only 8 percent displayed measurable amounts of radiation. It said screening tests since 1992 have found no evidence of plutonium exposure in workers.

But the greatest exposure to workers would have occurred before the enhanced monitoring that began in the late 1980s.

In 1990, the DOE audited safety practices at Paducah and found scores of deficiencies in radiation monitoring and worker protection. The audit team said Paducah failed to properly monitor radiation to workers' internal organs—even though plant managers had been repeatedly warned to do so.

Radiation-measuring equipment was either missing or not properly calibrated, the report said, and workers weren't being tested for the kinds of radiation known to exist at Paducah. Whether the plant's equipment and personnel were even capable of detecting exposure to plutonium and other transuranics was "questionable," the audit said.

Bolstering claims by workers that they had been left in the dark about radioactive hazards, the report found no mention of transuranics in plant safety procedures.

"Onsite environmental radiological contamination conditions are largely unknown," the report said. "A formal program with well-defined monitoring, sampling and analysis requirements does not exist."

Independent experts are investigating Paducah as part of two national studies of environmental and safety issues in the U.S. nuclear weapons complex. Both studies are relying primarily on data supplied by the plant.

Officials brought in two years ago to review past radiation hazards told The Post they were not informed that Paducah workers may have been exposed to significant amounts of plutonium.

Neither was Harold Hargan, a plant worker for 37 years. Hargan was one of about six workers who he says were told in 1990 that a test had found plutonium in their urine.

"It surprised me. Hell, it surprised the doctor," Hargan said. "Everybody knew there was no plutonium at Paducah."

What Happened Inside the Plant

Uranium is a naturally radioactive element that comes mainly in two forms, or isotopes: uranium-238 and a small amount of uranium-235. Only U-235 is fissile, or capable of being split in a nuclear chain reaction. To make bombs or nuclear fuel, uranium must be "enriched" by increasing the proportion of U-235.

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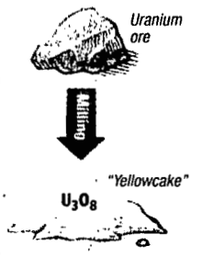
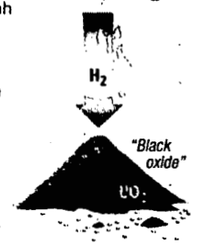
The Mississippi River Environment

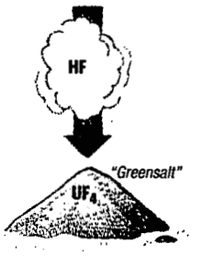
1. **Uranium ore** from mines is milled in a process to extract uranium oxide, known as **yellowcake.** The yellowcake is sent to Paducah.



2. At the Paducah plant, yellowcake is burned with hydrogen to form **uranium dioxide**, a black powdery substance called **"black oxide."**



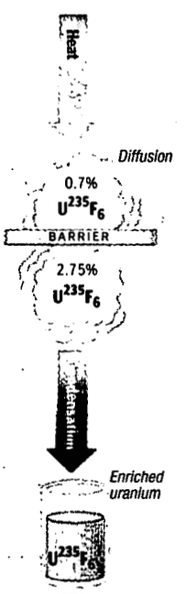
3. The black oxide is mixed with hydrofluoric acid to make **uranium tetrafluoride**, known as **greensalt.**



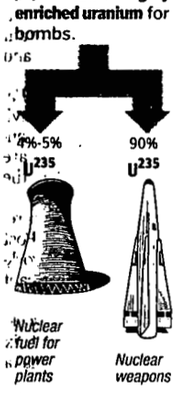
4. The greensalt is burned with **fluorine** to make **uranium hexafluoride**

■ *Since the late 1970s, Paducah has purchased uranium hexafluoride from other companies. Today, the enrichment process begins here.*

5. Finally comes the **gaseous diffusion** process for which the plant is named: The liquid uranium hexafluoride is heated and passed through a series of barriers, which separate and concentrate the U-235 isotope. The **low-enriched uranium** is condensed to a solid and packed into drums for shipping.



The enriched uranium is shipped to another plant for further enrichment to make **commercial nuclear fuel.** In the past, some was converted to **highly enriched uranium** for bombs.



Enormous amounts of uranium are left over after enrichment.

The processes used at Paducah also can move **backward**, turning uranium hexafluoride back into greensalt, or into depleted uranium metal for use in **armor-piercing munitions** or **armor plating.**

Uranium hexafluoride mixed with **magnesium** yields greensalt, uranium metal and **slag.**

Contamination Spreads

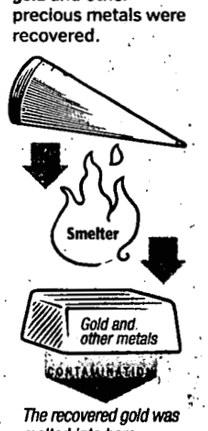
"Dirty Uranium"
Beginning about 1953, uranium from **spent nuclear fuel** was sent to Paducah to be enriched. Each shipment contained small amounts of **plutonium** and other radioactive contaminants.

Worker exposure

■ *Processing uranium generated large amounts of contaminated airborne dust inside the buildings. Also, radioactive material often was spilled, then swept up by hand, hosed into gutters or placed in regular trash receptacles, whistle-blowers say.*

■ *Workers carried uranium home on their skin and clothes.*

Metals Recovery
Old **nuclear warheads** were dismantled at Paducah, where the radioactive material was extracted and **gold** and other precious metals were recovered.



The recovered gold was melted into bars. Whistle-blowers allege some was shipped away without being measured for radiation.

CONTAMINATION *Tens of thousands of drums used to ship uranium are stored outdoors at the plant. Many drums still contain radioactive material.*

CONTAMINATION *This "depleted" uranium—still radioactive—is stored in tens of thousands of cylinders in open lots.*

CONTAMINATION *The plant continues to store significant amounts of various recovered metals deemed too contaminated to ship.*

CONTAMINATION *The concrete-like gray slag, a contaminated byproduct of the process, allegedly was trucked to sanitary landfills and dumped in public areas near the plant. Large amounts of contaminated slag remain on the site.*

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'Barrel Mountain': A nearly half-mile mound of large piles of rusted metal scrap and other waste materials, some of it contaminated.

Fouled ditches: Uranium, plutonium and other radioactive materials were flushed into ditches, such as this one, that flow into tributaries of the Ohio River. A test commissioned last month by The Washington Post found plutonium here. Earlier tests of the ditch inside plant grounds found plutonium at a level 100 times above what the government certifies as safe.

Tainted wells: Two large plumes of contaminated ground water extend more than a mile north of the plant into residential neighborhoods. The water is contaminated with chemical and radiological wastes.

Classified burial ground: This landfill contains nuclear weapons components. Workers who dismantled weapons may have been exposed to beryllium, a highly toxic metal.

Cylinder piles: More than 30,000 metal tanks containing a toxic mix of depleted uranium and fluorine are stacked in open lots. Until recently, some were stored in a nearby residential neighborhood.

Process buildings: The heart of the plant, these stadium-sized buildings now enrich uranium for commercial nuclear fuel. The truck alleys along the sides of each building are contaminated from spills during deliveries.

Burial pits: Enormous amounts of radioactive material lie in shallow landfills on plant grounds, and some are believed to be leaching into ground water. One pit contains hundreds of barrels of a highly flammable form of uranium stored in PCB-tainted oils.

One of the most contaminated buildings still in use, C-400 contained chemical solvent tanks for cleaning radioactive equipment. Workers this year found an old canister that contained radioactive technetium at levels millions of times above the safety standard.

Buildings 410 and 420: Hundreds of workers were exposed to radioactive dust in these buildings, which were used to process uranium before enrichment.

Chemical spills: Thousands of gallons of toxic chemicals—including suspected carcinogens—were released into the environment in a series of leaks and spills. Some ended up in nearby creeks.

Waste-water discharges: Company documents acknowledge the release of tens of thousands of pounds of uranium into creeks. Toxic chemicals and metals also were discharged in waste water.

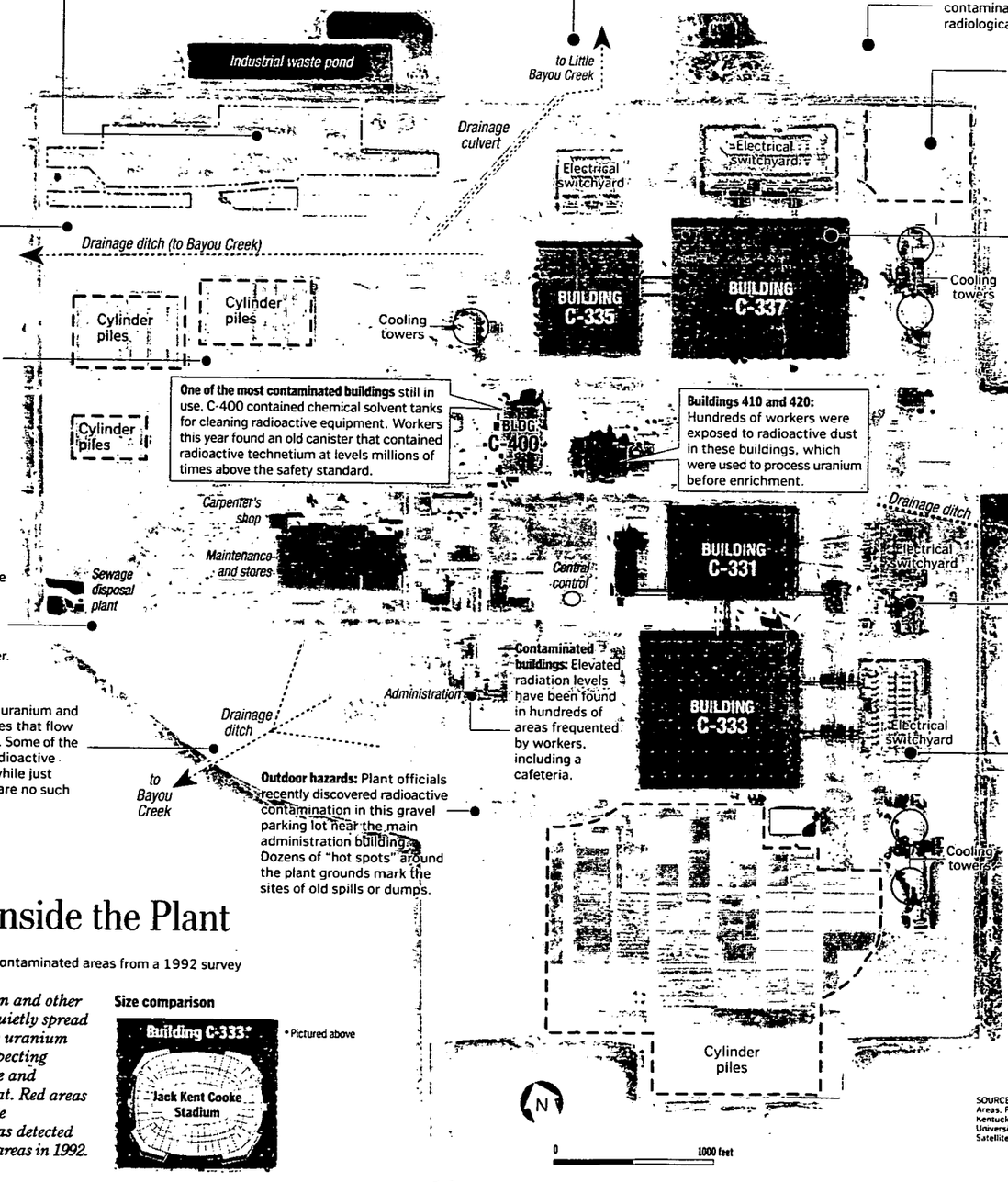
Contaminated buildings: Elevated radiation levels have been found in hundreds of areas frequented by workers, including a cafeteria.

Airborne releases: Exhaust fans vented radioactive dust into the atmosphere. Workers say the biggest releases were always at night.

Dirty runoff: Rain washes uranium and other hazards into ditches that flow past outdoor scrap yards. Some of the ditches are posted as radioactive inside the plant fence, while just outside the fence there are no such warnings.

Outdoor hazards: Plant officials recently discovered radioactive contamination in this gravel parking lot near the main administration building. Dozens of "hot spots" around the plant grounds mark the sites of old spills or dumps.

Switchyards: The plant requires enormous amounts of electricity—two generating plants are dedicated to its needs. As recently as 1996, the plant also was the nation's largest single emitter of freon, the coolant blamed for damaging the Earth's ozone layer.



Hazards Inside the Plant

Radioactively contaminated areas from a 1992 survey

For decades, plutonium and other radioactive hazards quietly spread through this Kentucky uranium plant, exposing unsuspecting workers to an invisible and potentially lethal threat. Red areas on this diagram denote contamination that was detected around the main work areas in 1992.

Size comparison

*Pictured above

SOURCES: "Radiological Survey of Selected Outdoor Areas, Paducah Gaseous Diffusion Plant, Paducah, Kentucky," prepared by Oak Ridge Associated Universities, April 1992; Washington Post research. Satellite photo from U.S. Geological Survey.

GRAPHICS BY WILLIAM MCNULTY, PATTERSON CLARK AND JACKSON DYKGRAF —THE WASHINGTON POST

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Big Problem: *A mountain of old uranium containers that still leak radiation sits on the grounds of Paducah Gaseous Diffusion Plant.*

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PHOTOS BY MICHAEL WILLIAMSON - THE WASHINGTON POST

Concern: *Warren Smith, who had his well capped because of contamination, visits a friend's grave near the plant.*

Richardson Orders Probe Of Uranium Plant in Ky.

By JOBY WARRICK
Washington Post Staff Writer

Energy Secretary Bill Richardson ordered an immediate investigation yesterday into reports that thousands of unsuspecting employees at a Kentucky uranium plant were exposed on the job to cancer-causing plutonium.

Richardson said he would meet with workers at the Paducah Gaseous Diffusion Plant and would request a National Academy of Sciences study to probe the links between worker illnesses and exposure to radioactive materials that occurred over decades at the federally owned plant.

He also called for expanding a newly created program to bring health screening and medical treatment to thousands of workers who may have been put in harm's way at Paducah and similar facilities that were part of the government's nuclear weapons complex.

"I have long maintained that we must correct the sins of the past by compensating workers who have been medically damaged," Richardson said in an interview. "I don't want this to be known as the department of excuses for not dealing with workers who have been harmed."

His remarks came after The Washington Post reported that workers at the Paducah plant had

See PADUCAH, *A4, Col. 1*

The Washington Post

MONDAY, AUGUST 9, 1999

Richardson Orders Uranium Plant Probe

PADUCAH, *From A1*

been unwittingly exposed to plutonium and other radioactive metals that entered the plant over decades in shipments of used uranium from military nuclear reactor fuel. The report was based in part on sealed court documents filed as part of a lawsuit by workers and an environmental group, the Natural Resources Defense Council. The suit alleges that government contractors concealed evidence of the exposure for decades while allowing plutonium and other hazards to spread into the environment.

The workers also allege that former plant managers allowed contaminated waste to be dumped into a state-owned wildlife area and a landfill not licensed for hazardous waste. They further contend that radioactively contaminated gold and other valuable metals may have been shipped out of the plant without being properly tested.

Thomas Cochran, a nuclear expert with the NRDC who reviewed conditions at the plant, said health and safety practices there were the worst "outside the former Soviet Union." Former plant operators had not been served with the suit and declined to comment. The whistleblowers and their Washington attorney, Joseph Egan, said they also could not comment because of the judge's seal on the case.

Energy officials sent a team to Paducah for an initial probe after the documents were first filed in June, Richardson confirmed. "They did not uncover any imminent threats . . . but we are continuing to investigate these concerns," Richardson said.

The expanded investigation he announced yesterday would seek to uncover "what actually occurred, who was responsible and what must be done to assure that it never happens again," he said.

Among the specific measures:

- Top Energy Department officials will be dispatched to Paducah this week to check compliance with environmental and safety regulations. The agency's Office of General Counsel will assess whether former contractors, including Lockheed Martin Corp. or Union Carbide Corp., had fulfilled their responsibilities to protect workers and the environment.
- Besides the health study by the National Academy of Sciences' Institute of Medicine, the Energy Department will institute a medical surveillance and screening program for employees. A screening of former Paducah workers is just beginning as part of the Former Worker Program, a congressionally ordered study of past exposures of employees in the U.S. nuclear complex.
- The department's fiscal 2000 budget request will be reassessed and revised as necessary to include money to probe and rectify environmental and health concerns at the government's uranium enrichment plants.
- Richardson will ask the White House to expand a newly created program to provide millions of dollars in medical screening and other benefits to Energy Department workers who were exposed to beryllium, a highly toxic metal used in nuclear weapons. "These actions are warranted given the concerns raised . . . and I will not rest until these issues are fully dealt with and any injured workers are fairly compensated," Richardson said.

Paducah workers were exposed to plutonium through shipments of contaminated uranium that arrived at the plant from 1953 to 1976, a period when national security priorities often surmounted concerns over risks to workers and the environment. The plutonium shipments stopped, but contaminants remain spattered over hundreds of acres of buildings and grounds. Workers did not learn of the problems until at least 1990, and some contend they were never told.

The U.S. Enrichment Corp., a government-chartered private corporation that took over management of the plant this year, contends that all significantly contaminated areas have been cleaned up or marked with warning signs.

Although no comprehensive study of worker medical histories has been conducted, current and former workers at the plant have linked past exposures to a string of cancers and other diseases.

Richardson said although many of the exposures at Paducah were historical, the government bears responsibilities for those who may have been injured.

"Even though it was the 1950s and everyone was gung-ho," he said, "it doesn't mean that you can forget about workers who have been made sick."

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