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MOUND

Environmental
Restoration
Program

CERCLA Notebook

Mound Plant
Miamisburg, Ohio

EG&G

DOE/EM-0013P
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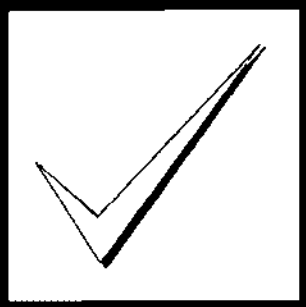

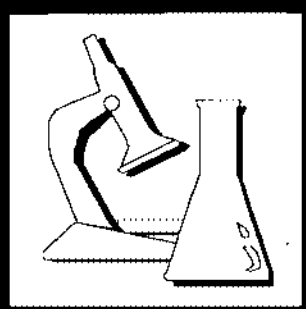

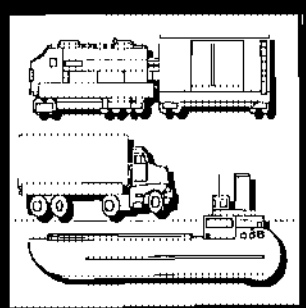

U.S. Department of Energy
Assistant Secretary for
Environmental Restoration and
Waste Management

December 1992

Environmental Restoration and Waste Management (EM) Program

An Introduction

For additional information on DOE's Environmental Restoration and Waste Management Program, contact:

Environmental Restoration and Waste Management Information Office, EM-40.3
U.S. Department of Energy
1000 Independence Ave., S.W.
Washington, D.C. 20585
(301) 903-4000

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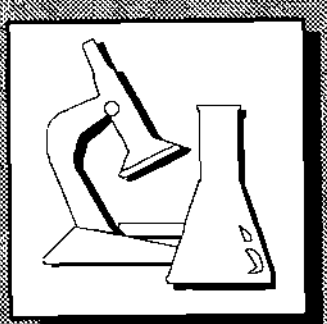

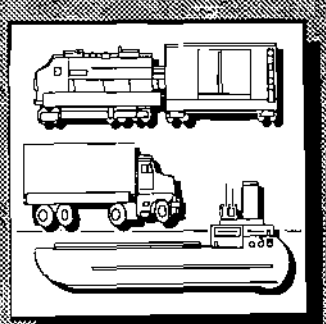

U.S. Department of Energy
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December 1992

Environmental Restoration and Waste Management (EM) Program

An Introduction

Virginia Tech
VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

This document was prepared by Management Systems Laboratories,
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Virginia Polytechnic Institute and State University,
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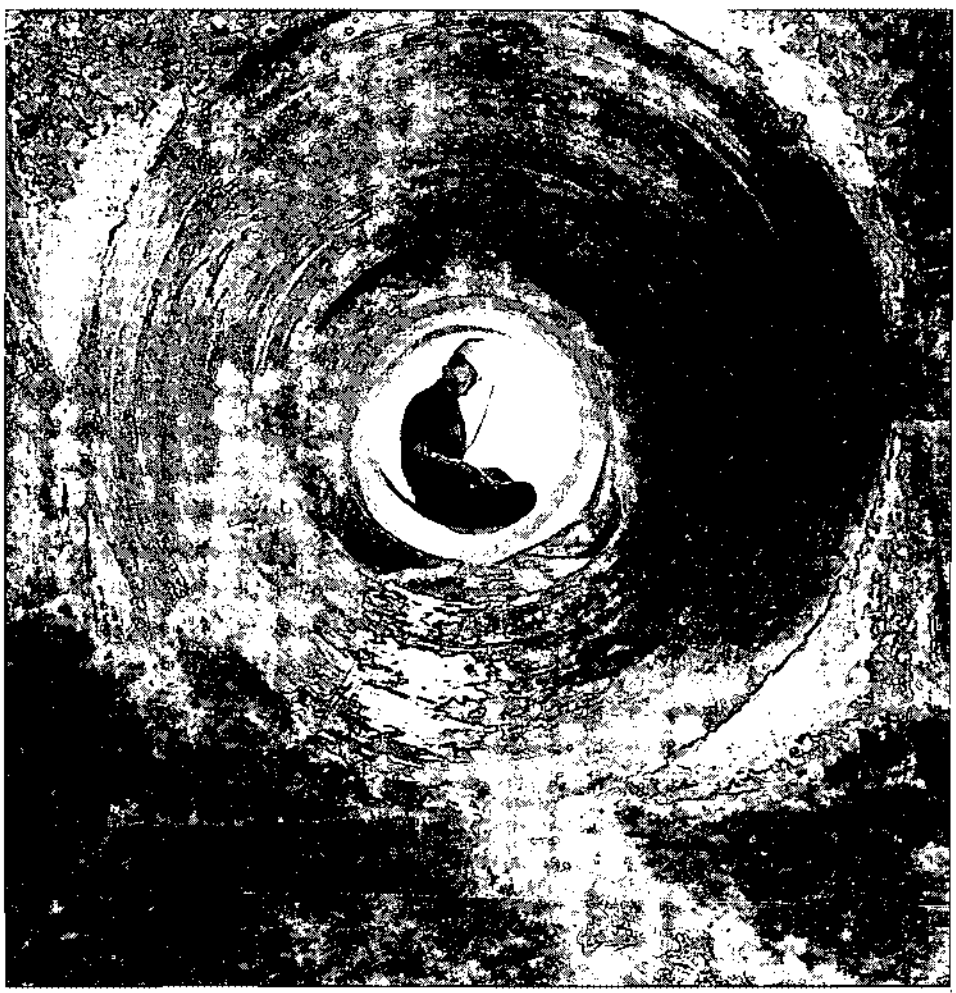
Foreword

This booklet introduces the reader to the mission and functions of a major office within the U.S. Department of Energy (DOE): the Assistant Secretary for Environmental Restoration and Waste Management (EM). The Secretary of Energy established EM in November 1989 to consolidate responsibility for environmental compliance and cleanup activities. DOE's annually updated Environmental Restoration and Waste Management Five-Year Plan (FYP) describes EM's plans to clean up its facilities and sites across the country.



Over 2,000 feet beneath a desert in New Mexico, a technician inspects a borehole in bedded salt. This DOE demonstration facility will assess the suitability of underground salt formations for the safe disposal of certain types of radioactive waste.

The Five-Year Plan

Our nation has entered an era in which the public is demanding cleanup and restoration of its environment, understandable information, and participation in decision making. DOE's old culture, which grew out of the Atomic Energy Commission's culture of classification, compartmentalization, and strict-need-to-know dissemination of information, was in direct conflict with this demand for public involvement. DOE recognized this situation as outdated and committed to changing its culture to one of more openness and public involvement in decision making and policy direction. One of the results of this commitment to an open culture--dedicated to the restoration of the nation's environment--was the creation of the Environmental Restoration and Waste Management (EM) Five-Year Plan.

First published in August 1989, and updated annually, the Environmental Restoration and Waste Management Five-Year Plan contains the framework for EM to characterize, prioritize, and consolidate cleanup activities for every EM site. Under the Five-Year Plan, immediate problems are to be confined and corrected and compliance and cleanup achieved in 30 years. (DOE plans to achieve compliance on a much faster track.) The priorities of a 30-year compliance and cleanup effort are based on credible science and technology.

In November 1989, DOE issued a Draft Applied Research, Development, Demonstration, Testing, and Evaluation (RDDT&E) Plan. The RDDT&E Plan is a real attempt to get results from research and technology demonstrations within a timetable driven by a hard assessment of need and risk. Decisions will be made based on performance and return on the dollar spent. DOE is building a methodology that applies tough cost/benefit criteria to all waste-related activities. DOE is using industry and peer review input to determine what's really useful and achievable. Thus, time won't be wasted on evaluating competing proposals that have limited value. The RDDT&E Plan is now a full-fledged section of the Five-Year Plan.

The Five-Year Plan supports DOE's strategy for meeting its 30-year compliance and cleanup goal. This strategy involves:

The Five-Year Plan

(1) focusing DOE's activities on eliminating or reducing known or recognized potential risks to workers, the public, and the environment; (2) containing or isolating, removing, or detoxifying onsite and offsite contamination; and (3) developing technology to achieve DOE's environmental goals.

Why the New EM Organization?

In its Five-Year Plan, DOE has committed to a 30-year goal of compliance and cleanup. That is, by the year 2019, DOE's goal is to clean up its 1989 inventory of contaminated inactive sites and facilities and, on a much faster track, bring its nuclear-related sites and facilities into compliance with applicable Federal, State, and local laws and regulations. Before the creation of EM, no single DOE focal point existed for such activities; programs responsible for these activities were spread among three distinct management elements--Defense Programs, Nuclear Energy, and Energy Research. The lack of a consolidated management approach reflected a less-than-top priority for nuclear waste-related compliance and cleanup. It also hampered DOE's effective and efficient response to increasingly numerous and strict environmental requirements.

However, on June 27, 1989, as part of his 10-point initiative, the Secretary of Energy announced a resetting of priorities in DOE to reflect environmental compliance and cleanup as more heavily weighted than nuclear materials and weapons production. Clearly, a new age was dawning for DOE where nuclear materials and weapons would no longer be produced without attention to a clean environment and compliance with applicable laws and regulations. And just as clearly, new strategic planning would have to emerge and a new, large, dedicated organization would have to take responsibility for implementing the Secretary's vision of environmental stewardship. The Office of the Assistant Secretary for Environmental Restoration and Waste Management (EM) was created to consolidate DOE-wide responsibility for compliance and cleanup. EM also assures that a top level of management coordinates compliance and cleanup within DOE's new culture of accountability in the areas of environment, safety, and health.

EM as the Cornerstone of DOE's Emerging New Culture

The Secretary has mandated that the "trust-me" culture that pervaded DOE and its predecessor agencies for more than 40 years must yield to a "watch-me" culture. As waste and contamination from DOE's defense-related nuclear activities have taken the brunt of increasing congressional, regulatory, and public concern and scrutiny, so must EM take the lead in conducting its compliance and cleanup efforts with excellence, timeliness, and cost-effectiveness. It's impossible to redress, all at once, the effects of decades of activities that were hazardous to human health and safety and the environment.

Likewise, it's impossible to change overnight the culture--the motivational structure--of tens of thousands of DOE and contractor employees across the nation. DOE's largely closed, hands-off posture reflected prevailing executive, congressional, and public concerns for national security. The Secretary's new vision recognized that, though DOE's purely defense-related activities must remain classified, its activities in environmental restoration and waste management must be open and openly communicated. They must be subject not merely to applicable laws and regulations but to the invited participation of affected parties at all levels of government and the private sector.

An example of this new openness is the State and Tribal Government Working Group (STGWG), which DOE created in early 1989 to review formulative drafts of the Five-Year Plan. Made up of representatives appointed by governors and tribal leaders from States and tribal lands hosting DOE facilities and waste sites, STGWG also includes representatives of the National Governors' Association, the National Conference of State Legislatures, and the National Association of Attorneys General. STGWG was instrumental in helping DOE establish its 30-year goal of compliance and cleanup. STGWG not only reviews the Five-Year Plan but also discusses other related issues which they or DOE may identify.

Another review group, the Stakeholders' Forum, is made up of some STGWG members as well as representatives from several federal agencies, public interest groups, university consortiums, management and operating (M&O) contractors, industry groups, and others. The Stakeholders' Forum provides input into the Five-Year Plan and communicates directly with DOE on issues related to the Five-Year Plan.

EM Structure and Responsibilities

EM's structure includes four programmatic offices and four support offices. Two field offices also report directly to EM.

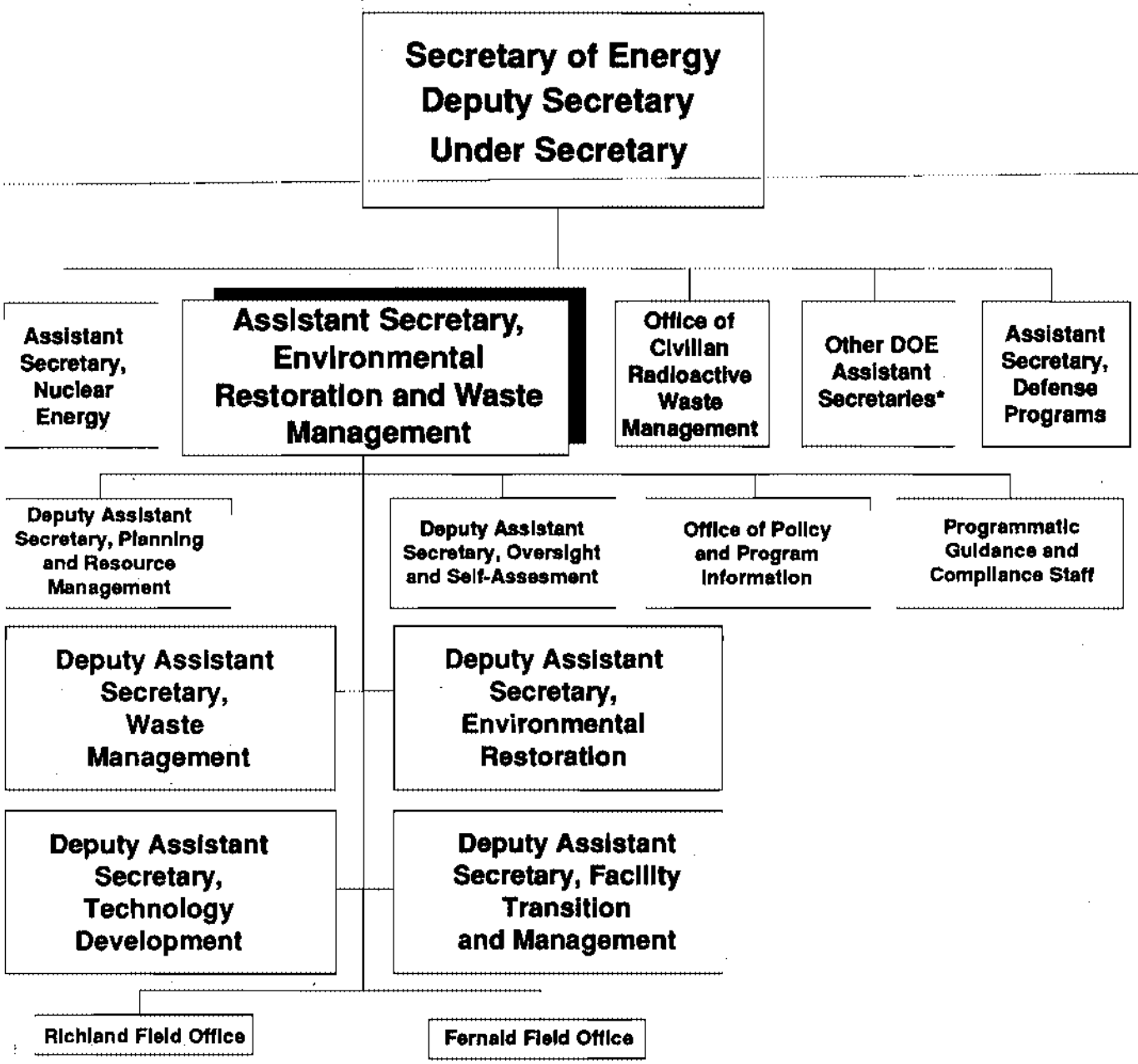
The Deputy Assistant Secretary for **Waste Management** oversees the treatment, storage, and disposal of radioactive waste, hazardous waste, mixed (both radioactive and hazardous) waste, and sanitary waste at all DOE sites. Waste Minimization and Corrective Activities (bringing facilities into compliance with applicable laws) are also included.

The Deputy Assistant Secretary for **Environmental Restoration** manages the cleanup of radioactive and hazardous waste at DOE sites through remedial actions and decontamination and decommissioning (D&D). DOE is currently responsible for cleaning up 134 sites in 34 states. The number of DOE cleanup sites changes as cleanup is completed and as new sites are assigned to DOE through legal or governmental actions.

The Deputy Assistant Secretary for **Technology Development** has responsibility for providing new and more effective technologies for meeting DOE's 30-year goal for compliance and cleanup. Included are research and development of new technologies; demonstration, testing, and evaluation of technologies developed internally and outside DOE; transportation; and educational programs to produce the scientists and engineers needed to reach the goal.

The Deputy Assistant Secretary for **Facility and Transition Management** is responsible for the safe transition to EM of surplus contaminated facilities within DOE. Responsibilities include maintaining a database of these facilities, developing transition and surplus facility release criteria, safely shutting down facilities designated as surplus, and negotiating uses for facilities and land after cleanup.

The Deputy Assistant Secretaries for **Planning and Resource Management** and for **Oversight and Self-Assessment**, along with the **Office of Policy and Program Information** and **Programmatic Guidance and Compliance Staff** provide budget and accounting support, compliance monitoring, legal guidance, policy recommendations, and public outreach coordination.



EM's organization structure consolidates environmental restoration, waste operations, technology development, and facility transition activities in support of the 30-year compliance and cleanup goal.

** These include the Assistant Secretaries for: Environment, Safety, and Health; Conservation and Renewable Energy; Domestic and International Energy Policy; Fossil Energy; and Congressional and Intergovernmental Affairs.*

Working to Resolve Infrastructure Limitations

DOE recognizes that the infrastructure needed to accomplish the work outlined under the Five-Year Plan does not exist and will not exist for some time. Although DOE Headquarters and Field Offices have embarked on expansions, they face a period of too few managers and technical staff. Contractor organizations are also growing and are beginning to experience shortages of qualified applicants.

DOE does not now know the precise resource limits of the environmental cleanup industry, but it is aware of the concern that exists throughout government and the private sector. Preliminary estimates indicate that DOE and its contractors must increase staff significantly from their present levels.

To help combat the infrastructure problem, DOE is sponsoring research through the Oak Ridge Associated Universities, and separately, through the University of Tennessee, to evaluate the human and industrial resources available to meet the anticipated demand for environmental cleanup. DOE has also begun education, training, and outreach activities to educate and train the human resources necessary to meet its 30-year compliance and cleanup goal.

Management of Waste and Facilities from Past and Current Programs Has Been Consolidated.

Assistant Secretary, Defense Programs

Military Applications
Nuclear Materials Production

Assistant Secretary, Nuclear Energy

Nuclear Energy R&D
Uranium Enrichment

Office of Energy Research

Basic Energy Sciences
Fusion Energy
Health & Environmental Research
High Energy and Nuclear Physics
Multiprogram Energy Laboratories - -Facilities Support

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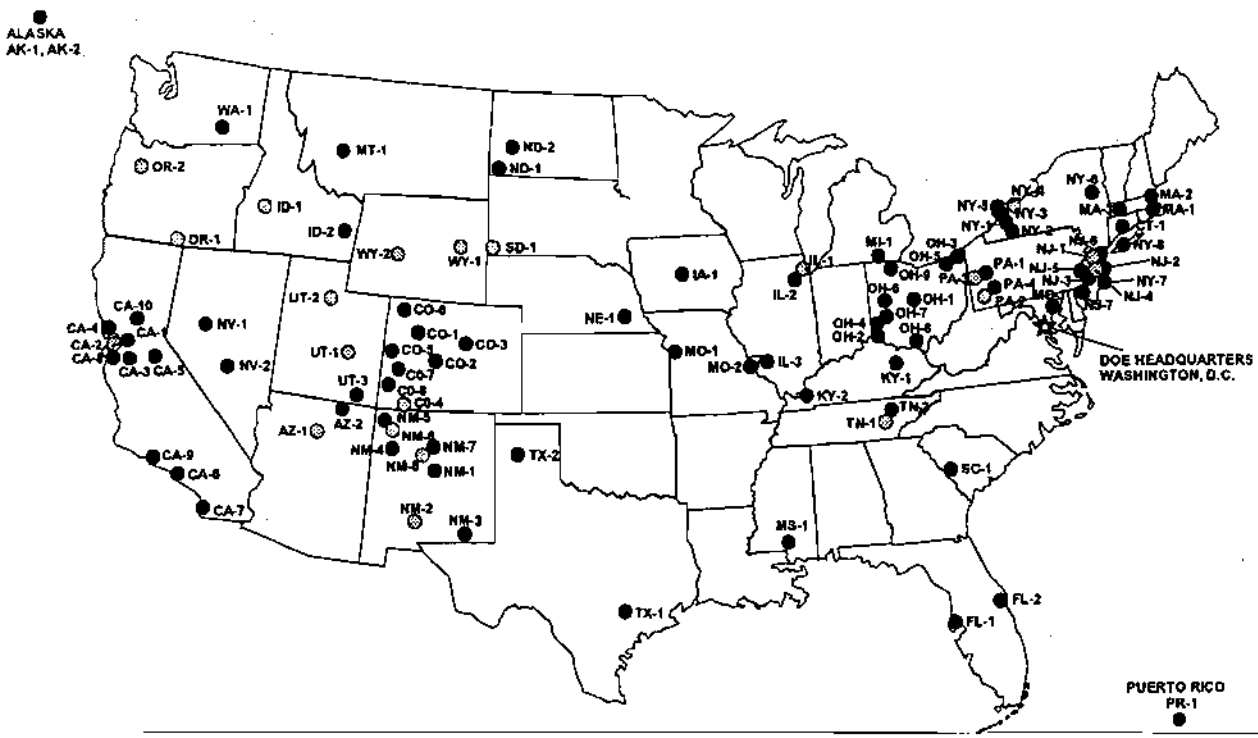
Assistant Secretary, Environmental Restoration and Waste Management (EM)

DOE's major nuclear programs generate waste. EM is responsible for managing this waste and the sites and facilities which generate it.



The Environmental Restoration and Waste Management Five-Year Plan outlines compliance and clean up activities at the above sites. (See Appendix for list of sites.)

EM Manages Four Categories of Radioactive Waste.*

High-Level Waste (HLW) is highly radioactive waste material resulting from the reprocessing of spent nuclear fuel. It includes liquid waste produced directly in reprocessing and highly radioactive solid waste derived from the liquid. Some HLW contains elements that decay very slowly and remain radioactive for thousands of years. Most HLW must be handled by remote-control from behind protective shielding. Spent fuel from civilian nuclear power plants, which is also classified as HLW, is the management responsibility of DOE's Office of Civilian Radioactive Waste Management.

Low-Level Waste (LLW) is any radioactive waste not classified as high-level waste, transuranic waste, spent nuclear fuel, or byproduct material. It is generated by uranium enrichment processes, reactor operations, isotope production, medical diagnostic procedures, and research and development projects. It is typically contaminated with small amounts of radioactivity dispersed in large amounts of material. LLW is usually rags, papers, filters, tools, equipment, and discarded protective clothing contaminated with radionuclides. Approximately 3% of LLW requires shielding during handling and transportation activities.

Transuranic (TRU) Waste is mostly LLW contaminated with alpha-particle-emitting isotopes which have decay rates and concentrations exceeding certain specified levels. It is produced during reactor fuel assembly, nuclear weapons fabrication, and fuel reprocessing operations. It contains man-made elements heavier than uranium, thus the name trans (or beyond) uranic. TRU waste decays slowly and requires long-term isolation. Protective clothing, equipment, and tools may be contaminated with TRU radionuclides. Approximately 2% of TRU waste must be handled remotely.

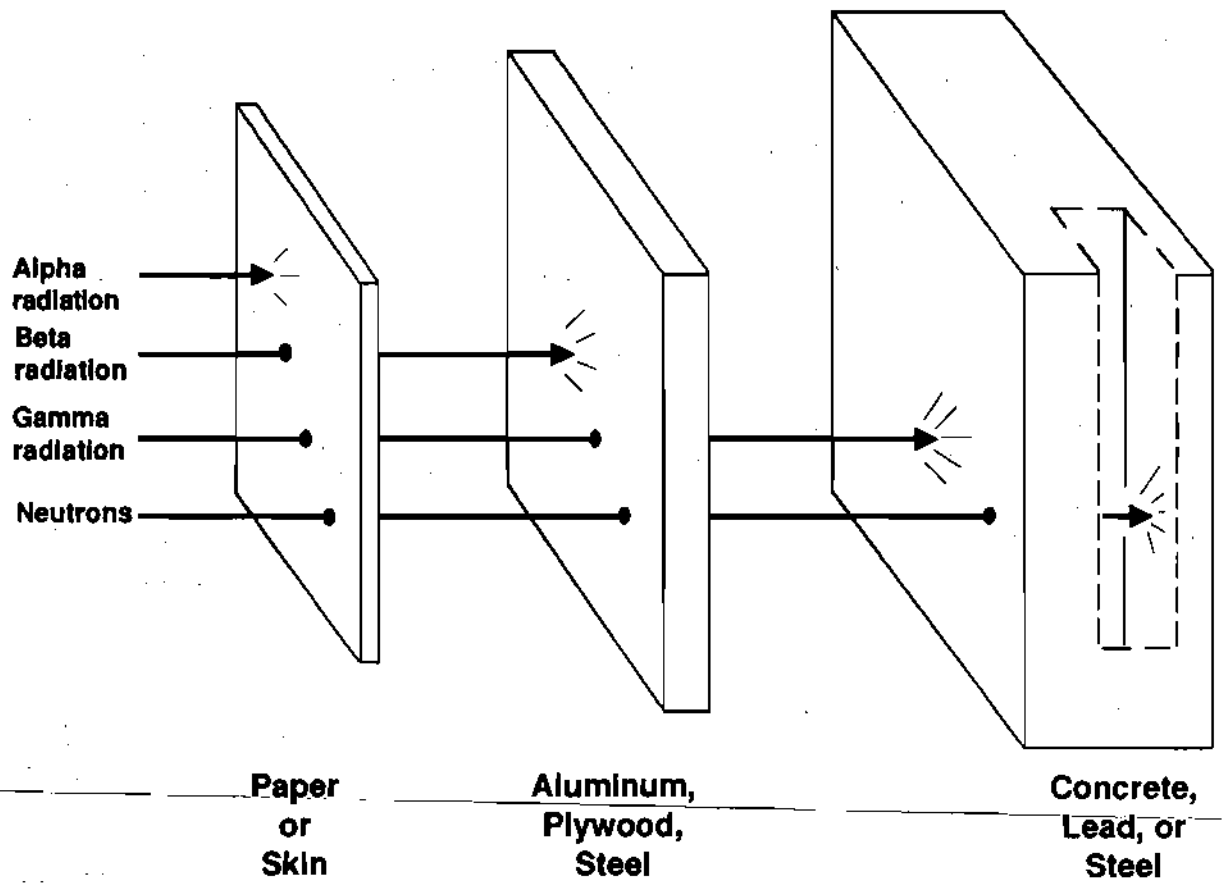
Uranium mill tailings are byproducts of uranium mining and milling operations. They are naturally occurring radioactive rock and soil. Tailings contain small amounts of radium that decay and emit radon, a radioactive gas. Released into the atmosphere, radon gas disperses harmlessly, but the gas is harmful if a person is exposed to high concentrations for long periods of time.

*Additional definitions for the four categories are provided in the glossary.

Radiation Can Be Shielded.

As radioactive materials decay into stable, nonradioactive substances, they give off, or emit, radioactive particles. Depending on the material, the decay process can take from a fraction of a second to billions of years. Radiation, or radioactive emissions, can be shielded from humans and the environment using various materials, as shown below.

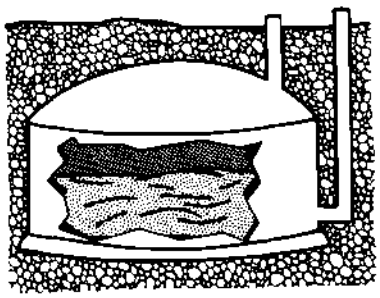
There are four principle types of radiation: alpha particles, beta particles, gamma rays, and neutrons. Alpha radiation can be shielded by a sheet of paper and will not penetrate skin. Beta radiation can pass through an inch of water or human flesh, but can be shielded by a thin sheet of aluminum, plywood, or steel. Gamma radiation is the most dangerous and can pass through many materials, including the human body. Dense materials like lead or concrete must be used for shielding gamma rays. Neutrons are the uncharged particles found in the nucleus of every atom heavier than hydrogen. Thick barriers made of dense materials like lead, steal, or concrete can shield neutrons.



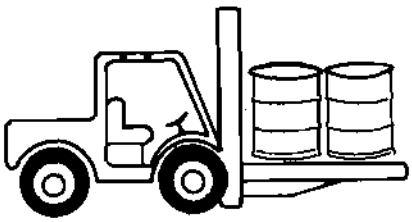
Radioactive Waste Exists in Many Forms.

Liquid waste from reprocessing plants can be converted to sludge or immobilized in solids to facilitate handling and storage. Contaminated materials, such as empty containers, protective clothing, and used equipment, are compacted and stored in metal drums or wooden boxes.

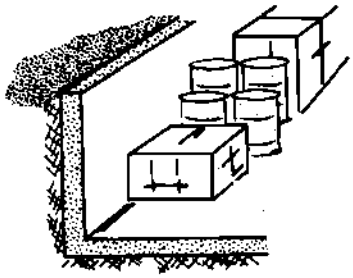
Wall and floor surfaces in certain areas of a nuclear facility can be contaminated by radioactive substances. The decontamination process generates additional radioactive waste materials which must be disposed.



High-level waste needs heavy shielding to confine penetrating radiation and dissipate heat.



Radiation from most transuranic waste is blocked by a storage container.



Engineered barriers can effectively isolate low-level waste from the environment.

EM Also Manages Hazardous, Mixed, and Sanitary Waste.

Hazardous Waste

Nuclear materials production activities also generate **hazardous waste.** These toxic, corrosive, reactive, or ignitable substances can affect human health and damage the environment. Hazardous waste includes chemicals, such as chlorinated and nonchlorinated hydrocarbons, explosives, gasoline, diesel fuel, asbestos, acid, organic solvents, metals, and pesticides.

Like private industry, DOE must comply with strict Federal, State, and local environmental regulations in treating and disposing of hazardous waste.

Mixed Waste

Some waste which EM manages contains both radioactive and hazardous components. This is called **mixed waste.** Treatment standards and disposal facilities are being developed for mixed waste to satisfy requirements for both the hazardous and the radioactive components.

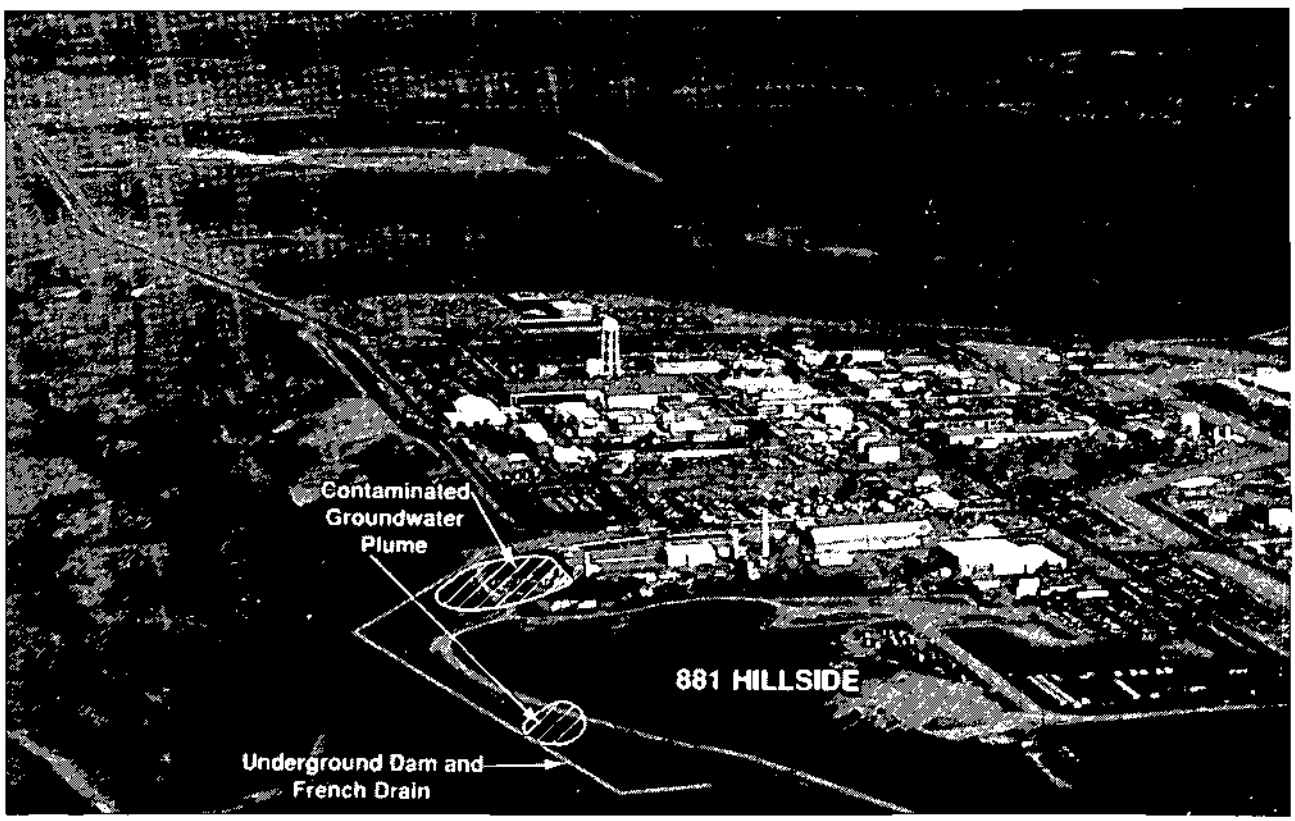
EM Also Manages Hazardous, Mixed, and Sanitary Waste (cont).

Sanitary Waste

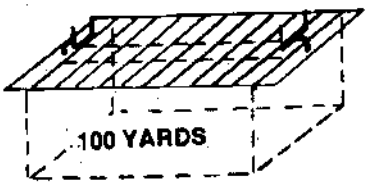
Sanitary waste is routinely generated by normal housekeeping activities. It is neither radioactive nor hazardous. This waste is garbage and is disposed of in sanitary landfills. Sanitary waste also includes liquids which are treated in sewage treatment plants.

EM Also Manages Contaminated Soil and Groundwater.

Other waste EM manages from past activities includes **soil and groundwater** contaminated with radioactivity, hazardous chemicals, or both. EM's site characterization and cleanup activities themselves will yield additional challenges when materials dug up to satisfy one set of regulations must be reburied according to another set of regulations.

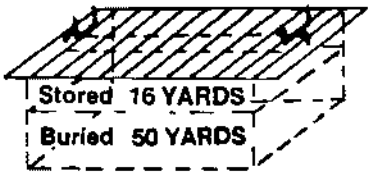


The 881 Hillside area at Rocky Flats Plant in Golden, Colorado is an important cleanup project. The site contains radioactive and chemical waste from the 1950's and 1960's. The cleanup work focuses on a system to remove chemical contaminants from groundwater. It involves constructing an underground dam and water-collection system at the base of the hillside to intercept groundwater contaminated with organic chemicals.



DEFENSE HIGH-LEVEL WASTE

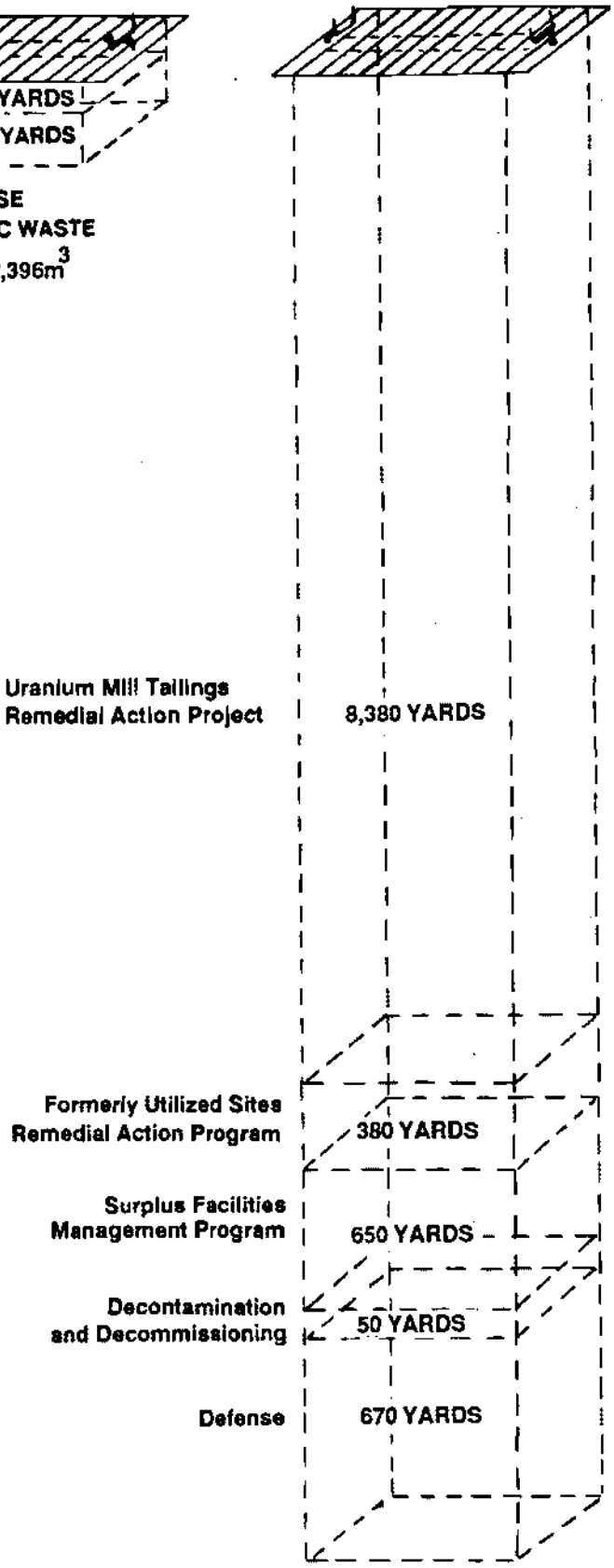
TOTAL: 379,000m^3



DEFENSE TRANSURANIC WASTE

TOTAL: 252,396m^3

If all DOE waste produced as of December 31, 1989 was combined to fill football field size areas, high-level waste would fill a hole about 100 yards deep and transuranic waste would fill a hole about 65 yards deep. Low-level waste would fill a hole about 9,000 yards (about 6 miles) deep. There is about 55 times as much low-level waste as high-level waste and transuranic waste combined.



LOW-LEVEL WASTE

TOTAL: 387,453,300m^3

Corrective Activities

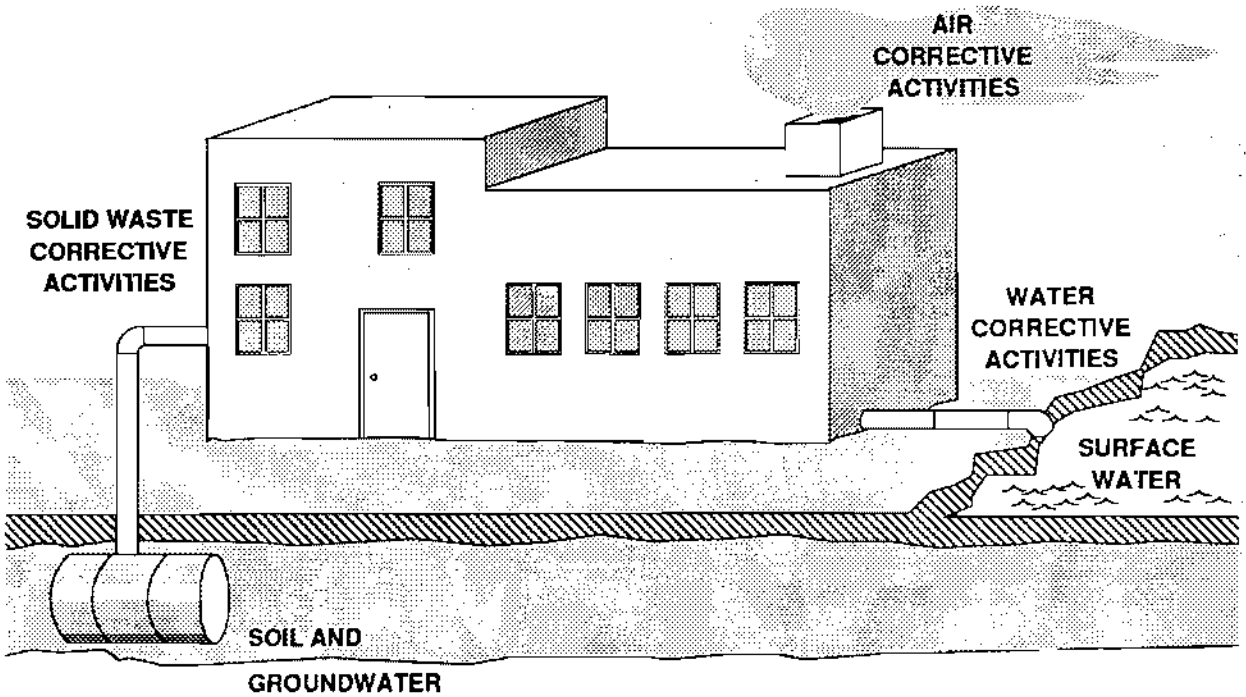
DOE is currently out of compliance with Federal, State, and local environmental requirements at a majority of its sites. Corrective Activities are actions and projects required to bring DOE's active and standby facilities into compliance. Corrective Activities also include those actions and projects identified by Field Offices as out of compliance with near-term regulatory requirements.

There are three categories of Corrective Activities:

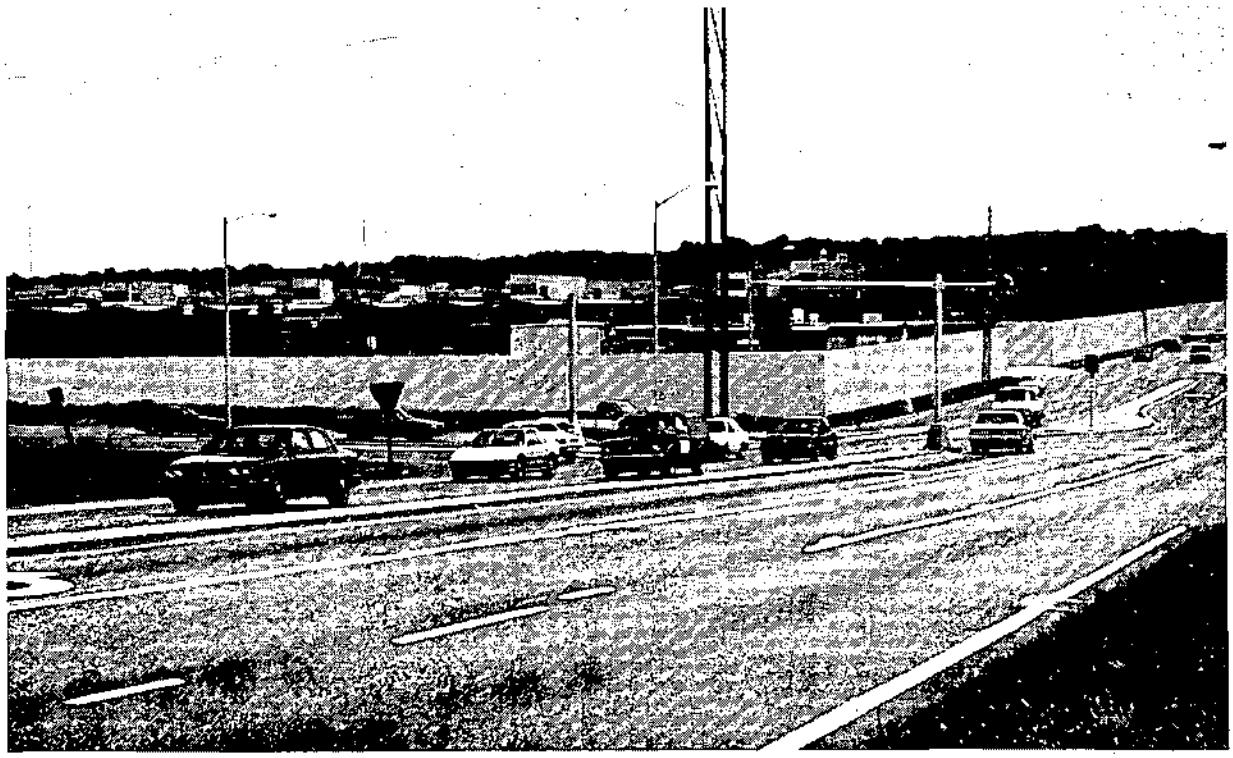
Air Corrective Activities reduce or eliminate releases of contaminants to the atmosphere. These releases occur through regulated sources such as stacks and exhaust vents and must comply with the Clean Air Act, which includes its amendments and the National Emission Standards for Hazardous Air Pollutants (NESHAPs).

Water Corrective Activities reduce or eliminate releases of contaminants to surface waters regulated under the Clean Water Act, which includes the National Pollutant Discharge Elimination System (NPDES).

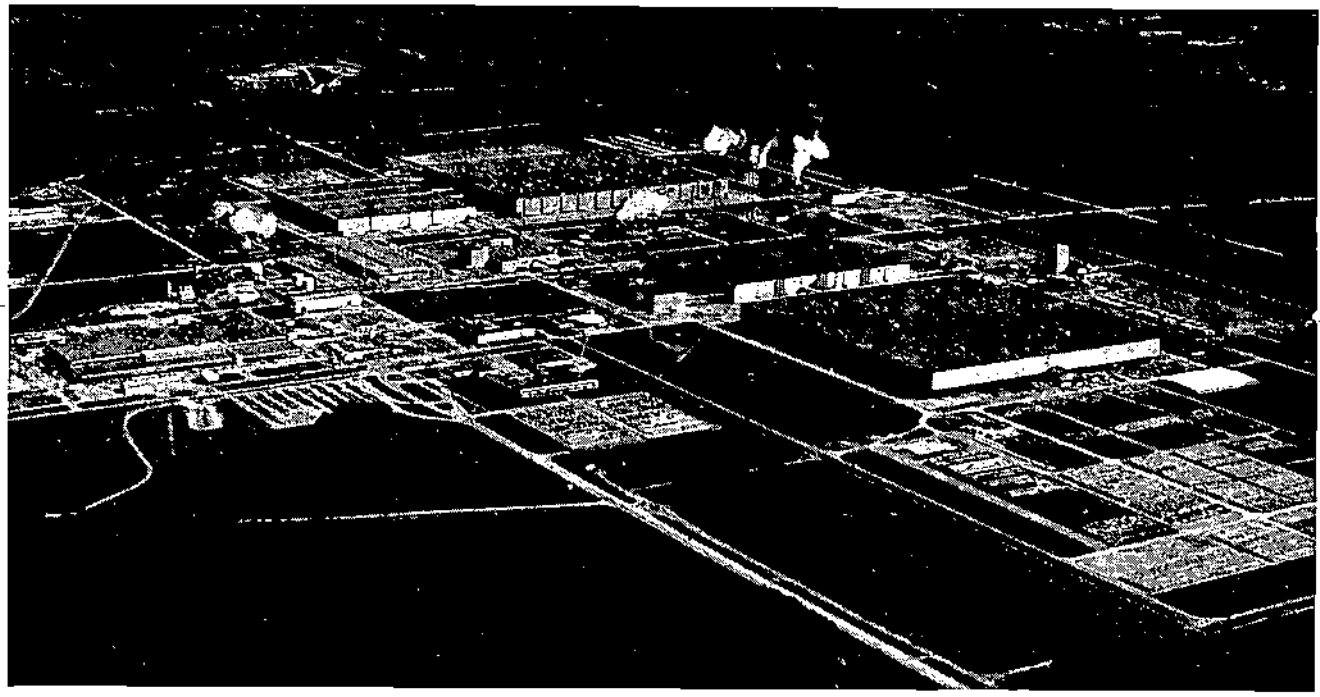
Solid Waste Corrective Activities bring solid waste management operations that may or may not have contaminated the soil and groundwater into compliance. They are needed to comply with Federal, State, and local solid waste and groundwater requirements. The following Federal Statutes apply to the solid waste corrective activities category: the Resource Conservation and Recovery Act (RCRA), the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Atomic Energy Act (AEA), the Safe Drinking Water Act (SDWA), the Toxic Substances Control Act (TSCA), and the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA).



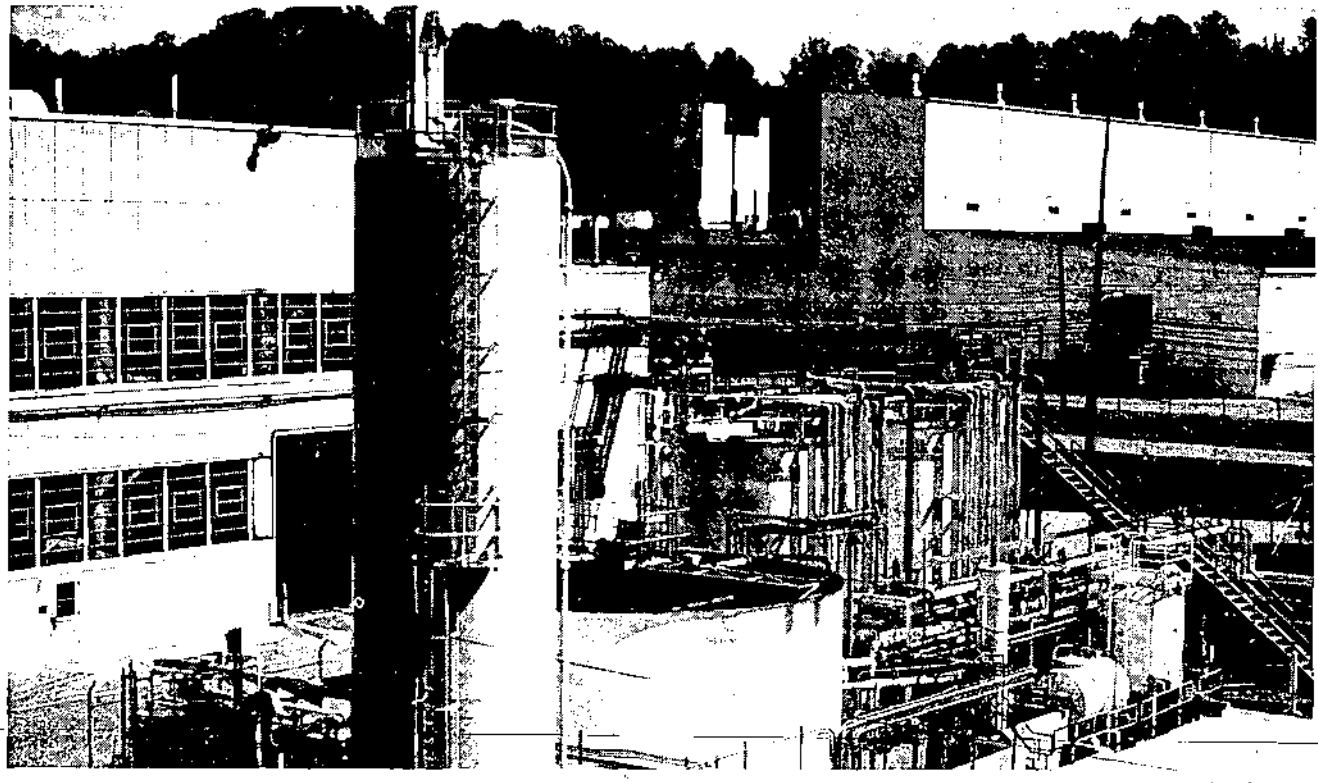
Corrective Activities cover the full range of environmental releases: (1) air, (2) surface water, and (3) soil and groundwater (solid waste).



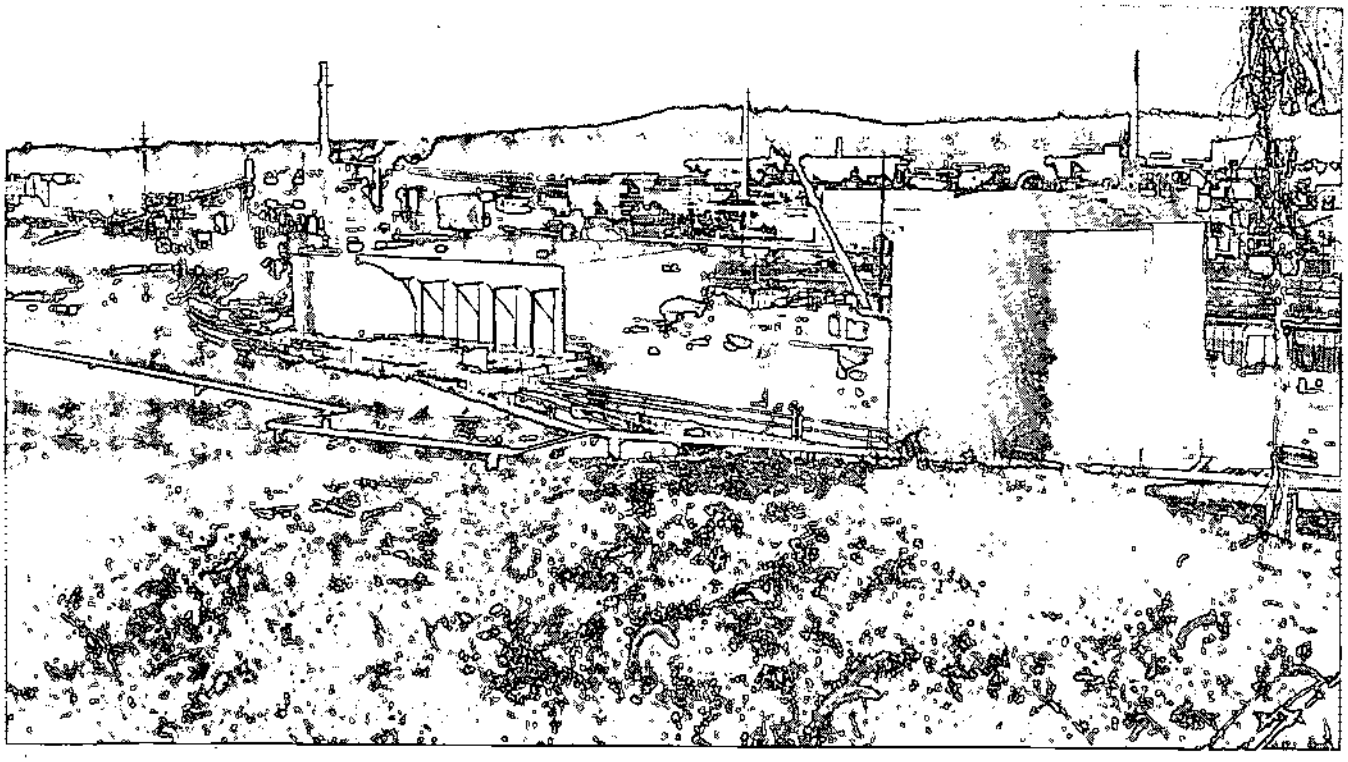
At the Kansas City Plant, a berm is being built to protect the site and the surrounding area from contamination in case of flooding. Shown here is an artist's conception of the planned berm superimposed on a photograph of the Plant. Spill containment devices will be constructed at DOE sites where they are needed to comply with the Resource Conservation and Recovery Act (RCRA) and other applicable laws.



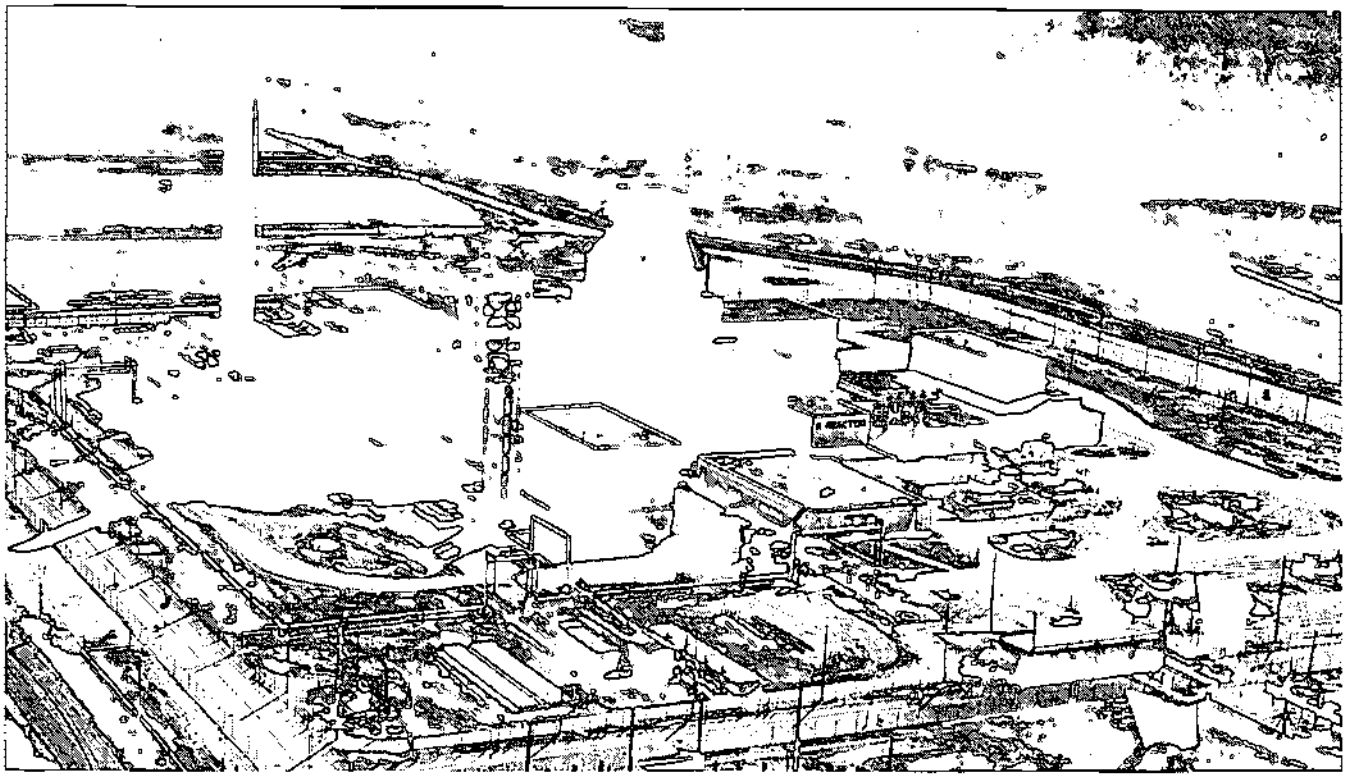
The ventilation systems at DOE's gaseous diffusion plants, such as the Paducah, Kentucky one shown above, are over 40 years old. These ventilation systems contain gaskets that were impregnated with PCB-containing materials. DOE is taking action to prevent PCB oils from escaping from these systems.



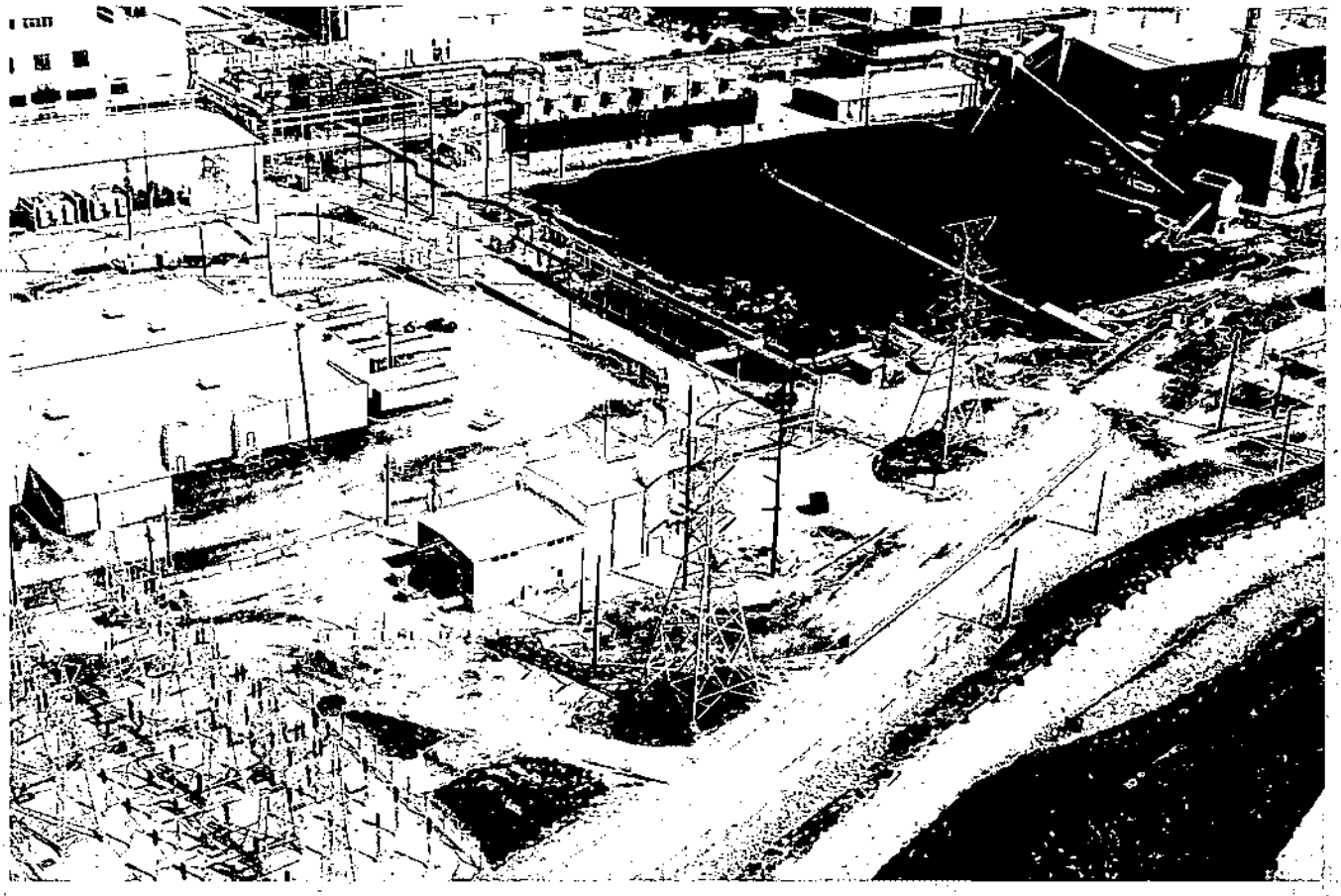
The Central Neutralization Facility was constructed to bring the Oak Ridge Gaseous Diffusion Plant, in Tennessee, into compliance with National Pollutant Discharge Elimination System (NPDES) limits. The facility treats wastewater to remove uranium and chemical contaminants.



The new Nonradiological Waste Water Treatment Project, at Oak Ridge National Laboratory in Tennessee, treats process waste water to remove organics and metals. The operation of this facility will comply with the National Pollutant Discharge Elimination System (NPDES) provision of the Clean Water Act.



A cooling tower is being built at K-Reactor at the Savannah River Site, in Aiken, South Carolina, to comply with the National Pollutant Discharge Elimination System (NPDES) provision of the Clean Water Act.



The Coal Pile Run-Off Treatment Facility at the Y-12 Plant in Oak Ridge, Tennessee, collects run-off from coal piles and treats it to avoid contamination of the East Fork Poplar Creek and to comply with the Clean Water Act.

Environmental Restoration

The goal of environmental restoration is to ensure that risks to human health and safety and to the environment posed by DOE's past, present, and future operations at its facilities and sites are either eliminated or reduced to prescribed, safe levels. The Environmental Restoration Program assesses and cleans up sites and facilities contaminated with radioactive, hazardous and mixed waste as a result of past operations connected with DOE nuclear programs. These sites and facilities must be cleaned up to meet Federal, State, and local regulations. DOE recognizes that some facilities and sites will be returned to a condition suitable for unrestricted use; however, in certain instances, in-place remedies, such as in situ treatment for destruction or detoxification, and stabilization followed by monitoring, may be a preferred alternative. Remediation decisions will be made in accordance with the regulatory and public interaction processes prescribed by law.

Environmental Restoration consists of two sets of activities: Remedial Actions and Decontamination and Decommissioning (D&D). Remedial Actions encompass (1) site discovery, preliminary assessment, and site inspection; (2) site characterization, analysis of remediation alternatives, and selection of remedy; (3) remediation and site closure; and (4) site compliance monitoring. Although Remedial Actions may deal with surface water contamination or with tanks, buildings, or structures, most Remedial Actions activities are concerned with contaminated soil and groundwater. The number of hazardous substance release sites is approximately 3,700. The Uranium Mill Tailings Remedial Action (UMTRA) Project addresses the cleanup of sites and adjacent (or vicinity) properties contaminated with tailings from inactive uranium mills. The UMTRA Project is responsible for 24 former uranium ore processing sites, and an additional 5,000 vicinity properties. Remedial Actions are completed or started at 15 of the 24 sites; 4,200 vicinity properties have been completed. The Formerly Utilized Sites Remedial Action Program (FUSRAP) addresses the cleanup of sites and adjacent properties contaminated by activities of the Manhattan Project. The FUSRAP scope is 43 sites, of which 11 have been completed.

D&D is concerned with the safe caretaking of surplus nuclear facilities until their decontamination, followed by entombment, dismantling and removal, or conversion to another non-nuclear use. D&D tasks encompass (1) surveillance and maintenance; (2) assessment and characterization; (3) environmental review; (4) engineering design; (5) D&D operations; (6) waste disposal; and (7) closeout. Although D&D activities may deal with soil and

Environmental Restoration

groundwater contamination, most are concerned with facilities such as reactors, hot cells, processing plants, storage tanks, and other structures from which there have been no known releases to the environment. Approximately 500 contaminated facilities are included under D&D.

The Environmental Restoration and Remediation Process (page 22) shows that information is collected and analyzed to help identify and evaluate potential cleanup remedies that meet requirements under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Resource Conservation and Recovery Act (RCRA), and the National Environmental Policy Act (NEPA). CERCLA addresses the uncontrolled releases of hazardous substances to the environment and the cleanup of former or otherwise inactive waste sites. RCRA addresses the management of regulated hazardous waste and requires that permits be obtained for DOE facilities that treat, store, or dispose of hazardous waste or mixed waste. RCRA also establishes standards for these facilities, and requires corrective activities (e.g., remediation) for past releases of hazardous waste from regulated waste management units. NEPA requires that DOE perform an environmental review, with public participation, of proposed major Federal actions that may have an impact on the human environment. This review usually results in an Environmental Assessment or Environmental Impact Statement. DOE's policy is to integrate NEPA requirements with CERCLA and RCRA requirements for all Environmental Restoration projects.

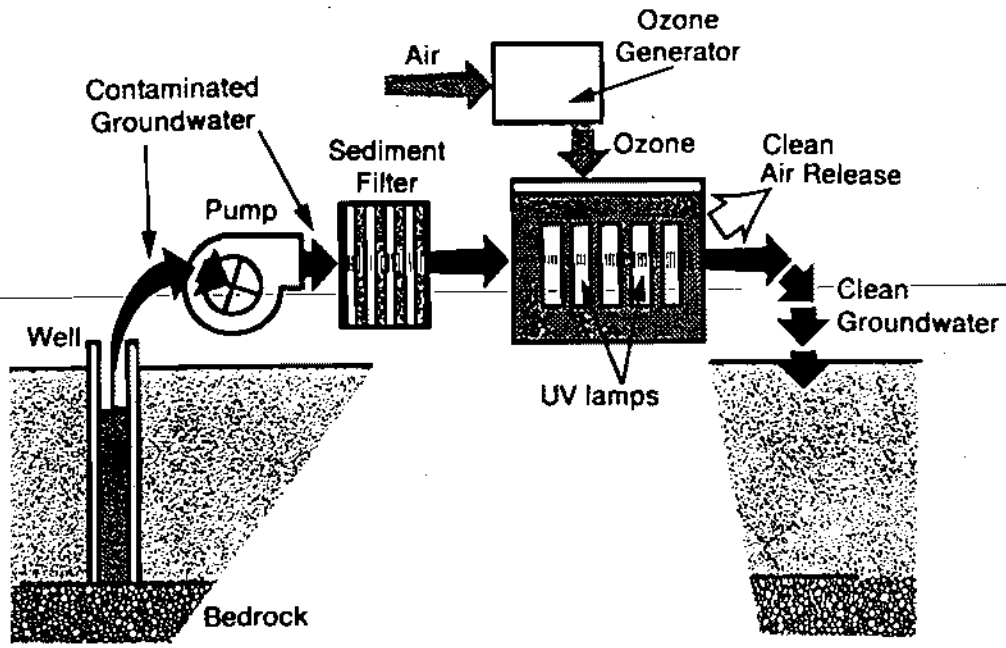
Environmental Restoration and Remediation Process:

DOE Assessment and Cleanup Phase Terminology	RCRA Terminology	CERCLA Terminology	D&D Terminology
Assessment Tasks			
Preliminary Assessment	RCRA Facility Assessment	Preliminary Assessment	Included in Characterization
Inspection	Included as a Part of RCRA Facility Assessment	Site Inspection	Included in Characterization
Characterization	RCRA Facility Investigation	Remedial Investigation	Characterization
Evaluation of Cleanup Alternatives	RCRA Corrective Measures Study	Feasibility Study Record of Decision (ROD)	NEPA Environmental Review Record of Decision (ROD) or Finding of No Significant Impact (FONSI)
Cleanup Tasks			
Cleanup Action	RCRA Corrective Measures	Remedial Design Remedial Action	Engineering & Operation
Compliance	Postclosure Monitoring	Operation and Maintenance	Postdecommissioning

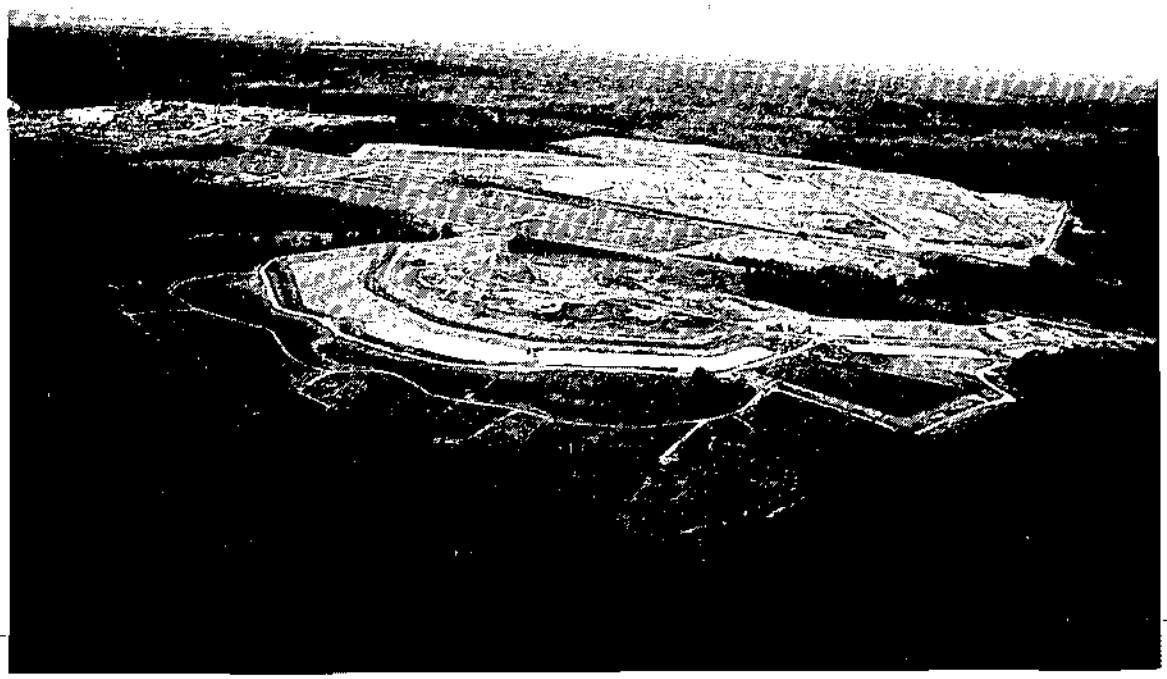
Note: An interim removal remedial action may be undertaken during any phase of the assessment task.

CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act
D&D: Decontamination and Decommissioning
RCRA: Resource Conservation and Recovery Act
NEPA: National Environmental Policy Act

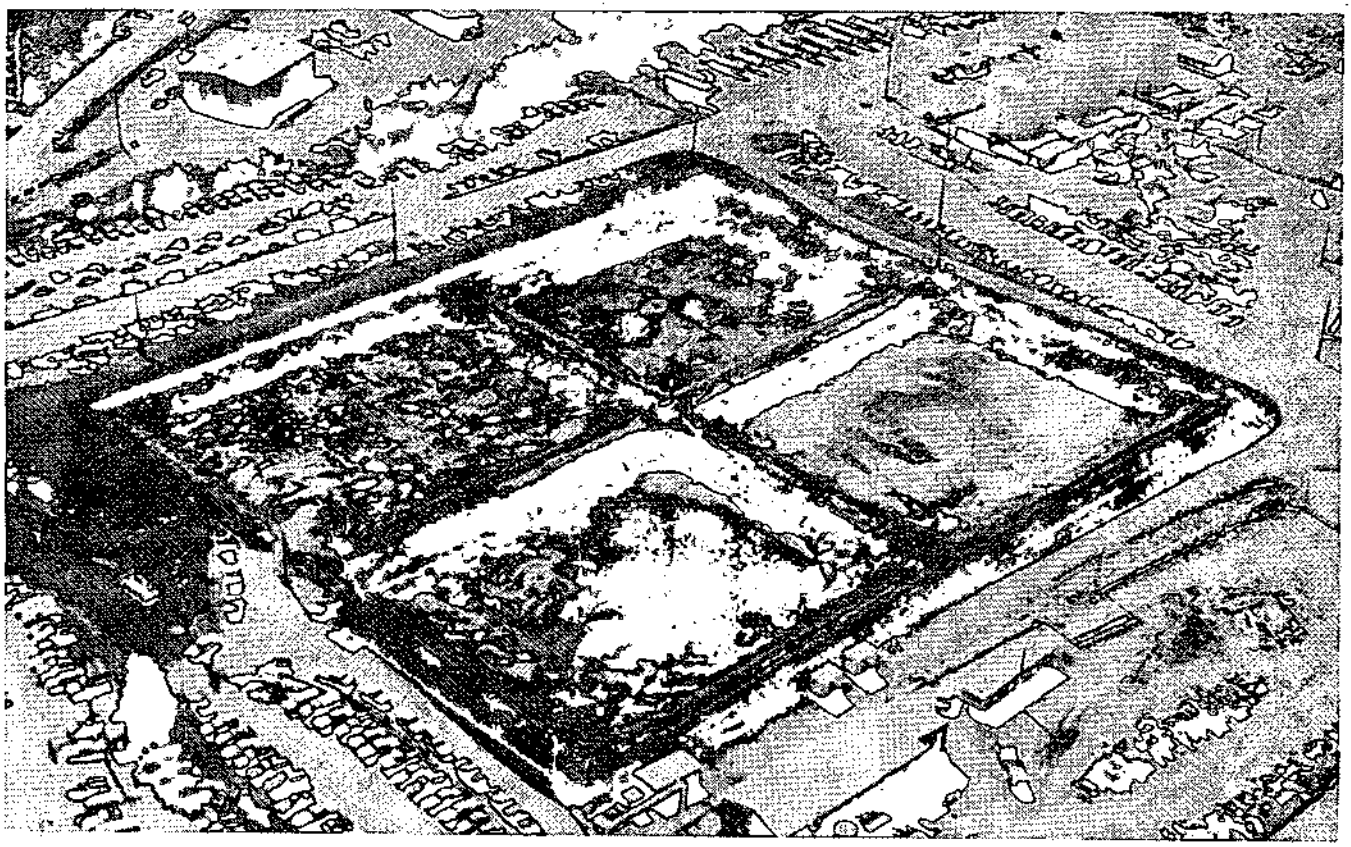
Remedial actions require completion of a lengthy evaluation and assessment process before actual waste handling, decontamination, treatment, removal, or storage can take place.



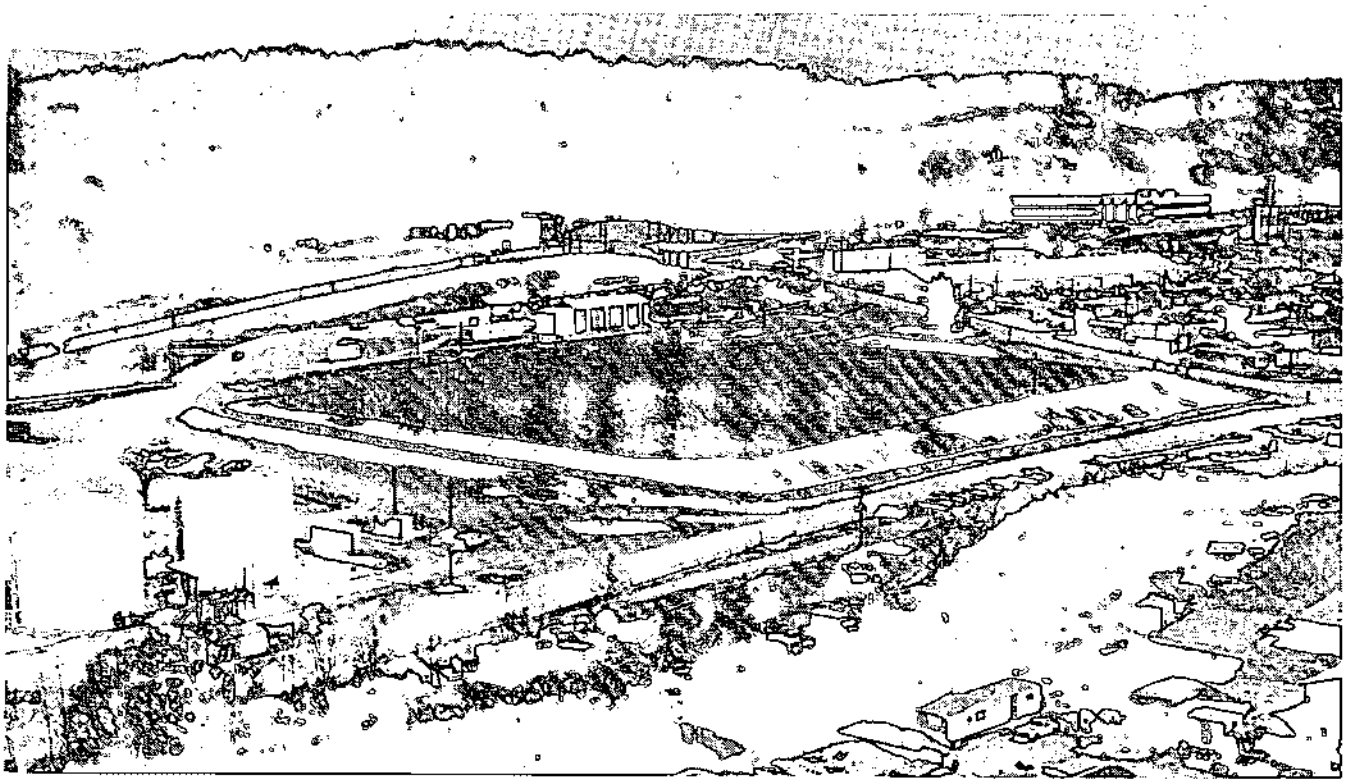
At a pilot plant in Kansas City, groundwater contaminated with organic compounds is exposed to ozone and ultraviolet light in a reaction chamber. The process breaks down contaminants, leaving only carbon dioxide, nitrogen, hydrogen, and water.

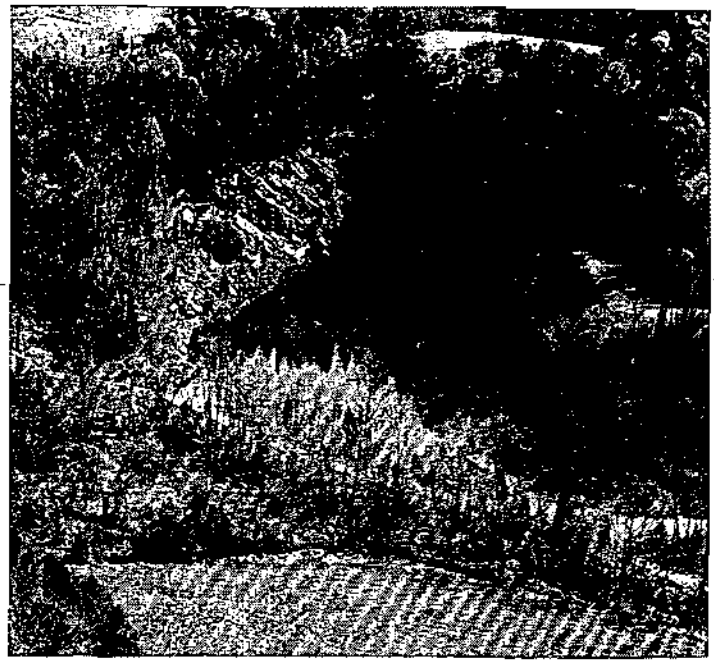


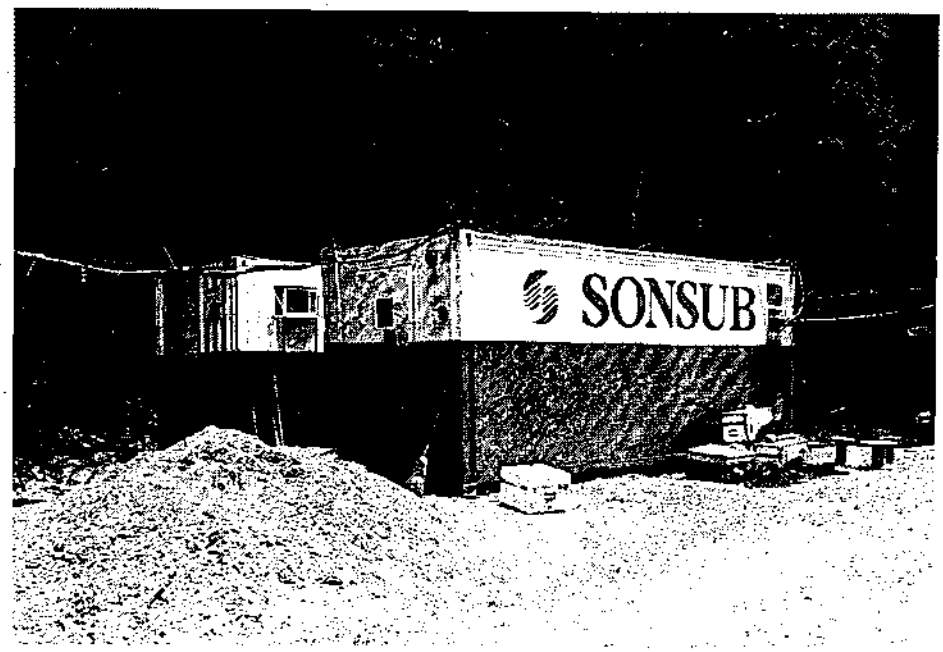
At the Savannah River Site in South Carolina, seepage basins that collected waste water have been emptied and closed. The waste water was treated to remove contaminants, and the basins were drained and capped.



The four ponds in the photograph above are part of a waste water treatment facility for acid and organic waste containing uranium. In the past, the four ponds were used for disposal of these materials at the Y-12 plant in Oak Ridge, Tennessee. The liquid in these ponds was treated to remove contaminants, and the ponds were drained and capped, as shown below.

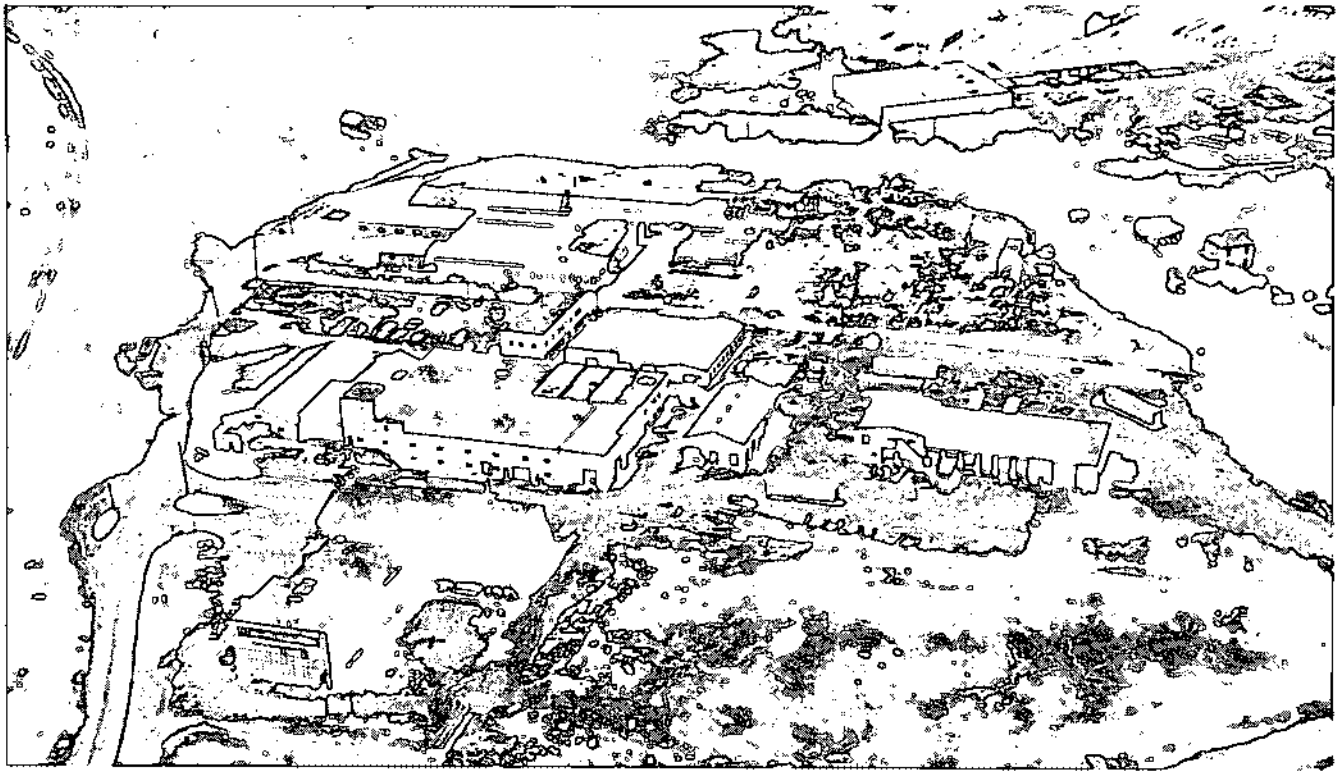




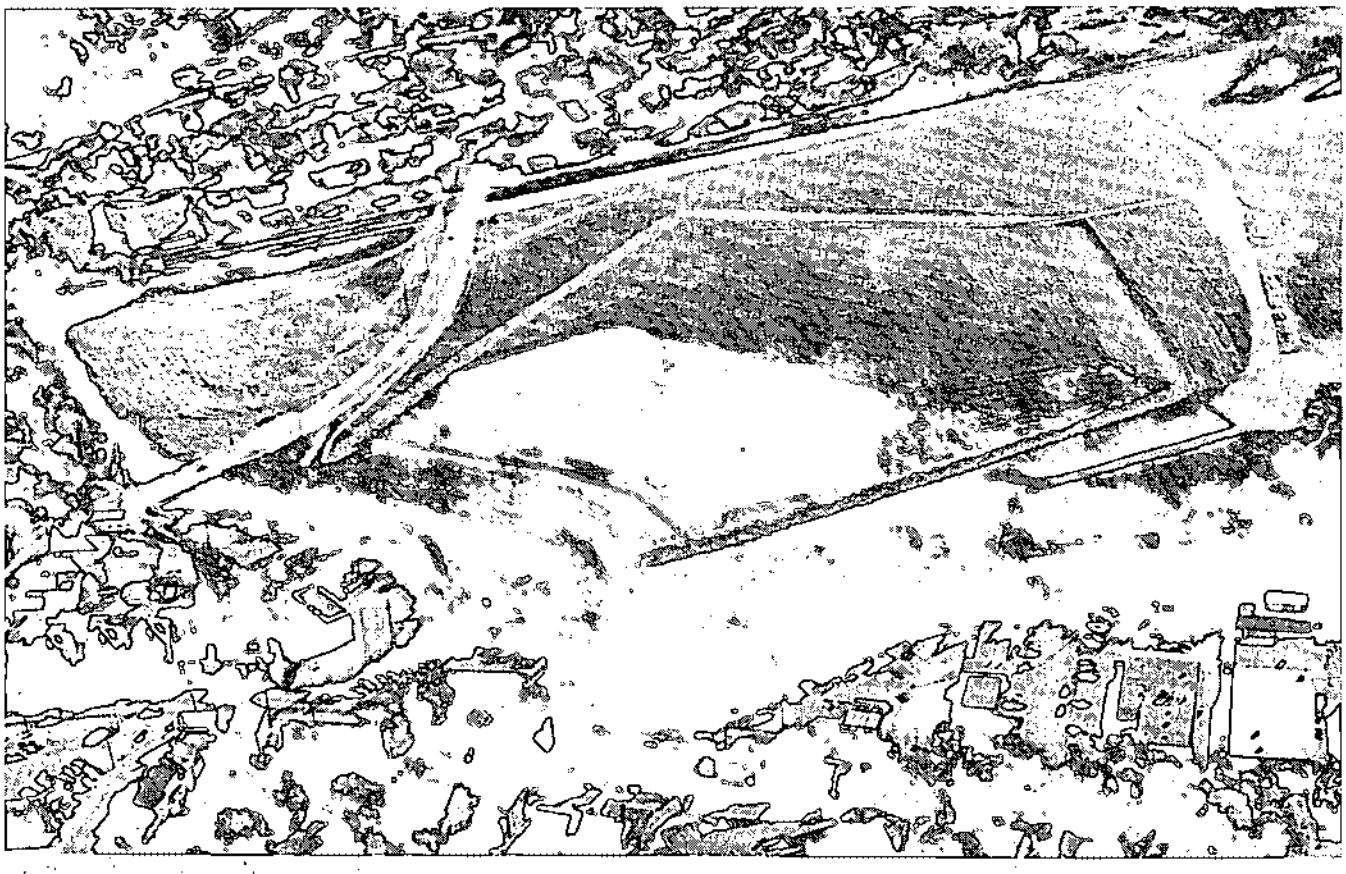


At the Kerr Hollow Quarry on the Oak Ridge Reservation in Tennessee, several thousand potentially hazardous containers are being removed. The quarry was used for treatment of water-reactive materials and potentially explosive chemicals, and for disposal of empty, compressed gas cylinders. The quarry water contains no traces of hazardous materials.

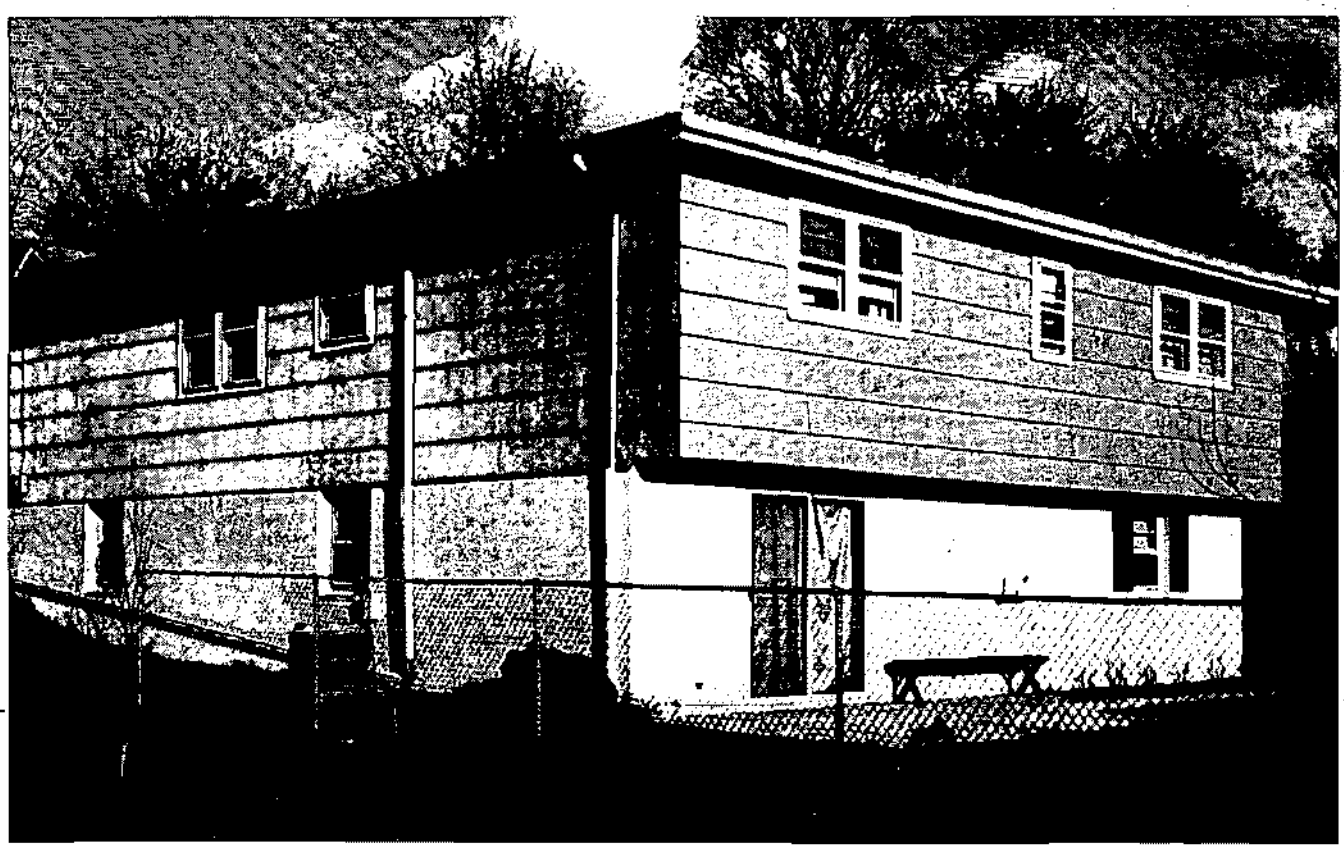
The SONSUB Remotely Operated Vehicle (shown in the upper right-hand corner), will perform an underwater inspection of the containers. Following the inspection, the empty containers will be removed from the quarry area and placed in a DOE-permitted landfill. Workers monitor the submarine's activities from trailers, as shown above.

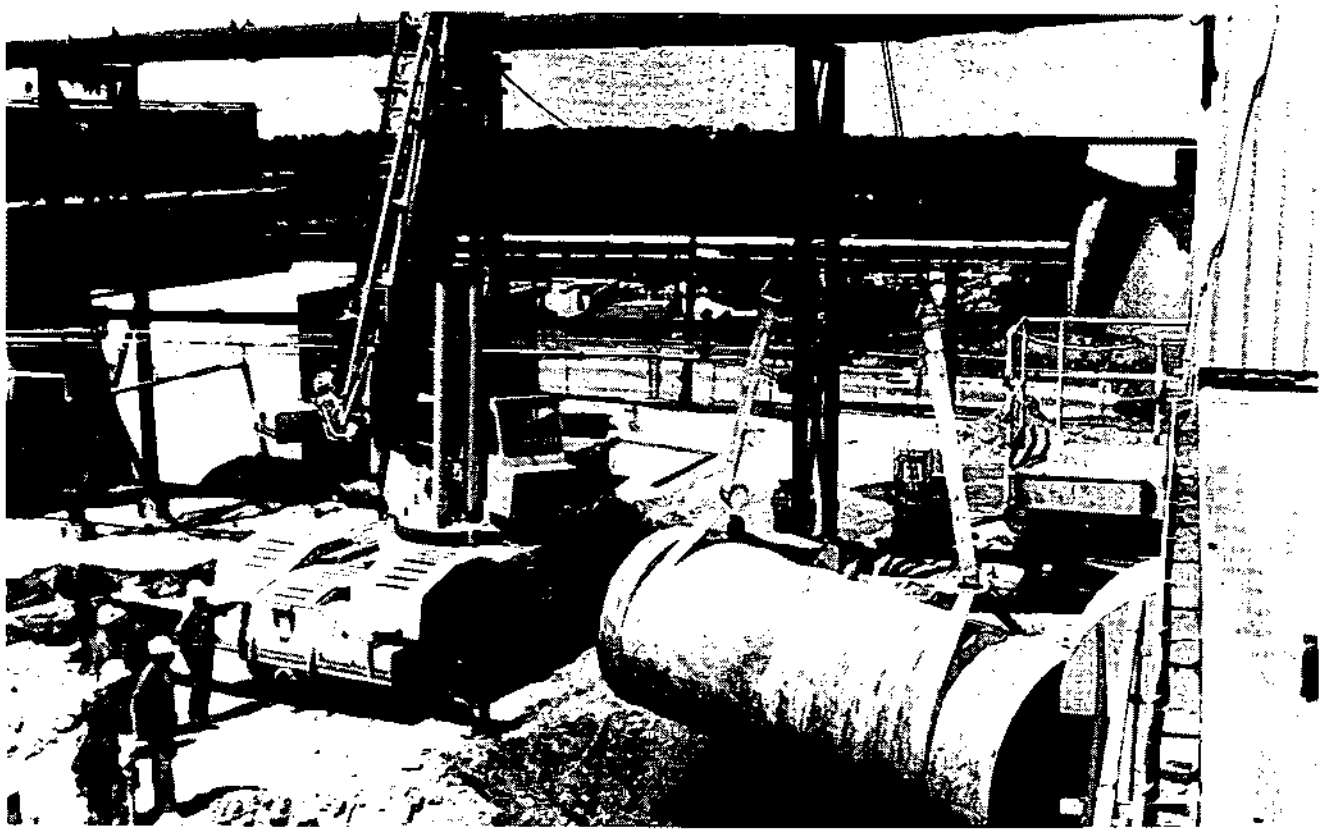


The Uranium Mill Tailings Remedial Action (UMTRA) Project evaluates and cleans up sites contaminated with, for example, fill dirt from a uranium mining site. This site in Canonsburg, Pennsylvania required complete removal of all buildings.

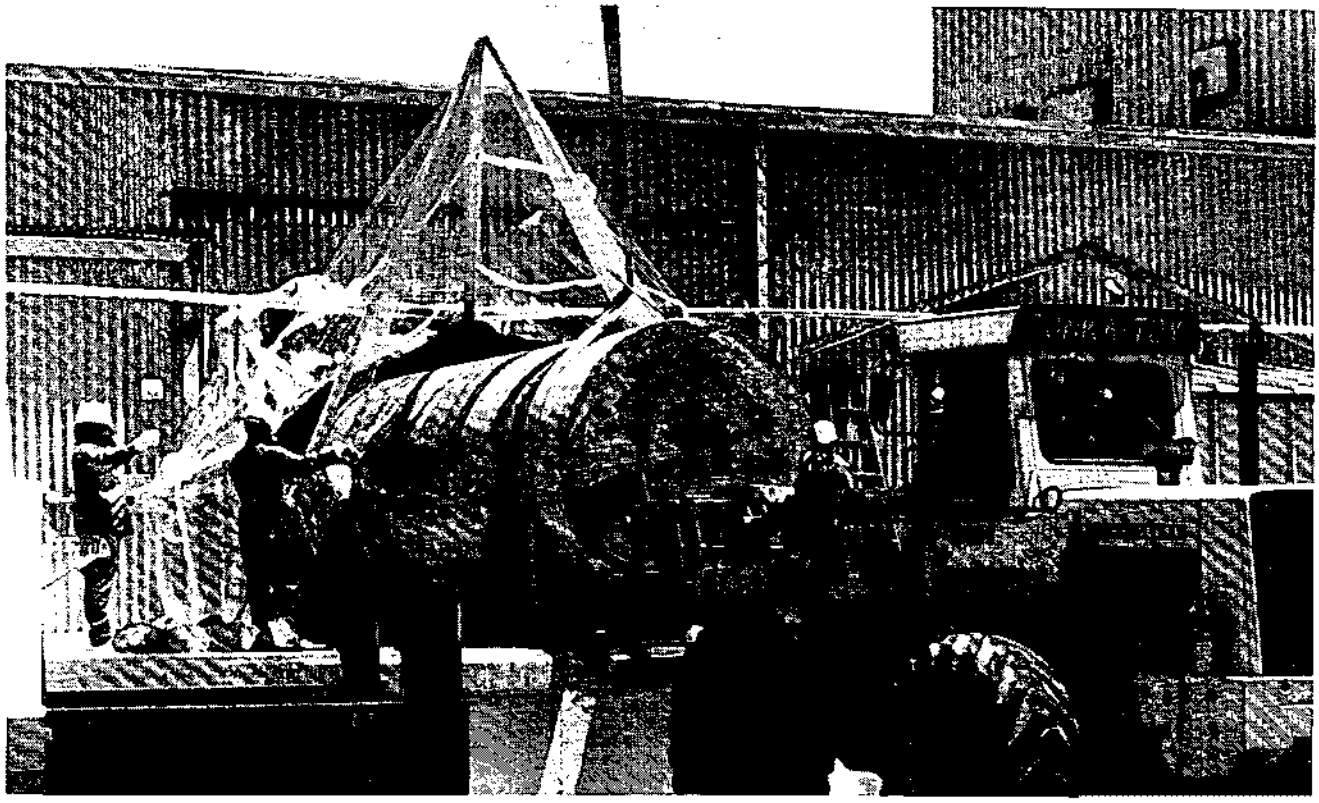


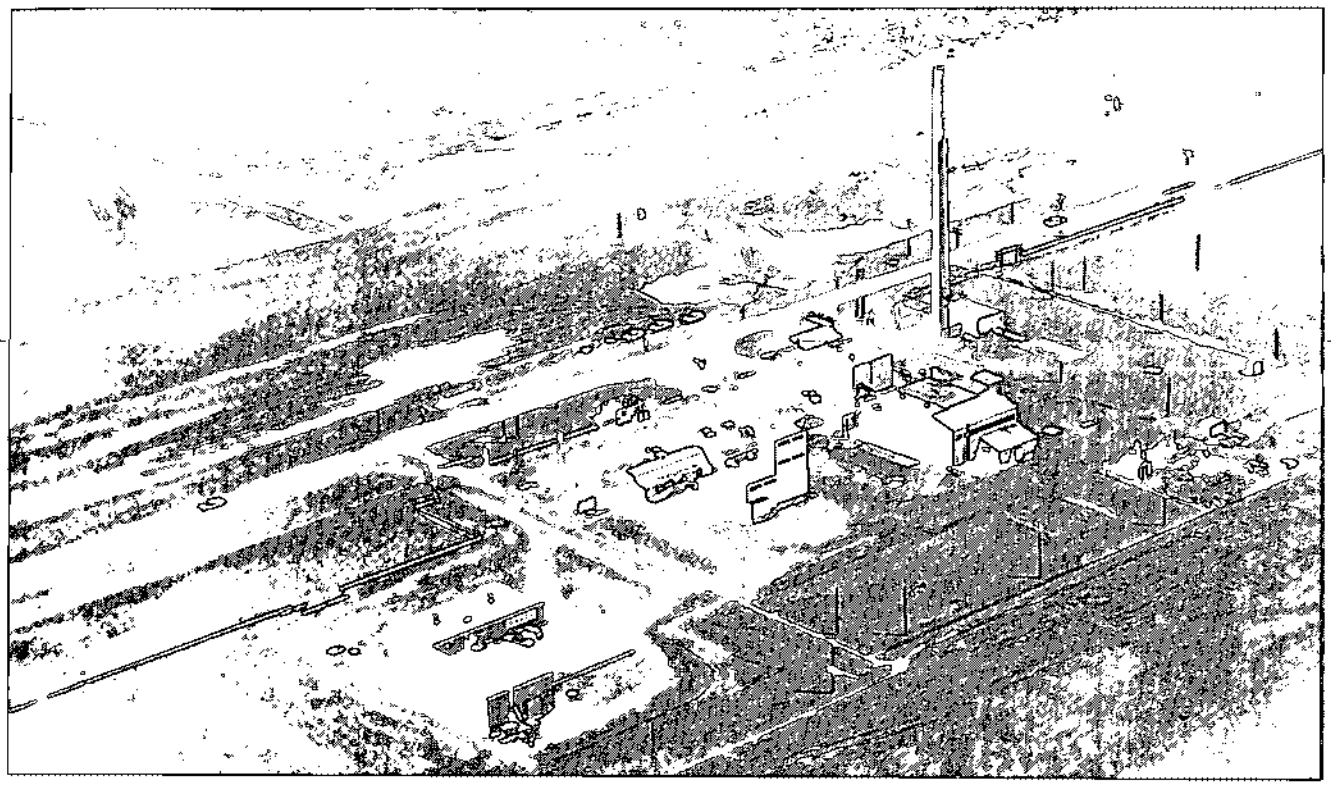
The Formerly Utilized Sites Remedial Action Program (FUSRAP) ensured that this non-DOE property in Maywood, New Jersey was remediated. Before their hazard was recognized, mill tailings were used as fill in populated areas. FUSRAP activities include their removal and replacement with uncontaminated soil or other uncontaminated materials. Similar cleanups have been conducted under the Uranium Mill Tailings Remedial Action (UMTRA) vicinity properties cleanup program.



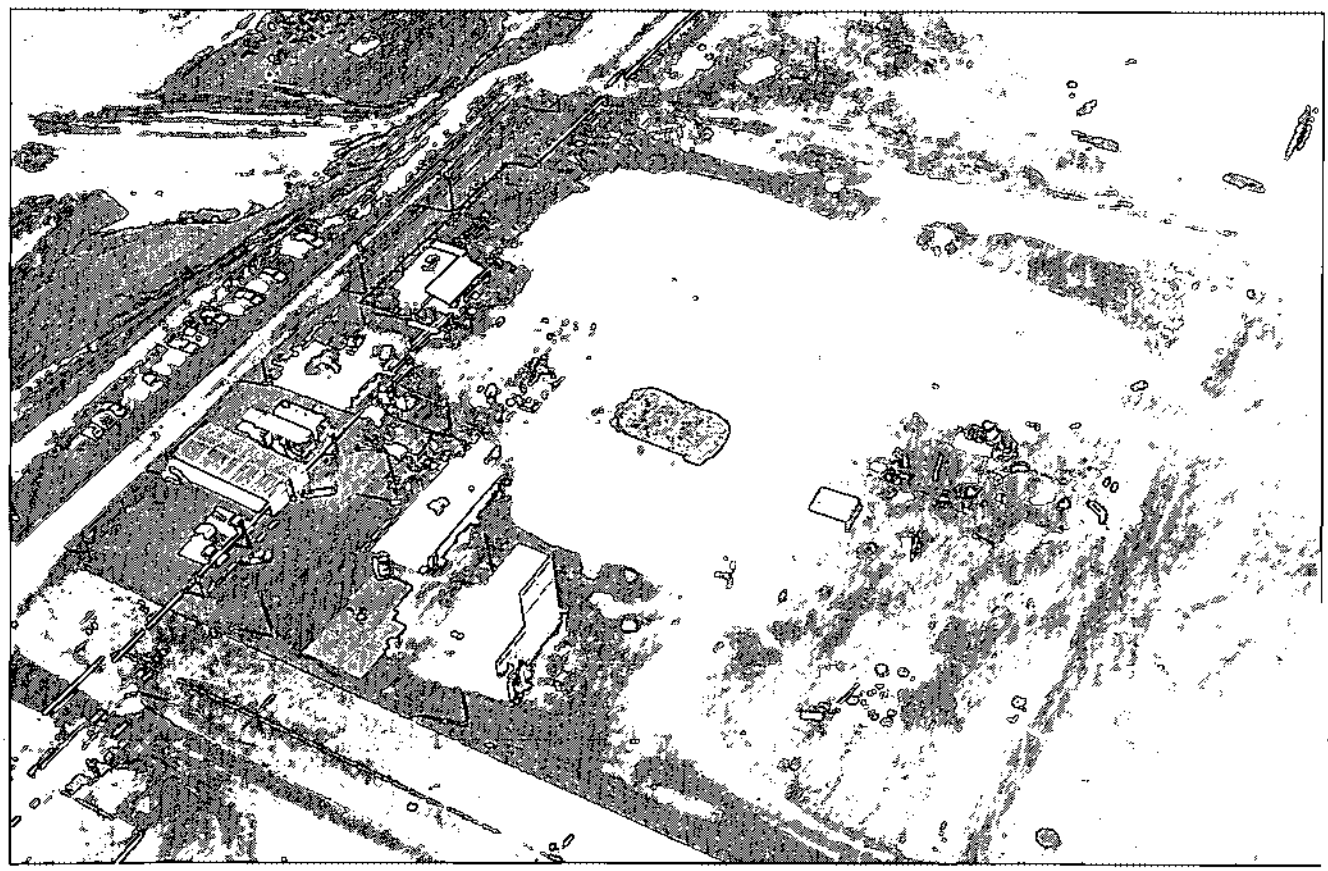


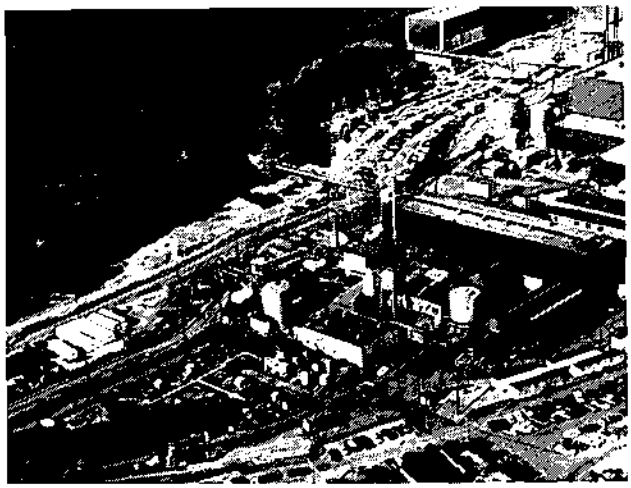
One step in the decommissioning of a plutonium facility in Miamisburg, Ohio involved draining and excavating two large liquid waste tanks containing radioactively contaminated methanol. The tanks were moved inside the building for decontamination and size reduction before disposal.

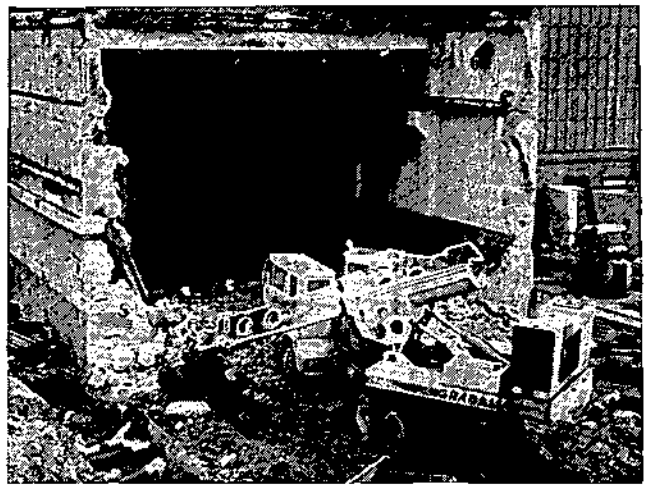


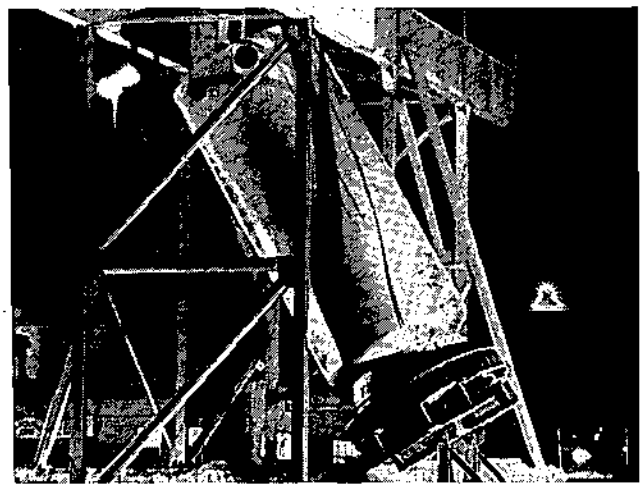


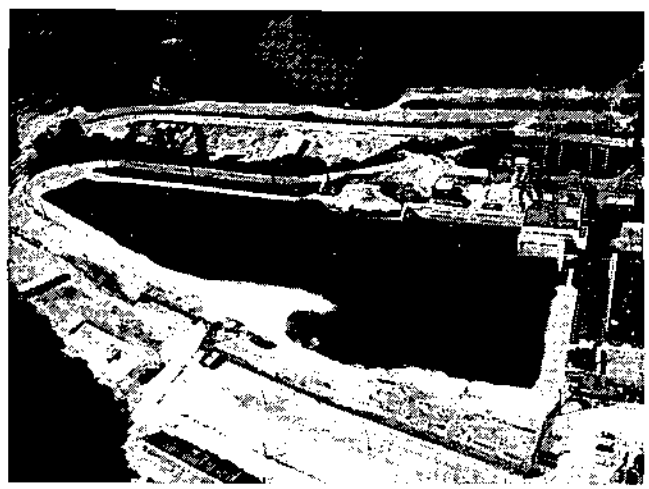
The 201-C Strontium Semi-Works at the Hanford Site in Washington State were completely removed and the site restored. The stack and buildings were demolished and radioactive waste was disposed of at the Hanford Site.









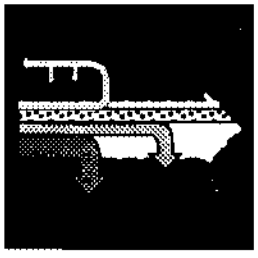


Decommissioning the Inactive Shippingport Atomic Power Station involved activities ranging from demolishing all structures to planting grass. The reactor vessel package and all radioactive components were removed and safely transported to the Hanford Site in Washington State for permanent disposal.

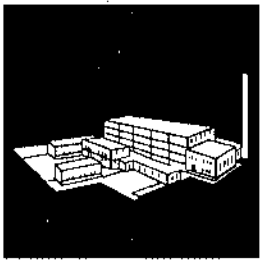
Waste Management

Waste Management's (WM) function is to manage, account for, and dispose of DOE waste in a safe and environmentally sound manner. Achieving this purpose yields two benefits. It protects people and the environment today and in the future, and it avoids the creation of additional waste sites.

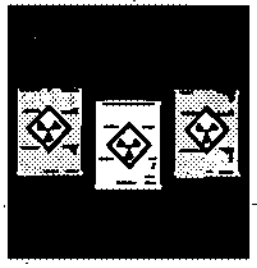
WM accepts waste produced by DOE's processing, manufacturing, and research activities and manages this waste using appropriate treatment, storage, and disposal technologies. Aside from managing waste materials on a daily basis, another fundamental goal is to achieve reductions in the volume and toxicity of hazardous, mixed, radioactive, and sanitary waste generated by DOE's activities. Waste minimization programs are promoted at all DOE sites to assist the waste generators with detailed planning and implementation. Another goal is to provide treatment, storage, and disposal capacity to accommodate both the waste currently stored and the waste expected from future operations.



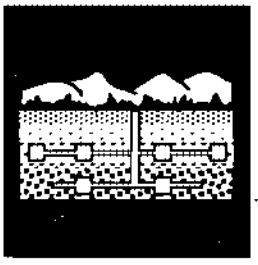
MINIMIZATION



TREATMENT



STORAGE



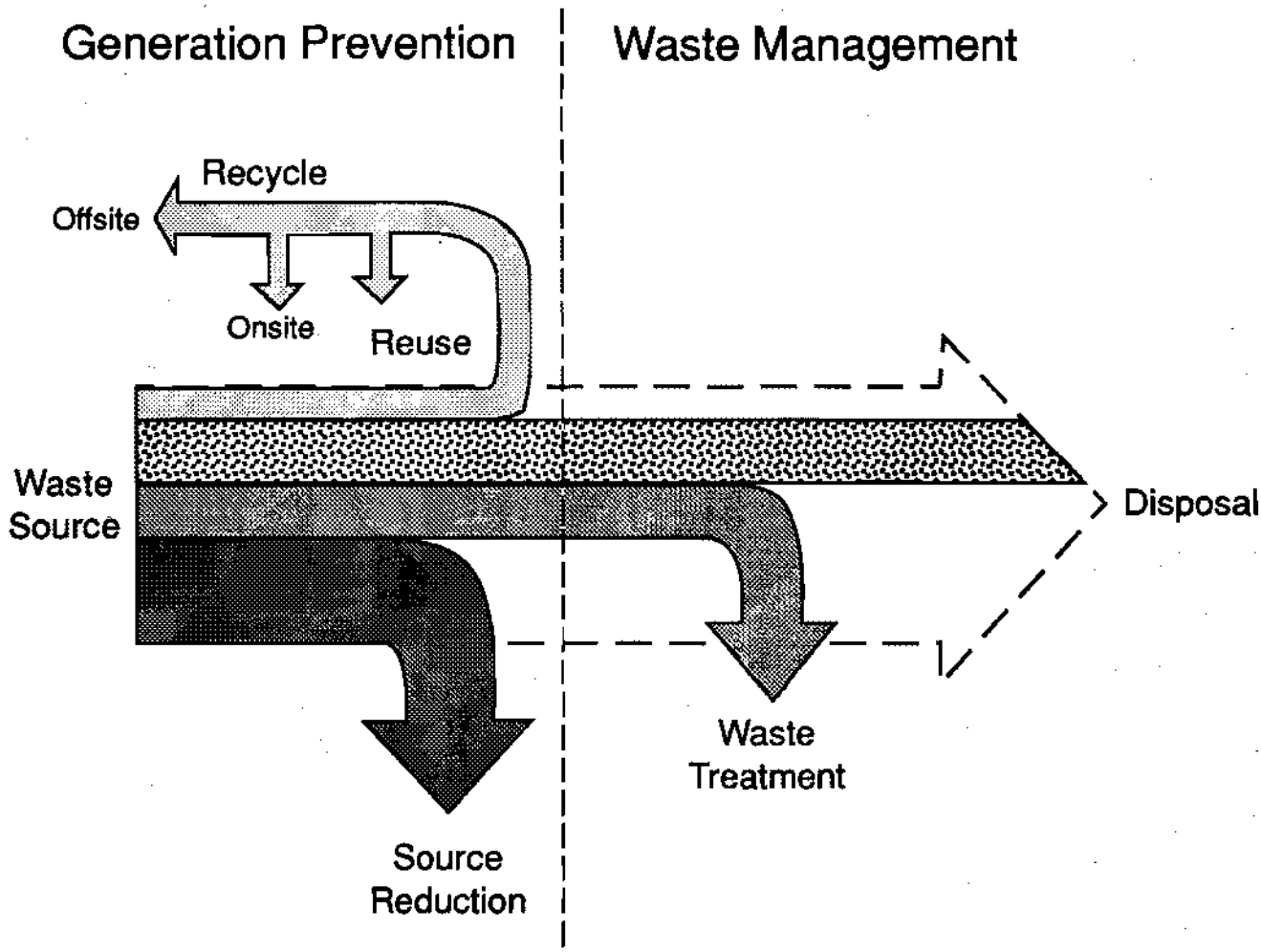
DISPOSAL

Waste Minimization

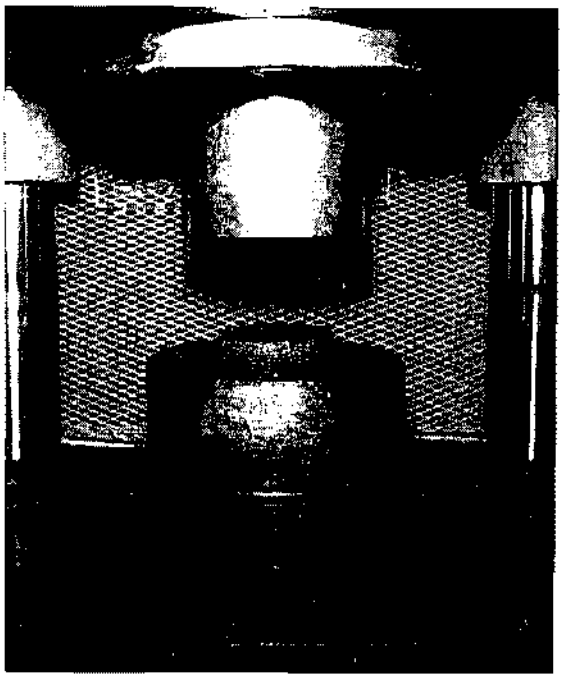
Although historically understood, in part, as reduction in waste volume and concentration, true waste minimization must be seen as avoidance of the generation of radioactive, hazardous, mixed, and sanitary waste. DOE is making waste minimization a key objective, not only in process and facility modification, but also in the procurement of goods and services. Waste minimization technology is the most interdisciplinary of the waste management tools, affecting all present and proposed DOE operations. Establishing a waste minimization program requires cultural as well as technical changes in the DOE complex. A "design for minimization" philosophy must be adopted across the DOE system.

The objective of waste minimization is to achieve a 50 to 80 percent reduction in manufacturing waste generation (FY 1985 baseline) using material substitution, process alteration, new production hardware, and recycling. A comprehensive waste minimization program contributes to decreases in waste treatment, storage, and disposal costs and lower health risks to workers and the public. Technical approaches are being sought to (1) minimize the number of production operations required; (2) increase the use of nonhazardous chemicals and chemicals that produce waste compatible with the environment; (3) increase the use of recyclable chemicals and materials; and (4) design new products, processes, and facilities or redesign existing ones to generate less waste. Some criteria to determine a successful technology include improved processing yield, reduced quantities of scrap, reduced waste and processing of byproducts, reduced use of hazardous chemicals, positive return on investment, and no loss of product quality.

Waste Reduction

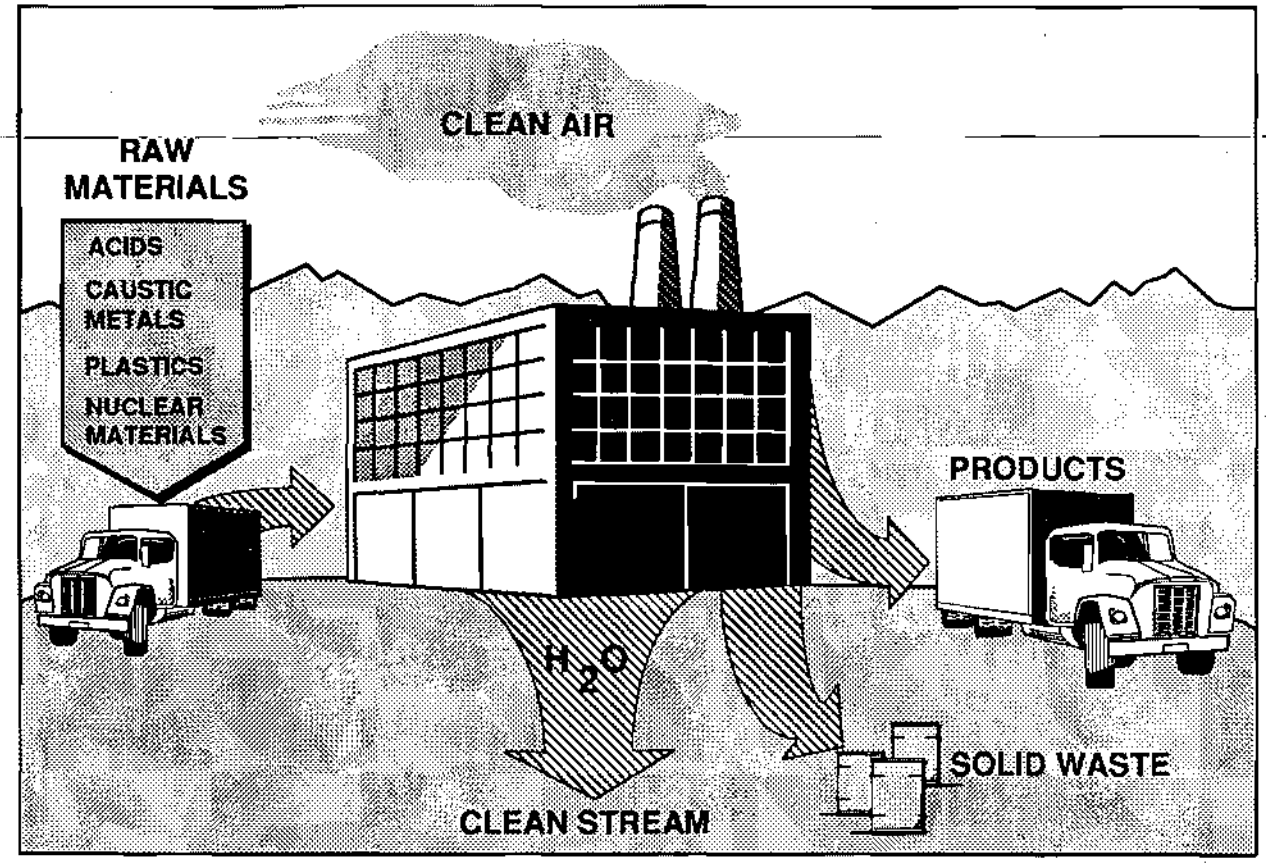


Generation prevention is applied to manufacturing activities to reduce the amount of waste produced. Source reduction, rather than recycle, is the major focus of waste minimization. Adjusting manufacturing processes will help reduce the amount of waste that requires treatment and disposal.



New technology for uranium recycling can reduce waste and lower waste treatment, storage, and disposal costs considerably at the Oak Ridge Y-12 Plant in Tennessee. Scrap from machining operations is processed and compacted into billets which are returned to the manufacturing operation, thereby reducing the amount of new uranium purchased by DOE.

This new process for enriched uranium waste minimization eliminates 100 percent of the fluoride chemical waste and reduces the total process waste 30 to 60 percent. The uranium recovered by this system can be reused with lower overall waste handling cost.



Through changes in manufacturing technology, waste can be made environmentally benign.

Treatment

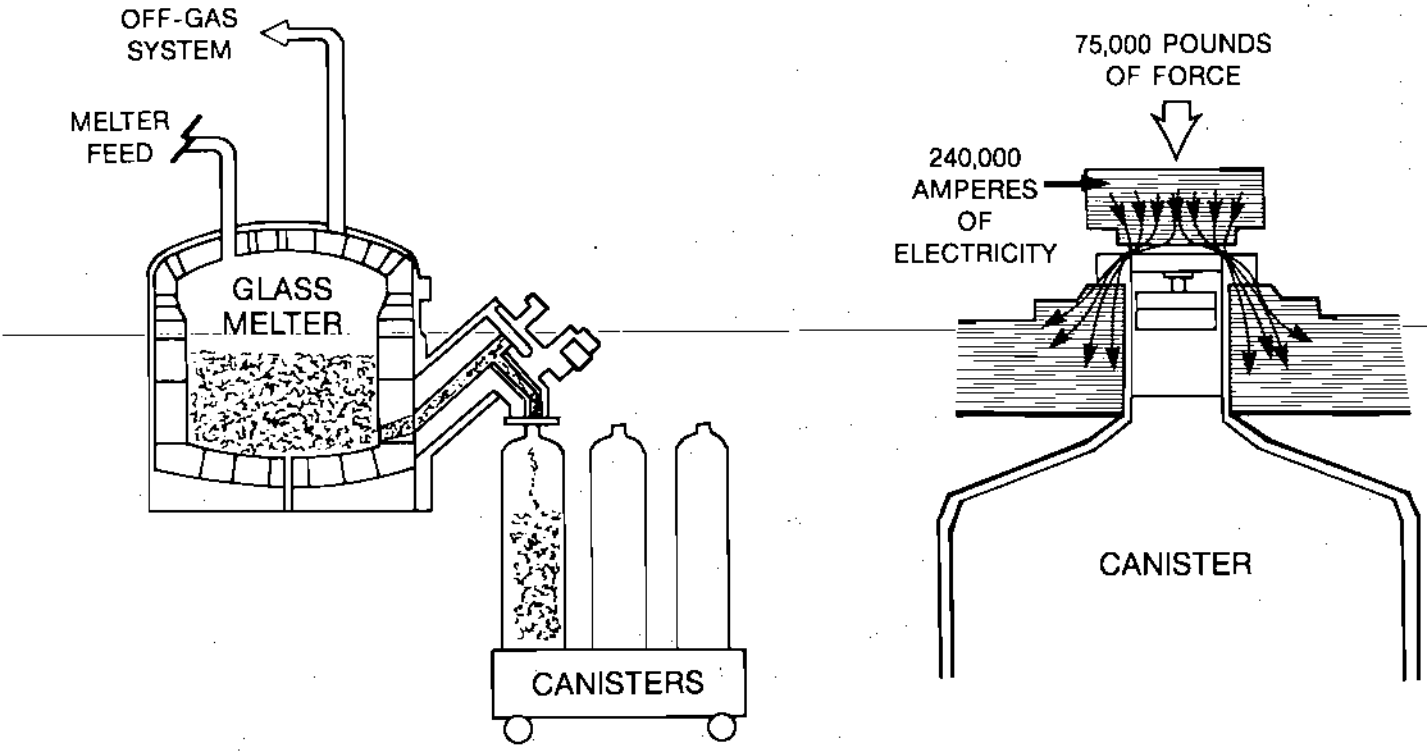
Treatment facilities process waste to reduce the volume or toxicity of radioactive and hazardous chemical material and make it safer to handle. Selection of treatment methods depends on the quantity and form of the waste material.

Chemical processing plants take liquid waste or sludge and convert it to a waste form suitable for permanent disposal in a geologic repository. Liquid waste can be solidified by spraying droplets onto hot particles and removing moisture (calcining). Sludge can be immobilized by mixing it with molten glass particles (vitrification).

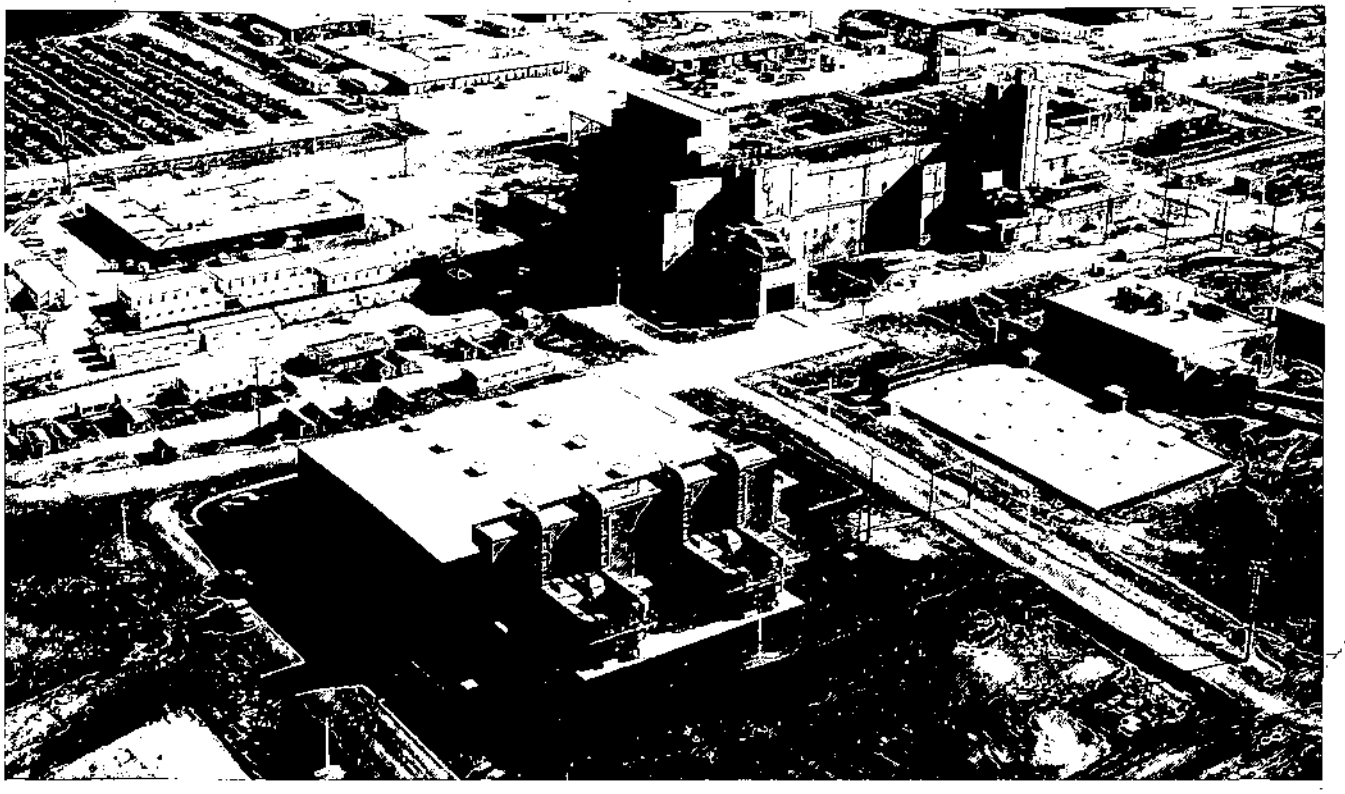
The volume of solid waste can be reduced through processes such as compaction, incineration, smelting, and acid digestion.

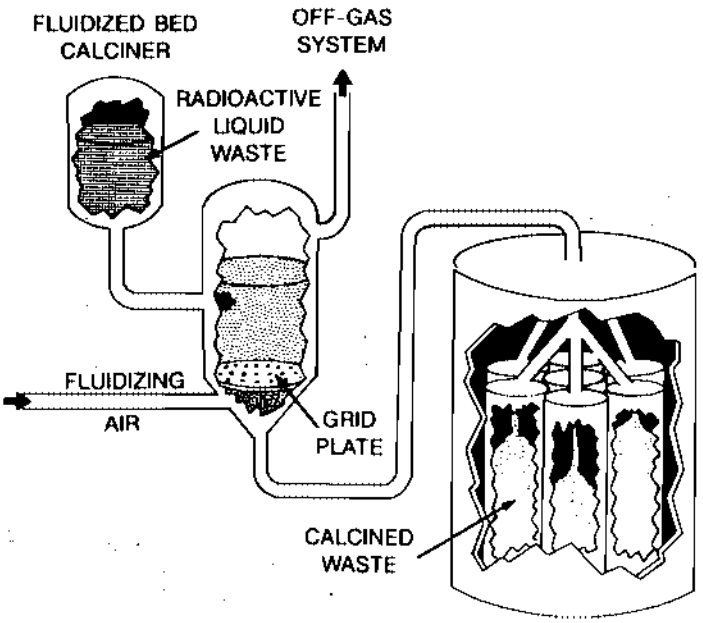
DOE's near-term objective is to treat hazardous waste as it is generated to avoid the need for additional storage capacity.

Few mixed waste treatment standards have been established. In May 1990, Congress established four new specific waste treatment standards for mixed waste containing mercury, lead, powdered zirconium, and high-level radioactive waste. DOE is building facilities to process these wastes in accordance with the new standards.

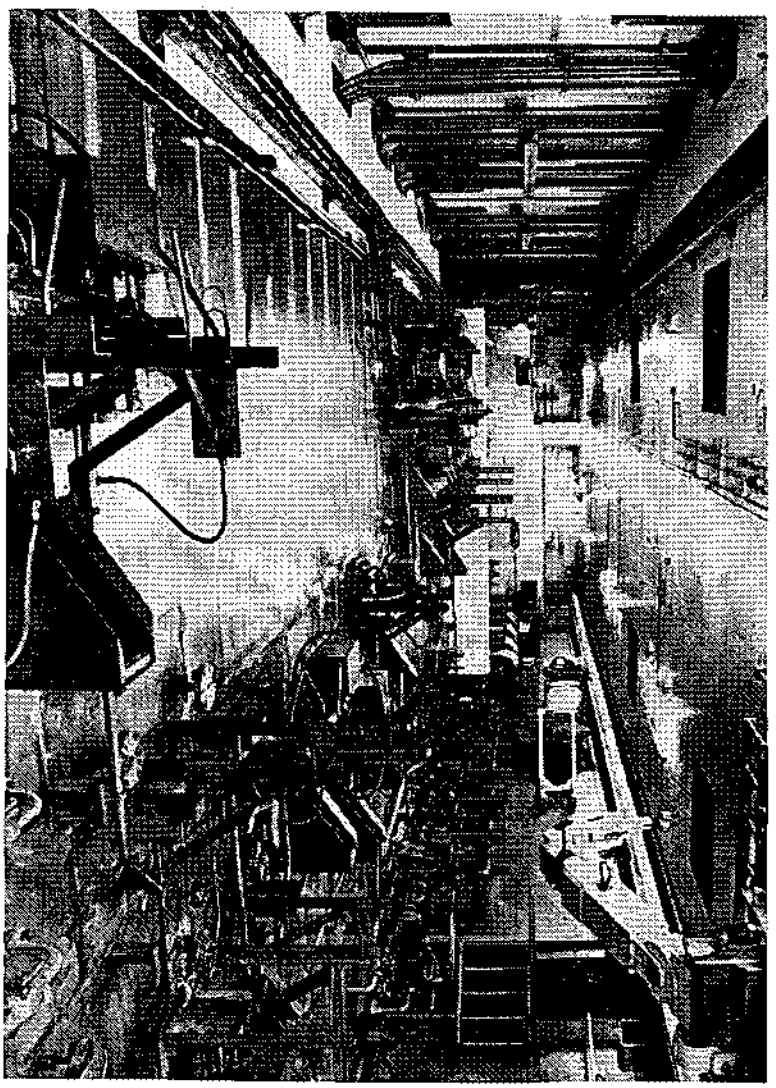


The Defense Waste Processing Facility (DWPF), at the Savannah River Site in South Carolina, will process high-level waste into a solid form suitable for permanent disposal. Radioactive sludge is dissolved in molten borosilicate glass and poured into stainless-steel canisters. A plug is fused to the canister opening resulting in a seal that is stronger than the canister itself. DOE plans to construct a similar facility for the Hanford Site in Washington State.



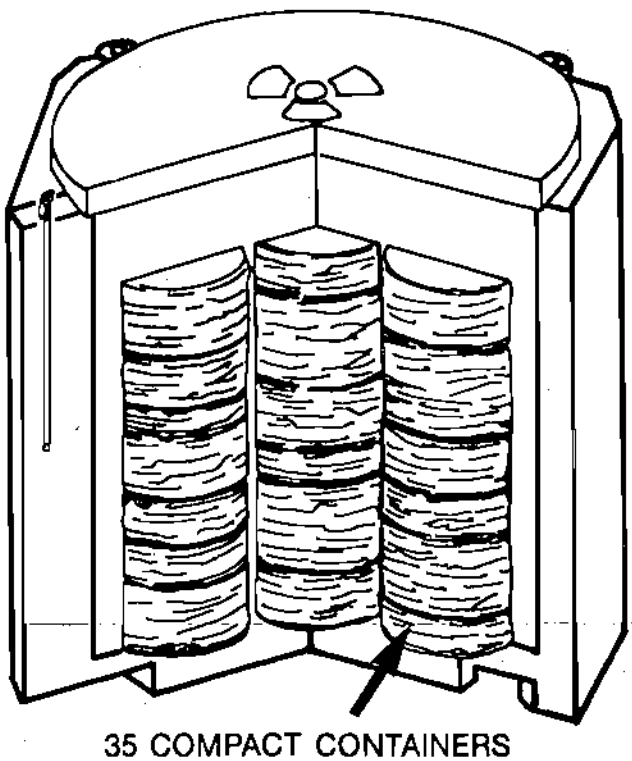


The New Waste Calcining Facility (NWCF) in Idaho converts high-level waste into calcine. Liquid waste droplets contact hot particles in the fluidized bed and solidify onto them. The granular end product is transported through pipes to stainless-steel bins. The bins, which have a life span of hundreds of years, are encased in underground concrete vaults.

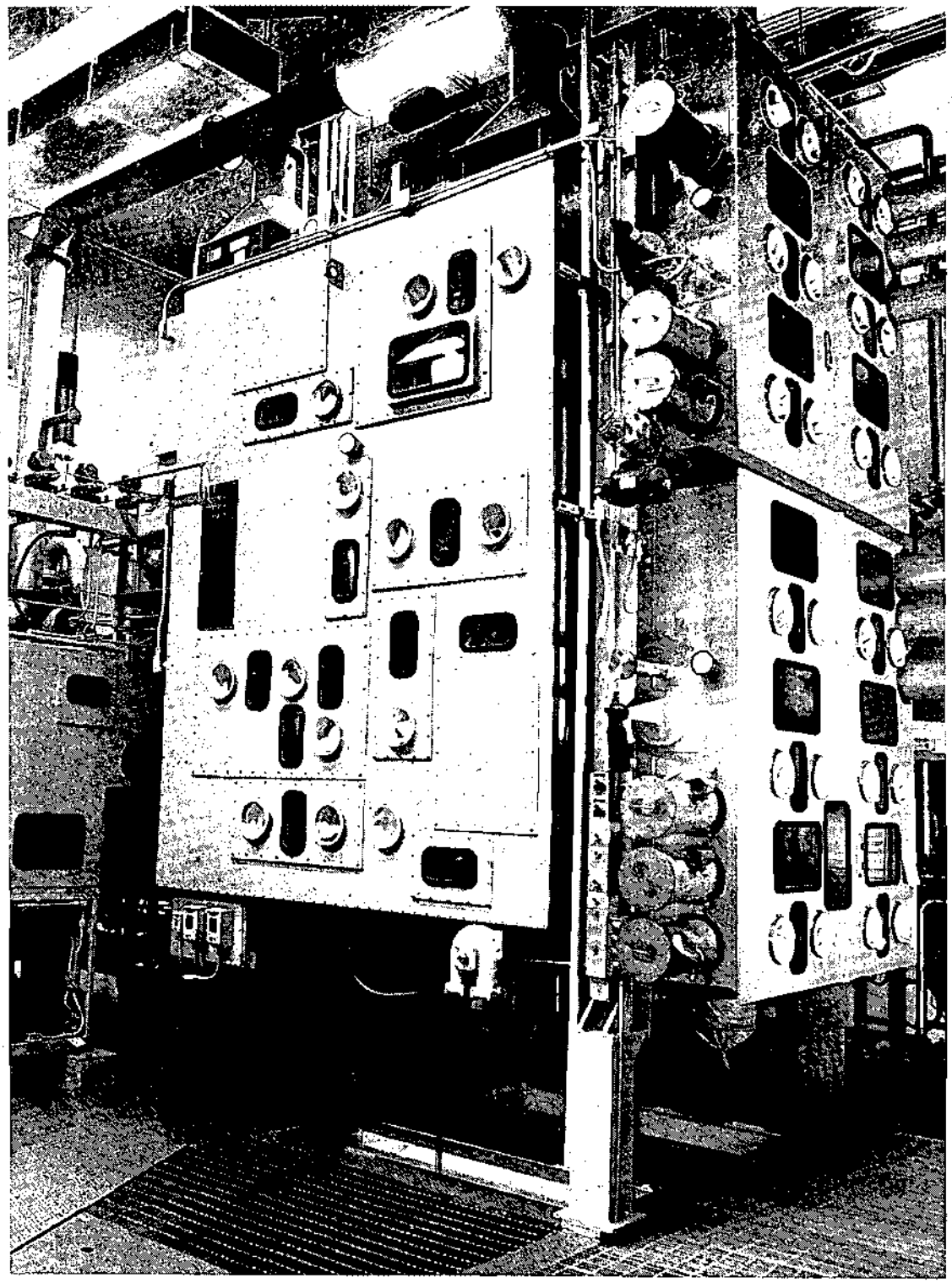


Remote maintenance systems in the New Waste Calcining Facility (NWCF) reduce personnel exposure to radiation and shorten plant maintenance downtime.

The volume of transuranic-contaminated material can be significantly reduced by various methods before storage or disposal. After treatment, the contents of the drum on the left will fit in the small can on the right.



Compaction of drums makes shipping easier and reduces required storage and disposal space.

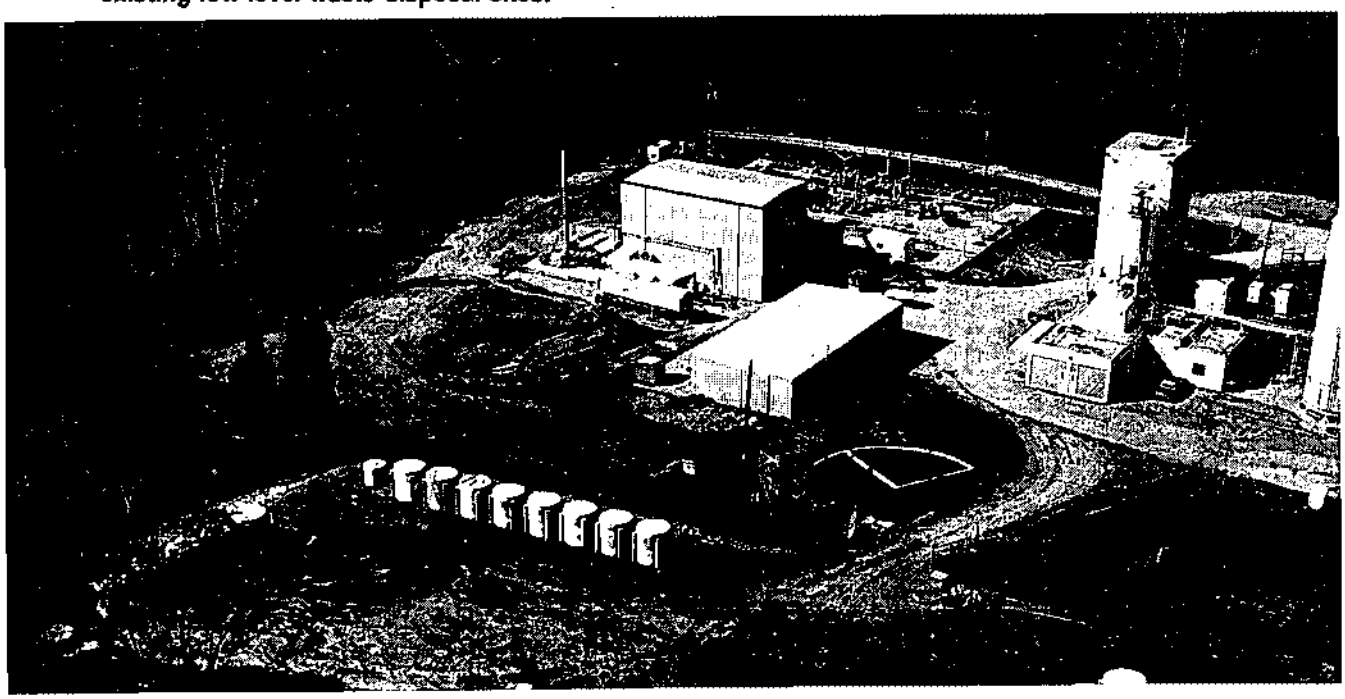


This radioactive and mixed waste controlled-air incinerator at Los Alamos National Laboratory in New Mexico will be used for volume reduction of transuranic waste and destruction of hazardous components of mixed waste. The incineration process, as it exists today, is the culmination of 15 years of research and development work. The extensive off-gas containment system removes radioactive particles, reduces off-gas temperature, and scrubs and absorbs acid gas from combustion of hazardous waste. The incinerator has been demonstrated to safely process radioactive waste without release of any radioactivity to the environment.

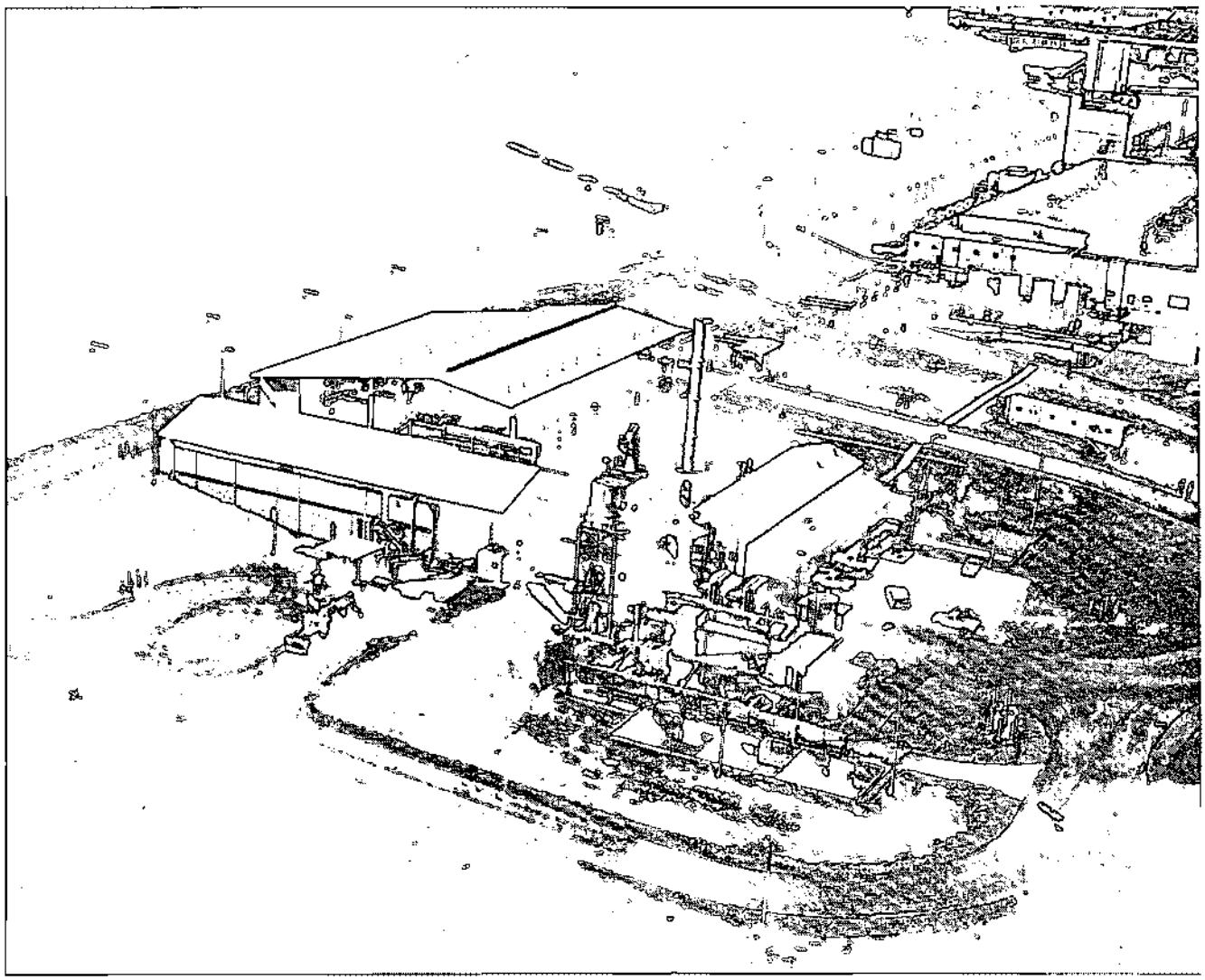
Before reduction

After reduction

The Waste Experimental Reduction Facility at the Idaho National Engineering Laboratory reduces the volume of low-level waste by as much as 300%. Volume reduction extends the lifetime of existing low-level waste disposal sites.



Shown above is a liquid low-level waste Storage and Treatment Facility at Oak Ridge National Laboratory in Tennessee. Liquid low-level waste is stored in underground tanks and solidified in the solidification building. This solidification process mixes low-level waste sludge with cement and fly ash, resulting in a grout mixture. The solidified grout is stored in above-ground vaults on a gravel pad awaiting final disposal.



This state-of-the-art Toxic Substances Control Act (TSCA) Incinerator in Oak Ridge, Tennessee is processing hazardous and mixed waste, such as uranium-contaminated polychlorinated biphenyls (PCBs) and contaminated waste oils, solvents, biological matter, and sludges. This incinerator uses a highly instrumented kiln and secondary combustion chamber, as well as an off-gas treatment system that holds gas for 4 seconds, twice what is required by Federal regulations. As part of a test program to evaluate the incinerator, significant upgrades were made to handle specific waste types more efficiently and effectively. This incinerator meets TSCA requirements of 99.9999 destruction efficiency to ensure no toxic emissions are released. Approximately one million pounds of mixed waste have been incinerated.

Storage

Waste storage is an interim measure. The goal of the Waste Management Program is to eliminate the backlog of stored waste and reduce inventories to normal operating levels. Storage of newly generated waste will become only a short-term operational step before disposal.

High-level waste is stored before it is stabilized in liquid form (combinations of liquid, salts from evaporation, and sludge) in double-wall, carbon-steel tanks encased in concrete. These double-wall tanks have capacities ranging from 500,000 to about 1,000,000 gallons and replace old single-wall tanks. The double-wall tanks provide two separate tanks with a space between them for detecting and cleaning up potential leaks.

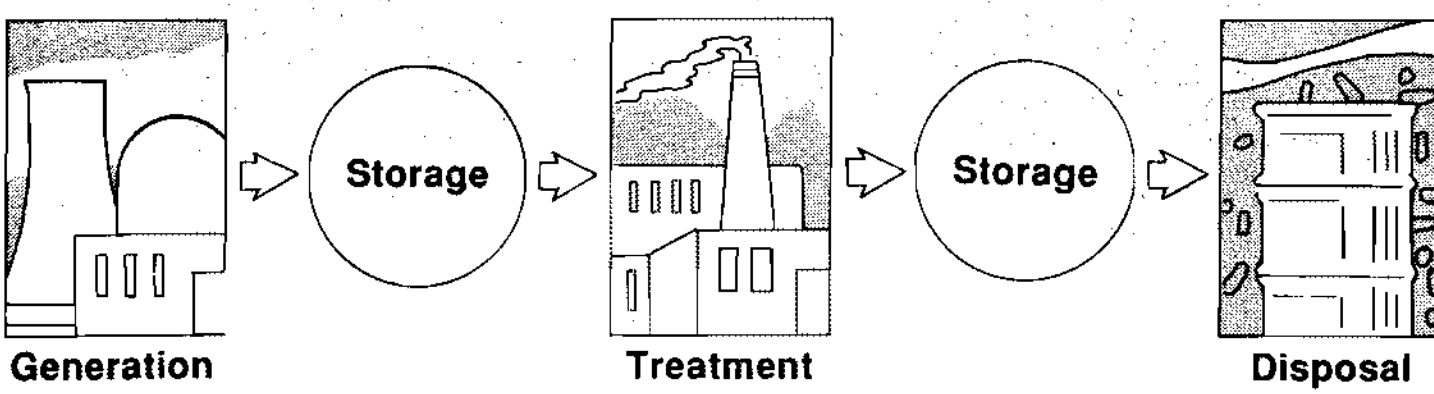
Transuranic waste is placed in containers and stacked on asphalt or concrete pads. DOE is planning to conduct a test program at the Waste Isolation Pilot Plant (WIPP) near Carlsbad, New Mexico, to determine if the facility is suitable for disposal of transuranic waste.

The majority of DOE low-level waste will continue to be disposed of using proved and improved techniques at selected DOE locations. Some low-level waste must be stored awaiting treatment and/or disposal. Storage requirements for this waste are being assessed.

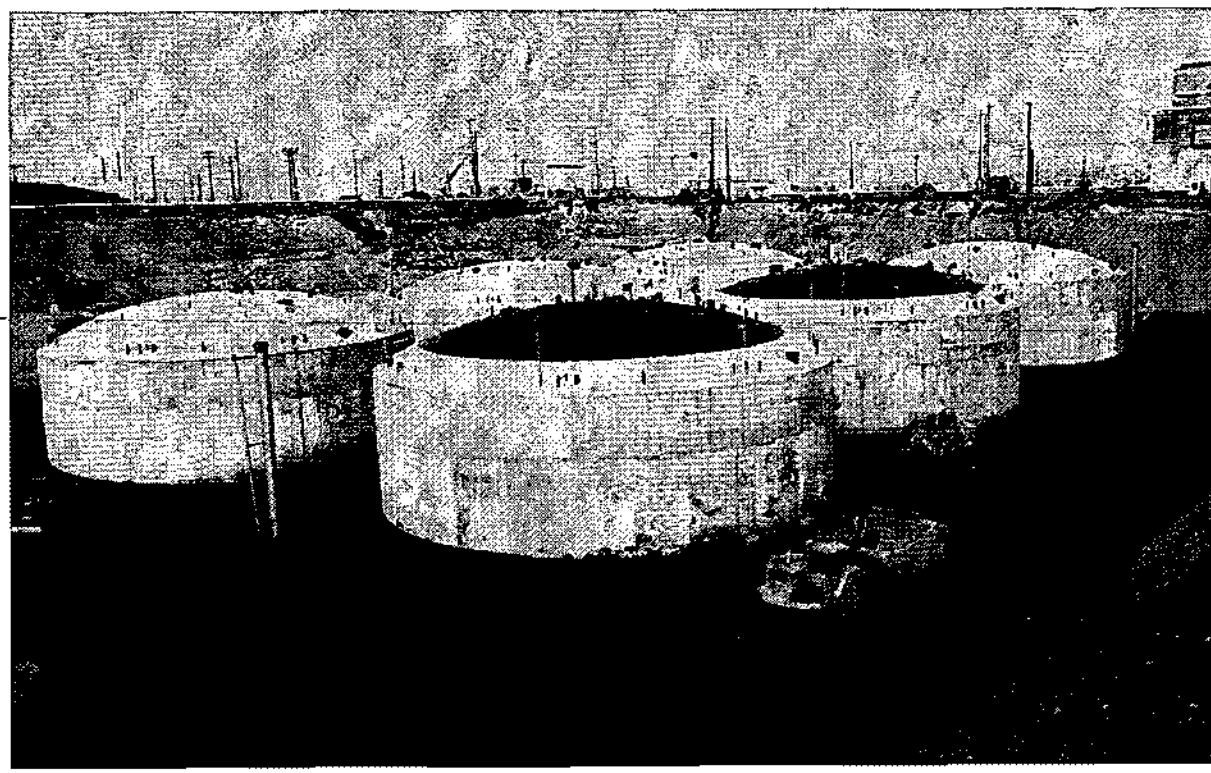
Hazardous waste is stored in permitted DOE facilities. Hazardous waste storage will rise to a peak, then diminish steadily as advanced minimization and treatment programs are established and implemented. Land disposal restrictions (LDR's) ensure that hazardous waste is stored and disposed according to specific regulatory provisions in preparation for treatment.

Mixed waste is stored pending treatment. Most storage complies with current regulatory requirements. Regulations restrict the amount of time that untreated mixed waste may be stored.

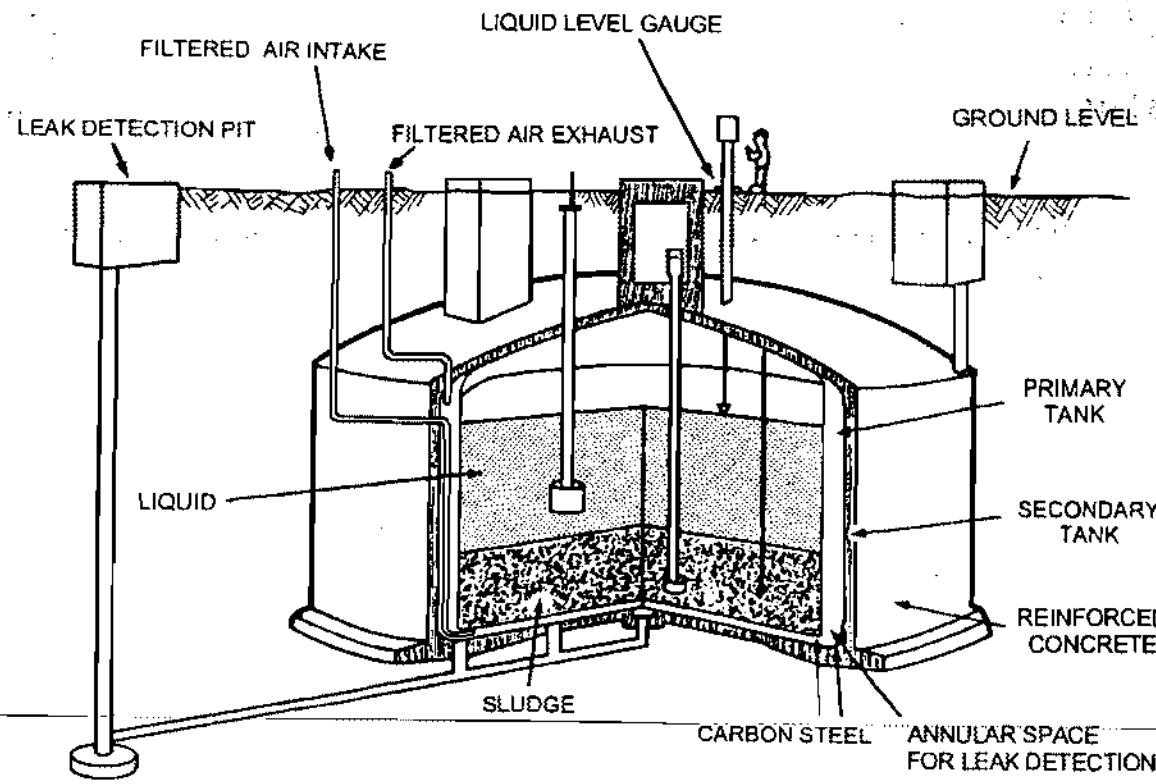
Waste storage is an interim measure.

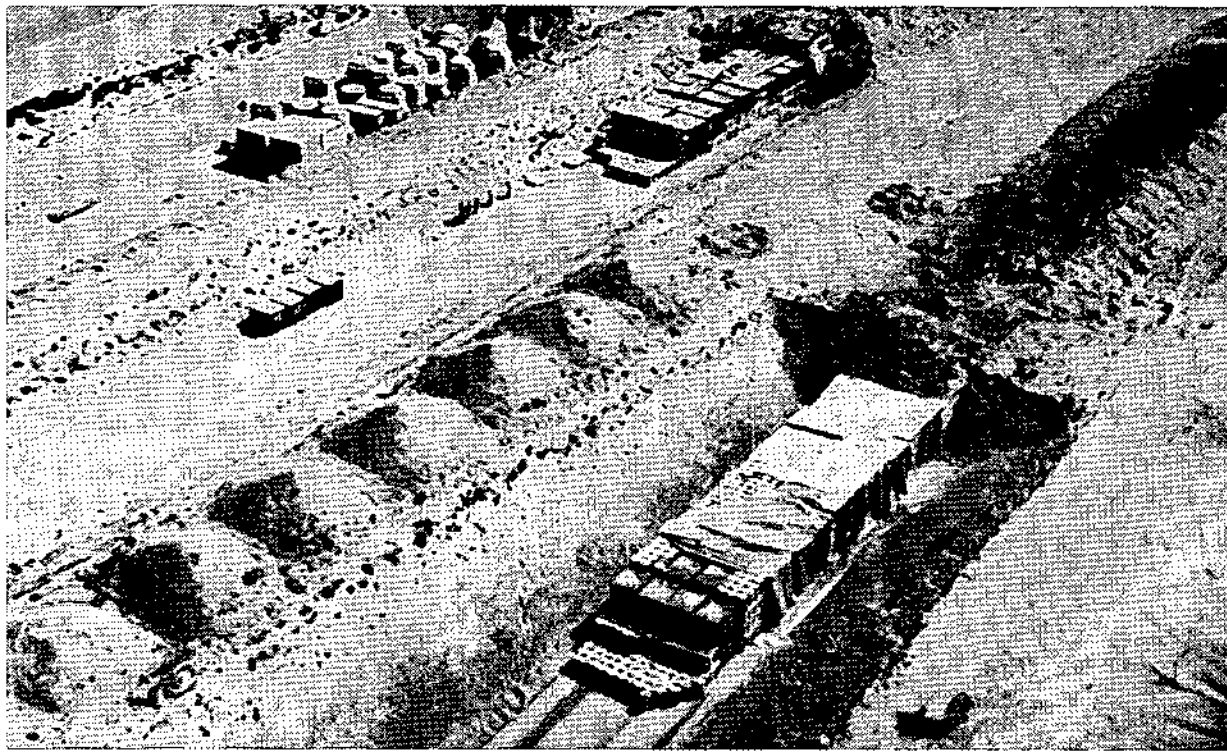


DOE's long-term waste management goal is to end storage and begin permanent disposal.

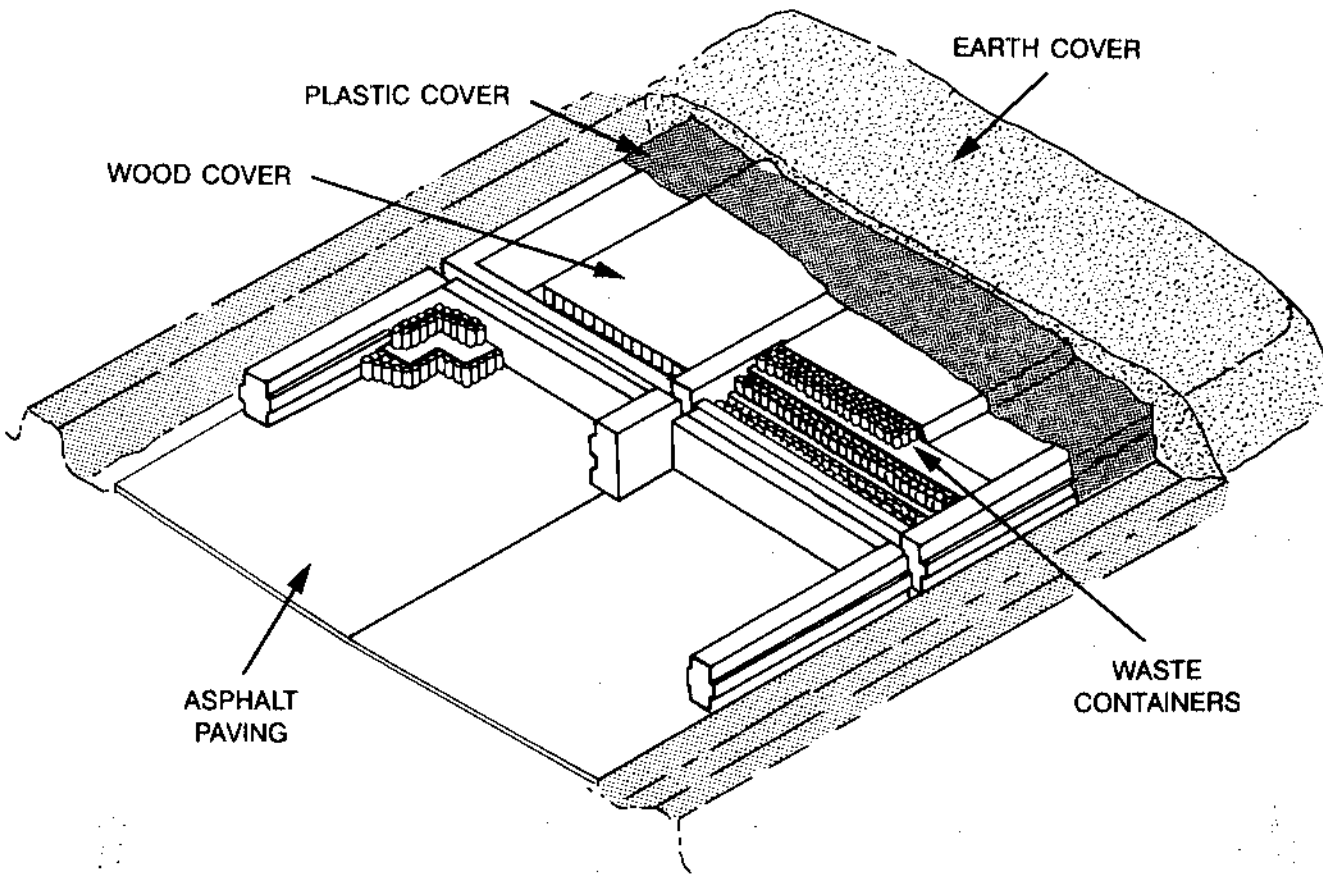


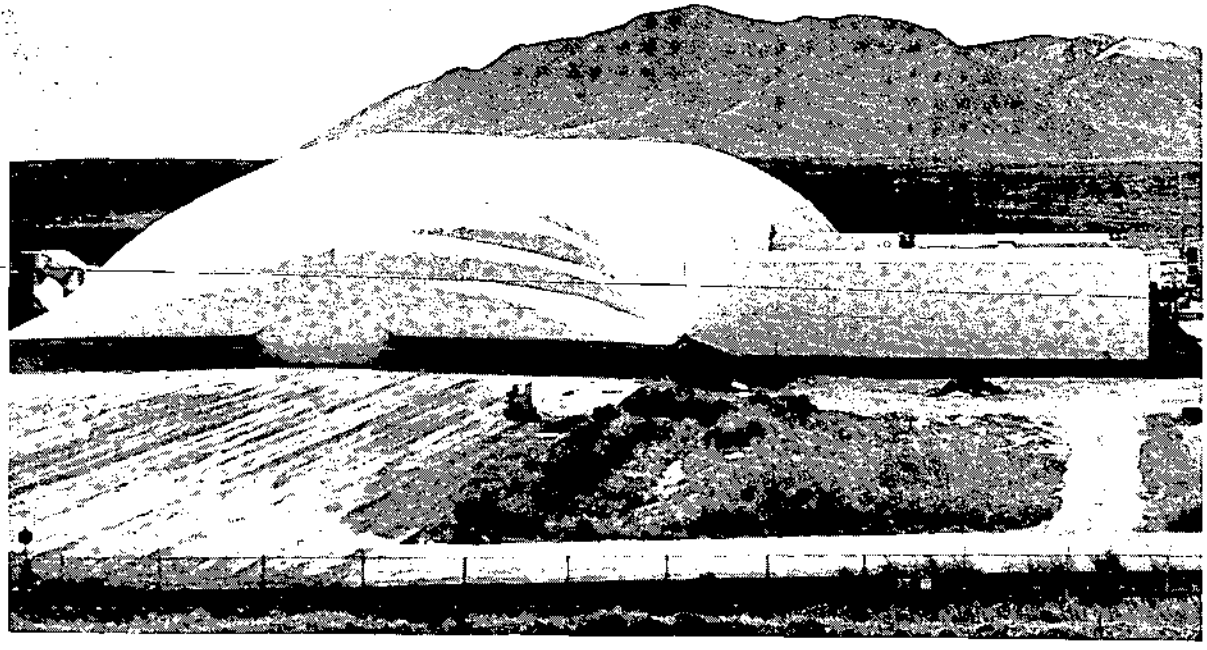
Double-shell tanks with improved leak detection systems and waste containment features were built to replace old single-shell tanks.



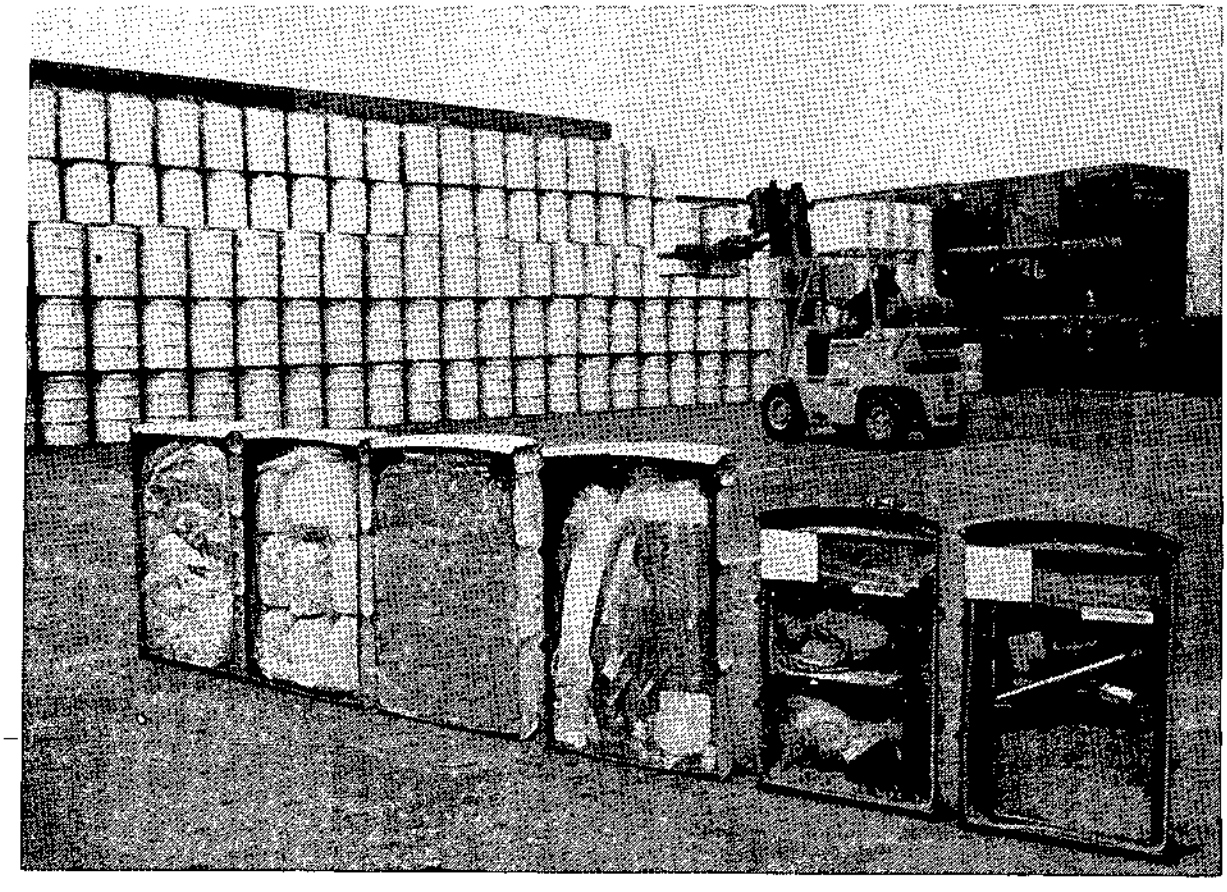


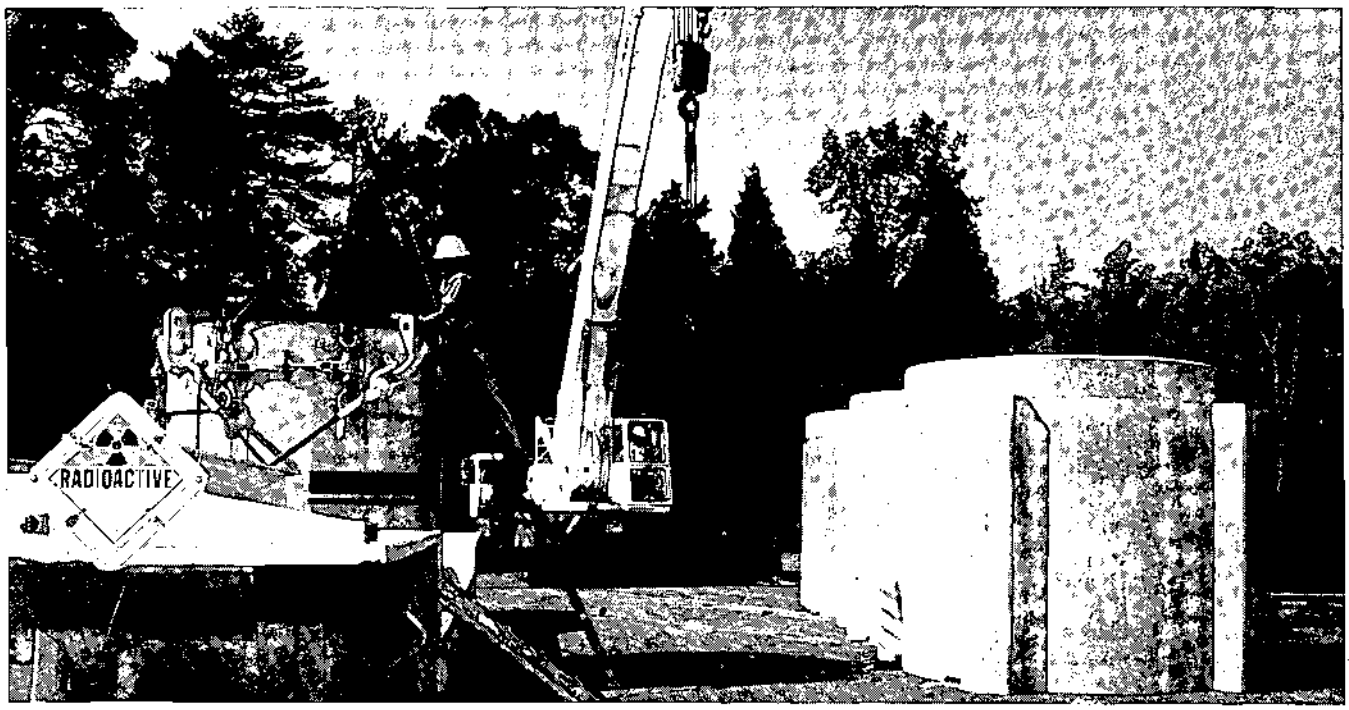
At some sites, metal drums and boxes containing transuranic waste are stored on asphalt pads in trenches. The containers are enclosed in a protective vinyl cover and backfilled with soil. The waste will be easily retrieved for processing and disposal if the Waste Isolation Pilot Plant (WIPP) becomes operational.





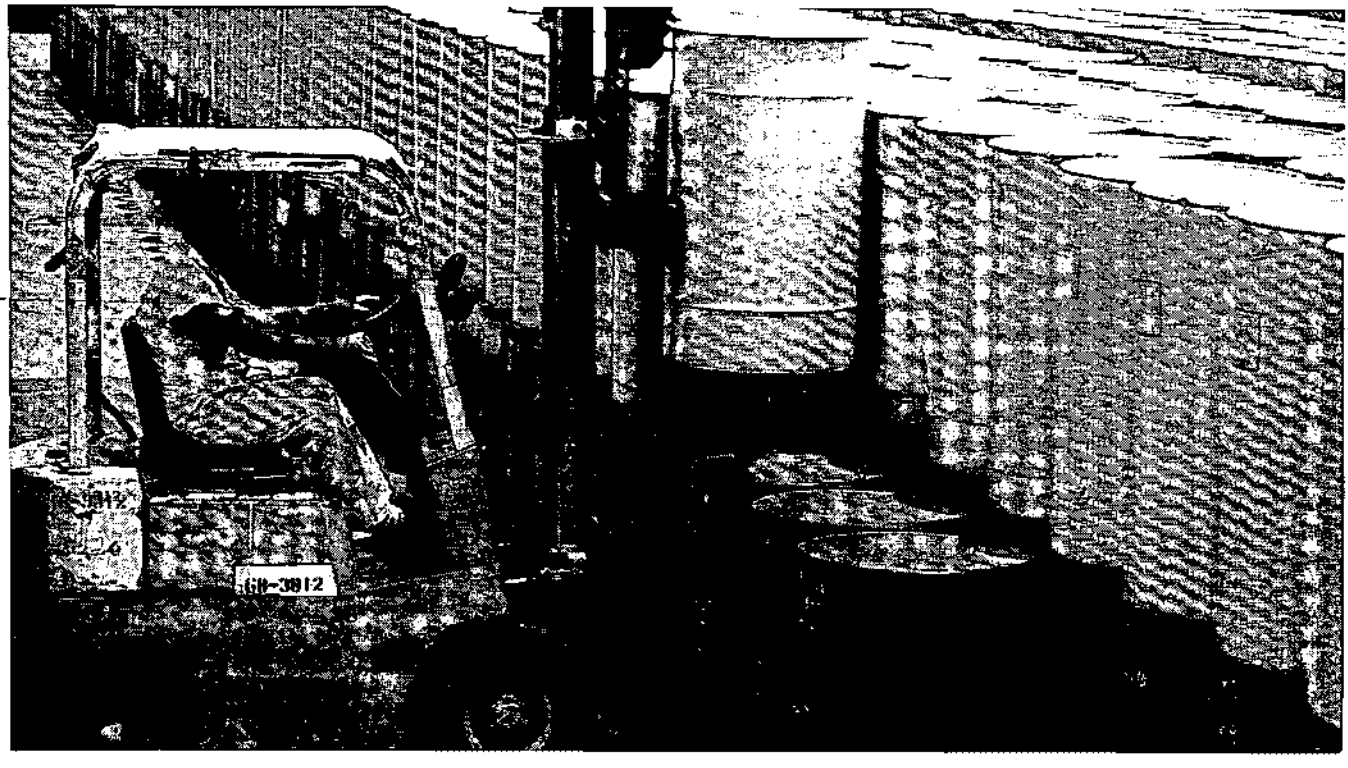
At Idaho, some transuranic waste is stored in an air-supported building. The remainder is stored on asphalt pads in drums, and covered with plastic and earth. The cut-open drums in the photograph below show typical transuranic waste items. Transuranic waste is also stored at the Transuranic Storage Area under berms.





Solidified liquid low-level waste which can't be disposed of in existing facilities is stored in steel drums inside concrete vaults.

Liquid low-level waste is stored in tanks before treatment solidifies it. The liquid in these 350,000 gallon tanks will be grouted (mixed with a cement-like substance) and stored in aboveground concrete vaults.



Hazardous waste is packaged in drums and stored on concrete pads awaiting treatment and disposal. Some hazardous waste is solidified, packaged in drums, and disposed of in permitted commercial landfills.

Some hazardous waste is stored in buildings on DOE sites awaiting disposal.

Disposal

Waste Management develops the technologies and processes to prepare DOE waste for permanent disposal. Facilities are being designed, built, and tested so the process of reducing inventories of stored waste can begin.

DOE's goal is to send high-level waste to a planned Federal repository which is proposed to begin operations sometime after the year 2000. In 1987, the U.S. Congress designated Yucca Mountain, near the Nevada Test Site, as the site to be studied by DOE for possible development as a repository. Yucca Mountain offers an extremely dry location, a very deep water table (1,700 feet), and a solid rock formation known as "welded tuff" (a dense form of compacted volcanic ash). Studies are ongoing to evaluate Yucca Mountain as a potential repository site. These include habitat preservation of the endangered desert tortoise, underground shock resistance, and the repository's potential socioeconomic impact.

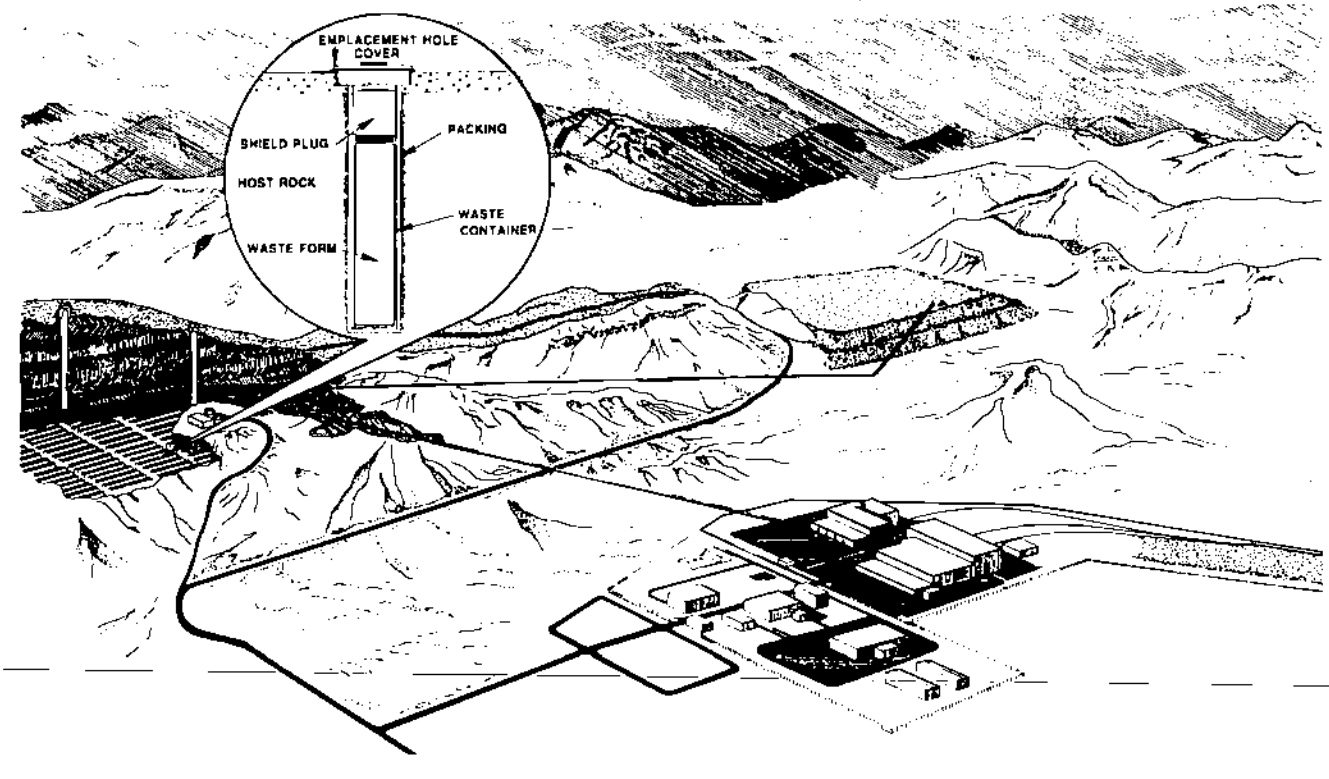
A facility for disposal of transuranic waste has been completed near Carlsbad, New Mexico. If test demonstrations are successful, the Waste Isolation Pilot Plant (WIPP) will become a permanent disposal site. Examination and processing facilities at various DOE sites will certify that transuranic waste shipments meet the criteria for disposal.

Low-level waste is disposed of by shallow land burial in trenches and aboveground in tumulus (a concrete-like material) vaults. New technologies, stabilization techniques, and site monitoring systems ensure protection of the environment.

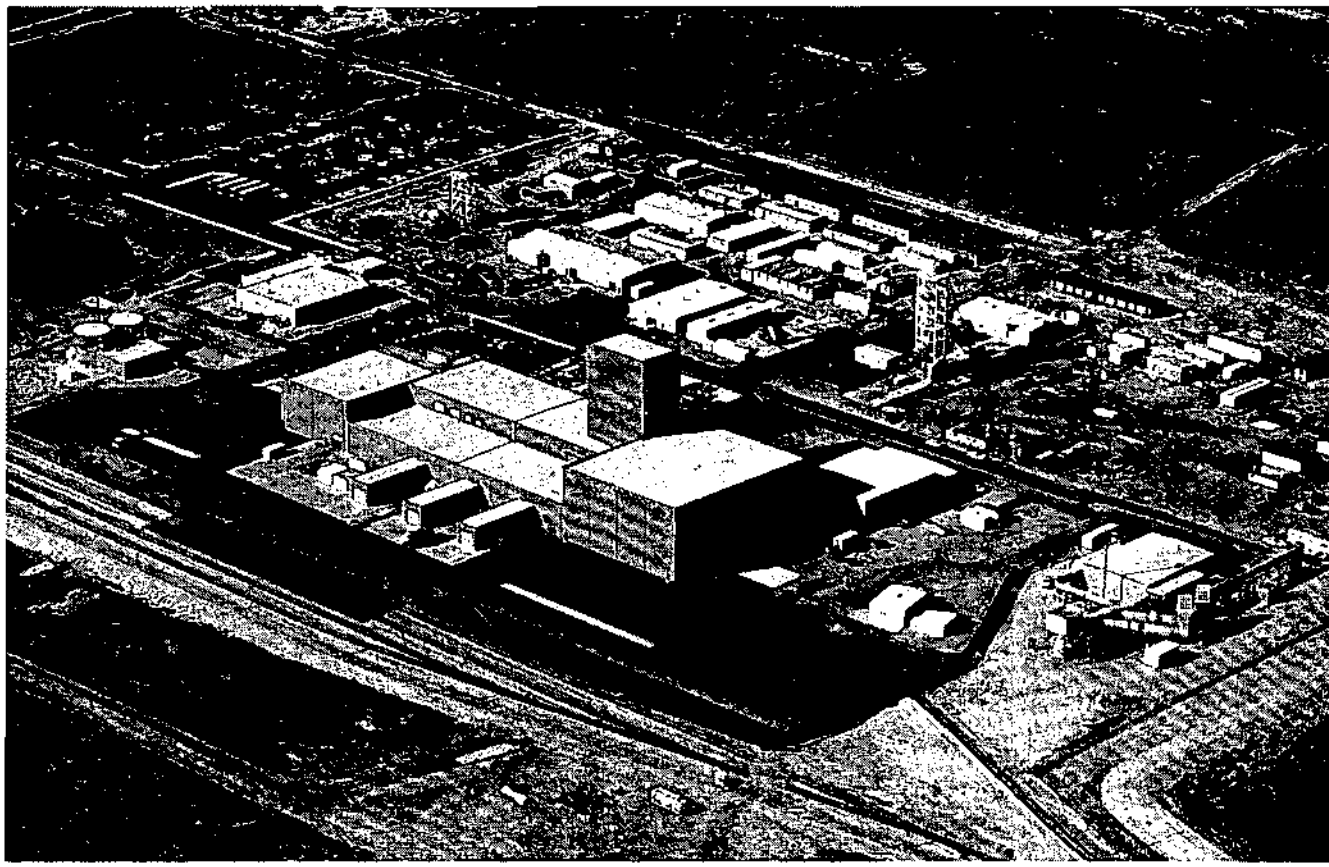
After treatment, hazardous waste is disposed of in permitted commercial facilities.

Mixed waste is stored pending treatment. Mixed waste disposal facilities are being planned at various DOE sites.

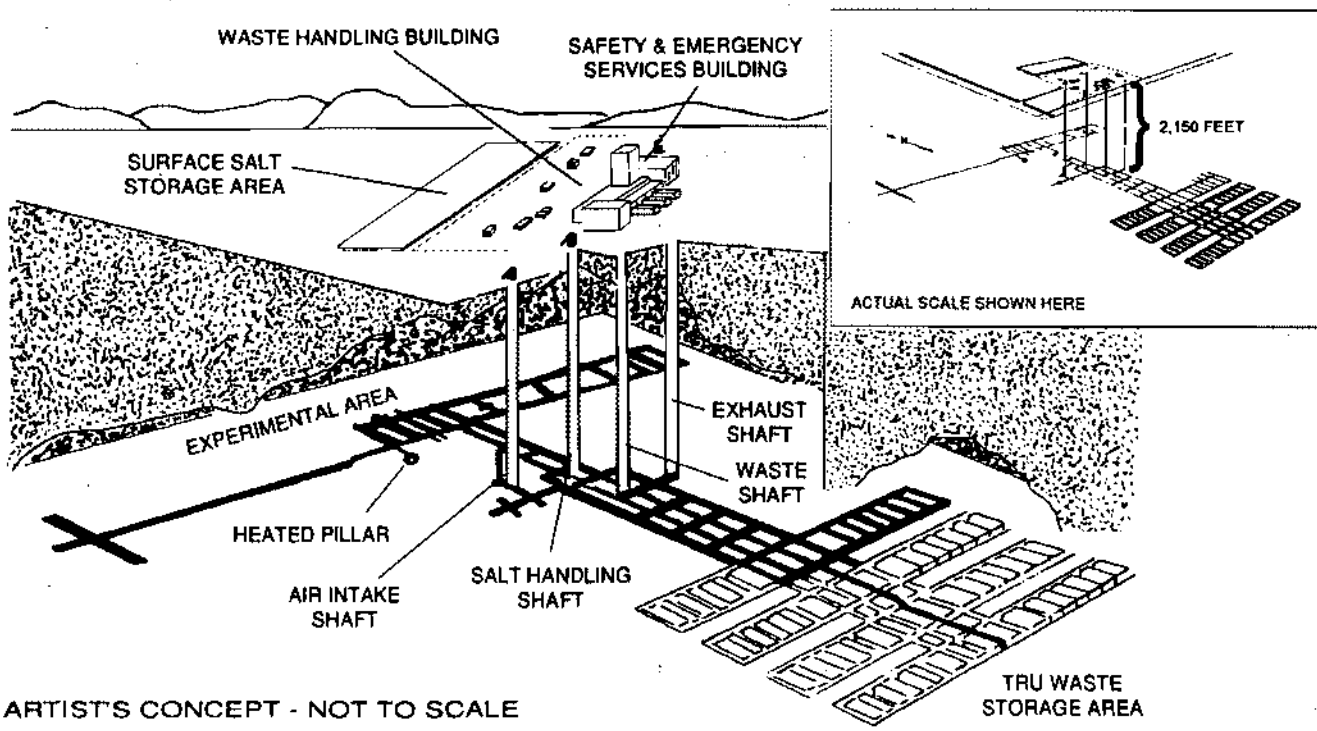
Congress has mandated that high-level waste be permanently disposed of in deep geological repositories. DOE is currently characterizing a site at Yucca Mountain, Nevada, to determine whether or not it is suitable for development as such a repository.

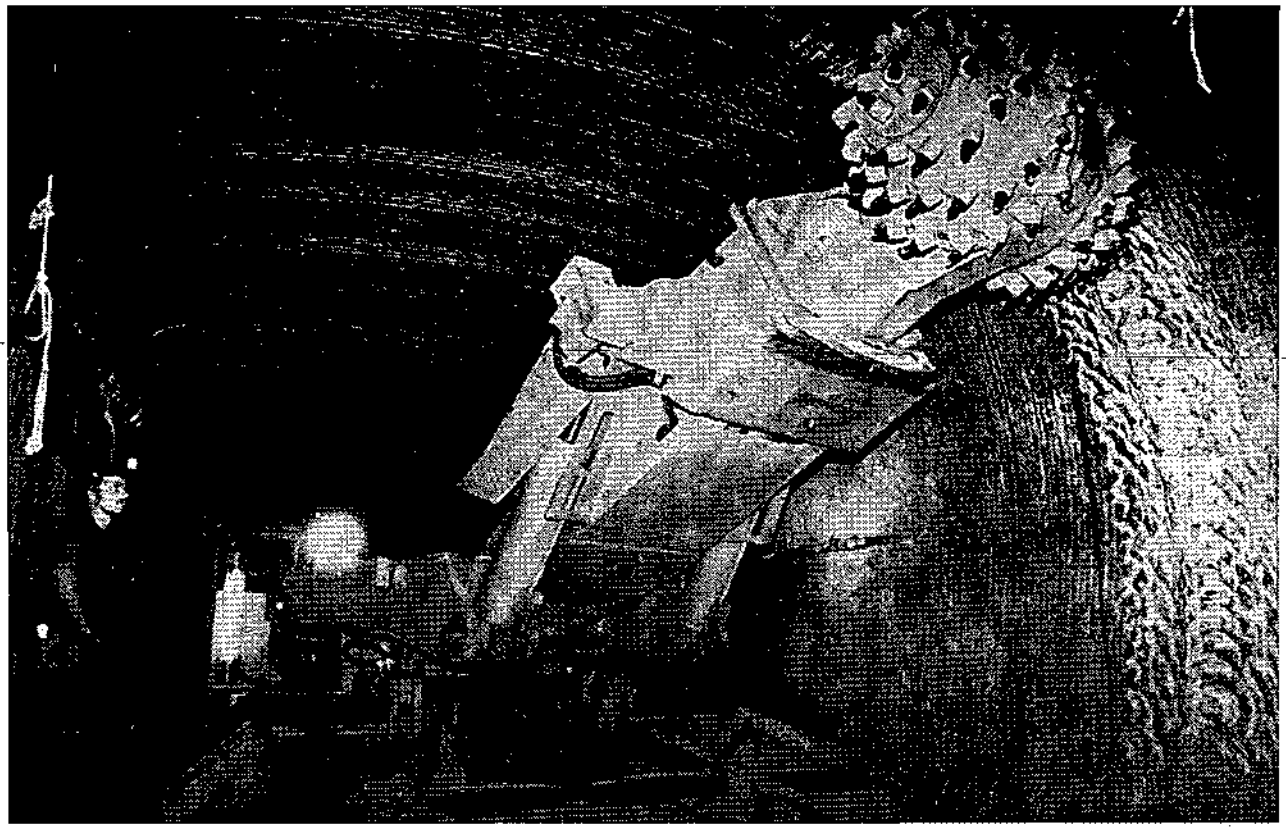


ARTIST'S CONCEPT



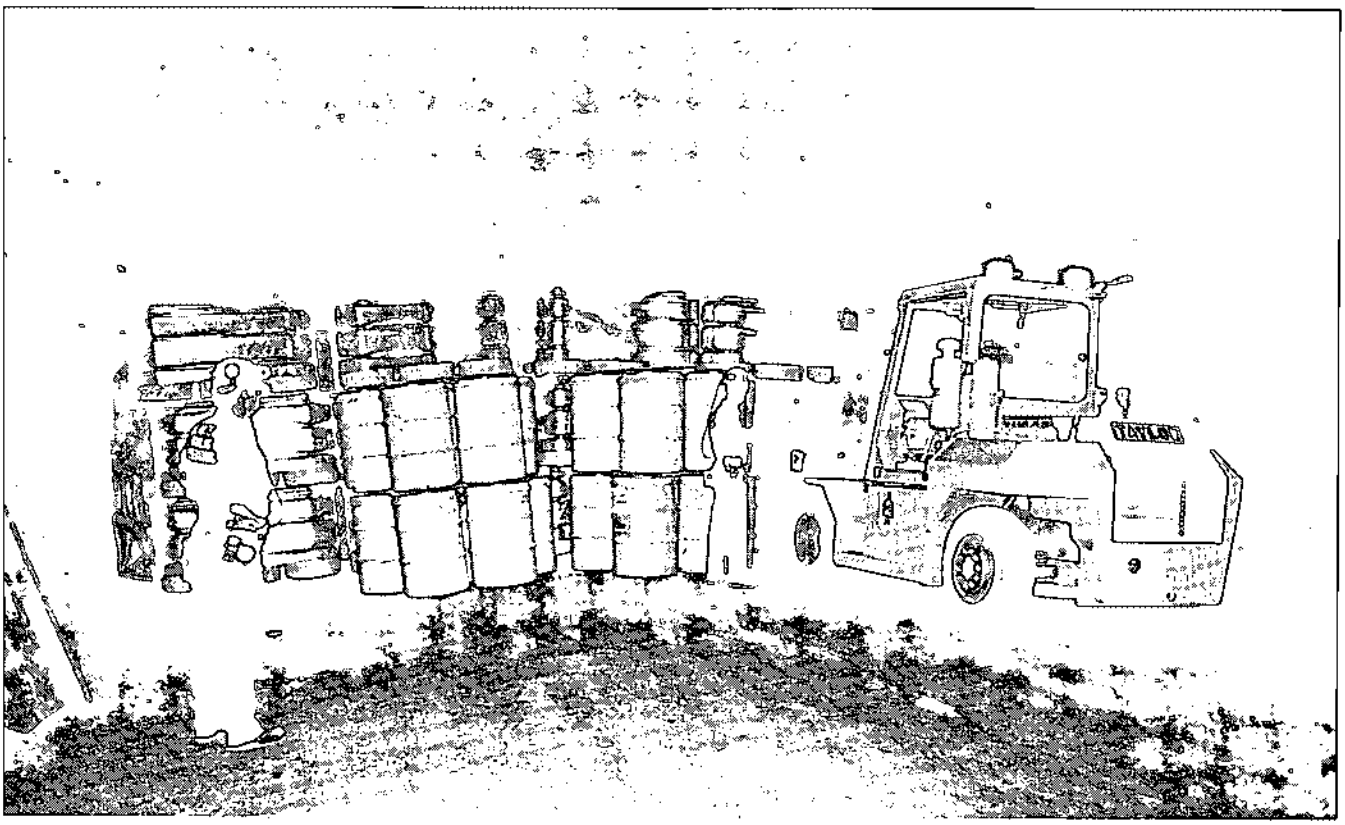
The Waste Isolation Pilot Plant (WIPP) in New Mexico is designed to demonstrate the safe and permanent disposal of transuranic waste in a salt formation more than 2,000 feet underground. If the demonstration is successful, WIPP will become a disposal site for transuranic waste.



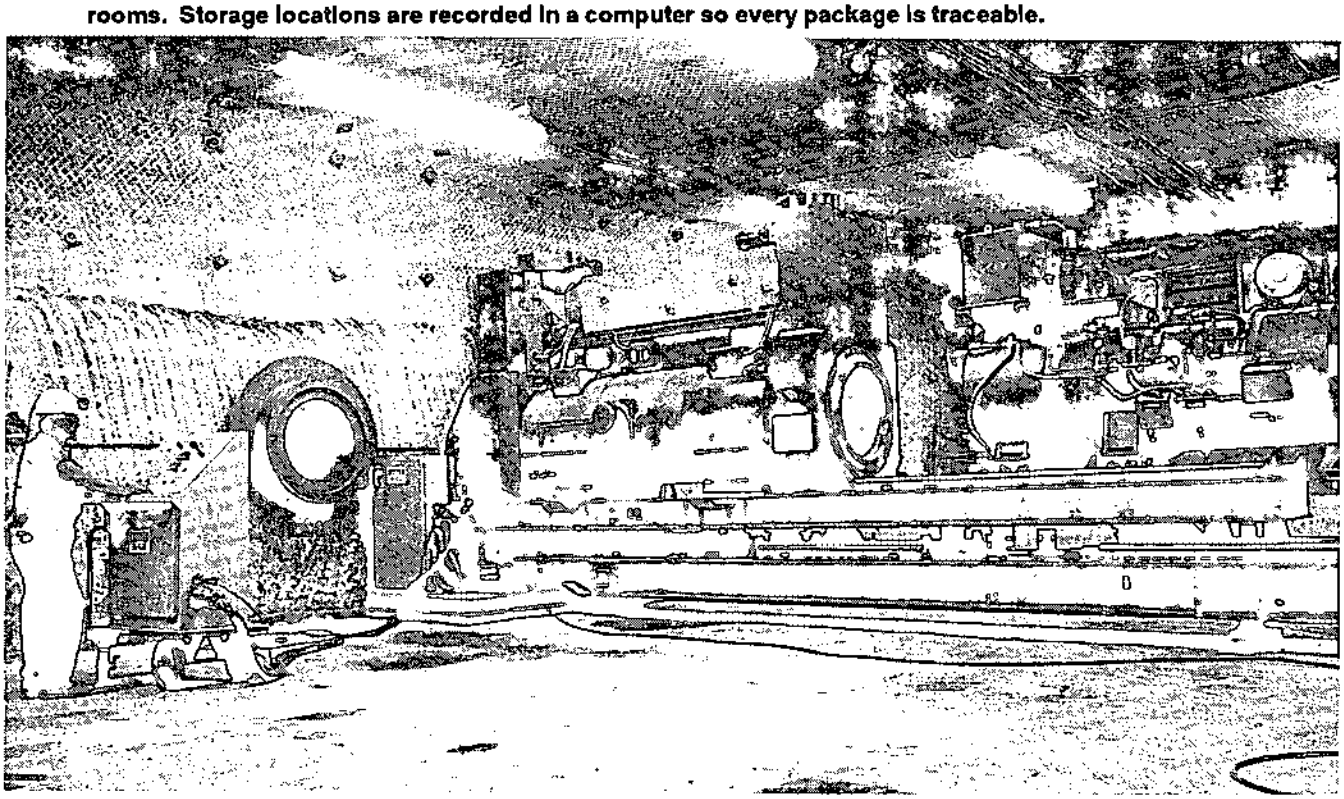


This continuous mining machine at WIPP mines salt underground at the rate of 300 tons per hour to form passages and storage rooms.

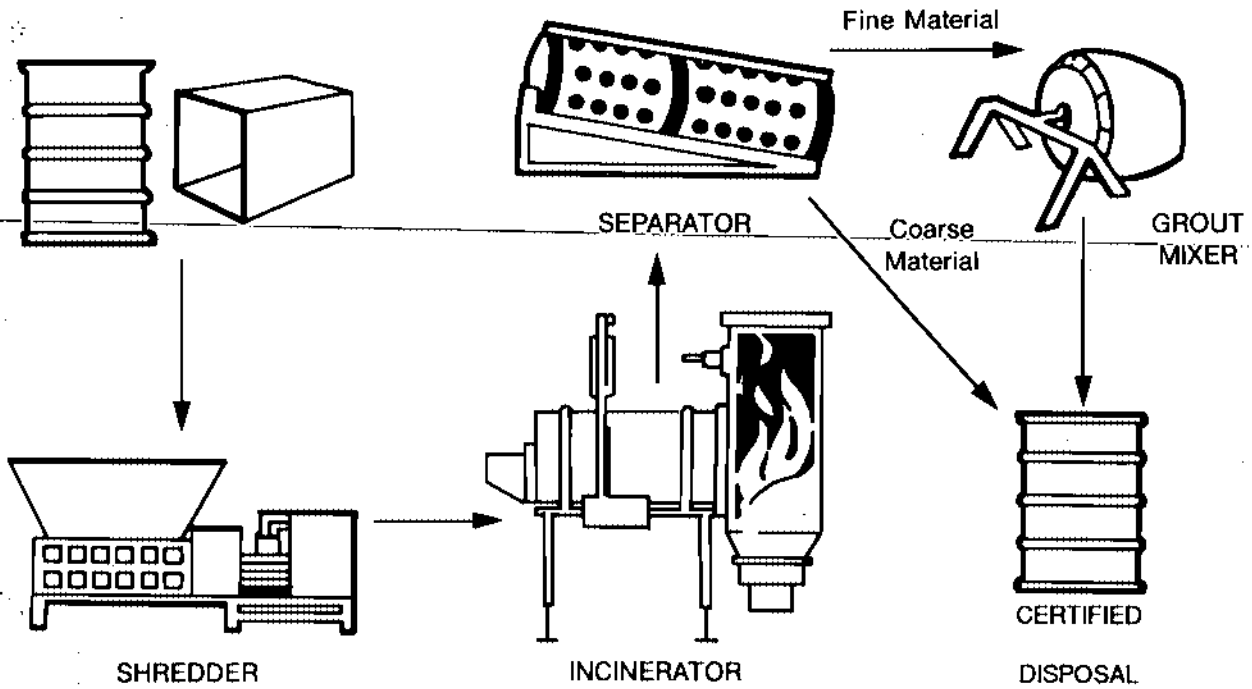
An Experimental Program for WIPP was developed to thoroughly explore the technological issues of deep geologic disposal in a saltbed. This room is used to test disposal techniques for transuranic waste using simulated waste containers.



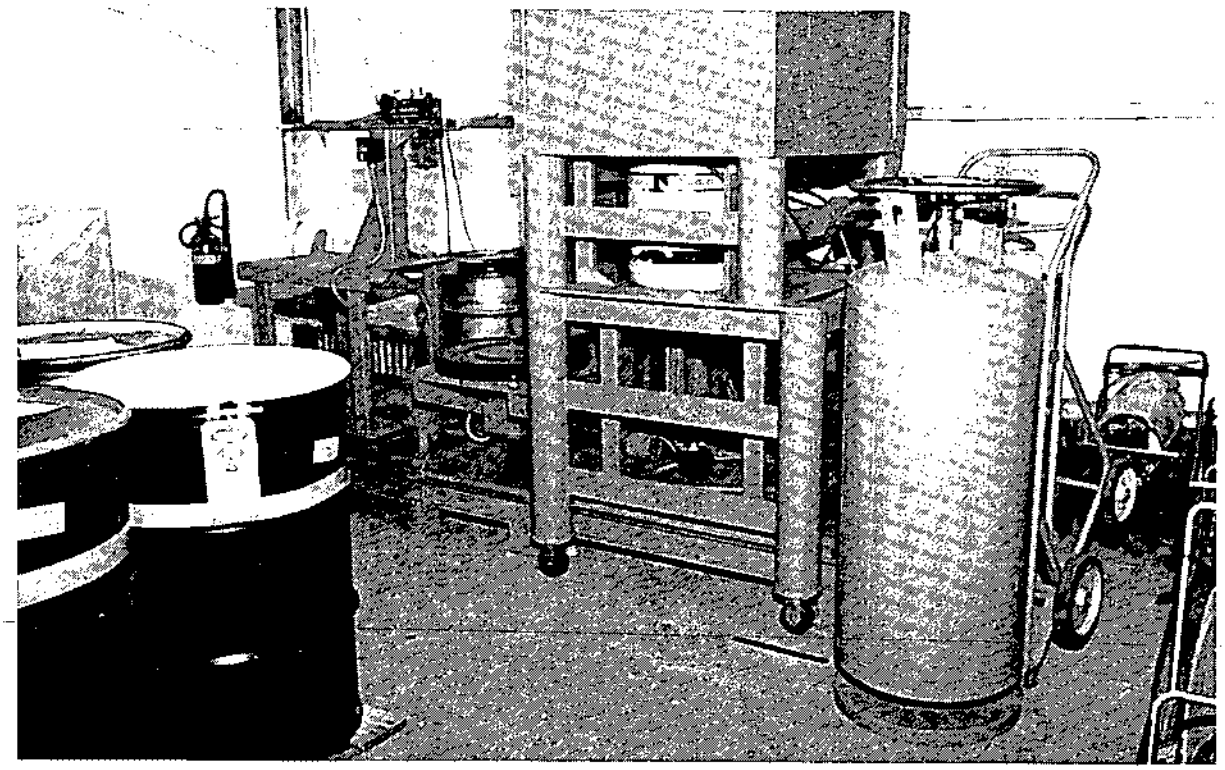
At WIPP, simulated transuranic waste containers that can be handled directly are stacked in underground rooms. Storage locations are recorded in a computer so every package is traceable.

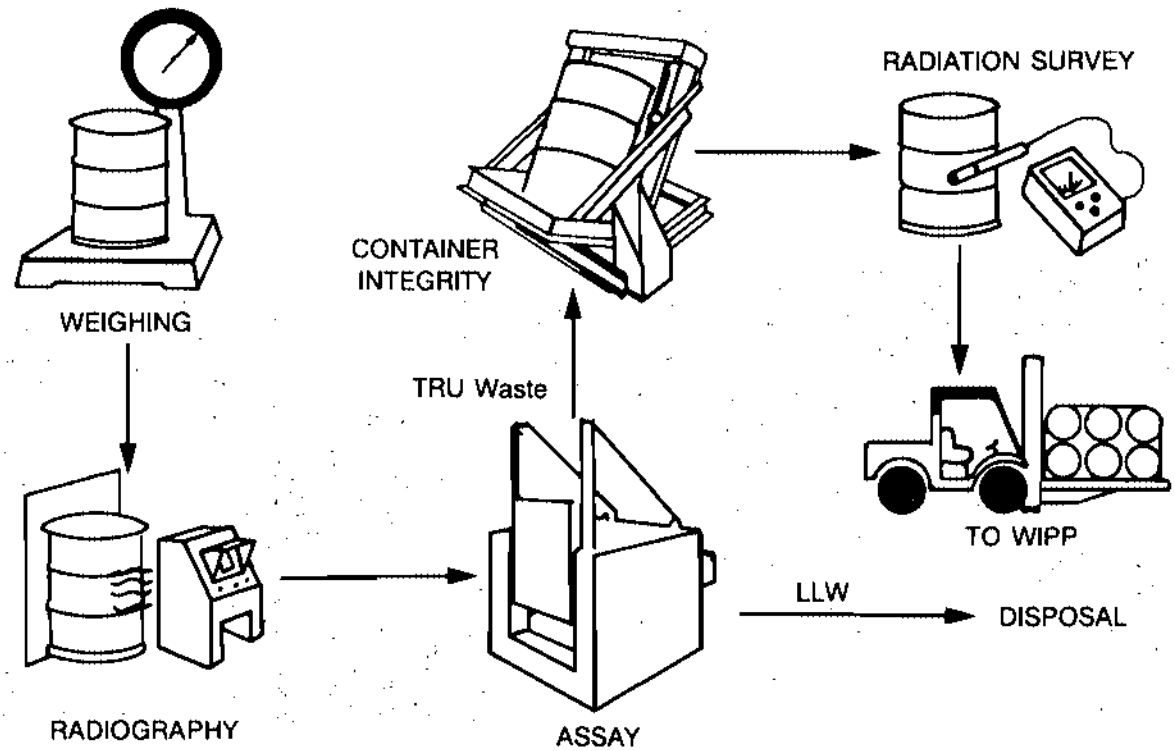


Containers that must be handled remotely because of radiation levels are inserted into holes bored in the salt walls at WIPP. A specially designed machine, which emplaces the containers and plugs the hole, can also retrieve this remote-handled waste if required.

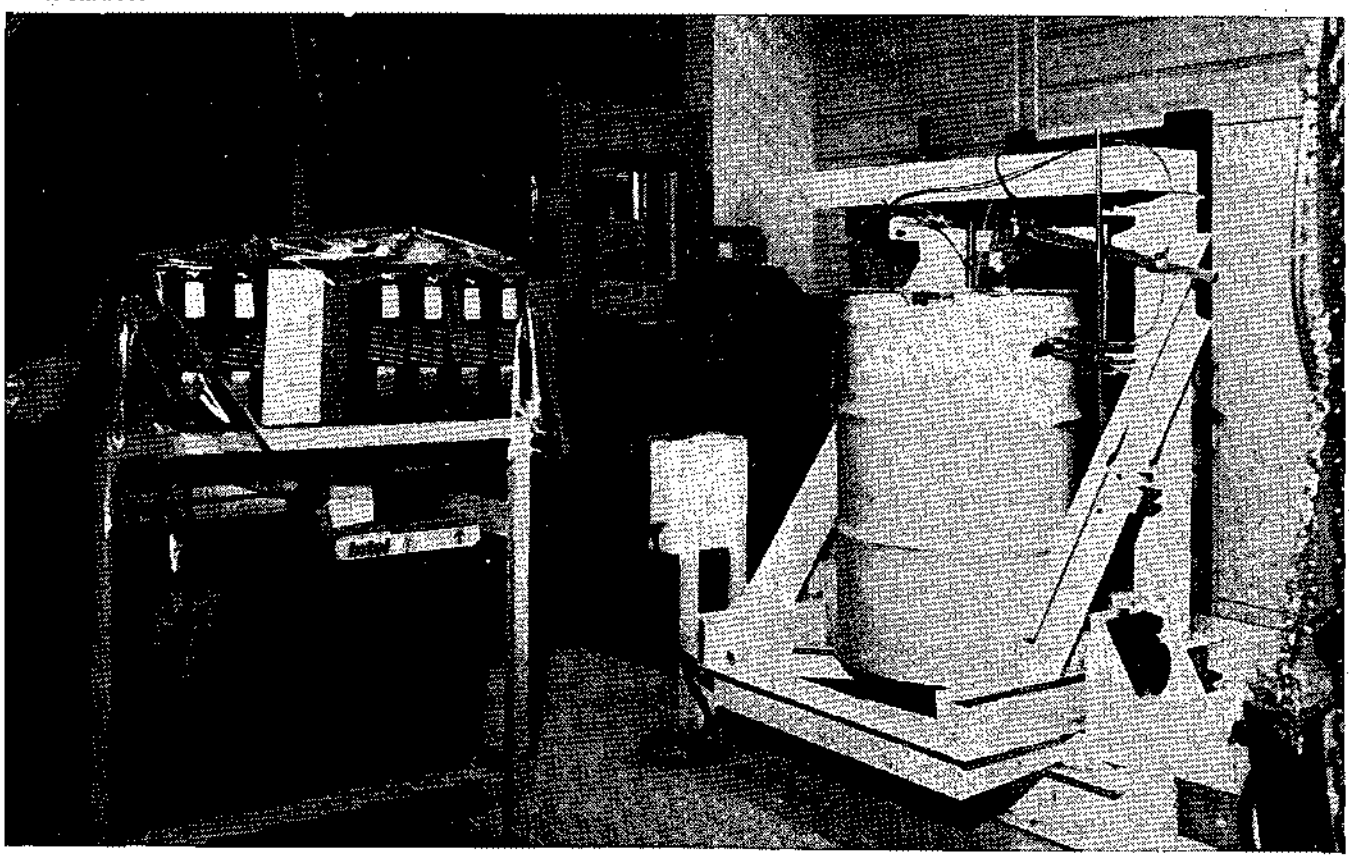


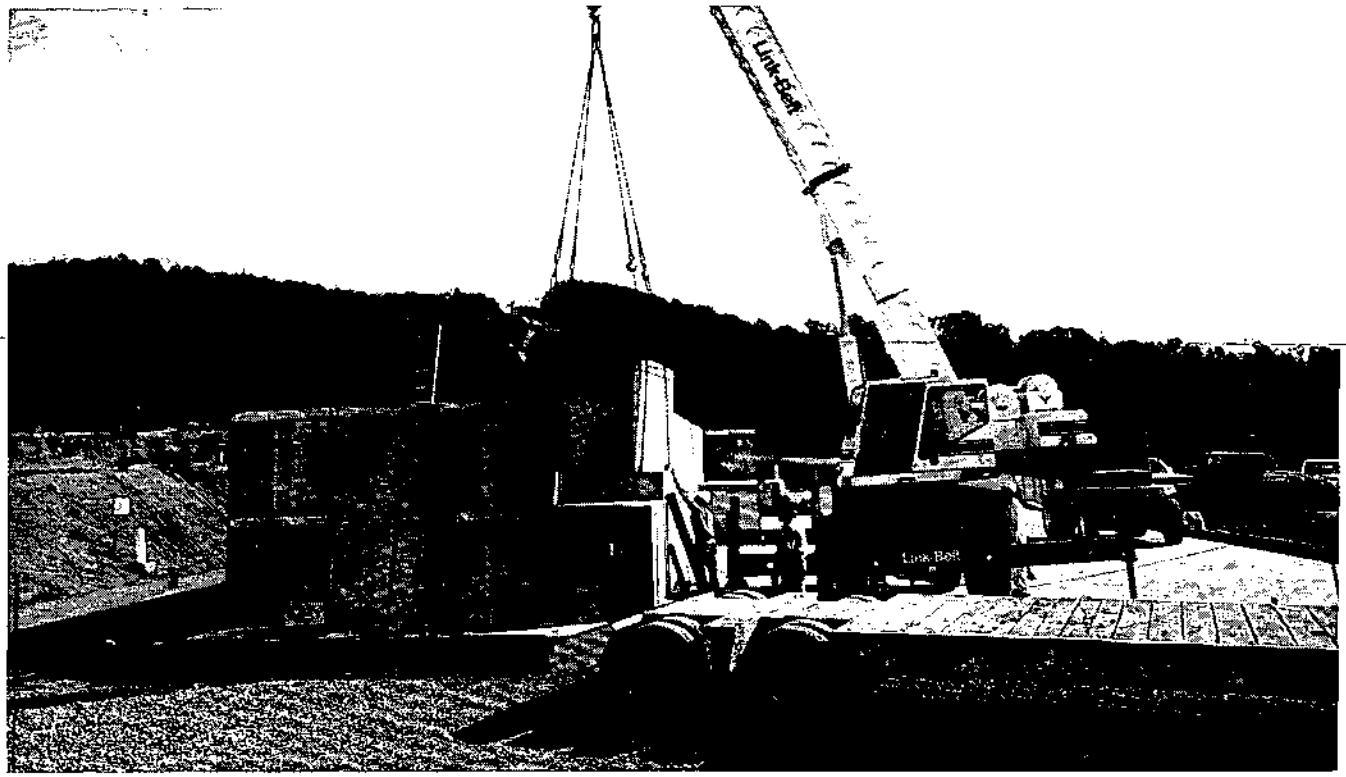
Transuranic waste shipped from generating sites to WIPP must be certified for disposal. Various facilities to treat, assay, and process transuranic waste before it is sent to WIPP are planned at DOE sites. The segmented gamma scanner at Oak Ridge National Laboratory shown below is used to detect gamma-emitting isotopes in waste drums. If they are detected, the drums must be re-processed before being certified for disposal.



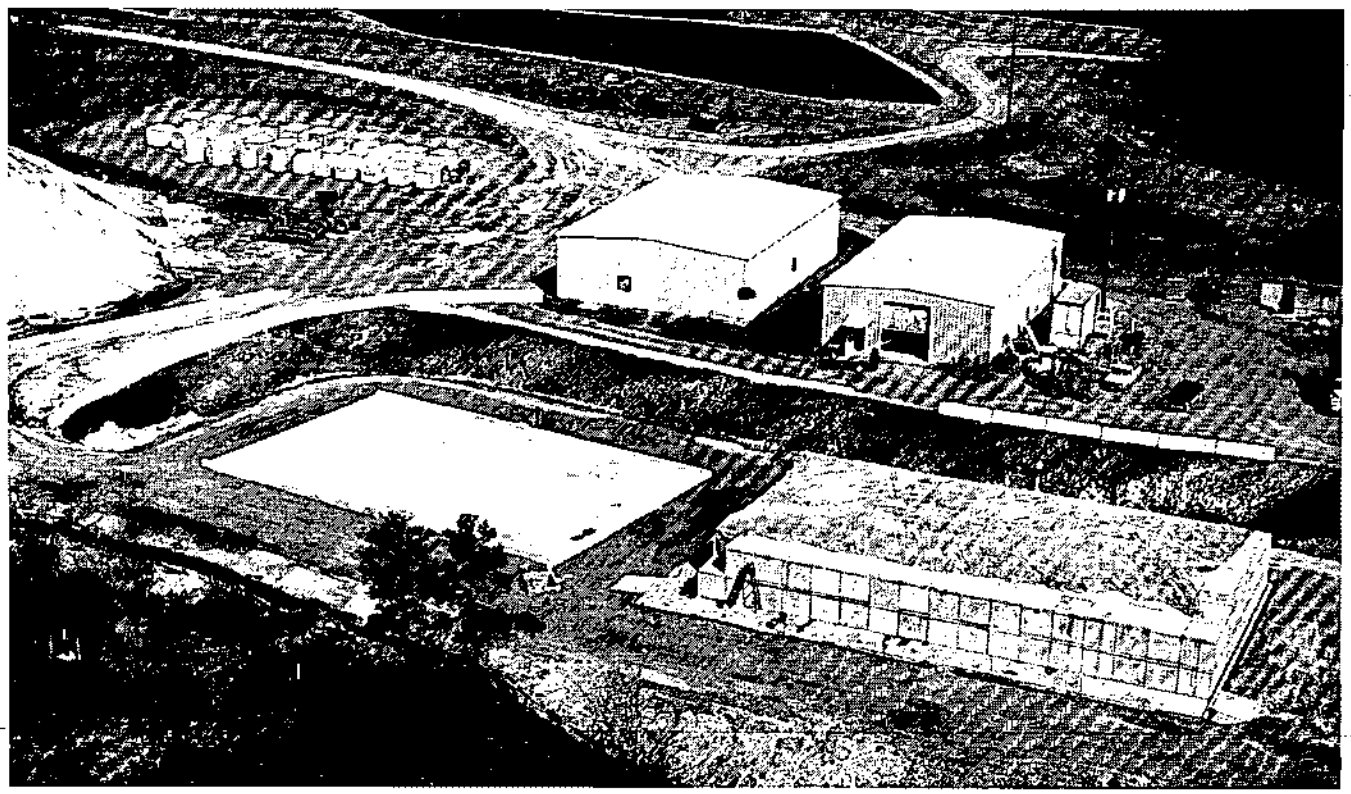


Transuranic waste is examined at the Stored Waste Examination Pilot Plant (SWEPP) in Idaho to certify that it meets the acceptance criteria for WIPP disposal. Other DOE sites also have examination and certification facilities.

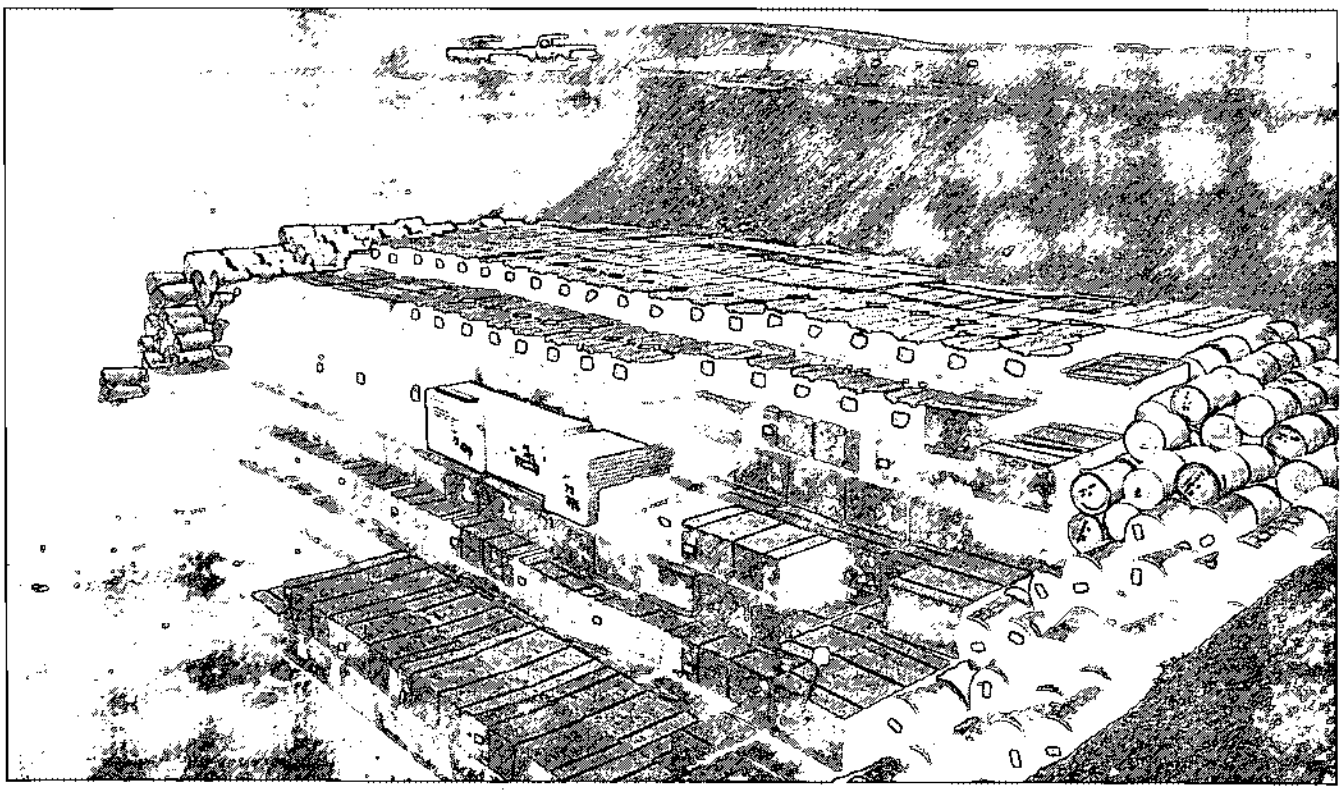




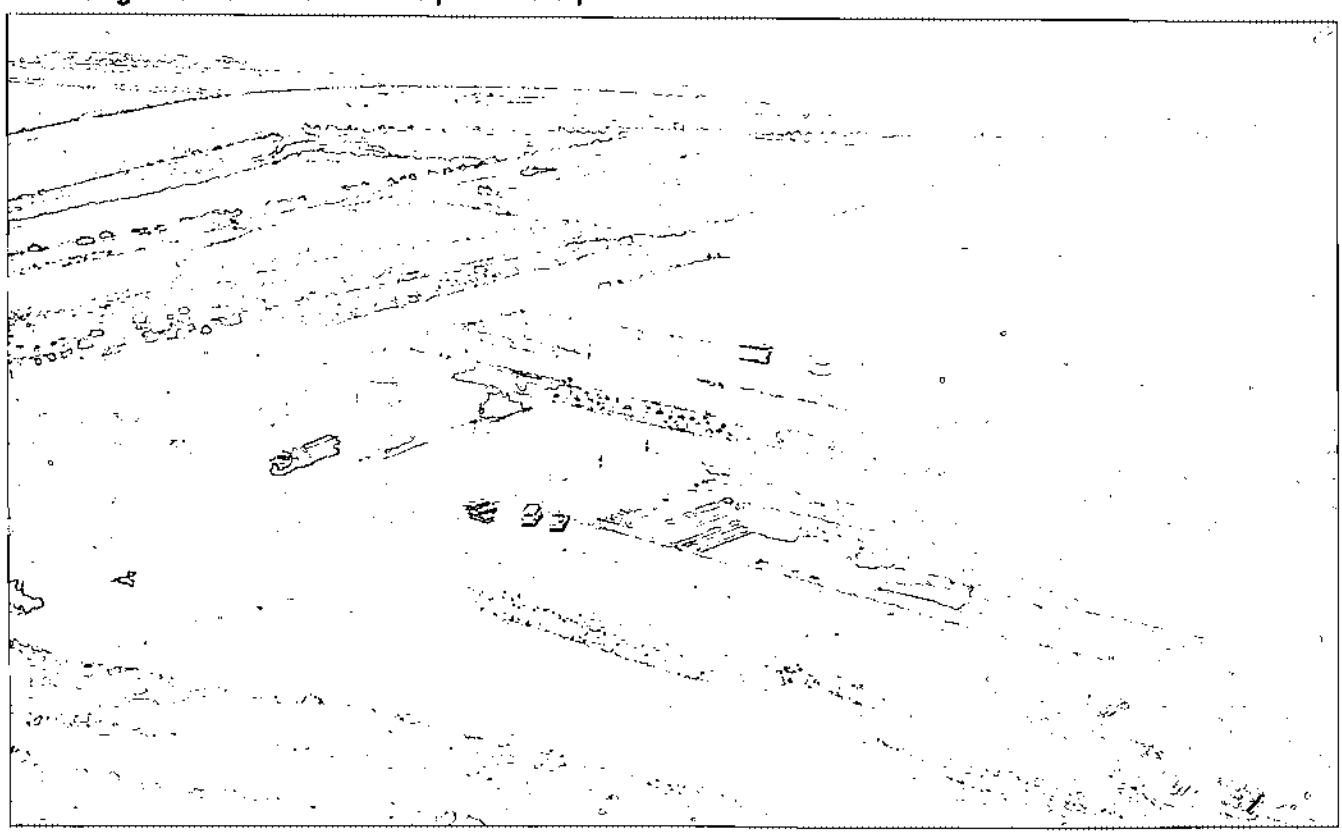
Solid low-level waste is disposed of in tumulus vaults aboveground to protect the environment in humid or wet areas. The concrete-like vaults are sealed on all sides. This photo shows a typical loading operation for tumulus vaults at the Tumulus I facility at Oak Ridge National Laboratory in Oak Ridge, Tennessee.



The lower right-hand side of this photo shows the Tumulus I disposal facility loaded. The lower left-hand side shows the newly constructed Tumulus II facility.



Solid low-level waste, such as rags or gloves contaminated with low levels of radioactivity, are safely disposed of by shallow land burial in dry areas. When all available space in the trenches is used, earth and a protective covering for erosion control will be placed on top of the waste containers.



Technology Development

Technology Development (TD) seeks to resolve major technical issues and rapidly advance beyond current technologies for Environmental Restoration and Waste Management activities. TD supports the 30-year compliance and cleanup goal and will reduce overall program costs.

Long-term TD goals are to: (1) become the international leader in technology development for environmental restoration and waste management operations; (2) expand the talent pool for site cleanup and waste management through significant support of education in science and technology; and (3) provide effective support to EM in the identification and resolution of technology needs. Attainment of these goals will reduce waste generation, overall costs, and risks.

Several broad TD program areas have been established. They include Research, Development, Demonstration, Testing, and Evaluation (RDDT&E); Technology Integration; Education; and Transportation (which will be discussed in the next section).

The RDDT&E Program develops, demonstrates, and transfers needed technologies to Environmental Restoration, Waste Operations, and Defense Programs. These technologies will minimize the toxicity and volume of waste; manage unavoidable waste more efficiently and safely; accomplish faster, better, cheaper, and safer remediation of waste problems; and produce safe, permanent disposal of waste within regulatory guidelines.

The RDDT&E Program is executed in three phases: Innovative Technology (IT); Research and Development (R&D); and Demonstration, Testing, and Evaluation (DT&E). The IT phase stimulates new and better approaches to all aspects of environmental restoration and waste management. R&D supports research applied to developing environmental restoration and waste management technologies. DT&E validates technologies by demonstrating effectiveness, cost savings, improvements, and risk-reduction potential.

RDDT&E is organized into integrated demonstrations and programs that focus activities toward the end objective--a fully workable, faster, and cost-effective technology. The integrated demonstrations and programs are the mechanisms to help move the technology products from the universities, industries, government

Technology Development

agencies, international agencies, and DOE laboratories and sites into the hands of the user. The integrated demonstration is the cost-effective mechanism that assembles a group of related and synergistic technologies to evaluate performance individually or as a complete system in correcting environmental restoration and waste management problems. Integrated Demonstrations will be conducted in the areas of (1) Groundwater and Soils Cleanup, (2) Waste Retrieval and Waste Processing, and (3) Waste Minimization and Waste Avoidance.

Groundwater and Soils Cleanup technologies will be developed and advanced through integrated demonstrations that (1) remove or reduce hazardous toxic materials from contaminated groundwater and contaminated soils underground or on the surface; (2) remove or reduce the radioactivity levels; and/or (3) provide interim or temporary measures to retard migration of hazardous materials until a suitable technology can be developed or until agreements can be reached on the applicable compliance requirements.

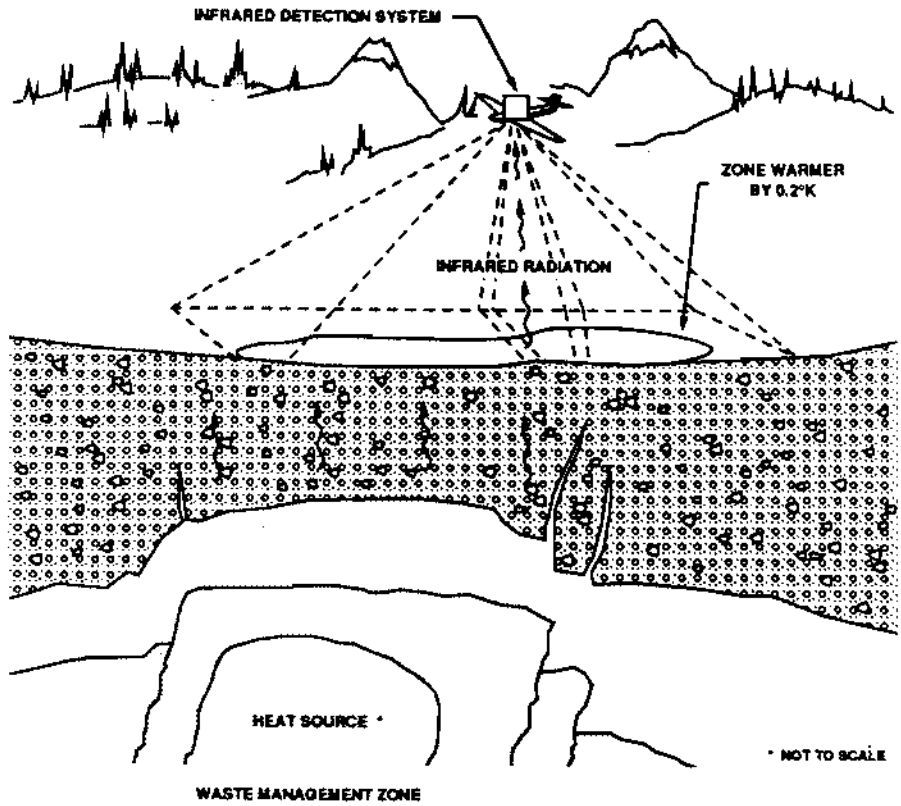
Waste Retrieval and Waste Processing technologies will be developed and advanced through demonstrations that (1) remotely or otherwise excavate or remove contaminated material from the site or tank; (2) process contaminated material into a suitable form for shipping and/or disposal; (3) treat and dispose of waste arising from operations; and (4) decontaminate and decommission materials, equipment, and facilities.

Waste Minimization and Waste Avoidance technical approaches include substitution of solvents to reduce or eliminate the use of hazardous chemicals; development of alternative metal-forming processes that consume less stock and yield less waste; and recycling of scrap. Minimization goals for reducing waste generation range from 50 to 80 percent.

TD's Technical Integration Program ensures implementation of rapid, efficient technology for environmental restoration and waste management. It does this by encouraging the transfer of technology among Federal agencies, industries, universities, the national laboratories, and the international sector.

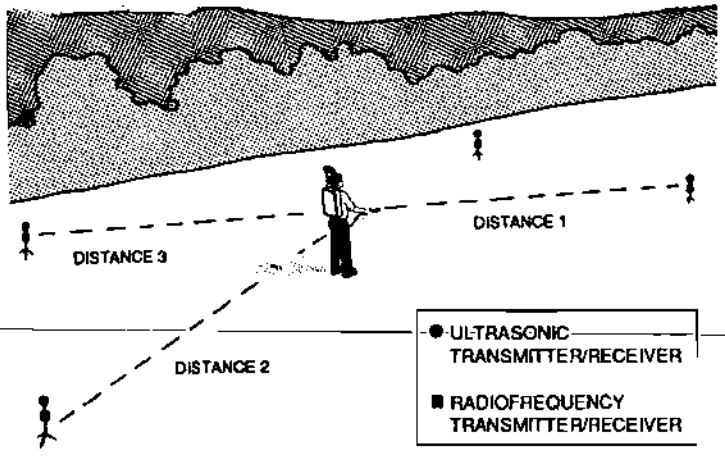
Technology Development

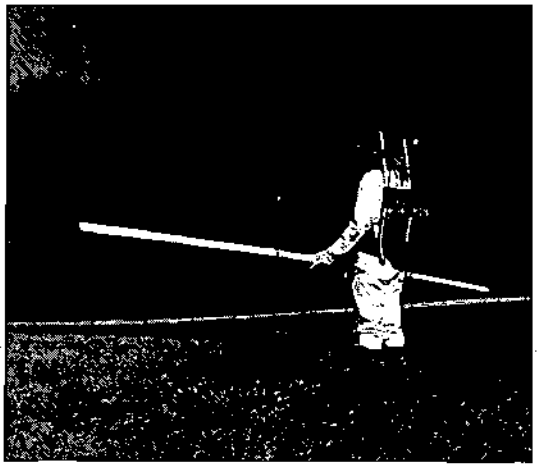
Finally, TD's Education Development Program identifies DOE's human resource needs for environmental restoration and waste management and develops innovative programs to ensure the needed human resources are available to meet the 30-year compliance and cleanup goal. It encourages the academic community to focus on environmental restoration and waste management science and technology and stimulates students to pursue environmental management careers. The program also aims to involve minorities, women, Native Americans, and disadvantaged persons in environmental programs. To pursue these goals, pilot DOE-university partnership programs, scholarship and fellowship programs, and an outreach program for grades K-12 have been established.



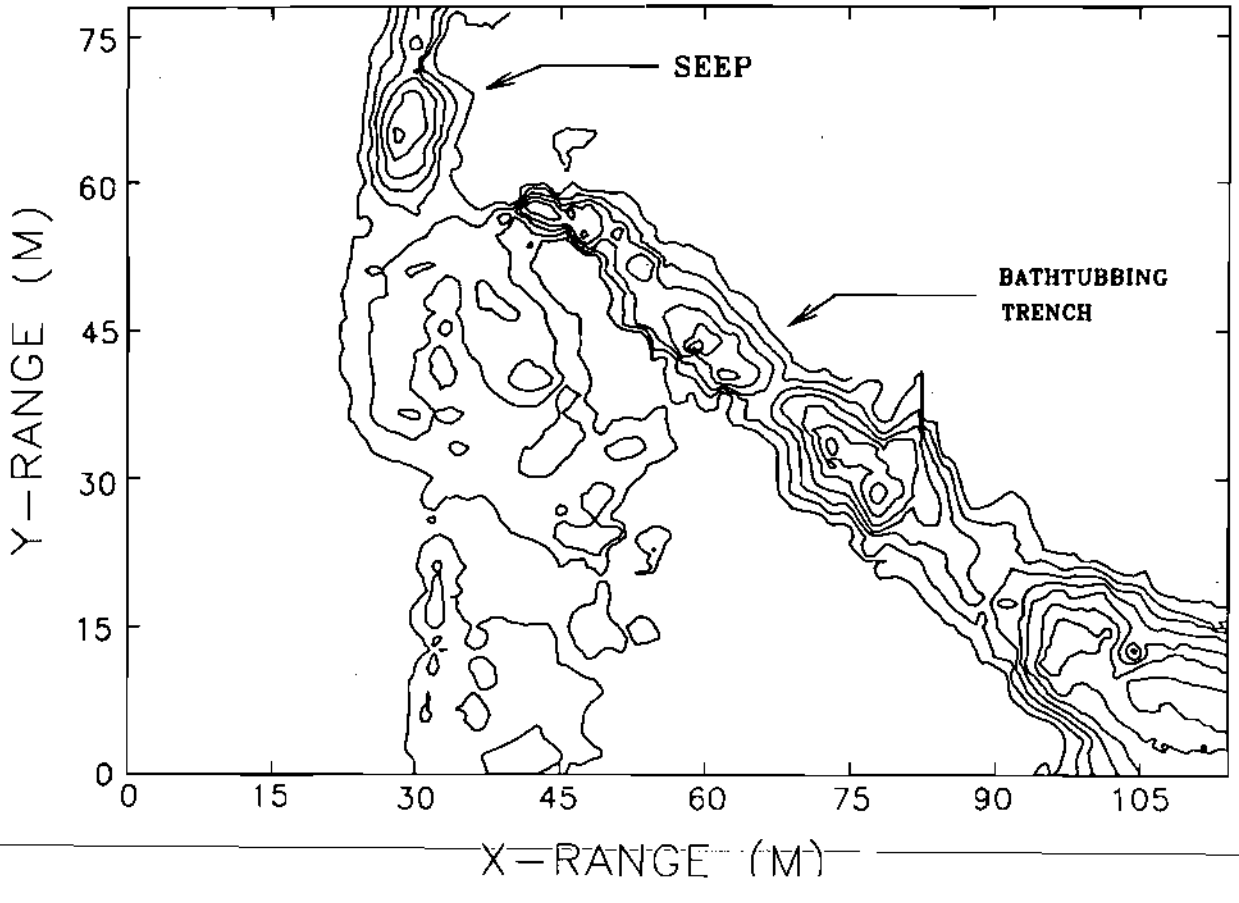
Advanced technologies for remote sensing will save time, reduce exposure, and save money. Airborne infrared surveys provide rapid characterization data that can be used to delineate waste disposal areas, contamination zones, and site performance characteristics.

This infrared photo shows areas where moisture is retained near the ground surface (shaded). These areas represent disposal trenches which have trapped infiltrating groundwater.

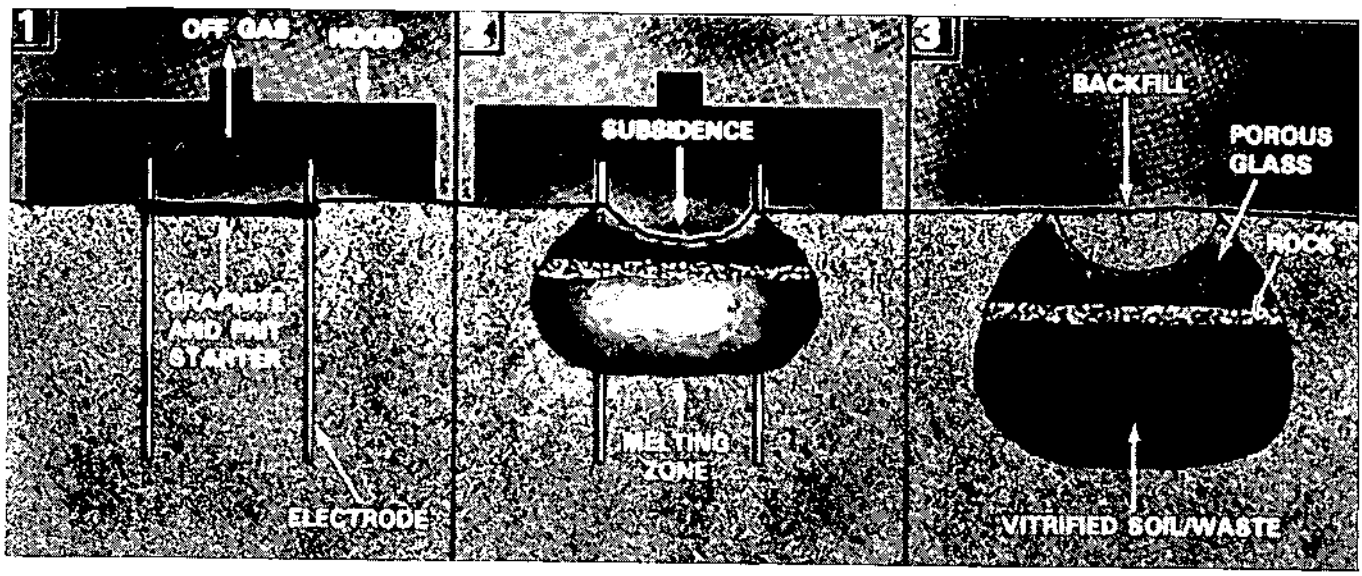


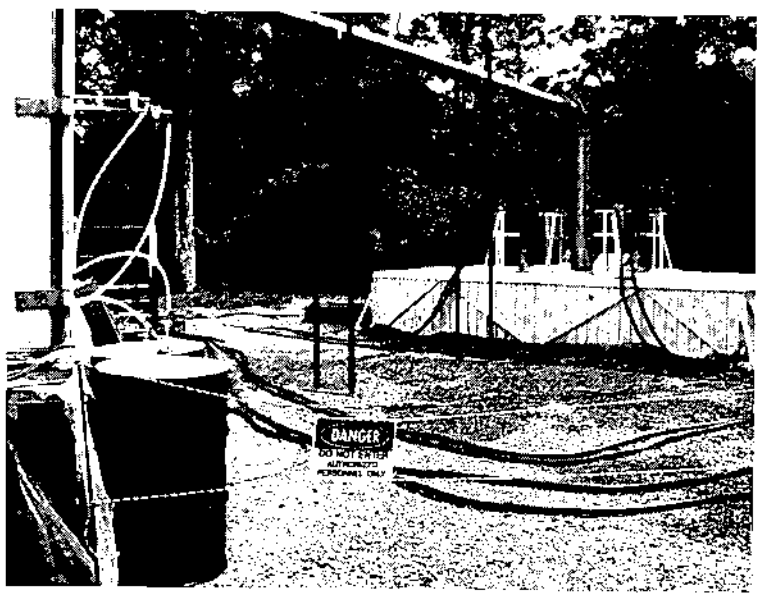


Integration of remote sensing and computer technology is used for non-intrusive characterization of waste sites. Ultrasonic Ranging and Data System (USRADS) was originally developed to survey properties suspected of containing uranium mill tailings. Using an ultrahigh-frequency sound, the hand-held instrument sensor determines the path of the surveyor and transmits data to a nearby portable computer. The processed data from USRADs is used to create a real-time display of the results. Non-intrusive surveys can be conducted rapidly and are less expensive than drilling which may spread contamination and create leaks in the waste site. USRADS is being adapted to many types of sensor instruments such as the EM-31 Terrain Conductivity Meter (shown on the right) to characterize buried waste that is electrically conductive.



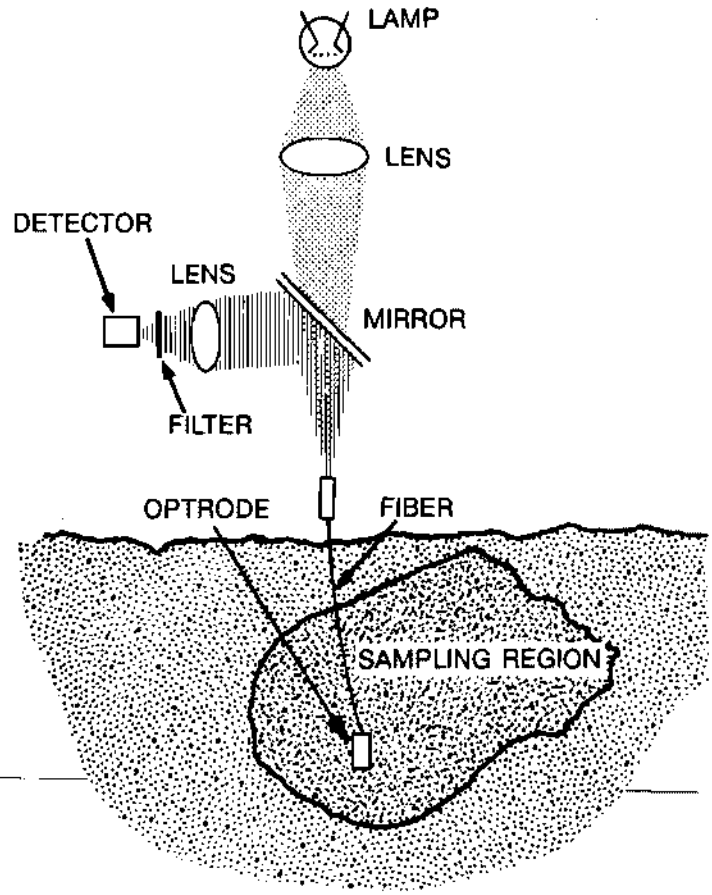
This is an example of survey results taken from the EM-31 Terrain Conductivity Meter shown above. A "bathtubbing" burial trench--partially filled with water--is clearly delineated.



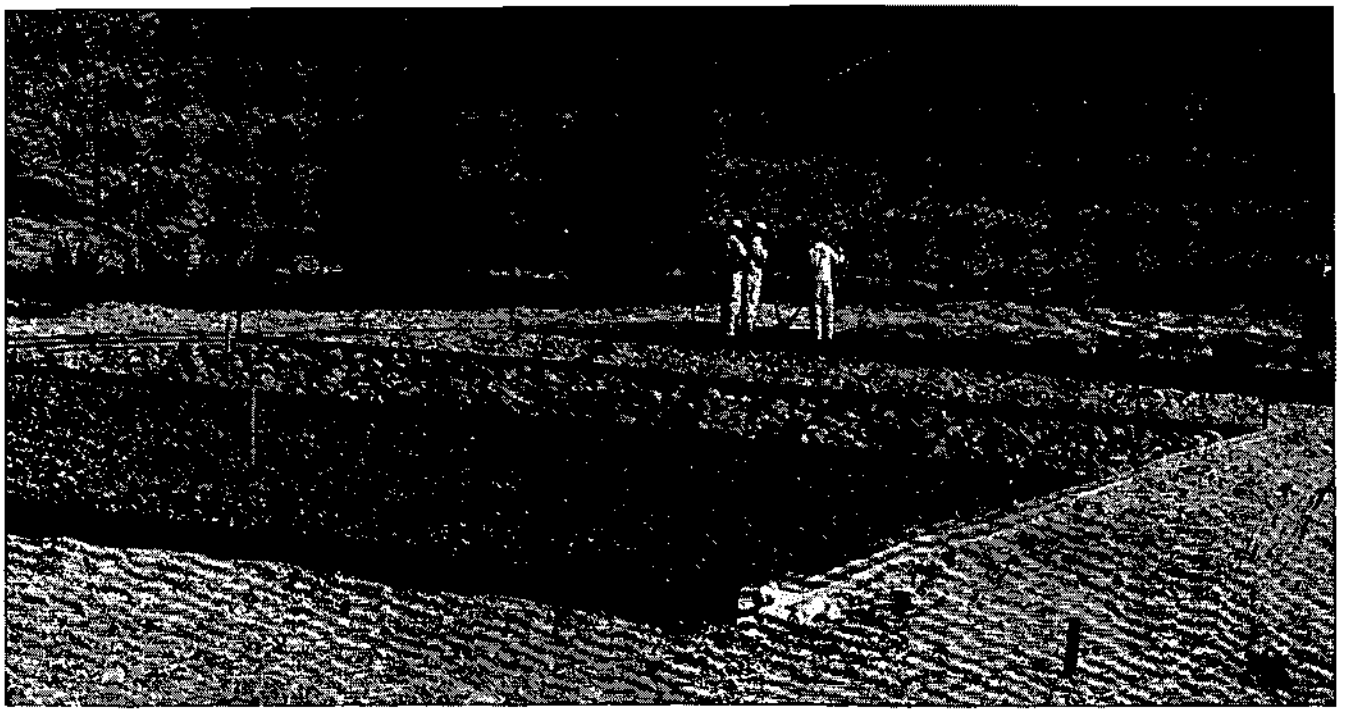


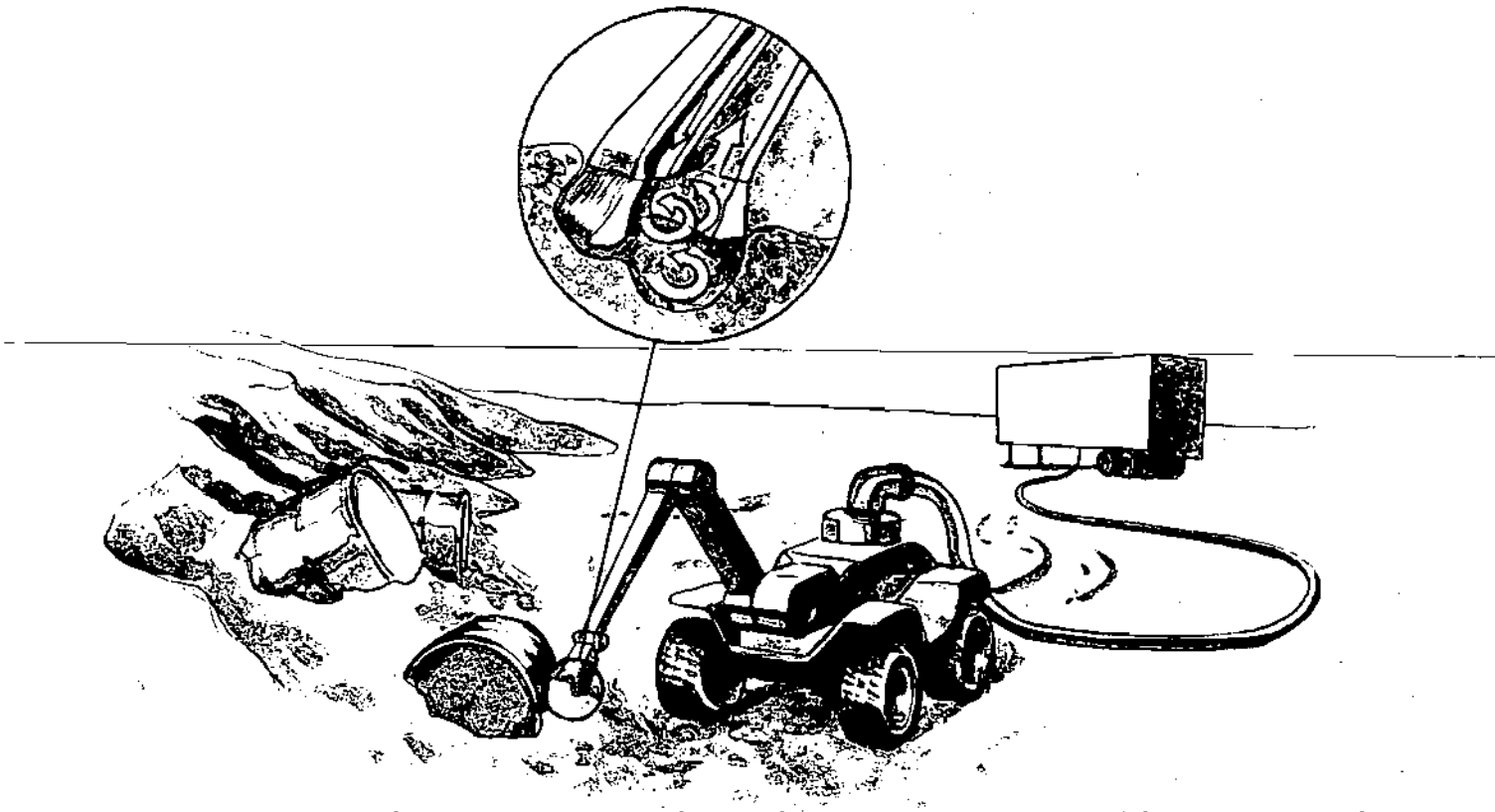
Beneath the large gas exhaust hood in the lower left picture, electrodes melt and solidify soil and waste material to isolate contaminants from the environment. Shown on the right is 10 tons of soil vitrified in the pilot scale test.

Researchers are working on a system to monitor the effectiveness of environmental barriers designed to prevent migration of contaminants outside the disposal area. The system uses chemically sensitive fiber optic sensors called optrodes. A bundle of sensors, each treated to react to a different chemical, is buried in the soil. A change in the light reflectivity of a particular sensor indicates the presence of a specific contaminant.

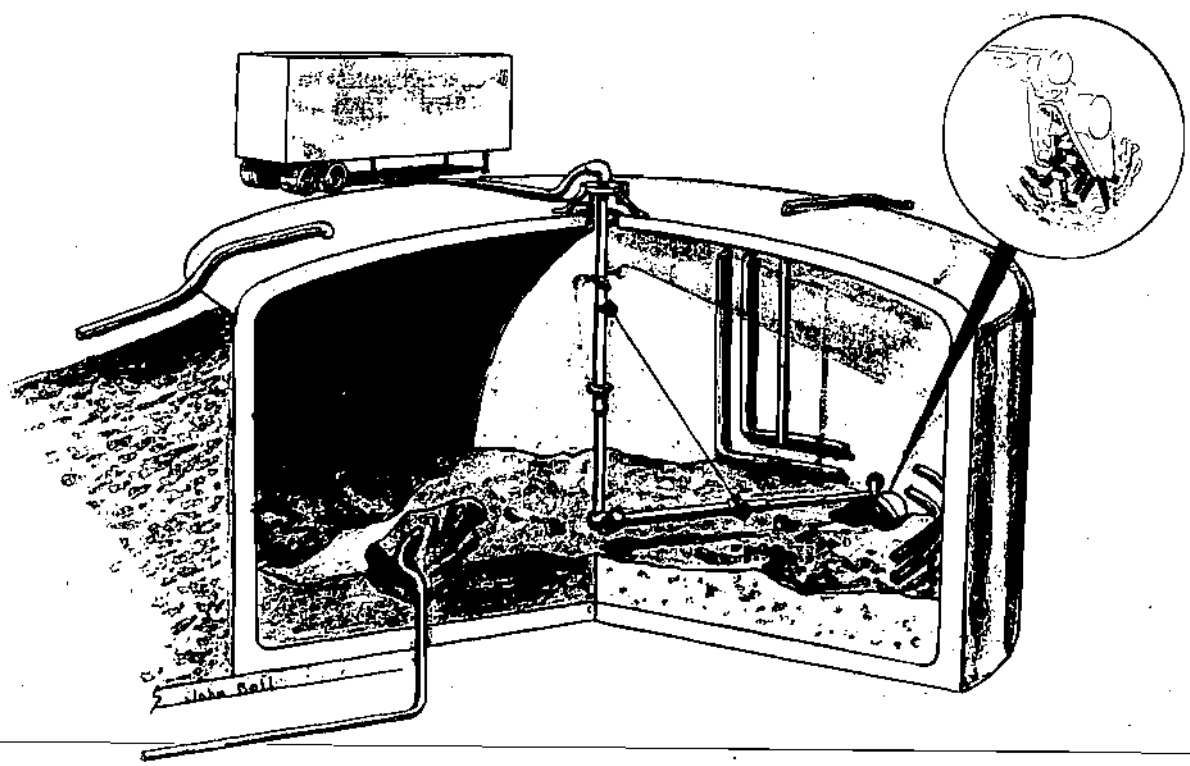


Research to improve disposal methods is carried out at a number of DOE sites. A researcher at Sandia National Laboratories in New Mexico (left) develops instruments to measure the effects of radiation from a nuclear waste container on salt formations. Demonstrations show that improved cover systems (below) ensure isolation of buried low-level waste from the environment.

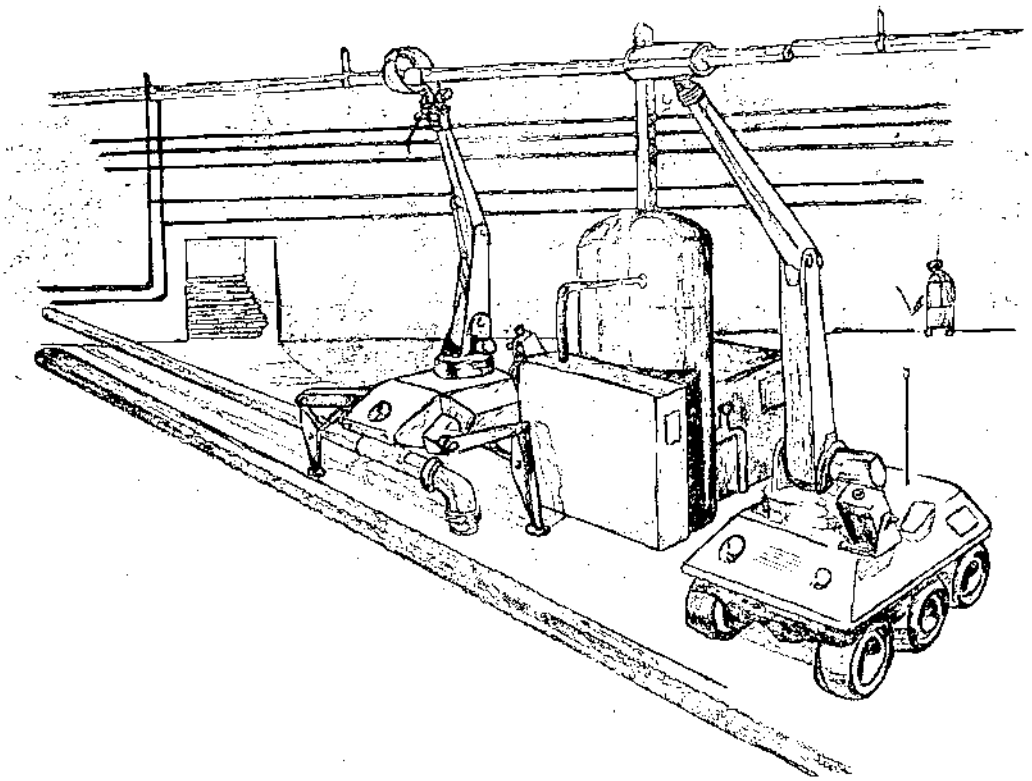




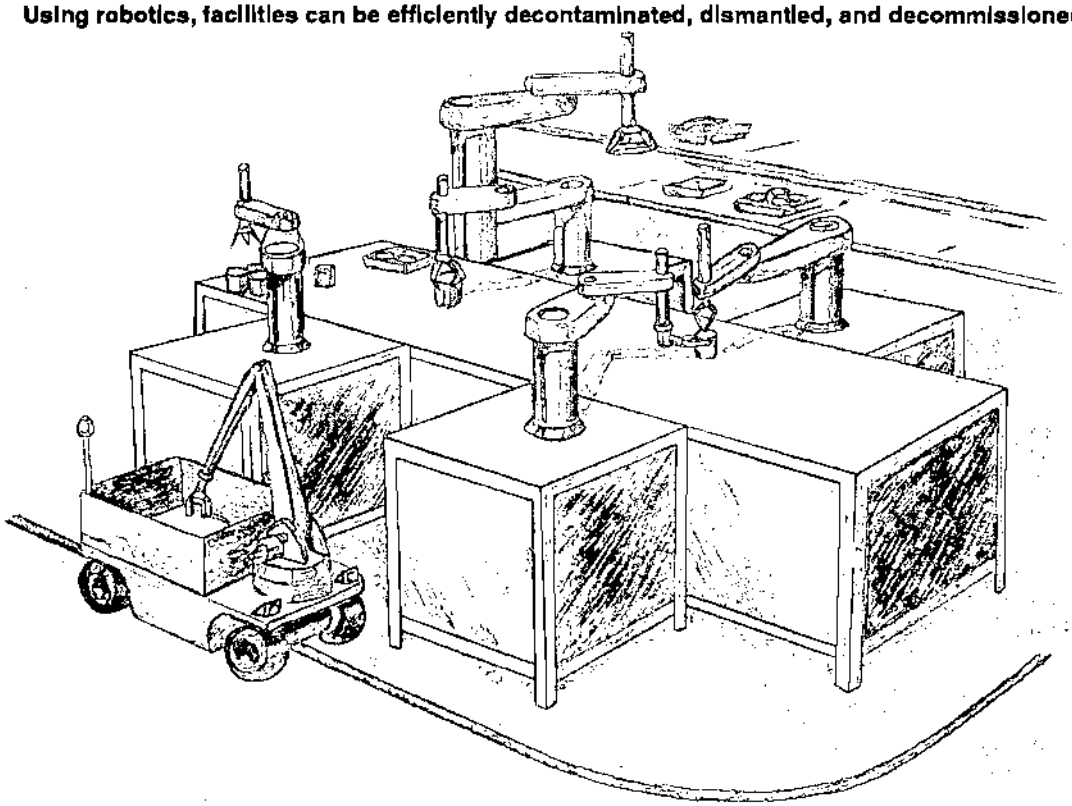
Robots have many applications in environmental restoration and waste management. Field sites can be safely excavated by robots equipped for digging and handling large objects.



Robotics may be the only way to safely disassemble highly radioactive systems. Using robotic equipment, high-level waste storage tanks can be emptied without excessive human exposure.

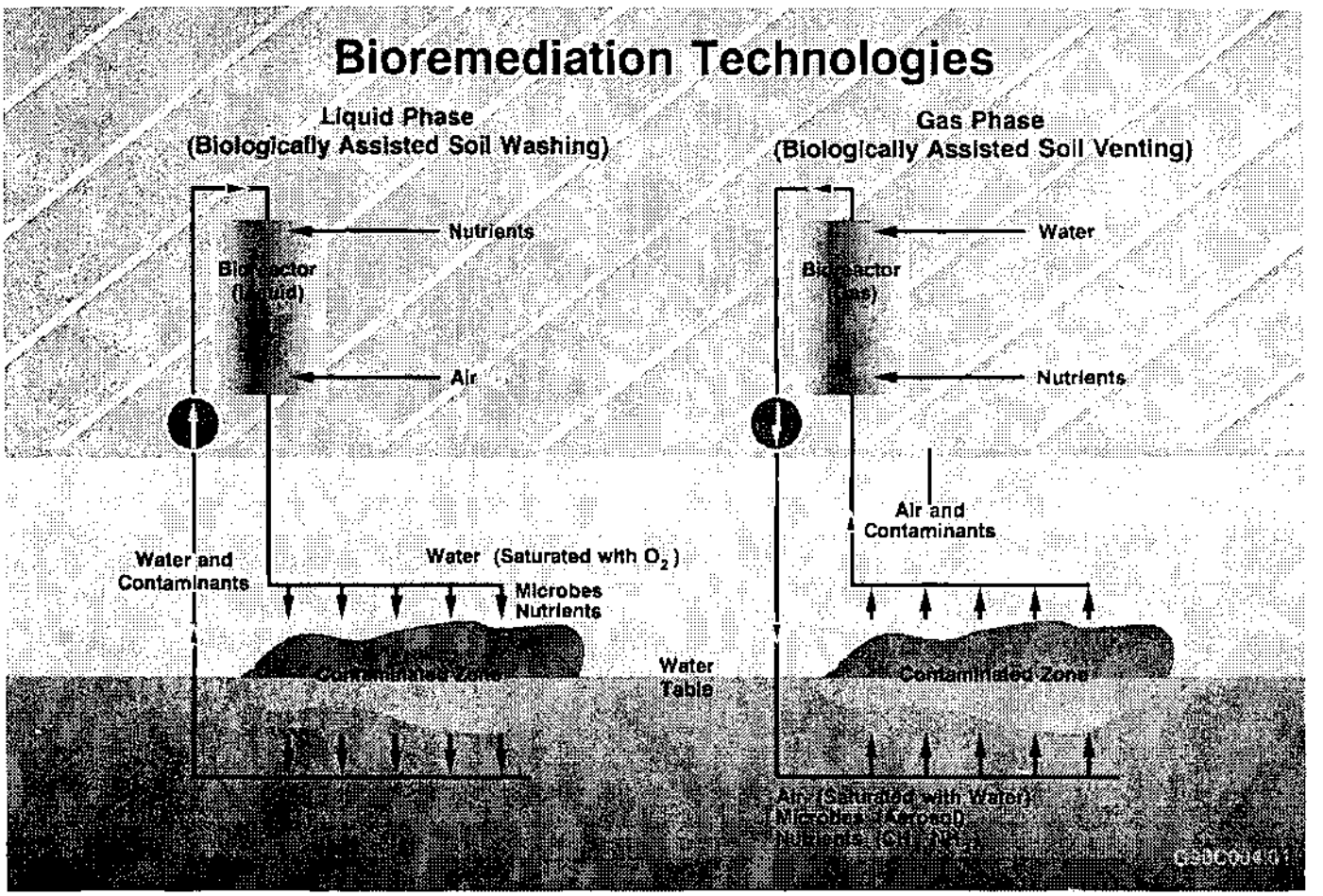


Using robotics, facilities can be efficiently decontaminated, dismantled, and decommissioned.



With the use of robots, laboratory operations can be made more precise and can be operated with less human participation.

One of the most promising, cost-effective, and efficient methods of treating contaminated soil uses bacteria. Some microorganisms convert toxic metals into a form that is less toxic or innocuous to the environment. Other biological treatment systems convert organic contaminants into water and carbon dioxide. The systems have been tested in the laboratory and the Environmental Protection Agency (EPA) is now evaluating field studies.

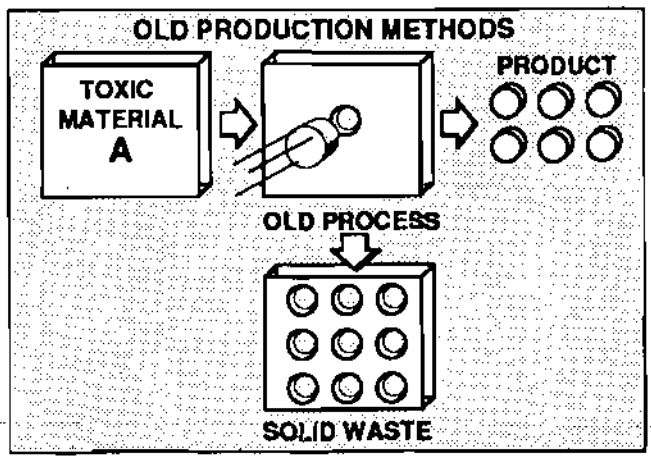


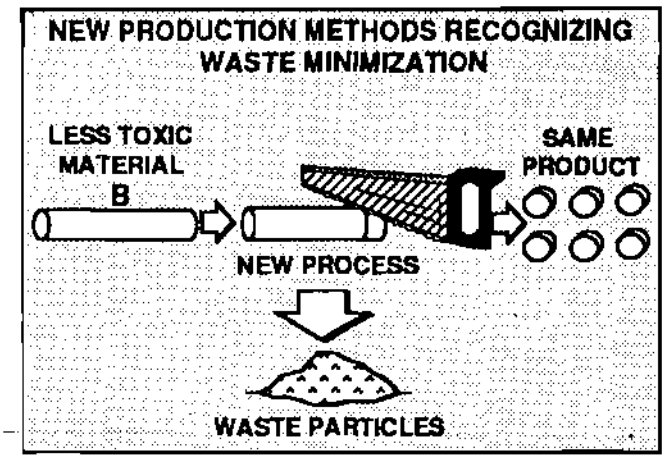
Biologically assisted restoration technologies include soil washing and venting. In biologically assisted soil washing, water with added nutrients and air is pumped into the contaminated zone, and contaminated water is pumped from beneath the zone through a bioreactor in which contaminants are destroyed or trapped. The effluent is fertilized with nutrients and air and returned to the contaminated zone to restart the cycle.

In biologically assisted soil venting, a combination of air, nutrients, and methane is injected with an inoculation of microbes, if needed, below the contaminated zone. As the contaminants are degraded, the volatile products are collected from above the contaminated zone and cycled through a bioreactor for further processing.

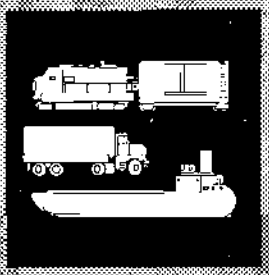
Waste Type	Reduction goal (%)
Transuranic	60
Low-level	80
Hazardous	80
Mixed	80
Sanitary	50

The previous photos show technology development activities in the areas of site characterization and assessment, treatment, and remediation. These activities are integral to achieving EM's environmental cleanup goals. Waste minimization technology development efforts, which focus on reducing waste generation, are also necessary to achieve EM's environmental cleanup goals. Technology Development goals for waste reduction range from 50 to 80 percent. This chart shows waste minimization goals for weapons manufacturing and is based on FY 1985 manufacturing waste generation rates using volume or weight as appropriate.





New designs and manufacturing processes will result in efficient material usage and reduced waste.



Transportation

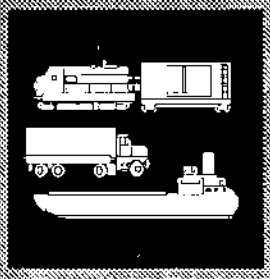
DOE safely and efficiently transports secure shipments of material used in DOE program activities. Although radioactive material makes up a small percentage of the material shipped by DOE, it receives, by far, the most attention. The radioactive material shipped ranges from relatively low levels of radioactivity, such as uranium ore, to highly radioactive material, such as spent nuclear fuel. Byproducts from processing this material, as well as from the production of other useful radioisotopes, are shipped for use in medical treatment, industrial processes, consumer goods, and research programs.

DOE has a system to protect workers, the public, and the environment from the potential hazards of radioactive material. This system is based on a simple principle--if a package contains enough radioactivity to present a significant risk of injury or property loss if released, then the package must be designed to retain its contents during severe transportation accidents. Protection is provided by the packaging, rather than by relying on special handling, routing, or the performance of transportation workers. As a result, there has never been a death or injury due to the radioactive nature of DOE's cargo.

DOE's packaging must be capable of surviving a variety of stringent tests. They must be capable of surviving a drop onto an unyielding surface, a drop onto a spike, a hot fire, and immersion in water. Material containing lower levels of radioactivity does not require as much protection, but still must be packaged in high-quality packaging designed to withstand ordinary handling accidents. These packages must be capable of surviving water spray, drop, compression, and penetration tests.

The stringent packaging requirements, combined with strict regulations and procedures governing the shipment of radioactive material, ensure radioactive transport is a safe activity. DOE follows U.S. Department of Transportation (DOT) regulations, including training, placing and securing the cargo, identifying the material on packages and vehicles through labels and placards, providing detailed information and emergency response contacts on shipping papers, maintaining the vehicles, and selecting the best routes. For shipments containing higher levels of radioactive material, the carrier must use an interstate highway system, including beltways around major cities. State and Tribal authorities may designate an alternate route after consulting with other affected States and municipalities and following DOT guidelines for a safety analysis.

Transportation



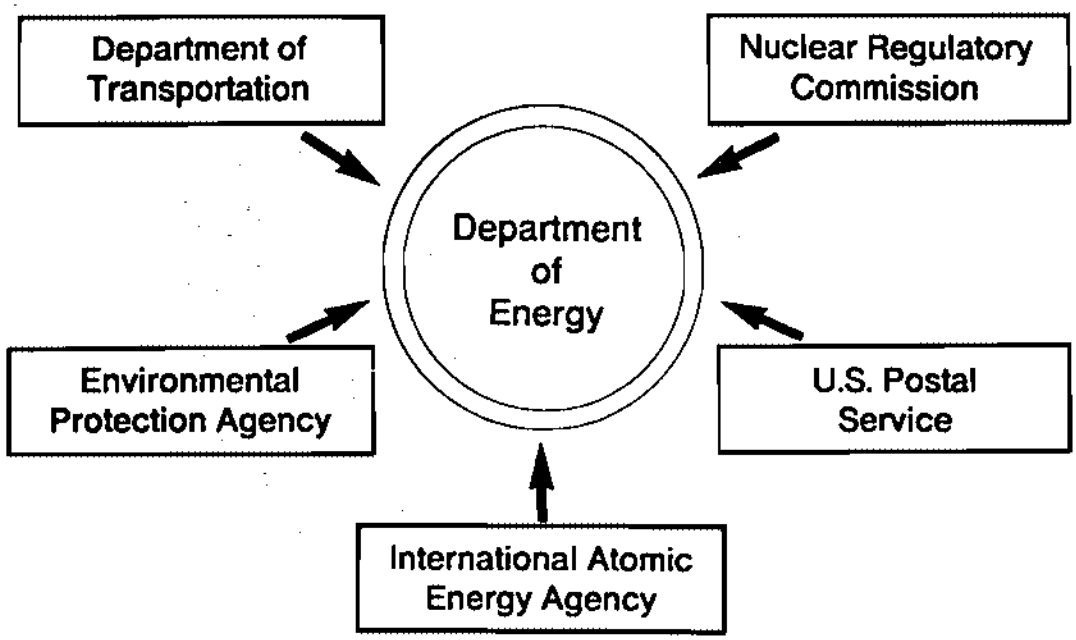
EM's Transportation Management Program (TMP) develops policies and management procedures to facilitate and coordinate the many elements of DOE transportation, including the shipment of radioactive material and waste. In addition to developing safe guidelines for DOE's packaging, including packaging maintenance and use, TMP conducts other operational activities such as negotiating rates and services, developing carrier selection standards; training DOE and contractor employees and others on regulations and procedures governing radioactive and other hazardous material shipments; and maintaining data systems to enable DOE and other interested parties to retrieve and analyze information on DOE shipments. TMP also appraises DOE field operations to assure they are in compliance with regulations and procedures.

TMP's Research and Development (R&D) Program improves and develops new transportation systems and packaging designs to meet DOE needs. The R&D Program develops and maintains computer programs to assess the risks and consequences of transporting radioactive material, maintains facilities and equipment for testing and modeling package designs, and works with regulatory bodies to achieve a single technical position on transportation regulatory issues.

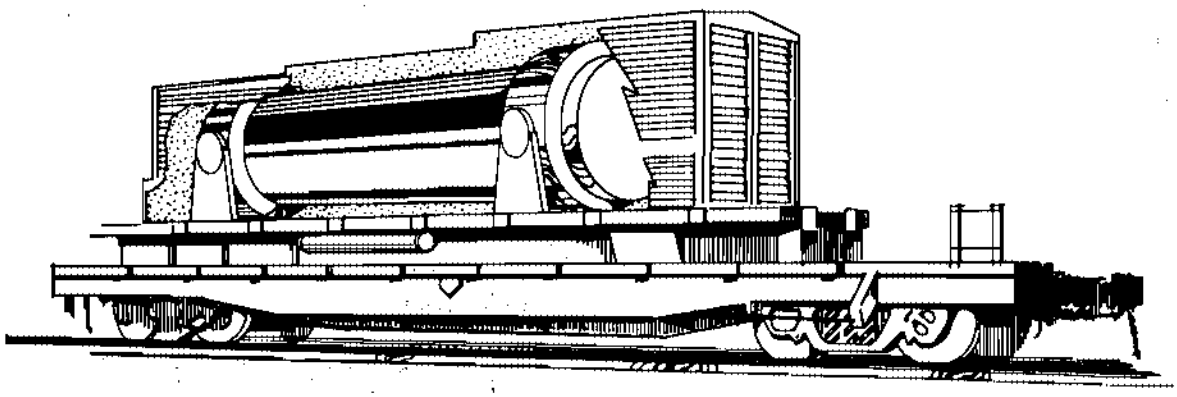
In addition, TMP supports an Emergency Preparedness Program to coordinate DOE-wide policies and activities for transportation incidents. This Program supports regional emergency response workshops for DOE and State and local public safety personnel. The Emergency Preparedness Program also sponsors a tracking system called TRANSCOM to monitor the movement of specified radioactive material shipments.

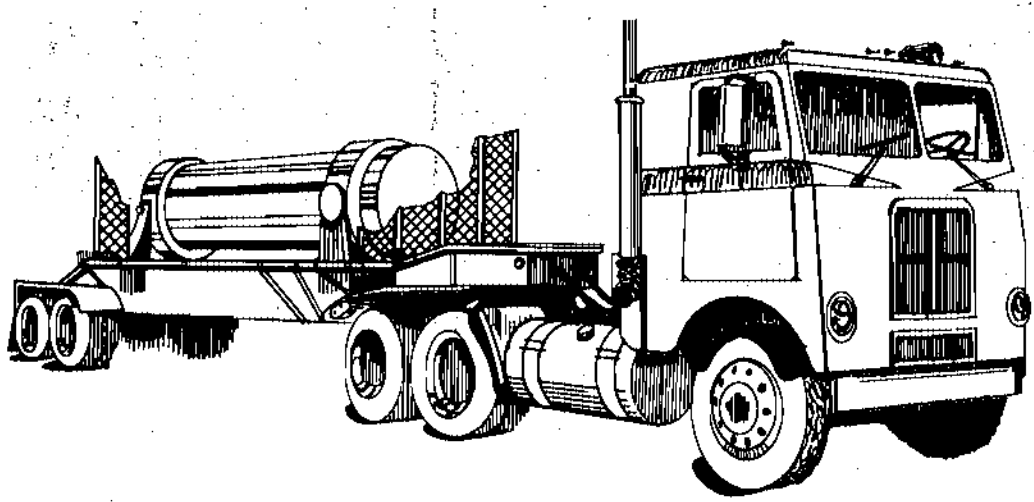
TMP's Institutional Program facilitates interactions between DOE and those interested and affected by DOE's transportation activities, and encourages resolution of transportation issues. Productive exchange is reinforced by the development of transportation-specific resources such as telecourses, videos, exhibits, models, and written materials.

These activities support DOE's commitment to protect the health and safety of the public and the environment during its shipment of radioactive and other hazardous material and waste.

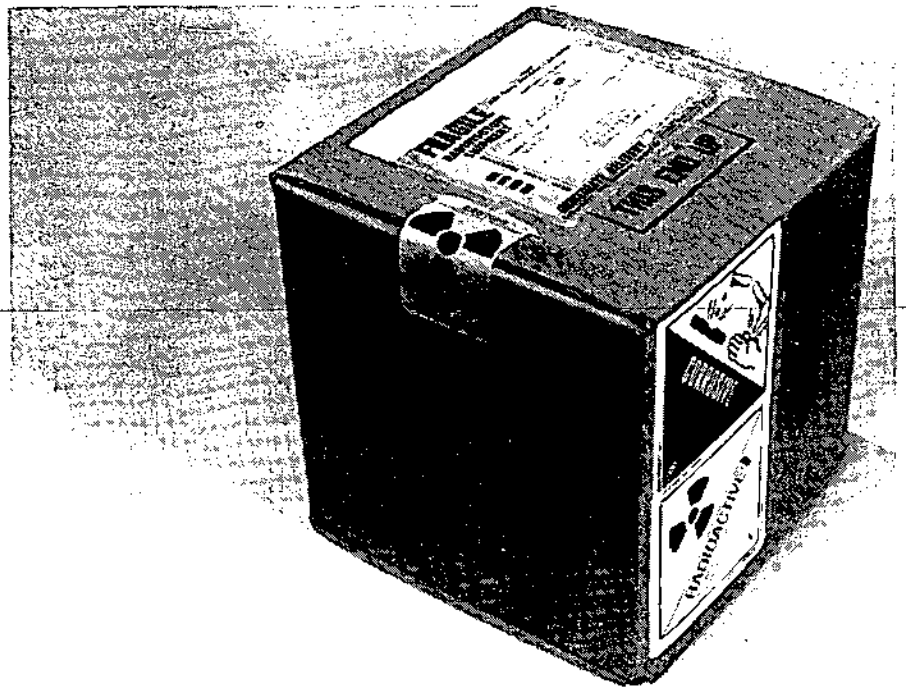


Transportation, especially for radioactive material, is highly regulated by Federal, State, and local laws.

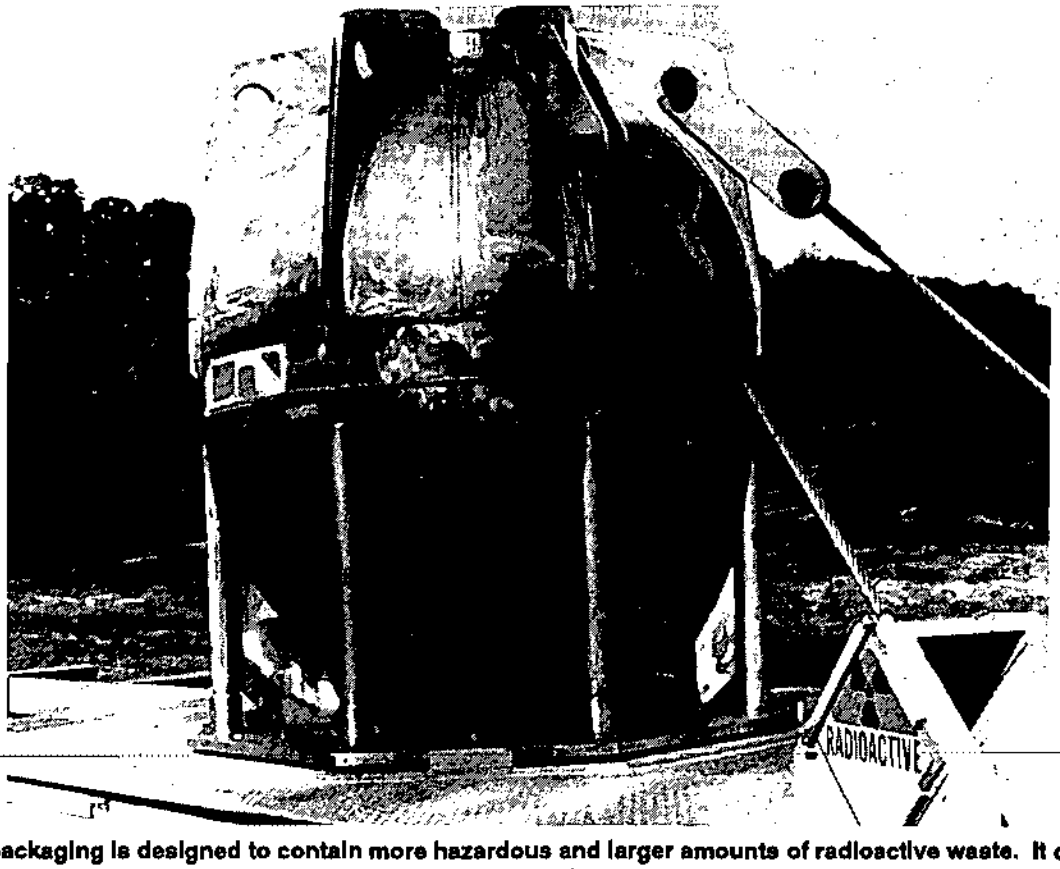




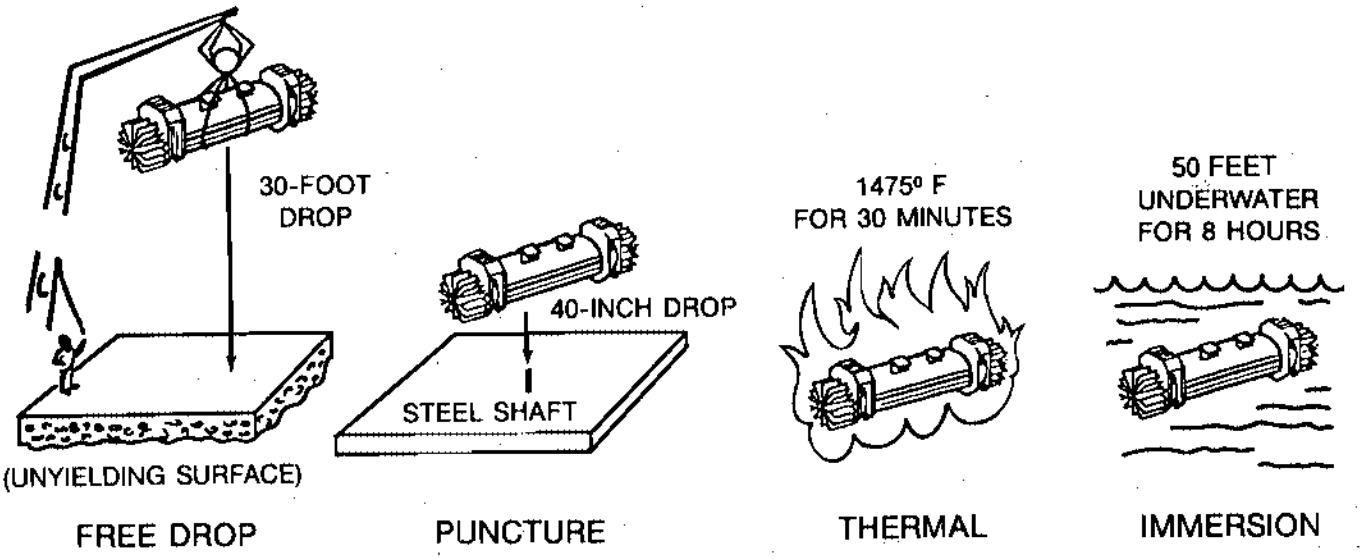
Impact-resistant packagings, called casks, provide safety for radioactive material shipped by rail and truck.



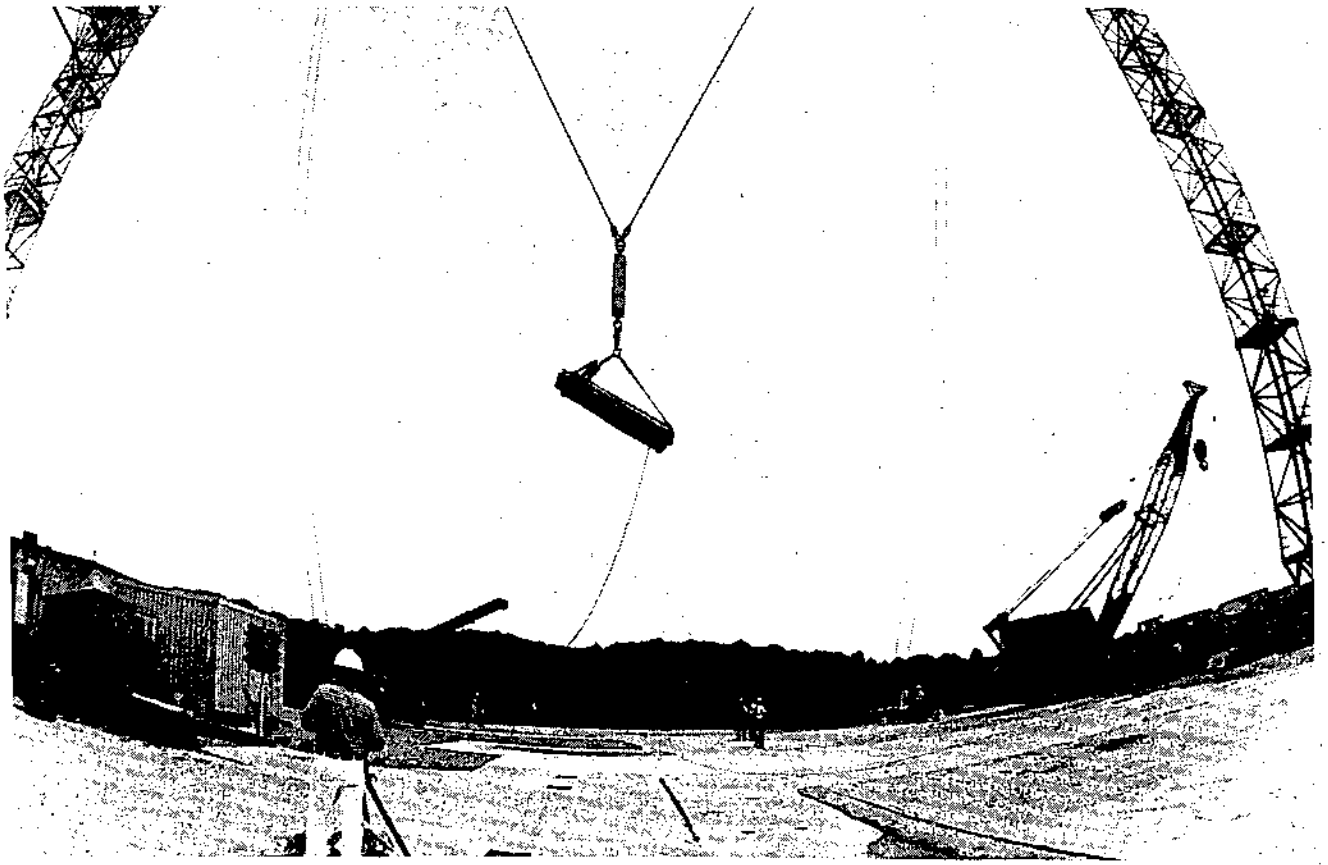
Radioactive material is shipped in secure packages. Type A packages contain small amounts of radioactive material and are designed to withstand normal conditions of transport. Type A packages are subjected to rigorous water spray, free-fall, compression, and penetration tests carried out in sequence to ensure the radioactive materials are contained.

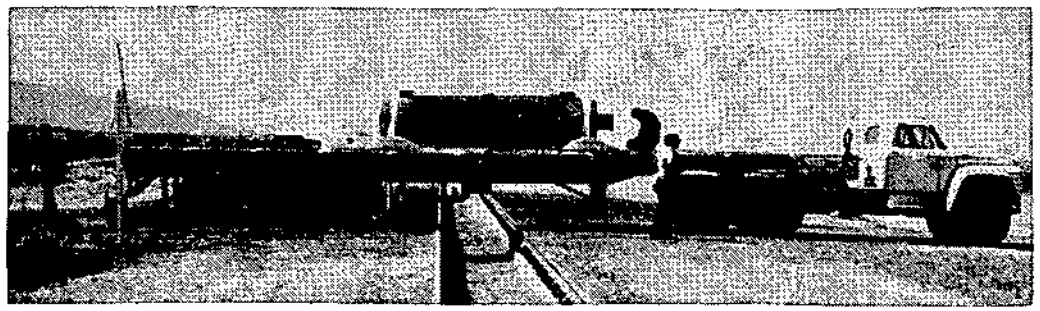


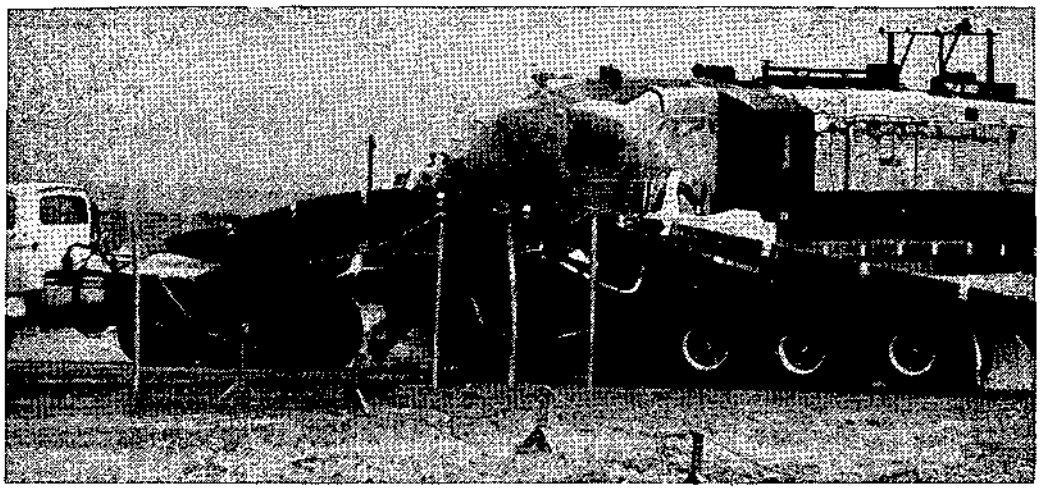
Type B packaging is designed to contain more hazardous and larger amounts of radioactive waste. It can withstand severe accident conditions and contain radioactive material under any circumstance.

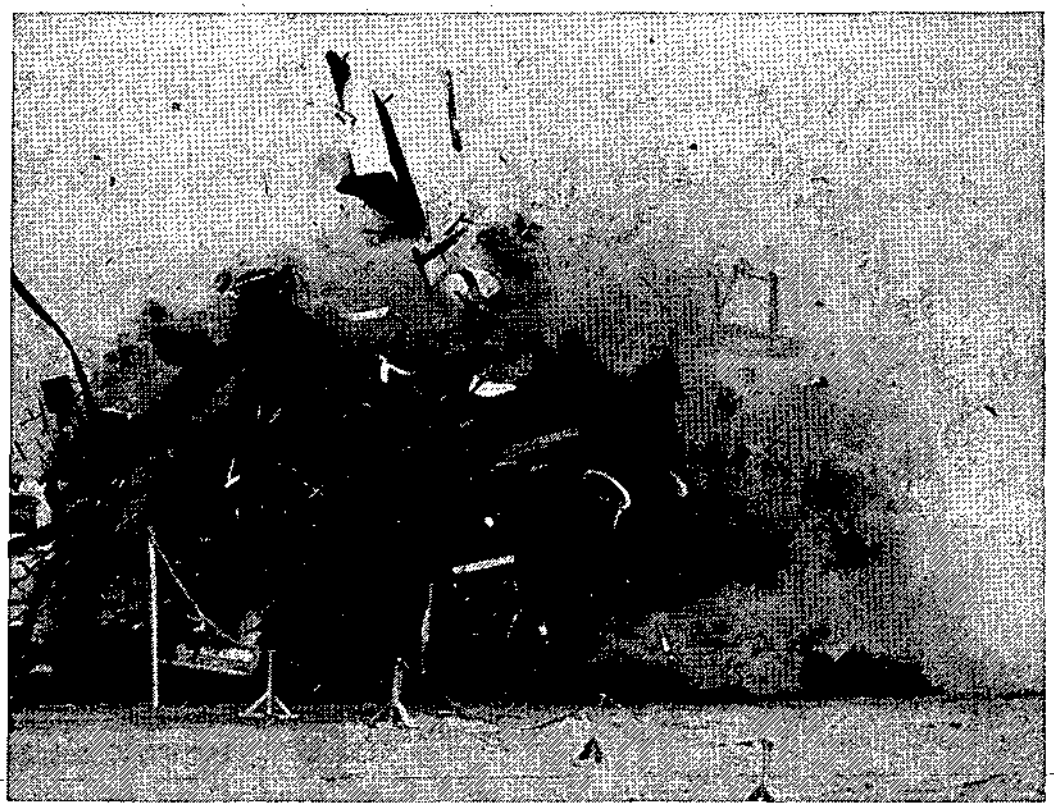


Packaging for highly radioactive material (Type B, see previous page) must be capable of surviving severe accident conditions. These test conditions are proven through computer modeling, conducting the above tests, or both. In the photograph below, a cask is raised into position for a free-drop test onto a massive unyielding surface. An unyielding surface won't "give" at all, or absorb shock, so all the shock of the fall is absorbed by the packaging. In both drop tests, the packaging's weakest and most vulnerable spot is struck. The entire packaging is also exposed to a very hot fire. For fissile materials, the packaging is immersed under 3 feet of water for 8 hours; for all other materials, a separate packaging is immersed under 50 feet of water for 8 hours. These tests are carried out in sequence.





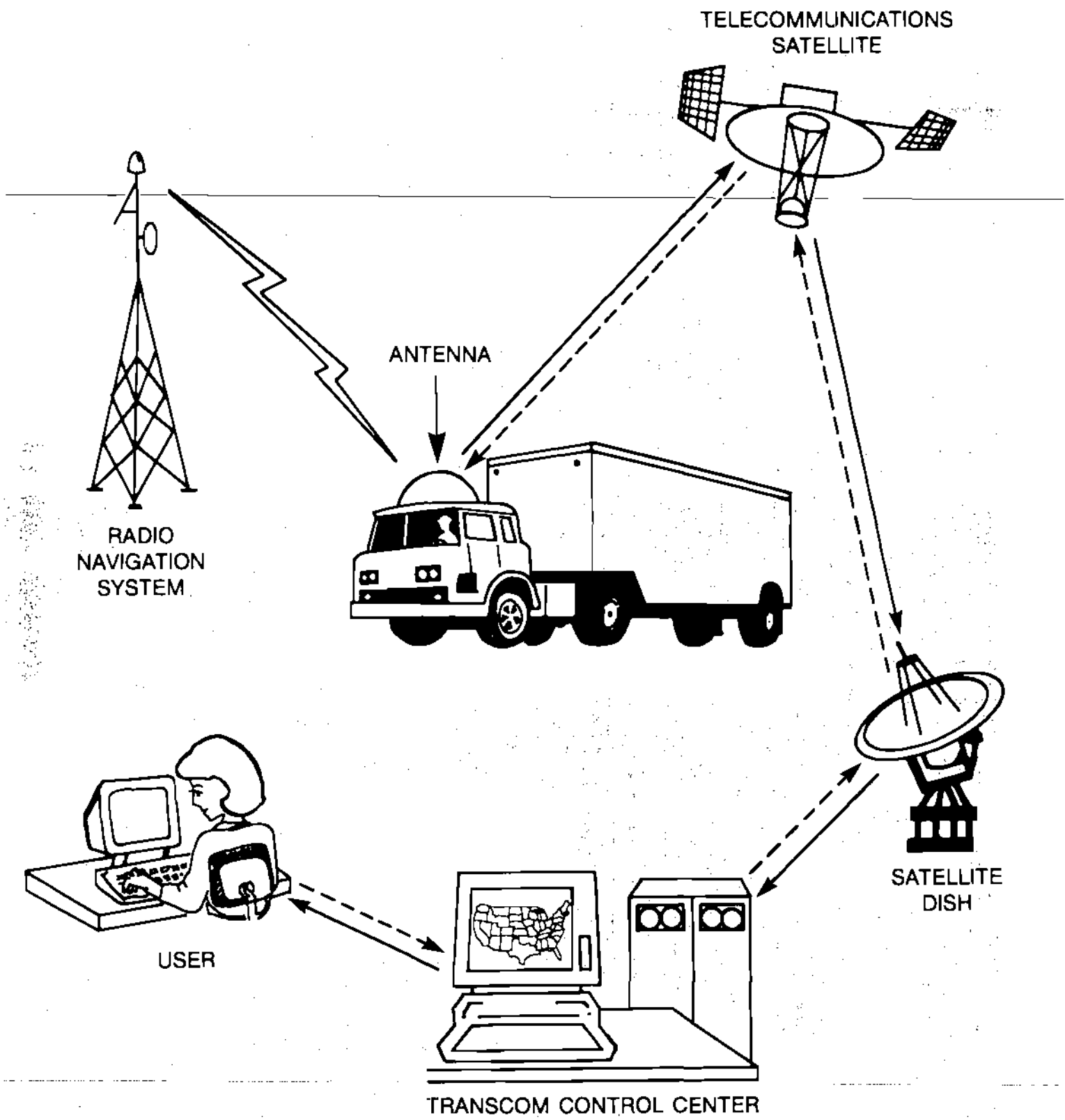




To evaluate the validity of the design and construction of packaging used to carry highly radioactive material, real-life demonstrations were staged. A truck-mounted cask was struck by a locomotive traveling at 80 miles per hour.

As shown on the previous page, the locomotive was destroyed but the cask was only slightly dented. It suffered no loss of structural integrity or shielding and none of the simulated radioactive material was released.

DOE provides extensive training courses on hazardous material identification, regulations on shipping radioactive material, and emergency response.



A system combining the technologies of land-based navigation, satellite communication, computerized database management, user networks, and ground communication, tracks some shipments of radioactive material enroute.

Glossary

Alpha Particle: A positively charged particle emitted by the nucleus of some radioactive materials undergoing radioactive decay. Alpha particles are the least penetrating of the three common forms of radiation (alpha, beta, gamma); they can be stopped by a sheet of paper or an inch of air. Alpha particles cannot penetrate skin, but materials that emit alpha particles (alpha emitters) are harmful if inhaled or ingested.

Atom: A unit of matter indivisible by chemical means. Atoms are the fundamental building blocks of chemical elements. Elements differ from each other because they are made up of different atoms.

Atomic Energy Act (AEA): The Act (1954) which placed production and control of nuclear materials within a civilian agency, originally the Atomic Energy Commission, now the Department of Energy.

Beta Particle: A negatively charged particle emitted from an atom during radioactive decay. Beta particles are easily stopped by a thin sheet of metal. Exposure to high levels of beta radiation can cause skin burns.

Burial Grounds: Areas designated for near-surface disposal of containers of low-level radioactive waste and obsolete or worn-out radioactively contaminated equipment.

Buried Waste: Low-level radioactive waste (or in some cases, pre-1970 TRU-contaminated waste) that has been disposed of by near-surface burial. (See Transuranic Waste.)

Byproducts: Radioactive materials resulting from the production or processing of nuclear materials. Some byproducts have beneficial commercial uses.

Calcining/Calcination: The process of making unconsolidated powder or granules by thermal evaporation and partial decomposition (release of gases) of high-level waste.

Canister: A container for radioactive waste forms, especially vitrified high-level liquid waste that has been solidified and immobilized. (See Vitrification.)

Cask: A thick-walled container that provides shielding during the transportation of canisters of highly radioactive materials.

Characterization: Facility or site sampling, monitoring, and analysis activities to determine the extent and nature of a release. Characterization provides the basis for acquiring the necessary technical information to develop, screen, analyze, and select appropriate cleanup techniques.

Clean Air Act (CAA): The purpose of this Act is to "protect and enhance the quality of the Nation's air resources." Its primary application is through permits to regulate new and existing facilities. Of increasing importance are the National Emissions Standards for Hazardous Air Pollutants (NESHAPs). The CAA was passed in 1970 and was amended in 1977 and 1990.

Cleanup: Actions taken to correct a release or threat of release of a hazardous substance that could affect humans and/or the environment. The term "cleanup" is sometimes used interchangeably with the terms remedial action, removal action, response action, or corrective action or activity.

Clean Water Act of 1977 (CWA): Amended the Federal Water Pollution Control Act passed in 1956. Its objective is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." The Act's major enforcement tool is the National Pollutant Discharge Elimination System (NPDES) permit. The CWA addresses surface waters only. (See SDWA.)

Compliance Agreements: Legally binding agreements between regulators and regulated entities that set standards and schedules for compliance with environmental statutes. Includes Consent Order Compliance Agreements, Federal Facilities Agreements, and Federal Facilities Compliance Agreements.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): Federal statute (also known as Superfund) enacted in 1980 and reauthorized in 1986, that provides the statutory authority for cleanup of hazardous substances that could endanger public health, welfare, or the environment. Program activities include establishing the National Priorities List, investigating sites for inclusion on the list, determining their priority level on the list, and conducting, and/or supervising the ultimately determined cleanup and other remedial actions. (See National Priorities List.)

Contact-handled: Waste containers that can be handled without shielding. (See Transuranic Waste.)

Contamination: The presence of unwanted radioactive matter, or the "soiling" of objects or materials with "radioactive dirt."

Decay: The spontaneous radioactive transformation of one nuclide into a different nuclide or into a lower energy state of the same nuclide. (See Nuclide.)

Decommissioning: The process of removing a facility from operation, followed by decontamination, and then entombment, dismantlement, or conversion to another non-nuclear use.

Decontamination: The removal of unwanted material (especially radioactive material) from facilities, soils, or equipment by washing, chemical action, mechanical cleaning, or other techniques.

Depleted Uranium: Uranium that has a smaller percentage of uranium-235 than the 0.7 percent found in natural uranium. It is found in some spent nuclear fuel or as byproduct "tails" of uranium isotope separation. (See Uranium, Spent Nuclear Fuel.)

Dismantlement: The removal of radioactive and nonradioactive contaminated equipment and materials from a facility to reduce the potential hazard to humans and to meet regulatory requirements.

Disposal: Final placement or destruction of toxic, radioactive, or other waste, surplus or banned pesticides or other chemicals, polluted soils, and drums containing hazardous materials from removal actions or accidental releases. Disposal may be accomplished through use of approved, secure, regulated landfills, surface impoundments, land farming, deep well injection, or incineration.

DOE Orders: Internal requirements which establish DOE policy and procedures for compliance with applicable laws and regulations.

DOE Waste: Radioactive waste from any activity performed in whole or in part in support of DOE Nuclear Energy, Defense, or Energy Research activities; excludes waste under purview of the Nuclear Regulatory Commission (NRC) or generated by the commercial nuclear power industry.

Electron: A negatively charged atomic particle. Electrons surround the atom's positively charged nucleus and determine the atom's chemical properties.

Element: One of the 107 known chemical substances that cannot be divided into simpler substances by chemical means. The Periodic Table lists these elements. (Examples: Hydrogen, Lead, Uranium)

Engineered Barriers: Features of a disposal site constructed of materials designed to isolate radioactive materials from the environment.

Enrichment: A process by which the natural ratios of the isotopes of a given element are altered. (See Feed Materials, Nuclear Fuel Cycle.)

Entombment: The process of sealing or burying radioactively contaminated materials to prevent dispersion or intrusion.

Environmental Assessment: A written environmental analysis which is prepared pursuant to the National Environmental Policy Act (NEPA) to determine whether a federal action would significantly affect the environment and thus require preparation of a more detailed environmental impact statement.

Environmental Impact Statement: A document required of Federal Agencies by the National Environmental Policy Act (NEPA) for major projects or legislative proposals significantly affecting the environment. A tool for decision making, it describes the positive and negative effects of the undertaking and lists alternative actions. The report documents the information required to evaluate the environmental impact of a project. Such a report informs decision makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the environment.

Environmental Restoration: Cleanup and restoration of sites contaminated with radioactive and hazardous substances during past DOE production activities.

Feasibility Study: Analysis of the practicability of a proposal; e.g., a description and analysis of the potential cleanup alternatives for a site on the National Priorities List. The feasibility study usually recommends selection of a cost-effective alternative. It usually starts as soon as the remedial investigation is underway; together, they are commonly referred to as the "RI/FS." The term can apply to a variety of proposed corrective or regulatory actions.

Feed Materials: Refined uranium or thorium metal or their pure components in a form suitable for use in nuclear reactor fuel elements or as feed to uranium enrichment facilities.

Fission: The splitting of a heavy nucleus into two roughly equal parts (which are nuclei of lighter elements), accompanied by the release of a relatively large amount of energy and frequently one or more neutrons. Fission can occur spontaneously, but usually it is caused by the absorption of gamma rays, neutrons, or other particles.

Formerly Utilized Sites Remedial Action Program (FUSRAP): A program under the direction of the Office of Environmental Restoration and Waste Management that addresses the cleanup of sites and adjacent properties contaminated by activities of the Manhattan Project.

Fuel: Fissionable material used as a source of power when placed in a specific arrangement in a nuclear reactor.

Fuel Cycle: The series of steps involved in supplying fuel for nuclear power reactors. It includes original fabrication of fuel elements, their use in a reactor, spent-fuel storage at the reactor, transportation of materials, and disposal of waste products. (See Nuclear Fuel Cycle.)

Fuel Element: A tube, rod, or other form into which fuel material is fabricated for use in a reactor.

Fuel Fabrication: The process through which fissionable metal is configured into precisely shaped fuel or target elements and clad in lead or other materials, ready for use in a reactor.

Fuel Reprocessing Plant: A chemical plant where irradiated fuel elements are processed to separate fission products from uranium and plutonium.

Gamma Ray: High energy, short wavelength, electromagnetic radiation emitted by a nucleus during radioactive decay. Gamma rays are very penetrating and are best blocked by dense materials like lead and depleted uranium. X-rays, although of non-nuclear origin, also occur in this same energy range, as do ultra-violet rays. Gamma radiation is usually accompanied by alpha and beta radiation, and always accompanies fission.

Gaseous Diffusion: A technology for separating fissionable uranium-235 isotopes from the more abundant nonfissionable uranium isotopes by pumping gaseous uranium hexafluoride through resistant barriers.

Geologic Repository: A mined facility for disposal of radioactive waste that uses natural geologic barriers to provide waste containment for geologic time periods (millions of years).

Groundwater: Water that exists or flows in a zone of saturation beneath land surface; liquid occurring beneath the earth's surface, in the interstices between soil grains, in fractures, or in porous formations.

Groundwater Remediation: Treatment of groundwater to remove pollutants.

Grout: A cement-like substance used to solidify and immobilize liquid low-level radioactive waste for disposal or to stabilize disposal trenches.

Half-Life: Time required for a radioactive substance to lose 50 percent of its radioactivity by decay. After a period equal to 10 half-lives, the radioactivity has decreased to about 0.1 percent of its original value. (See Alpha Particle, Beta Particle, Gamma Ray.)

Hazardous Waste: As defined in the 1976 Resource Conservation and Recovery Act (RCRA), a solid waste, or combination of solid waste, that because of its quantity, concentration, or physical, chemical, or infectious characteristics, may cause or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating reversible illness or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.

High-Level Waste: The highly radioactive waste material that results from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid waste derived from the liquid, that contains a combination of transuranic waste and fission products in concentrations high enough to require permanent isolation. It also includes other highly radioactive material that the Nuclear Regulatory Commission (NRC), consistent with existing law, determines to require permanent isolation.

Inactive Waste Site: Site formerly used for the treatment, storage, or disposal of waste.

Incineration: A treatment technology using combustion to destroy organic constituents and reduce the volumes of waste, e.g. burning sludge to remove the water and reduce the remaining residues to a safe, non-burnable ash which can be disposed of safely on land or in underground locations.

Irradiation: Exposure to radiation of wavelengths shorter than those of visible light (gamma, x-ray, or ultraviolet). For medical purposes, the destruction of bacteria in milk or other foodstuffs, or for inducing polymerization of monomers or vulcanization of rubber.

Isolation: The placement of radioactive waste so that contact between the waste and humans or the environment will be highly unlikely for a chosen period of time.

Isotope: Atoms with the same atomic number (same chemical element) but different atomic weights. In other words, the nuclei have the same number of protons, but a different number of neutrons. (See Element, Atom.)

Plutonium: A radioactive element with an atomic number of 94. Its most important isotope is fissionable plutonium-239, produced by neutron irradiation of uranium-238. (See Neutron, Irradiation, Isotope.)

Preliminary Assessment: The process of collecting and reviewing available information about a known or suspected waste site or release.

Production Reactor: A reactor designed primarily for large-scale production of tritium or plutonium by neutron irradiation of uranium-238. The term also refers to a reactor used primarily for the production of isotopes.

Proton: A positively charged nuclear particle; one of the two principal components of nuclei. (See Neutron.)

Quality Assurance/Quality Control: A system of procedures, checks, audits, and corrective activities to ensure that all research design and performance, environmental monitoring and sampling, and other technical and reporting actions are of the highest achievable quality.

Radiation: The propagation of energy through matter or space in the form of waves, rays, or streams of energetic particles. The term is frequently used in relation to the emission of rays from the nucleus of an atom. In nuclear physics, the term has been extended to include fast-moving particles, e.g., alpha and beta particles, and gamma rays.

Radioactive Decay: The spontaneous decay or disintegration of an unstable atomic nucleus, accompanied by the emission of radiation.

Radioactive Waste: A solid, liquid, or gaseous material of negligible economic value that contains radionuclides in excess of threshold quantities. Does not include material contaminated by radionuclides from nuclear weapons testing.

Radioactivity: The rate at which radioactive material is emitting radiation, given in terms of the number of nuclear disintegrations occurring in a suitably small unit of time. The common unit of radioactivity is the curie (Ci), which is 3.7×10^{10} disintegrations per second.

Radioisotope: A radioactive isotope of a chemical element. (See Element, Isotope.)

Remedial Action Project: A group of activities initiated to assess a DOE facility or radioactive waste site that may require restoration to achieve acceptable radiation levels.

Remedial Investigation (RI): The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process of determining the extent of hazardous substance contamination, and as appropriate, conducting treatability investigations. The in-depth study is designed to gather the data necessary to determine the nature and extent of contamination at a CERCLA site; establish criteria for cleaning up the site; identify preliminary alternatives for remedial action; and support the technical and cost analyses of the alternatives. The remedial investigation is usually done with the feasibility study. Together they are usually referred to as the "RI/FS." (See Feasibility Study.)

Neutron: An uncharged nuclear particle roughly equal in weight to a proton; one of the two principal components of nuclei. Neutrons sustain the fission chain reaction in a nuclear reactor. (See Fission.)

Nuclear Fuel Cycle: The complete series of steps involved in supplying fuel for nuclear reactors. It includes mining, refining, enrichment, fabrication of fuel elements, use in a reactor, chemical processing to recover the fissionable material remaining in the spent fuel, re-enrichment of the fuel material, refabrication of fuel elements, and management of radioactive waste. (See Fuel Cycle.)

Nuclear Radiation: Particulate and electromagnetic radiation emitted from nuclei. (See Alpha Particle, Beta Particle, Gamma Ray, Neutron.)

Nuclear Reactor: An assembly of nuclear fuel capable of starting and sustaining a controlled chain reaction based on nuclear fission.

Nuclear Waste: A term usually used interchangeably with radioactive waste.

Nuclear Waste Fund: A fund established by the Nuclear Waste Policy Act (NWPA) of 1982 which directed DOE to pursue a program toward disposal of commercial high-level and transuranic waste and defense high-level waste in a geologic repository. The nuclear waste fund assesses utilities a fee to pay for siting, development, and operation of a commercial repository. The share of the costs commensurate with the portion of the repository committed for disposal of defense high-level waste will be paid by DOE.

Nuclear Waste Policy Act (NWPA): An Act passed in 1982 and reauthorized in 1987 that directs DOE to design, site, and construct a geologic repository for the disposal of defense high-level radioactive waste and spent fuel from civilian (commercial) nuclear reactors. The NWPA also established the Office of Civilian Radioactive Waste Management to carry out these responsibilities. Waste generated during EM's cleanup activities is not covered under this Act. EM is responsible for the disposal of that waste.

Nucleus: The small positively charged core of an atom, which contains nearly all of the atom's mass. Except for ordinary Hydrogen, all nuclei contain protons, neutrons, and electrons.

Nuclide: Any species of atom that exists for a measurable length of time. A radionuclide is a radioactive nuclide. Radionuclides emit alpha, beta, and/or gamma rays, depending on their composition. (See Alpha Particle, Beta Particle, Gamma Ray.)

Off-Site Facility: A hazardous waste treatment, storage, or disposal area that is located at a place away from the generating site.

On-Site Facility: A hazardous waste treatment, storage, or disposal area that is located at the generating site.

Permit: An authorization, license, or equivalent control document issued by the Environmental Protection Agency (EPA) or an approved State agency to implement the requirements of an environmental regulation; e.g., a permit to operate a wastewater treatment plant or to operate a facility that may generate harmful emissions.

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Remote-handled: Refers to waste with a level of radioactivity that requires containers holding the waste to be shielded and handled remotely. (See Transuranic Waste.)

Removal Action: Short-term immediate actions taken to address releases of hazardous substances that require an expeditious response. (See Cleanup.)

Repository (Federal): A Federally owned and operated engineered facility for storage or disposal of specific types of radioactive waste DOE is responsible for.

Reprocessing: The chemical/mechanical processing of reactor fuel to recover the fission products and the unused fissionable material.

Resource Conservation and Recovery Act (RCRA): RCRA, an amendment to the Solid Waste Disposal Act (SWDA), was passed in 1976 to address the problem of how to safely dispose of municipal and industrial solid waste generated nationwide. It established a national policy to reduce or eliminate hazardous waste and conduct treatment, storage, or disposal to minimize its threat. RCRA was amended by the Hazardous and Solid Waste Amendments (HSWA) in 1984 to expand RCRA's scope and add detailed requirements.

Retrievability: Capability to remove waste from its place in storage.

Risk Assessment: The qualitative and quantitative evaluation performed in an effort to define the risk posed to human health and/or the environment by the presence or potential presence and/or the use of specific pollutants.

Safe Drinking Water Act (SDWA): Protects drinking water supplies. The maximum contaminant levels developed under this Act are used in groundwater monitoring programs. (See CWA.)

Sanitary Waste: Waste, such as garbage, that is generated by normal housekeeping activities and is not hazardous or radioactive. This waste is disposed of in sanitary landfills. Sanitary waste also includes liquids which are treated in sewage treatment plants.

Shallow Land Burial: Disposal of waste in shallow trenches; commonly used for low-level radioactive waste.

Shielding: A material interposed between a source of radiation and people and the environment for protection against the danger of radiation.

Shipping Cask: A specially designed container used for transporting nuclear materials.

Site Inspection: The collection of information from a CERCLA (Superfund) site to determine the extent and severity of hazards posed by the site. It follows a preliminary assessment and is more extensive. The purpose is to gather information necessary to score the site, using the EPA Hazard Ranking System, and to determine if the site presents an immediate threat that requires prompt removal action. (See National Priorities List.)

Site: For the purposes of this booklet, sites are lands, installations, and/or facilities for which DOE has or shares responsibility for environmental restoration and waste management activities.

Sludge: Slushy matter or sediment such as that precipitated by the treatment of liquid or solid waste.

Solid Waste: Non-liquid, non-soluble material ranging from municipal garbage to industrial waste that contains complex, and sometimes hazardous, substances. Solid waste also includes sewage sludge, agricultural refuse, demolition wastes, and residues. Technically, solid waste also refers to liquids and gases in containers.

Spent Nuclear Fuel: Nuclear reactor fuel that has been irradiated to the extent that it can no longer effectively sustain a chain reaction. Fuel becomes spent when its fissionable isotopes have been partially consumed and fission-product poisons have accumulated in it.

Stabilization: Conversion of the active organic matter in sludge into inert, harmless material. Also, activities to reduce the active management required for disposal facilities (such as burial ground stabilization and closure).

Standards: Prescriptive norms which govern action and actual limits on the amount of pollutants or emissions produced. The Environmental Protection Agency (EPA), under most of its responsibilities, establishes minimum standards. States are allowed to be stricter.

Storage: Retention and monitoring of waste in a retrievable manner pending final disposal.

Superfund Amendments and Reauthorization Act (SARA): The 1986 Act reauthorizing and amending the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

Surplus Facility: Any facility or site (including equipment) that has no identified programmatic use and may or may not be radioactively contaminated to levels that require controlled access.

Toxic Substances Control Act (TSCA): TSCA was enacted in 1976 to protect human health and the environment from unreasonable risk due to exposure to, manufacture, distribution, use, or disposal of substances containing toxic chemicals. For example, under TSCA, any hazardous waste that contains more than 50 parts per million of polychlorinated biphenyls (PCBs) are subject to regulations under this Act.

Transuranic Elements: Elements heavier than uranium, with an atomic number greater than 92. They include, among others, neptunium, plutonium, americium, and curium.

Transuranic (TRU) Waste: Waste that is contaminated with alpha-emitting transuranium nuclides with half-lives greater than 20 years and concentrations greater than 100 nanocuries per gram of waste. Contact-handled (CH) TRU waste does not require shielding and has a surface dose rate of less than 200 millirem (mrem) per hour. Remote-handled (RH) TRU waste has a surface dose rate greater than 200 mrem per hour and requires additional shielding because it presents an exposure hazard. The dose rates at the surface of RH-TRU waste packages fall within the 200 mrem to 1,000 rem per hour range. Some TRU waste was buried before these ranges were established. This is known as pre-1970 buried TRU waste.

Treatment: Any activity that alters the chemical or physical nature of radioactive or hazardous waste to reduce toxicity, volume, mobility, or render it amenable for transport, storage or disposal.

Tumulus: Above-ground waste burial using materials including cement, plastics, and dirt. Radioactive waste is immobilized, stored in concrete vaults, placed on an above-ground concrete storage pad, and covered with plastic and dirt. In humid or wet regions, tumulus disposal protects the water table.

Underground Storage Tank (UST): Any tank or associated piping containing hazardous materials as defined by the Hazardous and Solid Waste Amendments Act (Subtitle C or Subtitle I).

Uranium: A naturally occurring radioactive heavy metal element with the atomic number of 92 and an atomic weight of approximately 238. The two principal isotopes are the fissionable uranium-235 (0.7 percent of natural uranium) and the uranium-238 (99.3 percent of natural uranium).

Uranium Mill Tailings: Naturally occurring radioactive rock and soil that are the result of uranium mining and milling. Tailings may also contain other minerals or metals not extracted in the process of mining uranium from ore.

Uranium Mill Tailings Radiation Control Act of 1978: This Act directed DOE to provide for stabilization and control of the uranium mill tailings from inactive sites in a safe and environmentally sound manner to minimize radiation health hazards to the public. It authorizes DOE to undertake remedial actions at 24 designated inactive uranium processing sites and at an estimated 5,048 vicinity properties. The Uranium Mill Tailings Remedial Action (UMTRA) Project accomplishes this cleanup.

Vitrification: The process of immobilizing waste that produces a glass-like solid that permanently captures the radioactive materials.

Vitrify: To form into a glass-like material by heating and melting and cooling.

Waste Immobilization: The process of converting waste to a stable, solid form that encases the radionuclides to prevent or slow their migration to the biosphere.

Waste Isolation Pilot Plant (WIPP): Research and demonstration facility located at Carlsbad, New Mexico, intended to demonstrate safe disposal of radioactive waste in a deep geologic environment. A decision on whether to convert WIPP to a disposal facility for transuranic waste will be made after successful testing is demonstrated.

Waste Minimization: The reduction, to the extent feasible, of radioactive and hazardous waste that is generated before treatment, storage, or disposal of the waste. Waste minimization includes any source reduction or recycling activity that results in either: 1) reduction of total volume of hazardous waste; 2) reduction of toxicity of hazardous waste; or 3) both.

Waste Stream: Term used to refer to waste leaving a facility or operation.

Appendix

State #	City	Location	Status*
AK-1	Amchitka Island	Amchitka IslandTest Site	
AK-2	Cape Thompson	Project Chariot	
AZ-1	Tuba City	Tuba City	U/C
AZ-2	Monument Valley	Monument Valley	U
CA-1	Berkeley	Lawrence Berkeley Laboratory	
CA-2	Berkeley	University of California	F/C
CA-3	Livermore	Lawrence Livermore National Laboratory	
CA-3	Livermore	Sandia National Laboratory - Livermore	
CA-4	Bodega Bay	Farallon Islands	
CA-5	Vallecitos	G E Vallecitos Nuclear Center	
CA-6	Canoga Park (LA)	Atomics International	
CA-7	San Diego	General Atomics	
CA-8	Palo Alto	Stanford Linear Accelerator	
CA-9	Oxnard	Oxnard	
CA-9	Santa Susana	Santa Susana Field Laboratory	
CA-9	Santa Susana	Energy Technology Engineering Center	
CA-10	Davis	U.C. Davis	
CA-10	Davis	Laboratory for Energy-Related Health Research	
CO-1	Grand Valley	Project Rulison Site	
CO-1	Rifle	Rifle	U
CO-1	Rifle	Project Rio Blanco Site	
CO-2	Gunnison	Gunnison	U
CO-3	Denver	Rocky Flats Plant	
CO-4	Durango	Durango	U/C
CO-5	Grand Junction	Grand Junction Project Office	U
CO-6	Maybell	Maybell	U
CO-7	Naturita	Naturita	U
CO-8	Slick Rock	Slick Rock	U
CT-1	Seymour	Seymour Specialty Wire	F
FL-1	St. Petersburg	Pinellas Plant	
FL-1	St. Petersburg	4.5 Acre Site	
FL-2	Cape Canaveral	Cape Canaveral	
IA-1	Ames	Ames Laboratory	
ID-1	Lowman	Lowman	U/C
ID-2	Idaho Falls	Idaho Chemical Processing Plant	
ID-2	Idaho Falls	Idaho National Engineering Laboratory	
ID-2	Idaho Falls	Argonne National Laboratory - West	
IL-1	Chicago	University of Chicago	F/C
IL-1	Chicago	National Guard Armory	F/C
IL-1	Cook County	Site A/Plot M, Palos Forest Reserve	

*U = UMTRA; F = FUSRAP; C = COMPLETED

Note - Shaded groups of sites are shown as one circle on the DOE site map on page 9.

State #	City	Location	Status*
IL-2	Batavia	Fermi Laboratory	
IL-2	Lemont	Argonne National Laboratory - East	
IL-3	Granite City	Granite City Steel	F
IL-3	Madison	Madison	F
KY-1	Hillsboro	Maxey Flats	
KY-2	Paducah	Paducah Gaseous Diffusion Plant	
MA-1	Norton	Shpack Landfill	F
MA-2	Beverly	Ventron	F
MA-3	Indian Orchard	Chapman Valve	
MD-1	Curtis Bay	W.R. Grace & Company	F
MI-1	Adrian	General Motors	F
MO-1	Kansas City	Kansas City Plant	
MO-2	Hazelwood	Latty Avenue Properties	F
MO-2	St. Louis	Weldon Spring Site RAP	
MO-2	St. Louis	St. Louis Airport Vicinity Prop.	F
MO-2	St. Louis	St. Louis Airport Storage Site	F
MO-2	St. Louis	St. Louis Downtown Site	F
MS-1	Hattiesburg	Tatum Dome Test Site	
MT-1	Butte	Component Development & Integration	
ND-1	Bowman	Bowman	U
ND-2	Belfield	Belfield	U
NE-1	Lincoln	Hallam Nuclear Power Facility	
NJ-1	Jersey City	Kellex/Pierpont	F/C
NJ-2	Maywood	Maywood Chemical Works	F
NJ-3	Princeton	Princeton Plasma Physics Laboratory	
NJ-4	Middlesex	Middlesex Landfill	F/C
NJ-5	Middlesex	Middlesex Sampling Plant	F
NJ-5	New Brunswick	New Brunswick Laboratory	F
NJ-6	Wayne/Pequannock	Wayne/Pequannock	F
NJ-7	Deepwater	Du Pont & Company	F
NM-1	Alburquerque	South Valley Site	
NM-1	Alburquerque	Sandia National Laboratory - Alburquerque	
NM-1	Alburquerque	Inhalation Toxicology Research Institute	
NM-2	White Sands	Chupadera Mesa	F/C
NM-3	Carlsbad	Project Gnome Site	
NM-3	Carlsbad	Waste Isolation Pilot Plant	
NM-4	Ambrosia Lake	Ambrosia Lake	U
NM-5	Farmington	Project Gasbuggy Site	
NM-6	Shiprock	Shiprock	U/C
NM-7	Los Alamos	Los Alamos National Laboratory	
NM-8	Los Alamos	Bayo Canyon	F/C
NM-8	Los Alamos	Acid/Pueblo Canyon	F/C
NV-1	Fallon	Project Shoal Site	
NV-2	Central Nevada TA	Faultless	
NV-2	Nellis AFB	Tonopah Test Range	
NV-2	Mercury	Nevada Test Site	
NY-1	Buffalo	B & L Steel	F
NY-2	West Valley	West Valley Demonstration Project	

*U = UMTRA; F = FUSRAP; C = COMPLETED

Note - Shaded groups of sites are shown as one circle on the DOE site map on page 9.

State #	City	Location	Status*
NY-3	Tonawanda	Seaway Industrial Park	F
NY-3	Tonawanda	Ashland Oil #1	F
NY-3	Tonawanda	Ashland Oil #2	F
NY-3	Tonawanda	Linde Air Products	F
NY-4	Lewiston	Niagara Falls Storage Site Vicinity Property	F/C
NY-5	Niagara Falls	Niagara Falls Storage Site	F
NY-6	Colonie	Colonie	F
NY-6	Niskayuna	Separations Process Research Unit	
NY-6	Schenectady	Knolls Atomic Power Laboratory	
NY-7	Staten Island	Baker & Williams Warehouse	F
NY-8	Upton, LI	Brookhaven National Laboratory	
OH-1	Columbus	Battelle Columbus Laboratory	
OH-1	Columbus	B & T Metals	F
OH-2	Fernald	Fernald Environmental Management Project	
OH-3	Ashtabula	Fields Brook Site	
OH-3	Ashtabula	Reactive Metals Site	
OH-4	Oxford	Oxford	F
OH-5	Painesville	Painesville	F
OH-6	Piqua	Piqua Nuclear Power Facility	
OH-7	Miamisburg	Mound Plant	
OH-8	Portsmouth	Portsmouth Gaseous Diffusion Plant	
OH-9	Luckey	Luckey	F
OH-9	Toledo	Baker Brothers	F
OR-1	Lakeview	Lakeview	U/C
OR-2	Albany	Albany Metallurgical Research Center	F/C
PA-1	Aliquippa	Aliquippa Forge	F
PA-2	Canonsburg	Canonsburg	U/C
PA-3	Shippingport	Shippingport Atomic Power Station	C
PA-4	Springdale	Springdale	F
PA-4	West Mifflin	Bettis Atomic Power Laboratory	
PR-1	Mayaguez	Center for Energy & Environmental Research	
SC-1	Aiken	Savannah River Site	
SD-1	Edgemont	Edgemont	U/C
TN-1	Oak Ridge	Elza Gate	F/C
TN-2	Oak Ridge	Y-12 Plant	
TN-2	Oak Ridge	Oak Ridge K-25 Site	
TN-2	Oak Ridge	Oak Ridge National Laboratory	
TX-1	Falls City	Falls City	U
TX-2	Amarillo	Pantex Plant	
UT-1	Green River	Green River	U/C
UT-2	Salt Lake City	Salt Lake City	U/C
UT-3	Mexican Hat	Mexican Hat	U
UT-3	Monticello	Monticello	
WA-1	Richland	Hanford Site	
WY-1	Spook	Spook	U/C
WY-2	Riverton	Riverton	U/C

*U = UMTRA; F = FUSRAP; C = COMPLETED

Note - Shaded groups of sites are shown as one circle on the DOE site map on page 9.

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April 6, 1994

Dear Mound stakeholder,

We have assembled this CERCLA Notebook as part of an ongoing effort to keep you informed about Mound's CERCLA program. The notebook contains valuable information published since the beginning of Mound's CERCLA program in 1989. Included are a glossary of commonly used CERCLA terms, background on Mound Operable Units, fact sheets, *Superfund Update* newsletters, a list of current documents in the Mound Plant CERCLA Public Reading Room, and information on the U.S. Agency for Toxic Substances and Disease Registry (ATSDR).

To keep you current on Mound environmental restoration activities, we will send you quarterly notebook updates in the mail. Also, you have automatically been placed on Mound's CERCLA mailing list and will receive twice-quarterly issues of *Superfund Update*, Mound's CERCLA newsletter. Please add these new newsletters to the previously published newsletters found inside.

We hope this notebook provides a user-friendly account of the Mound CERCLA program and encourages your participation in the cleanup. The Mound CERCLA program is guided by community needs as expressed by community members themselves. In other words, because you have a stake in your community, your input in the Mound cleanup counts.

Thank you for your interest. If you have any questions on the Mound CERCLA program, please contact our Community Relations Office at (513) 865-4140.

Sincerely,

Monte Williams
Manager, Environmental Restoration/CERCLA

MOUND

Environmental
Restoration
Program

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EG&G

A. IMPORTANT PHONE NUMBERS

MOUND

Environmental
Restoration
Program

Important Phone Numbers

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Diane Spencer ..... (312) 886-5867

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Dayton Office
Jeff Smith ..... (513) 285-6046

Ohio Department of Health
Headquarters, Columbus 1-800-523-4439

ODH Radiological Section,
Columbus ..... (614) 644-2727

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B. GLOSSARY OF CERCLA AND RELATED TERMS

CERCLA GLOSSARY AND ACRONYMS LIST

Underlined words in definitions are themselves glossary terms. This listing also contains terms and acronyms that do not appear in this document, but which may appear throughout the CERCLA program. Terms with an asterisk are listed in the Mound Community Relations Plan.

Activity Data Sheet (ADS)	A project budget list prepared for DOE's use.
Administrative Order on Consent (AOC)	A legal agreement between EPA and Potentially Responsible Parties in which the PRP(s) agree to perform or pay the cost of a site cleanup. Unlike a consent agreement, an AOC does not have to be approved by a judge.
*Administrative Record	A file which contains all information used by the lead agency to make its decision on the selection of a response action under CERCLA. This file is to be available for public review and a copy to be established at or near the site, usually at one of the Information Repositories.
Agency for Toxic Substances and Disease Registry (ATSDR)	A federal agency created by CERCLA, ATSDR prepares health assessments for Superfund sites.
*Aquifer	An underground rock formation composed of materials such as sand, soil or gravel that can store and supply groundwater to wells and springs. Most aquifers used in the United States are within a thousand feet of the earth's surface.
AOC	Administrative Order on Consent
*Applicable or Relevant and Appropriate Requirements (ARARs)	Other federal, state and local requirements that must be followed during a CERCLA or DOE Environmental Restoration.
*ARARs	Applicable or Relevant and Appropriate Requirements.
ATSDR	Agency for Toxic Substances and Disease Registry.
*Background	Level of radiation that occurs in nature.
*CAA	Clean Air Act of 1990.
Carcinogen	A substance that can cause cancer.
Carbon Adsorption	A treatment system where contaminants are removed from groundwater or surface water when the water is forced through tanks containing activated carbon, a specially treated material that attracts the contaminants.
CD	Consent Decree.
*CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980.

*Characterization	Sampling, monitoring and analysis of a site to determine the presence, extent and concentration of contamination.
*Clean Air Act of 1990 (CAA)	Sets standards for pollution concentrations in air.
*Cleanup	Actions taken to deal with a release or threatened release of hazardous substances that could affect public health and/or the environment. The term "cleanup" is often used broadly to describe various response actions or phases of remedial responses such as Remedial Investigation/Feasibility Study.
*Clean Water Act of 1977 (CWA)	Sets standards for levels of contamination in the nation's waters.
COE	U.S. Army Corps of Engineers
*Comment Period	A time period, usually of 30 days, during which the public can review and comment on various formal documents and lead agency actions. For example, a comment period is provided when EPA proposes to add sites to the National Priorities List. Also, a minimum comment period is held to allow community members to review and comment on an RI/FS Proposed Plan. All documents subject to this formal review and comments are in the Information Repository.
*Community Relations (CR)	The lead agency's program to inform the public in the Superfund process and respond to community concerns.
*Community Relations Plan (CRP)	A formal plan for the lead agency's community relations at a Superfund site, in which the community's concerns are identified and a plan to address those concerns is made formal.
*Compact Heat Sources	Small devices containing nuclear material, the decay of which can be used both to generate heat or intense electrical energy. Used both in nuclear weapons and the aerospace industry.
*Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA)	A federal law passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act (SARA). CERCLA created a special tax that goes into a trust fund commonly known as Superfund to investigate and cleanup abandoned or uncontrolled hazardous waste sites. Under the program, EPA can either: • Pay for site cleanup when parties responsible for the contamination cannot be located or are unwilling or unable to perform the work; or • Take legal action to force parties responsible for site contamination to clean up the site or pay back the federal government for the cost of the cleanup.
*Conceptual Site Model	A compilation of data and maps used in the characterization of a site. Conceptual site models can be based both on physically observable information (such as photographs and water samples) and theoretical information (such as seismic mapping of bedrock hundreds of feet below the surface).

Consent Decree (CD)	A legal document issued by a judge that hold potentially responsible parties responsible for the cleanup of a Superfund site.
*Contamination	The presence of foreign materials, chemicals or radionuclides in the environment (soil, sediment, water or air) in significant concentrations.
Contract Lab Program	Laboratories under contract to EPA which analyze soil, water, and waste samples taken from areas at or near Superfund sites.
*CR	Community Relations.
*CRP	Community Relations Plan.
*CWA	Clean Water Act of 1977.
*D&D	Decontamination & Decommissioning Program.
*Decontamination and Decommissioning Program	DOE's cost-saving program to clean up and shut down unused equipment, sites or areas on sites.
DOC	Department of Commerce.
DOD	Department of Defense.
*DOE	Department of Energy.
DOI	Department of Interior.
EA	Environmental Assessment.
EIS	Environmental Impact Statement.
EM	Office of Environmental Restoration and Waste Management.
Emergency	Those release or threats of releases requiring immediate initiation of on-site recovery activity as soon as the lead agency determines that a removal action is appropriate.
Enforcement	EPA's efforts, through legal action if necessary, to force potentially responsible parties to perform or pay for a Superfund site cleanup.
*Engineering Evaluation/ Cost Analysis (EE/CA)	An analysis of removal alternatives for a site, similar to a remedial program Feasibility Study (FS). The EE/CA must be made available for a 30-calendar-day public comment period prior to initiating action if the planning period is greater than six months.
Environmental Assessment (EA)	Required by NEPA when the environmental impact of a project is uncertain. An EA's findings will lead either to a Finding of No Significant Impact (FONSI) or to an Environmental Impact Statement (EIS).
Environmental Impact Statement (EIS)	A study required by NEPA to determine the probable effects of any major undertaking that might damage the environment. Cleanup activities on federal facilities require an EIS unless specifically excluded by EPA.

Environmental Response Team (ERT)	EPA hazardous waste experts who provide 24-hour technical assistance to EPA Regional Office and States during all types of emergencies involving releases at hazardous waste sites and spills of hazardous substances.
*Environmental Restoration Program	One of three programs under the Office of Environmental Restoration and Waste Management (EM). At Mound, an Environmental Restoration Program has been in effect since 1984.
EPA	U.S. Environmental Protection Agency.
ERT	Environmental Response Team.
*Explosive Triggers	A general term used to describe small explosive devices used to trigger the atomic reaction in nuclear weapons. Explosive triggers contain both nuclear and non-nuclear components.
*Feasibility Study (FS)	See Remedial Investigation/Feasibility Study.
Federal Emergency Management Agency (FEMA)	Agency in charge of coordinating response to federal emergencies, including both man-made disasters (such as toxic spills) or natural disasters (such as hurricanes).
*Federal Facilities Agreement (FFA)	A legal agreement between EPA and DOE to define cleanup responsibilities, ARARs and interaction agencies involved in Mound's CERCLA program. May also include OEPA.
*FFA	Federal Facilities Agreement.
FEMA	Federal Emergency Management Agency.
Finding of No Significant Impact (FONSI)	One conclusion of an Environmental Assessment, a FONSI states in effect that the project in question will not harm the environment.
FONSI	Finding of No Significant Impact.
*FS	Feasibility Study (See Remedial Investigation/Feasibility Study).
*Groundwater	Water found beneath the earth's surface that fills pores between materials such as sand, soil, or gravel. In aquifers, groundwater occurs in sufficient quantities that it can be used for drinking water, irrigation, and other purposes.
Half Life	The time required for a radionuclide to lose half its radioactive concentration by decay. The half lives of different radionuclides vary from seconds to millions of years.

Hazardous Ranking System (HRS)	A system used to evaluate potential relative risks to public health and the environment from releases or threatened releases of hazardous substances. EPA and States use the HRS to calculate a site score, from 0 to 100, based on the actual or potential release of hazardous substances from a site through air, surface water, or groundwater to affect people. This score is the primary factor used to decide if a hazardous waste site should be placed on the National Priorities List.
*Hazardous and Solid Waste Amendments of 1984 (HSWA)	Amendment act that extended RCRA's jurisdiction to federal facilities and set of provisions for cleanup actions at RCRA sites.
*Hazardous Substances	Any material that poses a threat to public health and/or the environment. Typical hazardous substances are materials that are toxic, corrosive, ignitable, explosive, or chemically reactive.
HHS	Department of Health and Human Services.
HRS	Hazardous Ranking System.
*HSWA	Hazardous and Solid Waste Amendments of 1984.
*Hydrology	The science dealing with the properties, movement, and effects of water on the earth's surface, in the soil and rocks below, and in the atmosphere.
IAG	Interagency Agreement.
Incineration	Burning of certain types of soil, liquid, or gaseous materials under controlled conditions to destroy hazardous waste.
*Information Repository	A file containing current information, technical reports, and reference documents regarding a Superfund site. The information repository is usually located in a public building that is convenient for local residents--such as a public school, city hall, or library. Mound's Information Repository is located at the Miamisburg Branch of the Dayton-Montgomery County Public Library.
Interagency Agreement	Another kind of legal agreement between DOE and regulators. It is similar to an FFA, except that IAGs include state agencies in the process. An IAG defines CERCLA responsibilities, ARARs and interaction between responsible agencies.
*Lead Agency	An agency that provides the On-site Coordinator/Remedial Project Manager to plan and implement response action under the National Contingency Plan. In the case of a release of a hazardous substance, pollutant, or contaminant, where the release is from a federal agency maintains its lead agency responsibilities and remedies are selected by the EPA and the federal agency or by the EPA alone under CERCLA section 120. The lead agency will consult with the support agency, if one exists, throughout the response process.

*Monitoring Wells	Special wells drilled at specific locations on or off a hazardous waste site where groundwater can be sampled at selected depths and studied to determine such things as the direction in which groundwater flows and types and amounts of contaminants present.
*National Environmental Policy Act of 1969 (NEPA)	The nation's eminent environmental protection law, NEPA created the U.S. Environmental Agency (EPA). NEPA requires that environmental impact be considered before any major project is undertaken.
*National Oil and Hazardous Substances Contingency Plan (NCP)	The federal regulation that spells out activities required for a CERCLA program.
*NEPA	National Environmental Policy Act of 1969.
NOAA	National Oceanic and Atmospheric Administration.
*National Priorities List (NPL)	EPA's list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial response. The list is based primarily on the score a site receives on the Hazardous Ranking System (HRS).
National Response Team	Representatives of 12 Federal agencies that coordinate Federal responses to nationally significant pollution incidents and provide advice and technical assistance to the responding agency(ies).
*NCP	National Oil and Hazardous Substances Pollution Contingency Plan.
Non-Time-Critical Removals	Those releases or threats of releases requiring initiation of on-site activity within six months after the lead agency's determination, based on the site evaluation, that a removal action is appropriate.
*NPL	National Priorities List.
NRT	National Response Team.
O&M	Operations and Maintenance.
*OEPA	Ohio Environmental Protection Agency.
Office of Environmental Restoration and Waste Management (EM)	Set up in 1984 to address environmental issues at DOE sites. EM has three programs: Environmental Restoration, Waste Operations and Technology Development. EM currently covers 110 sites in 32 states and has a 30-year goal for full restoration of these sites.
On-Scene Coordinator (OSC)	The Federal Official who coordinates and directs Superfund removal actions.
*Operable Unit	Under a RI/FS, a grouping of cleanup areas based on their geographical locations and types of suspected contaminants.

Operation & Maintenance (O&M)	Activities conducted at a site after a response action occurs, to ensure that cleanup or containment system is functioning properly.
*OU	Operable Unit.
PA	Preliminary Assessment.
Parts Per Million (ppm)/ Parts Per Billion (ppb)	Units commonly used to express low concentrations of contaminants. For parts per billion (ppb) example, one ounce of trichloroethylene (TCE) in one million ounces of water is one ppb. If one drop of TCE is mixed in a competition-size swimming pool, the water will contain about one ppb of TCE.
*Plutonium	A man-made radionuclide used in nuclear power and nuclear weapons.
Potentially Responsible Party (PRP)	An individual or company (usually an owner, operator or transporter) potentially responsible for, or contributing to, the contamination problems at a Superfund site. Whenever possible, EPA requires PRPs, through administrative and legal actions, to clean up hazardous waste sites they have contaminated.
Preliminary Assessment	The process of collecting and reviewing available information about a possible release or actual release. EPA or States may use the information to determine if the site requires further study. If further study is needed, a site inspection is undertaken.
*Proposed Plan	A public participation document in which the lead agency summarizes for the public the preferred cleanup strategy, the rationale for the preference, reviews that alternatives presented in the detailed analysis of the Remedial Investigation/ Feasibility Study, and presents any waivers to cleanup standards which may be proposed. This may be prepared either as a fact sheet or as a separate document. In either case, if must actively solicit public review and comment on all alternatives under Agency consideration.
*PRP	Potentially Responsible Party.
QAPP	Quality Assurance Project Plan.
QA/QC	Quality Assurance/Quality Control.
Quality Assurance/ Quality Control (QA/QC)	A system of procedures, checks, audits, and corrective actions used to ensure that field work and laboratory analysis during the investigation and cleanup of Superfund sites meet established standards.
Quality Assurance Project Plan (QAPP)	A document describing the procedures to be used to ensure data of known degree of reliability, i.e., a document describing the QA/QC procedures. This document is subject to regulatory approval.

*RA	Remedial Action.
*Radioactive	Term used to describe substances that emit small particles and electromagnetic waves as they decay. Radioactive materials often are carcinogens.
*RCRA	Resource Conservation and Recovery Act of 1976.
*RD	Remedial Design.
*Reconfiguration	The reorganization of Mound Plant because of federal defense budget cuts. DOE is planning to send certain defense operations to other sites and bring private operations to Mound. The reconfiguration will be planned through the 1990s.
*Record of Decision (ROD)	A decision document that explains which cleanup alternatives will be used at National Priorities List sites. The Record of Decision is based on information and technical analysis generated during the Remedial Investigation/Feasibility Study and consideration of public comments and community concerns.
Regional Response Team (RRT)	Representatives of Federal, State, and local agencies who may assist in coordination of activities at the request of the On-Scene Coordinator or Remedial Project Manager before and during response actions.
REM (roentgen equivalent man)	A standardized unit measuring the amount of damage to human tissue from a dose of radiation.
*Remedial Action (RA)	The work that follows remedial design of the selected cleanup alternatives at a site on the National Priorities List.
*Remedial Alternatives	Cleanup methods and technologies considered during the Feasibility Study.
*Remedial Design (RD)	An engineering phase that follows the Record of Decision when technical drawings and specifications are developed for the subsequent remedial action at a site on the National Priorities List.
*Remedial Investigation (RI)	Investigation and analytical studies usually performed at the same time in an interactive, integrative process, and together referred to as the "RI/FS". They are intended to: • Gather the data necessary to determine the type and extent of contamination at a Superfund site; • Establish criteria for cleaning up the site; • Identify and screen cleanup alternatives for remedial actions; • Analyze in detail the technology and costs of alternatives.
Remedial Project Manager (RPM)	The Federal Agency, EPA or State, or lead agency official responsible for overseeing remedial response activities.

Remedial Response	A long-term action that stops or substantially reduces a release or threatened release of hazardous substances that is serious, but does not pose an immediate threat to public health and/or the environment.
*Removal Action	An action taken over the short-term to address a release or threatened release of hazardous substances.
*Resource Conservation and Recovery Act of 1976 (RCRA)	A Federal law that established a regulatory system to track hazardous substances from the time of generation to disposal. The law requires safe and secure procedures to be used in treating, transporting, storing, and disposing of hazardous substances. RCRA is designed to prevent new, uncontrolled hazardous waste sites.
Response Action	A CERCLA-authorized action at Superfund site involving either a short-term removal action or a long-term remedial response that may include, but is not limited to, the following activities: • Removing hazardous materials from a site to a hazardous waste facility for treatment, containment, or destruction • Containing the waste safely on-site to eliminate further problems • Destroying or treating the waste on-site using incineration or other technologies • Identifying and removing the source of groundwater contamination and halting further movement of the contaminants • Engineering studies.
*Responsiveness Summary	A summary of oral and/or written public comments received by the lead agency during a comment period on key lead agency documents, and the lead agency's responses to those comments. The responsiveness summary is a key part of the ROD, highlighting community concerns for lead agency decision-makers.
*RI	Remedial Investigation.
*Risk Assessment	An action that defines who is exposed to how much for how long and the consequences of that exposure. The process includes hazard identification, exposure assessment, toxicity assessment, and risk characterization. Usually, a baseline risk assessment is developed early during the Feasibility Study. If necessary, the risk assessment is used to develop remedial action objectives.
*ROD	Record of Decision.
*RPM	Remedial Project Manager.
*RRT	Regional Response Team.
*SARA	Superfund Amendments and Reauthorization Act of 1986.
*Seeps	Areas where groundwater oozes upward to the surface.

Site Inspection (SI)	A technical phase that follows a preliminary assessment designed to collect more extensive information on a hazardous waste site. The information is used to score the site with the Hazardous Ranking System to determine whether response action is needed.
*Superfund	The common name used for the collective powers of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Reauthorization and Amendments Act of 1986 (SARA). Sometimes referred to as the Trust Fund.
*Superfund Amendments and Reauthorization Act of 1986 (SARA)	Modifications to CERCLA enacted on October 17, 1986. SARA provided more funding for CERCLA, widened its jurisdiction to cover federal sites and instituted the Community Right to Know Act, which mandates labelling of hazardous materials.
Surface Water	Bodies of water that are above ground, such as rivers, lakes, and streams.
Time Critical Removals	Including emergencies lasting longer than 30 calendar days, those releases requiring initiation of on-site activity within six months of the lead agency's determination, based on the site evaluation that a removal action is appropriate.
*Toxicology	The study of the effects of poisonous substances.
*Treatability Study	A battery of testing to determine the treatments or remedial alternatives for contaminated areas.
Treatment, Storage, and Disposal Facility (TSD Facility)	Any building, structure, or installation where a hazardous substance has been treated, stored, or dispersed. TSD facilities are regulated by EPA and States under the Resource Conservation and Recovery Act.
*Tritium	A radioactive form of hydrogen gas used in a variety of industries, including weapons, energy and medical.
Trust Fund	A Fund set up under the Comprehensive Environmental Response, Compensation, and Liability Act to help pay for the cleanup of hazardous waste sites and to take action to force those responsible for the sites to clean them up.
TSD Facility	Treatment, Storage and Disposal Facility.
USCG	United States Cost Guard.
*U.S. Department of Energy (DOE)	Government agency involved with nuclear research and production for weapons, aerospace and electric power.
*U.S. Environmental Protection Agency (EPA)	Government agency enforcing federal environmental laws.
VOC	Volatile Organic Compounds.
*Volatile Organic Compounds (VOC)	An organic (carbon-containing) compound that evaporates (volatizes) readily at room temperature. VOCs are toxic and often are carcinogens.

Water Purveyor	A public utility, mutual water company, county water district, or municipality that delivers drinking water to customers.
*Water Quality Act of 1987	Updated the Clean Water Act of 1977.
*Work Plan	A document describing the work to be performed. It is subject to U.S. EPA or state approval before the work is performed. The document consists of Field Sampling Plan, Health and Safety Plan, and Quality Assurance Project Plan (QAPP).

C. CERCLA OVERVIEW

MOUND

Environmental Restoration Program

CERCLA Overview

CERCLA stands for the **Comprehensive Environmental Response, Compensation and Liability Act of 1980**, as amended by the **Superfund Amendments and Reauthorization Act of 1986 (SARA)**. Known commonly as "**Superfund**," CERCLA is the federal government's eminent environmental restoration law.

CERCLA identifies sites where uncontrolled **contamination** by hazardous substances is possible and may have an effect on human health or the environment. Identified sites are officially posted on the CERCLA **National Priorities List (NPL)**. Then begins a four-step program:

1) **Remedial Investigation (RI)**: Investigation into the extent of possible contamination
2) **Feasibility Study (FS)** and **Record of Decision (ROD)**: Recommendation and approval of cost-effective **cleanup** methods, if necessary
3) **Remedial Design (RD)**: Design of cleanup program
4) **Remedial Action (RA)**: Commencement of cleanup

Because the possibility of contamination can affect a community, CERCLA requires an organized effort to inform the public of all program issues and actions, and provides opportunity for public input to help guide program decisions. This organized effort is called **Community Relations**.

Mound Plant was added to the CERCLA program in November 1989 to address possible contamination of the environment as a result of accidental releases and inadequate regulatory disposal requirements in Mound's early operating years. In 1990, a **Federal Facility Agreement (FFA)** was signed by the **U.S. Department of Energy (DOE)** and the **U.S. Environmental Protection Agency (USEPA)** for Mound. This legal document defines the responsibilities for each party involved in the CERCLA program. The DOE owns the site, and under federal law becomes the **lead agency**, or the party primarily responsible for conducting the program. All CERCLA programs are subject to oversight by the USEPA which must review and approve all documents and decisions before they can be enacted. The **Ohio Environmental Protection Agency (OEPA)**, which also reviews Mound's CERCLA program, signed the FFA in July 1993.

The CERCLA program at Mound operates in conjunction with the DOE's **Environmental Restoration Program**, set up in 1984. CERCLA must comply with other federal environmental laws, such as the **Resource Conservation and Recovery Act of 1976 (RCRA)**, as amended by the **Hazardous and Solid Waste Amendments of 1984 (HSWA)**; the **Clean Air Act of 1990 (CAA)**; and the **Clean Water Act of 1977 (CWA)**, as amended by the **Water Quality Act of 1987 (WQA)**. CERCLA's term for these and other related requirements is **applicable or relevant and appropriate requirements (ARARs)**.

Mound Plant

Mound Plant is located approximately 10 miles south-southwest of Dayton, Ohio, and 31 miles north-northeast of Cincinnati, Ohio. The site abuts a portion of Miamisburg's southern border with Miami Township. The township surrounds Miamisburg on all sides but north.

These areas span a stretch of the narrow valley between the Great Miami River and Interstate 75 in southern Montgomery County.

Most of the 306-acre site overlooks the city from a ridge that extends downtown from the southern city line. Mound Road, on the east side of the plant, is lined by residences and provides access to the plant's main gate. Along Mound's western border runs a Conrail freight line. The old Miami-Erie Canal bed, part of the Miamisburg Community Park, is located west of the railroad tracks. The park contains a pool, tennis courts and a playground and is heavily used during the summer months. Main Street (called Old 25 in Miamisburg) is located west of the canal bed and east of the Great Miami River. The river is about a half mile from Mound.

The plant's name is derived from a 70-foot-high Native American burial mound located in Miamisburg Mound State Park, just across Mound Road and less than 400 feet south of the plant. Many city and township residences, five schools, Miamisburg's downtown and six of the city's 17 parks and playgrounds are located within one mile of the plant, making this a unique location for a nuclear weapons production facility.

Ownership and Operation

Owned by the DOE, the Mound Plant was operated from the beginning of its construction in 1947 through September 1988 by Monsanto Research Corporation, a contractor. Since October 1988, Mound has been operated by EG&G Mound Applied Technologies, a large, multi-specialty contractor for government and private industry. The site is highly secured because of its weapons work.

Mound's main function has been to manufacture both nuclear and non-nuclear components for nuclear weapons. Principal among these are **explosive triggers and compact heat sources**. The plant was originally used as an outgrowth of the Manhattan Project. A research, development and production site, Mound also does work for other industries, including energy, aerospace, medical and environmental.

Environmental Issues

Because of its many operations, Mound Plant uses, stores and disposes of a variety of **radioactive** materials. Mound also uses chemicals known as **volatile organic compounds (VOCs)**. The nuclear materials, referred to as radionuclides, consist mostly of **plutonium** and **tritium**. The VOCs are in the form of solvents, paints and other common industrial contaminants.

Harmful contamination might have occurred because regulations for storing and disposing of hazardous materials during Mound's early operating years were inadequate by today's standards. Throughout the years of Mound's operations, dramatic advancements have been made in the technology for detecting and measuring the presence of contaminants. These advancements have revealed relatively low levels of contamination that was previously undetectable. In turn, as the effects of these contaminants were studied, standards for allowable concentrations of hazardous materials have become much more strict. In the mid-1970s, the DOE began evaluating possible harmful effects of the accumulated buildup of low-level contamination over the years. By 1984, a DOE Environmental Restoration Program was established to address this concern. Though testing in the 1980s found no threat to public health or the environment, more comprehensive testing under CERCLA is furthering the investigation.

Through the Remedial Investigation (RI), the CERCLA program will continue to evaluate the effects of any releases of hazardous material. There have been two highly publicized off-site accidental releases of radioactive material. The first occurred in 1969 when liquid waste

containing plutonium-238 leaked into on-site soil after a pipeline ruptured. Heavy rain moved these soils off-site and into the bed of the Miami-Erie Canal, where it adhered to subsurface clays. The contamination was discovered in 1974 during routine environmental monitoring. The second incident occurred in November 1989 when a small quantity of tritium gas escaped through a plant smokestack following a lab accident. Nevertheless, years of testing, including a 1990 study by the National Institutes of Health, found no adverse health effects attributable to Mound Plant in residents of Montgomery County. Census figures for 1990 state that more than 887,000 people live within a 20-mile radius of Mound. This area encompasses Montgomery County and includes all of greater Dayton.

Because of the potential for migration of accidentally released tritium and VOCs through **groundwater**, the groundwater beneath the plant and around public drinking water supplies is monitored regularly. The Miamisburg area sits atop an **aquifer** that lies beneath the whole Great Miami River valley. Called the Buried Valley Aquifer, it is the source of industrial and drinking water for Miamisburg, Miami Township and neighboring communities. Six public drinking water wells and numerous industrial wells are within a five-mile radius of Mound. Currently, levels of tritium and two VOCs (trichloroethene and tetrachloroethane) found in groundwater beneath Mound's Main Hill occasionally exceed drinking water standards. However, concentrations in public drinking water supplies, though slightly higher than **background** (naturally occurring) levels, are within federal safe drinking water standards. Under the Mound Remedial Investigation/Feasibility Study (RI/FS), Operable Units 1 and 9 address specific locations of possible and confirmed groundwater contamination.

Mound filters its air **effluent** before releasing it to the environment and drains its treated liquid wastes into the Great Miami River. All effluent must meet strict EPA standards. No public drinking water is taken from the river downstream from Mound's discharge. The only users of **surface water** and subsurface water from the river basin downstream from Mound are manufacturing and power companies, which use the water for processing and heat exchange.

Remedial Actions

A **remedial action** is the long-term CERCLA process for studying and treating any contamination that does not pose an immediate threat to human health or the environment. The four-step CERCLA process described earlier in this section is the basic outline for a remedial action. Nearly all CERCLA work at Mound will be done as a remedial action. This means that most areas of suspected contamination pose no immediate threat and will not be altered in a way that could cause a possible threat. The Mound currently is conducting its Remedial Investigation (RI), the first major step in the plant's restoration. Because the Mound RI is searching for many different potential contaminants in numerous locations, the areas involved have been divided and grouped based on both geographic location and the type of possible contamination. These divisions are called **Operable Units (OUs)**. Each OU conducts a separate RI, and as a result, cleanup decisions will be made at different times as RIs are completed for each area. As testing proceeds, OUs may be added, eliminated or regrouped. Mound originally had nine OUs; it currently has six.

Upon completion of each OU's Remedial Investigation, a Feasibility Study (FS) will be conducted — if remediation is necessary — to evaluate the environmental effectiveness and cost effectiveness of prospective cleanup methods. A **Proposed Plan** for cleanup based on the information from the RI and FS is then prepared and released to the public. Before the recommendations in the Proposed Plan are adopted, CERCLA requires that the public be given an opportunity to evaluate and comment on them. Comments are responded to in a **Responsiveness Summary**, which is included in the Record of Decision (ROD). The ROD documents the final decision on how to address site contamination. The site-wide RI/FS for Mound is expected to be completed by the year 2007.

(Words in **bold** are defined in the **Glossary of CERCLA and Related Terms**.)

D. CERCLA OPERABLE UNITS

MOUND

Environmental Restoration Program

CERCLA Operable Units

June 1993

Operable Unit (OU): *In a CERCLA Program, a grouping of potentially contaminated areas based on the geographical location or types of suspected contaminants*

The Mound Operable Units have been redefined by CERCLA Program managers to reflect progress in the Remedial Investigation since the original OU definition in 1990. The new Operable Units better divide the site geographically, ensuring they include possible release sites identified since the Remedial Investigation began. The newly-defined OUs are also easier for members of the public to understand.

As part of the OU redefinition, OU3–Miscellaneous Sites–has been eliminated and the investigative areas within it distributed among other Operable Units. Because each Operable Unit has its own management staff and reporting requirements, the elimination of unnecessary OUs saves the CERCLA Program millions of dollars in management costs. It also signifies the finding of no harmful contamination at many suspected release locations on-site.

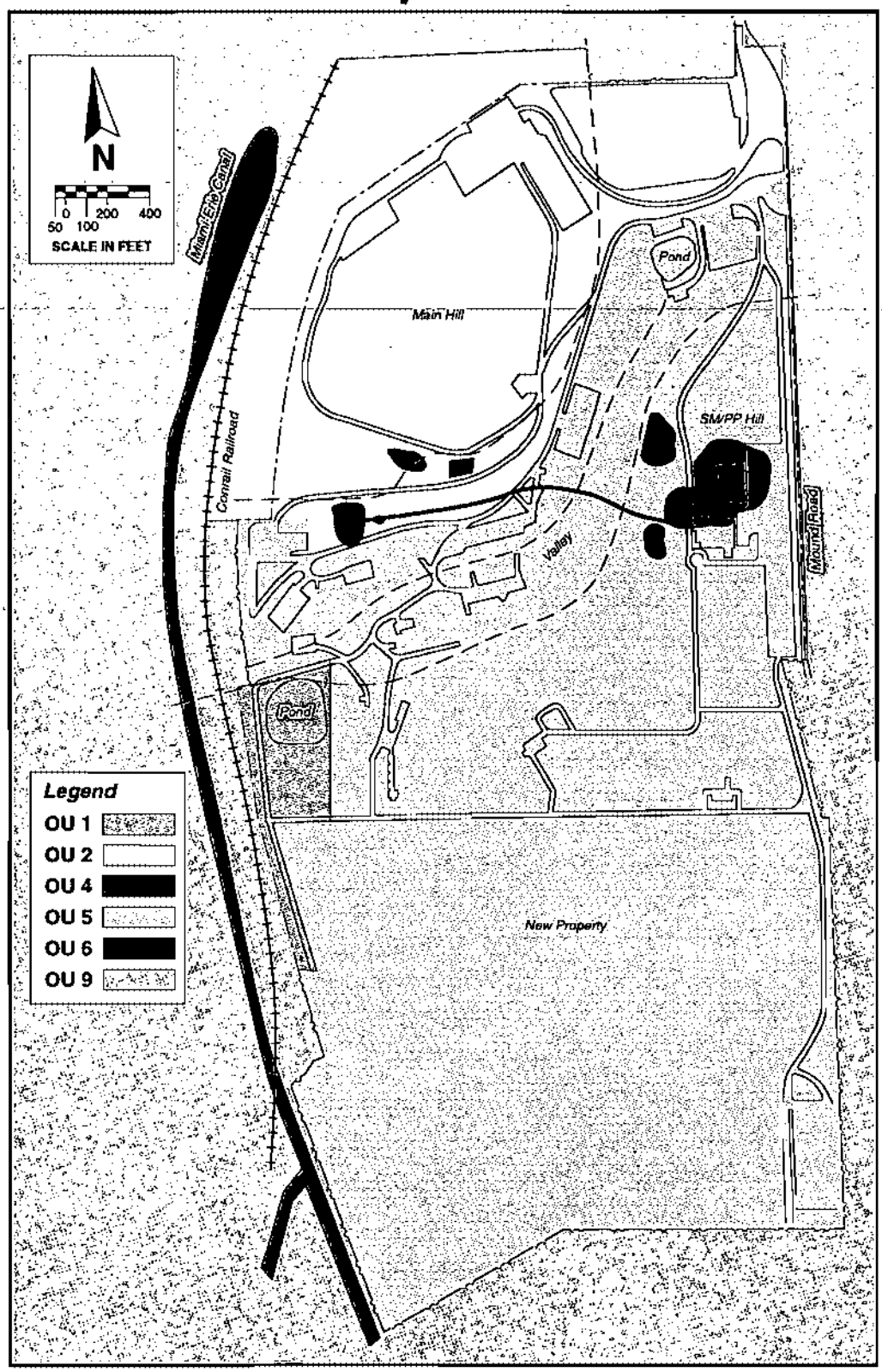
OUs 7 and 8 were eliminated previously. OU7 had addressed suspected release sites at which previous inspections found no evidence of a release. OU7 was eliminated in 1990 after current information was evaluated under CERCLA and it was determined the sites do not warrant further investigation.

OU8 had addressed underground storage tanks on-site. Some tanks were added to their geographically appropriate Operable Unit and the remaining tanks were placed in other regulated Mound programs. OU8 was eliminated in January, 1993.

Remaining release sites are now grouped into six OUs. The following are the new definitions for the Mound OUs, including an explanation of changes from the original definition.

EG&G

Mound CERCLA Operable Units – 1993



Operable Unit 6 shows only those D&D site surrently active; other areas will be added as the D&D program at Mound progresses. Limited on-site OU9 investigations are not shown on this map.

MOUND

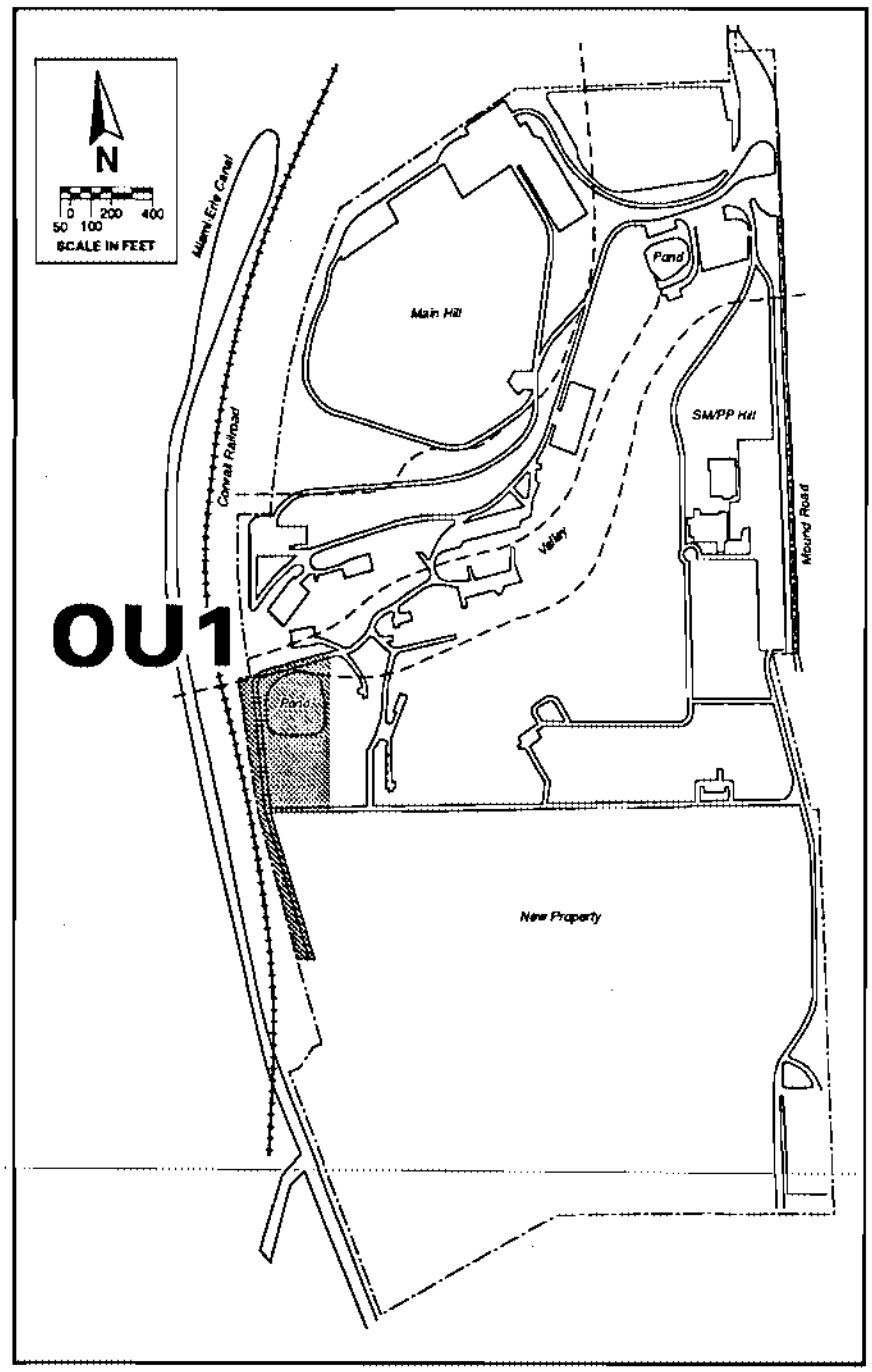
Operable Unit 1
Area B

Environmental Restoration Program

June 1993

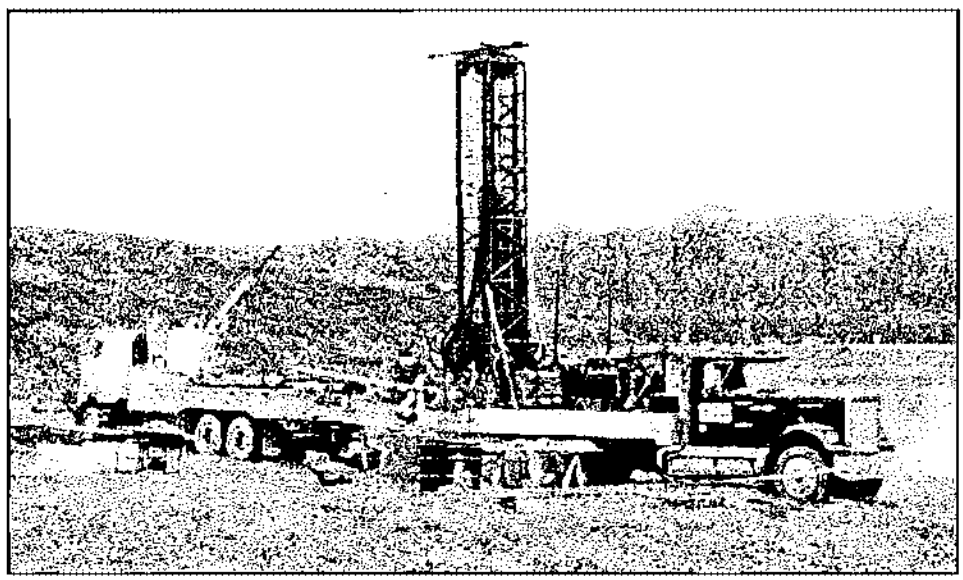
Addresses possible chemical and radioactive contamination of the portion of the Buried Valley Aquifer which underlies the southwest corner of the original Mound Plant. The main concern in OU1 is volatile organic compounds (VOCs) migrating in groundwater. It is believed that such contamination originates from the area that was formerly used for open burning and waste disposal. Crushed empty thorium drums and waste from cleaning filters in Mound's Waste Disposal Building are also included in OU1.

OU 1 covers four acres on-site and includes an historic landfill, the site sanitary landfill and an overflow pond.



Purpose

- Determine possible contamination of the Buried Valley Aquifer from:
  - **historic landfill** containing:
    - buried wastes, including empty crushed drums that had contained thorium; solid and liquid wastes disposed of by open burning until 1969.
  - **sanitary landfill** containing:
    - sanitary waste from historic landfill
    - materials from the excavation of the overflow pond.
  - **overflow pond** (stormwater retention pond)
- Gather enough information from this area to determine if a cleanup is necessary and, if so, how best to proceed with the remedial action.



Well Drilling Activities

Primary Contaminants of Concern

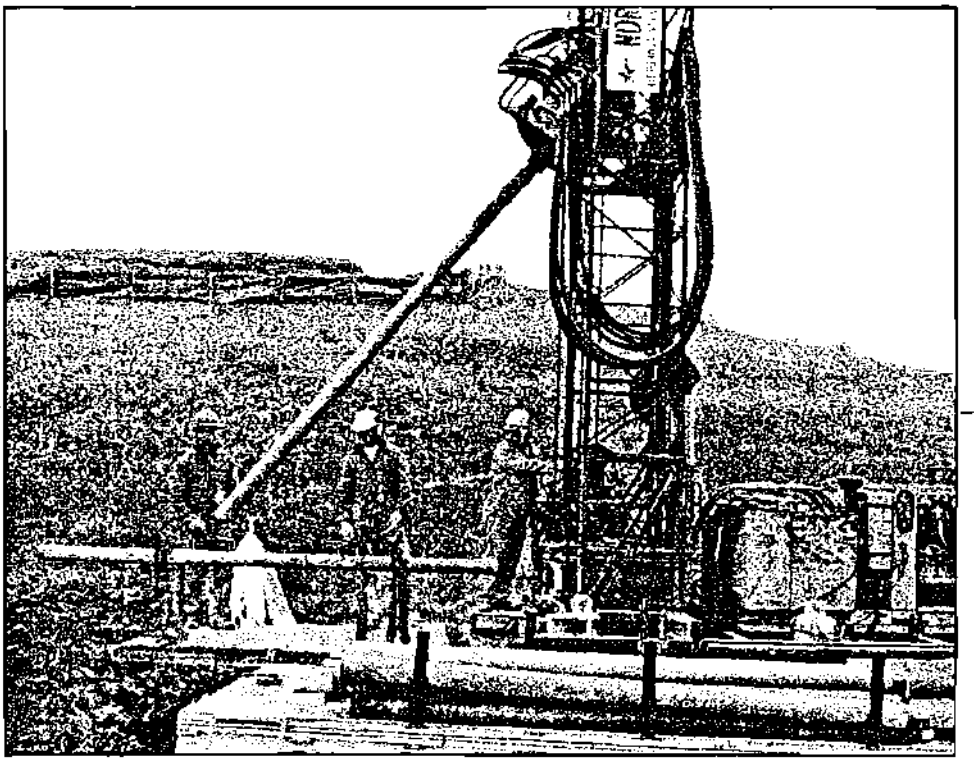
- Volatile organic compounds (VOCs)

Work Scope

Determining whether contaminants found in Area B are being carried off-site through groundwater by use of soil sampling, soil gas surveys, and hydrogeology surveys.

Progress to Date

- Subsurface soil sampling and soil gas sampling to identify contaminants in the soil, August–December 1992.
- Installation of 27 monitoring wells and piezometers. October–March, 1993
- Aquifer pump test currently underway using newly-installed and existing test wells to characterize groundwater flow in the immediate vicinity of Area B. May-June 1993
- Fieldwork for RI/FS complete after aquifer pump test



Drilling of OU1 Monitoring Well

Documents in Public Repository

History of Area B (February 1991)

Proposal for Additional Work (September 1992)

Schedule for Remainder of FY93

Begin work on the Remedial Investigation Report this summer.

Future Schedule Milestones

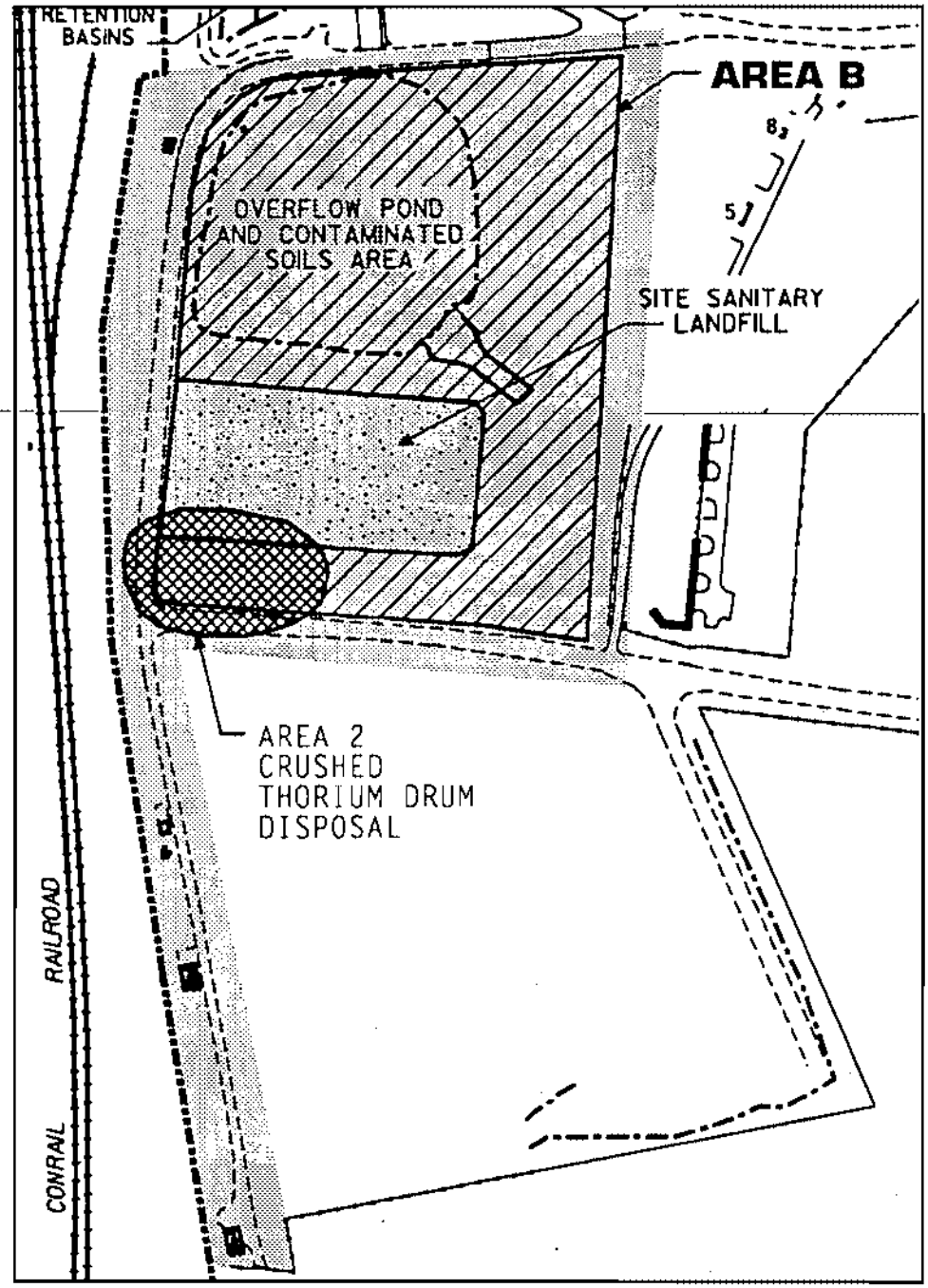
(assumes full funding)

FY1994:

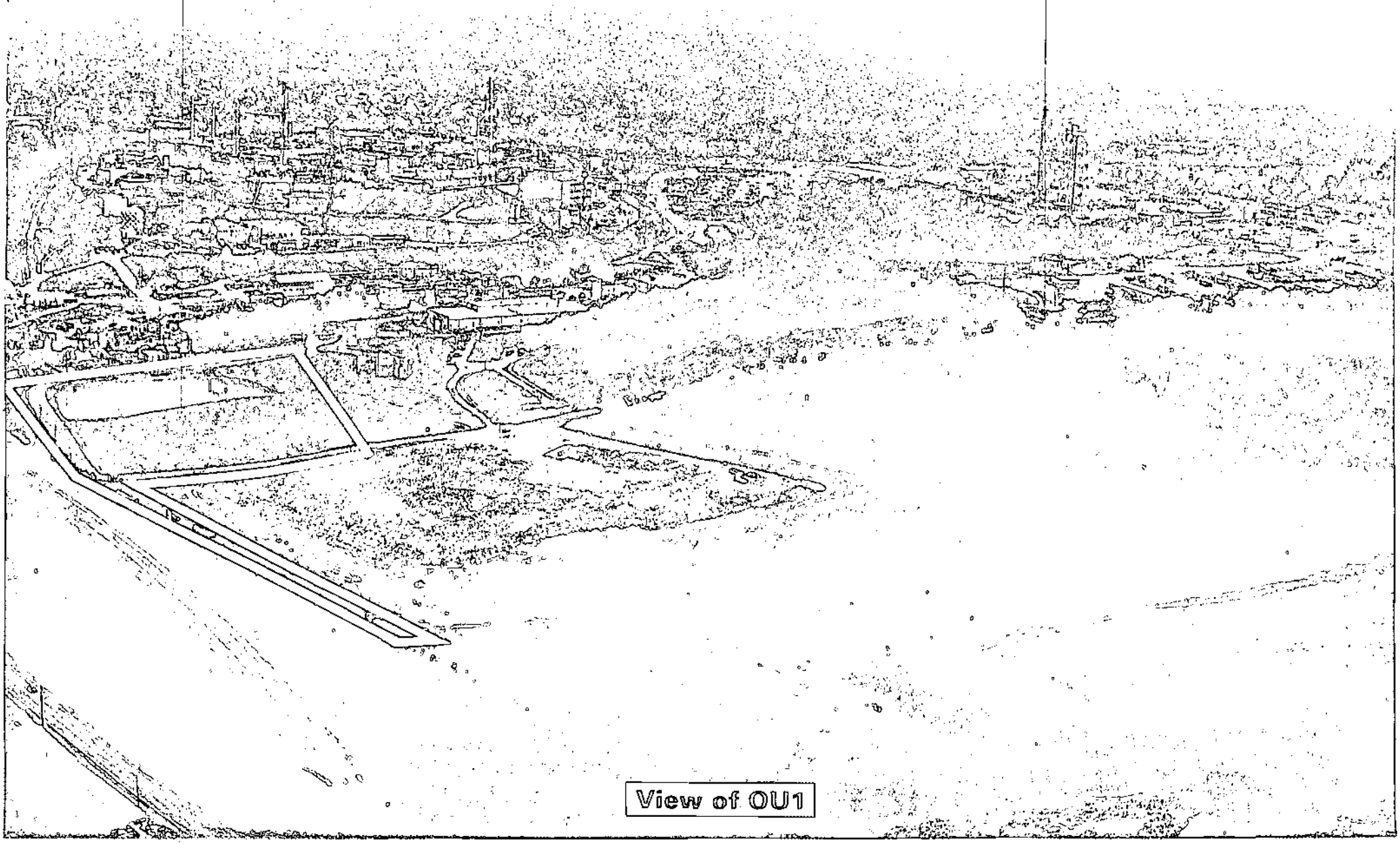
- Complete Remedial Investigation Report
- Conduct Feasibility Study/prepare Proposed Plan

FY1995:

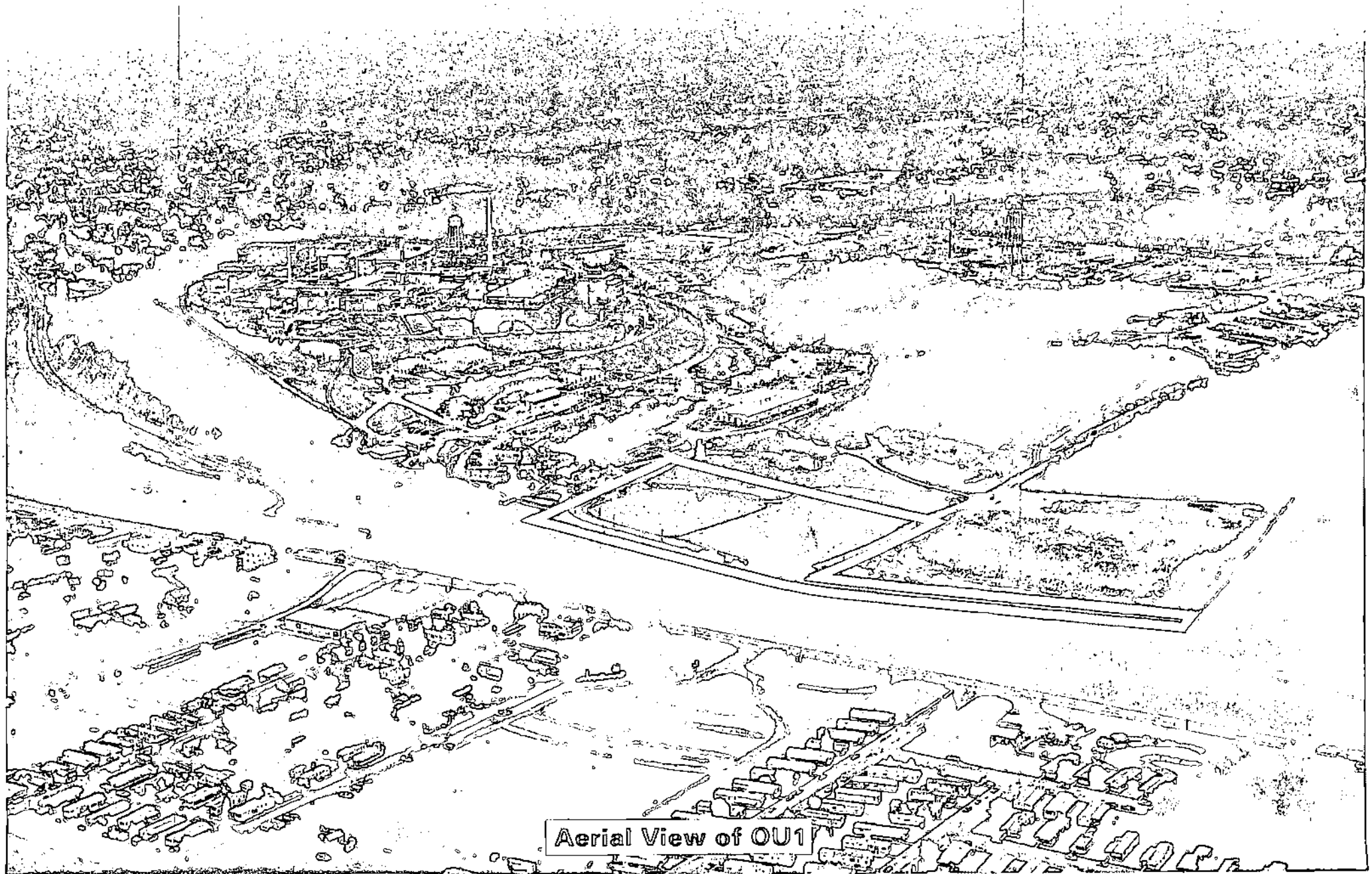
- Complete Record of Decision (ROD)



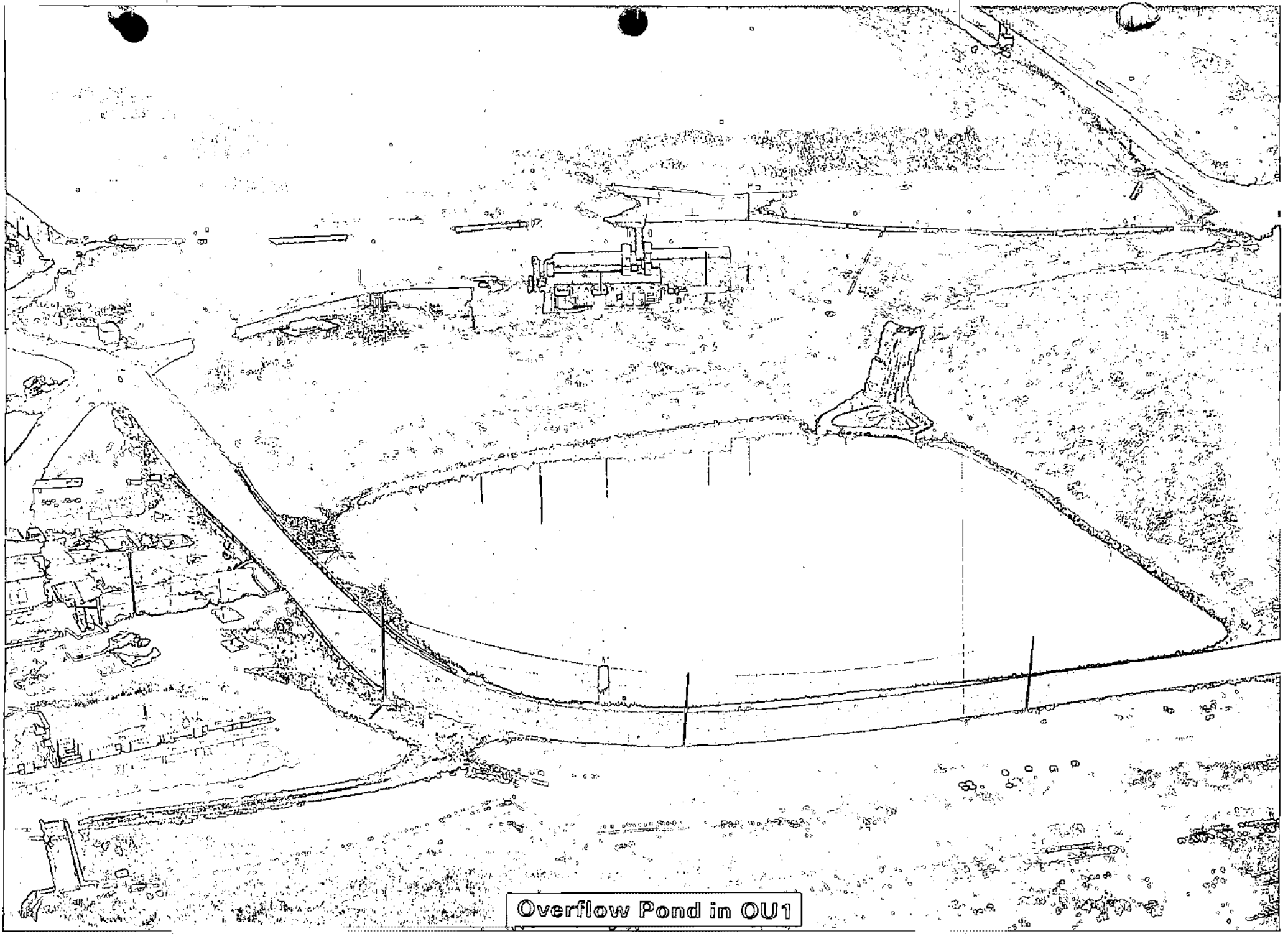
Closeup of Operable Unit 1



View of OU1



Aerial View of OU1



Overflow Pond in OU1

MOUND

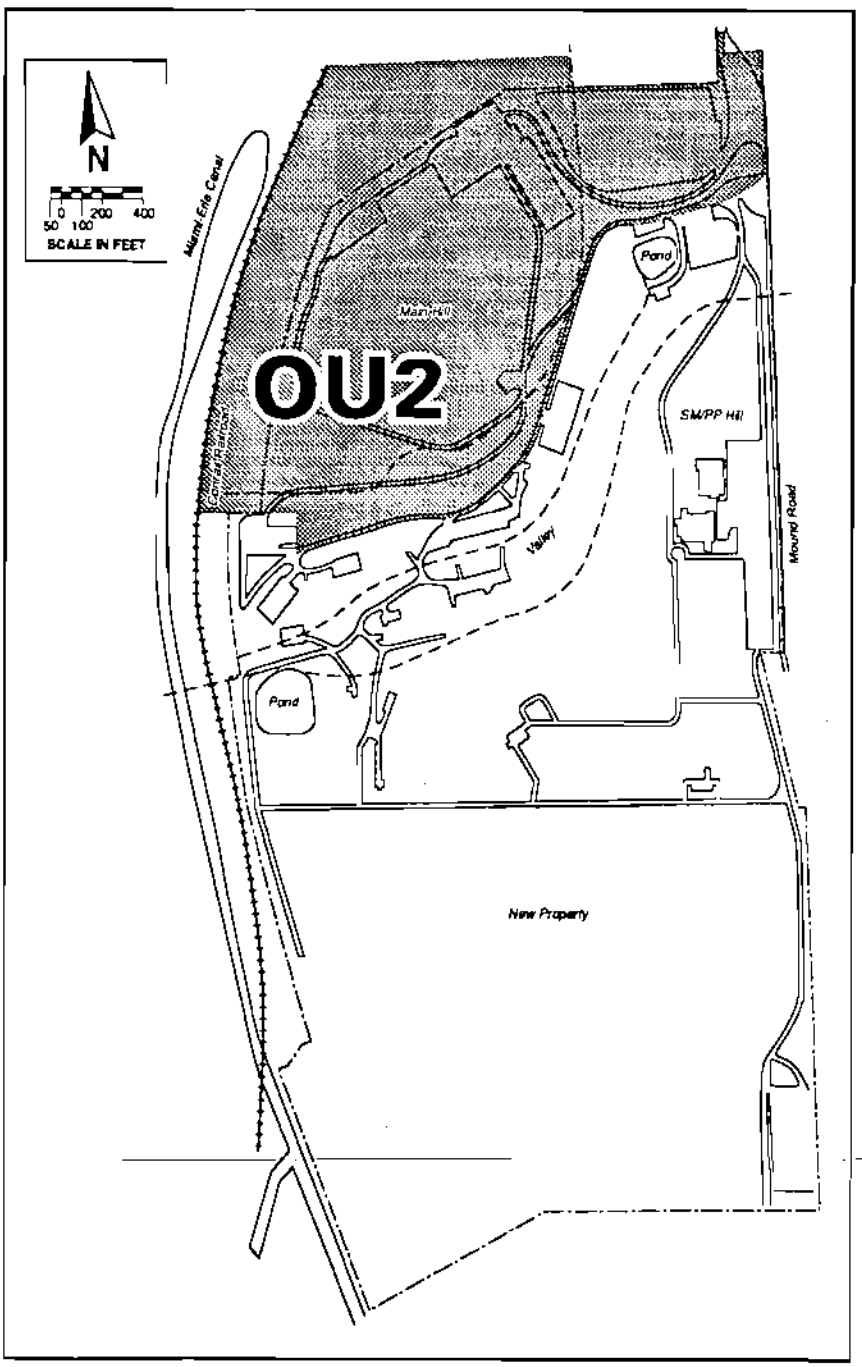
Operable Unit 2
Main Hill

Environmental Restoration Program

June 1993

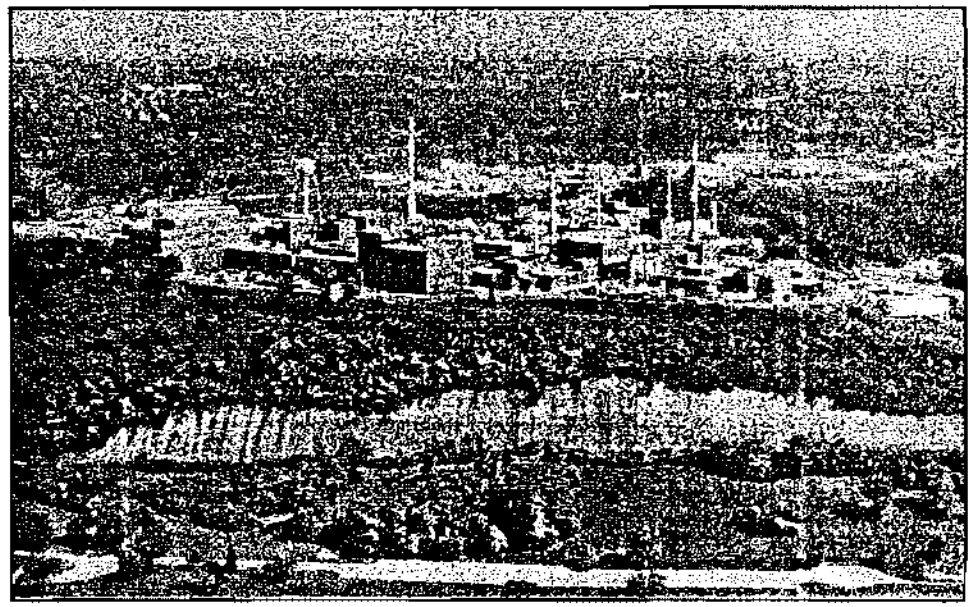
Addresses the source and pathways of possible groundwater contaminants on Mound's Main Hill. Historical tritium releases have been tracked since the 1970s; the extent of VOC contamination is uncertain. Off-site groundwater seeps on Mound's North Hillside are included in OU2.

The land area encompassed by OU2 has increased in size from its original delineation. OU2's enlargement results from its shift in focus to all hydrogeology and possible release sites on the Main Hill, not only the source of the Main Hill seeps. Also, former OU3 and OU5 areas on the Main Hill will be addressed by OU2.



Purpose

- Determine all possible sources of contaminants on Plant's Main Hill.
- After complete investigation of all possible scenarios, determine if any cleanup is necessary and, if so, conduct the necessary remedial action.
- Address possible sources of contamination:
  - Tritium processing facilities
  - Detonator production facilities
  - Plant support facilities, all of which are located on the Main Hill
  - Warehouses
  - Facilities for machining, plating, painting and welding operations



Main Hill and North Hillside

Primary Contaminants of Concern

- Volatile organic compounds (VOCs) in the form of industrial products (solvents, paints, fuels) and nitrates
- Tritium

Work Scope

- Identify the sources of contamination among the many buildings on the Main Hill–including former OU3 and OU5 sites.
- Characterize of the fractured bedrock underlying the Main Hill
  - necessary to determine flow pathways of groundwater to the seeps and potentially to the Buried Valley Aquifer.
- Investigate the integrity of surface and subsurface water and drainage system.

Progress to Date

- A Removal Action on PCB contamination of soils around the West Powerhouse was completed in 1991.
  - A further removal action is being considered for VOCs under the B Building Solvent Shed.
- Soil gas study to identify contaminants on the Main Hill completed in December 1992.
- Preparation of Work Plan underway.

Seep with PVC Pipe Installed for Sampling

Documents in Public Repository

- On-Scene Coordinator Report for CERCLA Section 104 Removal Action, West Powerfouse PCB Site (October 1991)
- Proposal for Additional Work–Soil Gas Survey and Geophysical Investigations, Mound Plant Main Hill and SM/PP Hill Areas (February 1992)
- Reconnaissance Sampling Report; Soil Gas Survey and Geophysical Investigations, Mound Plant Main Hill and SM/PP Hill (February 1993)

Schedule for Remainder of FY93

Complete Remedial Investigation Work Plan

Future Schedule Milestones

(assumes full funding)

FY1994

Start RI Field Work

Conduct Removal Action at B Building Site

FY1995

Continue RI Field Work

FY1996

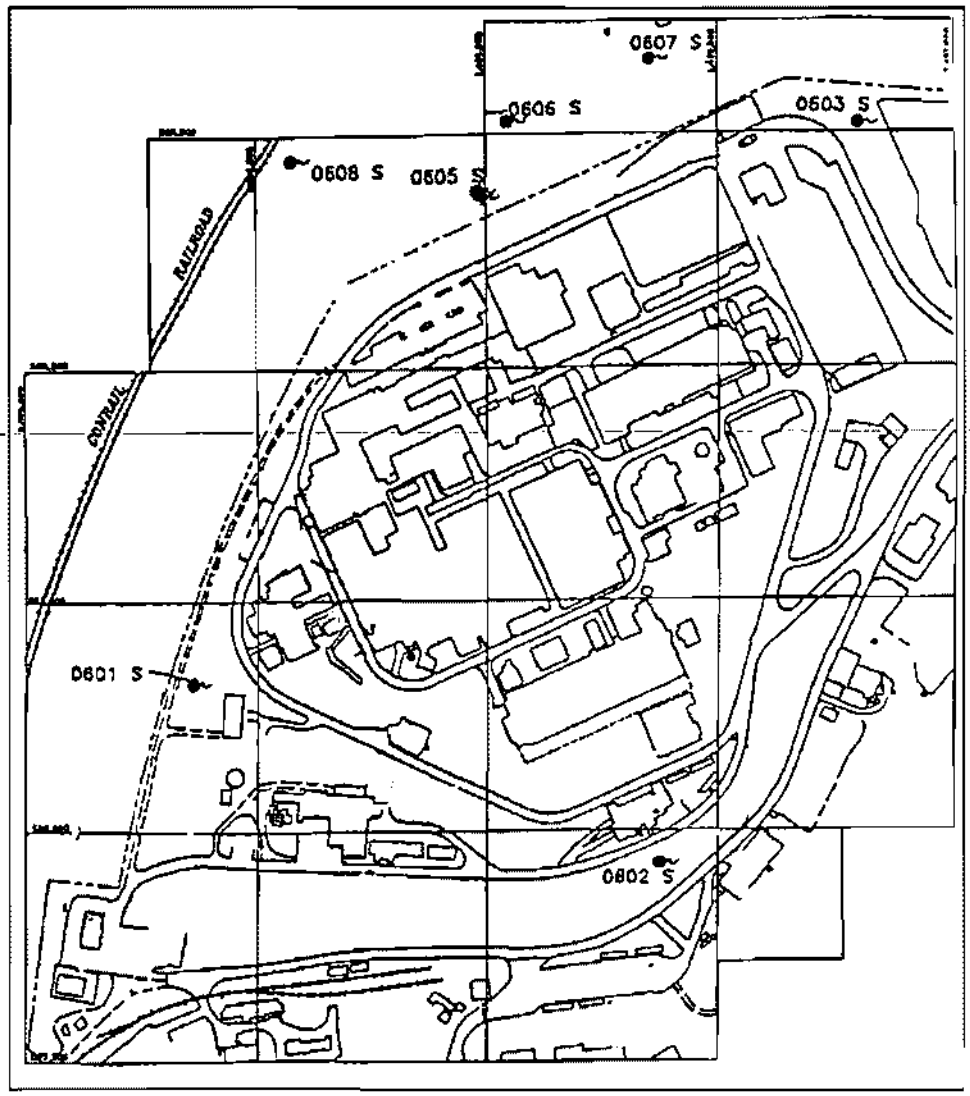
Complete Remedial Investigation Report

FY1997

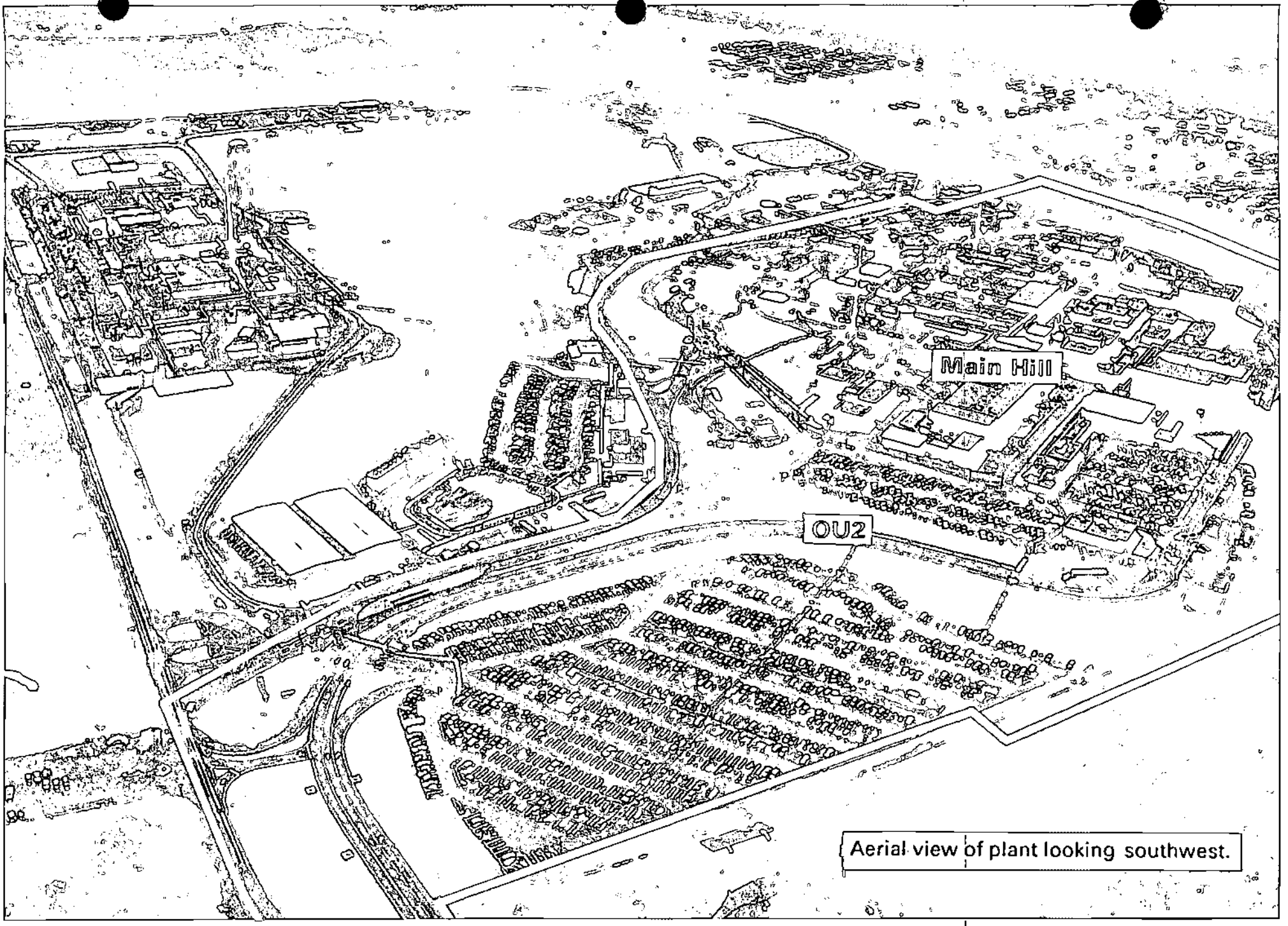
Conduct Feasibility Study/Proposed Plan

FY1998

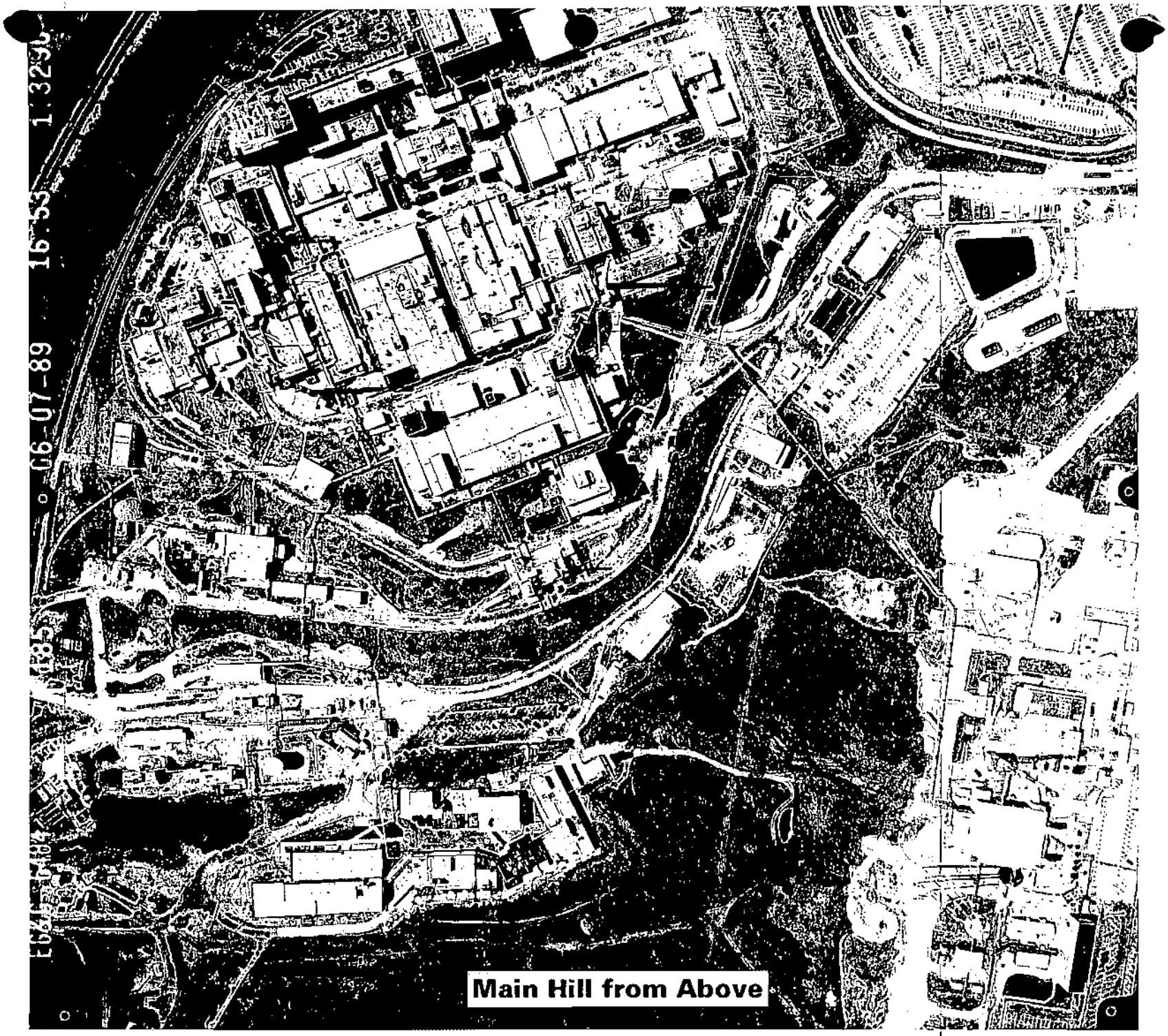
Prepare Record of Decision (ROD)



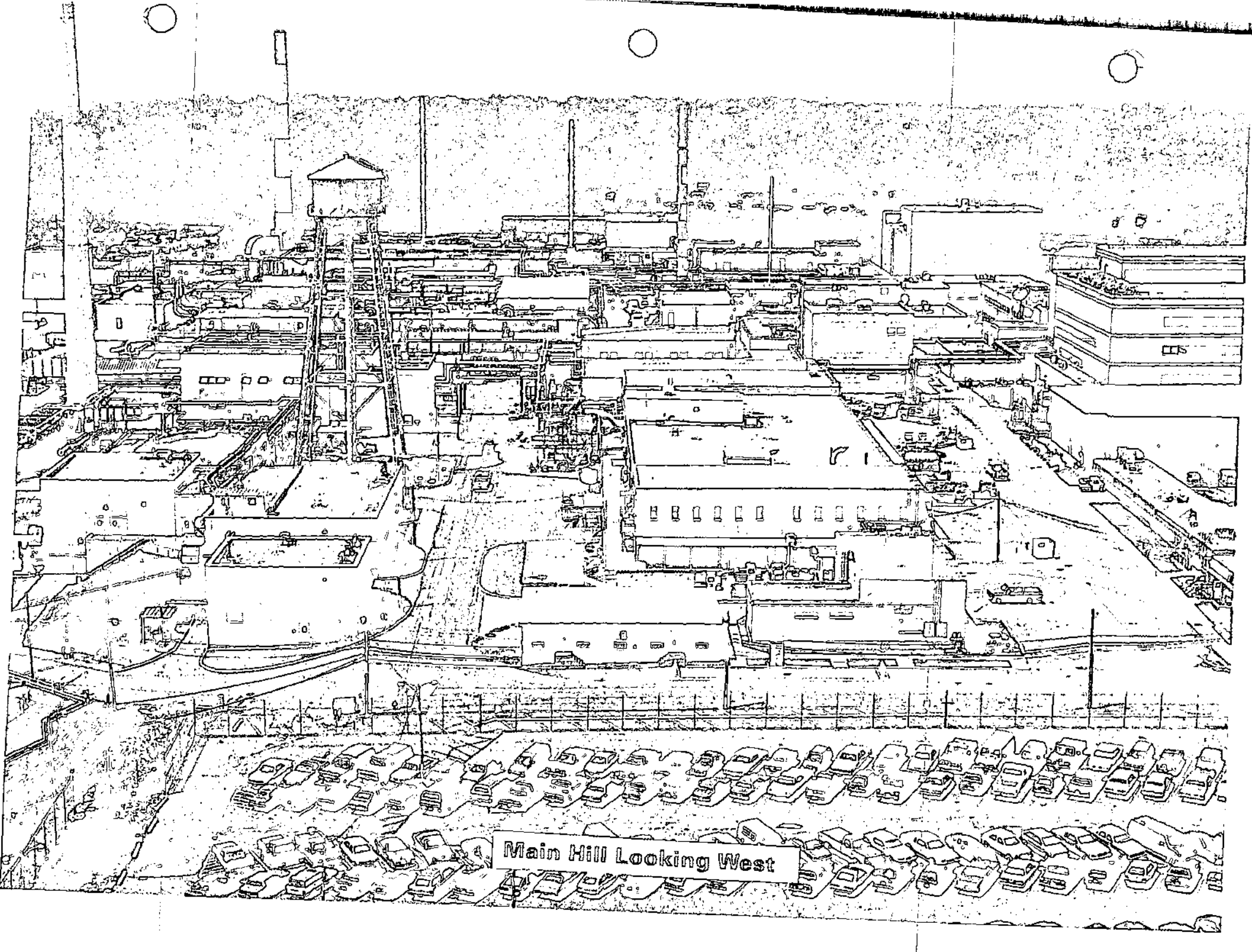
Main Hill Seeps



Aerial view of plant looking southwest.



Main Hill from Above


Main Hill Looking West

MOUND

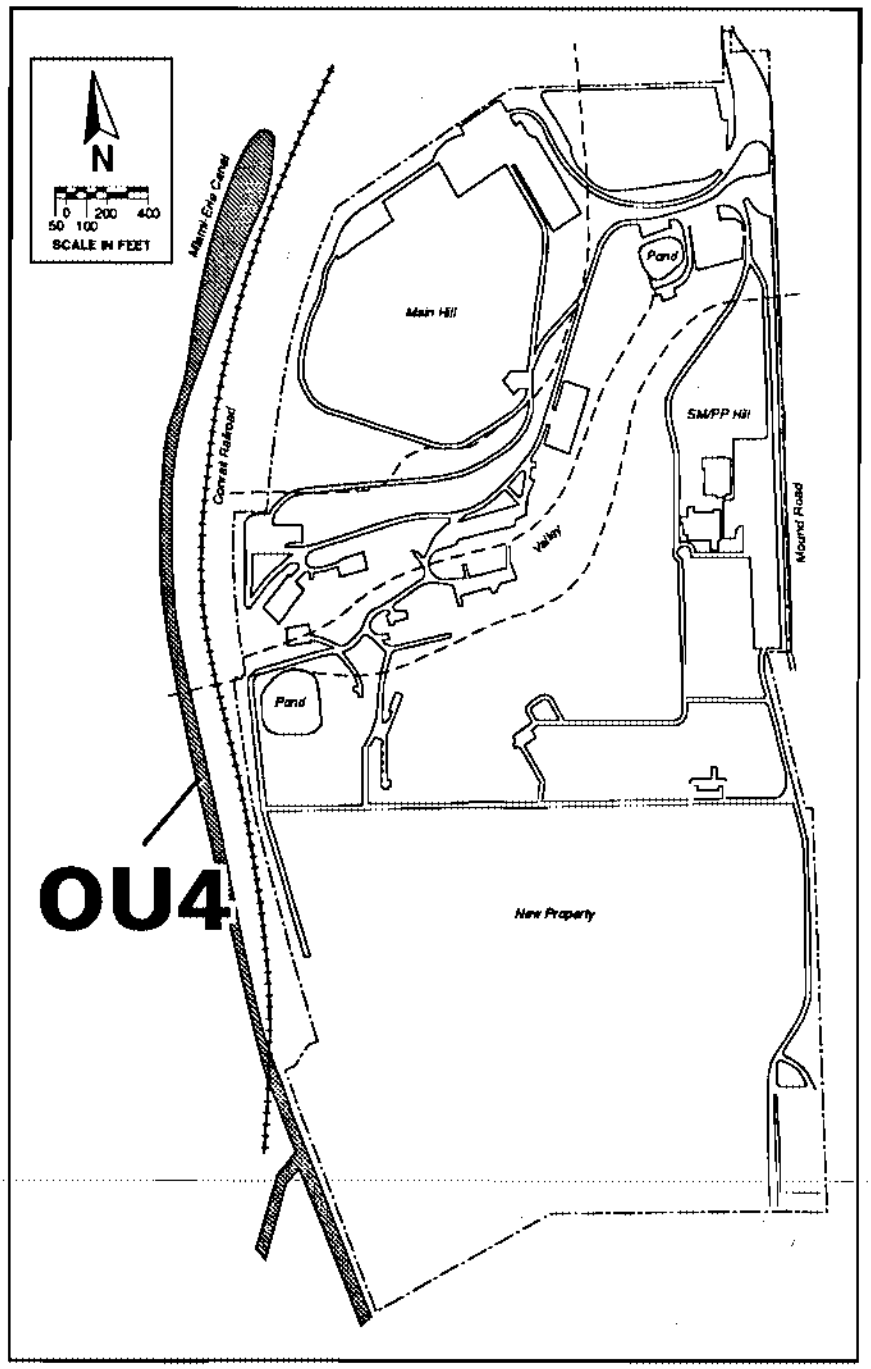
Environmental Restoration Program

Operable Unit 4
Miami-Erie Canal

June 1993

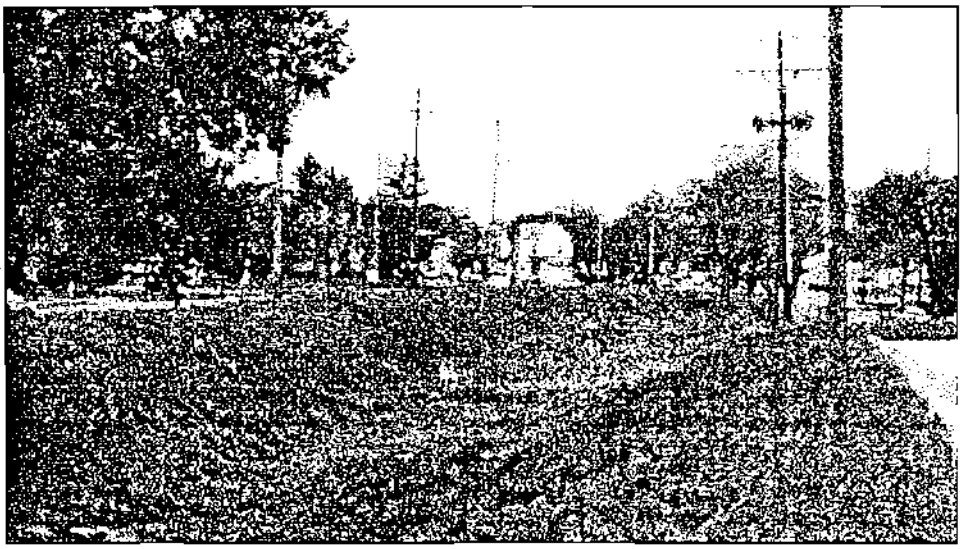
Addresses contamination of the old Miami-Erie Canal bed in Miamisburg resulting from plant runoff, including an accidental plutonium spill in 1969. The 1974 Rogers Study, conducted when the plutonium was discovered and supported by the US and Ohio EPAs and the Ohio Department of Health, concluded that the plutonium in the Canal posed no imminent threat to human health and the environment. Tritium is also a contaminant of concern in the canal and was studied in the late 1970s by the Potable Water Project. All drinking water supplies in the area are in compliance with the Safe Drinking Water Standard for tritium of 20 nanoCuries per liter as established by U.S. EPA.

The land area covered by OU4 has not changed from its original delineation. The north portion of Miami-Erie Canal bed is within the Community Park, owned by the City of Miamisburg.



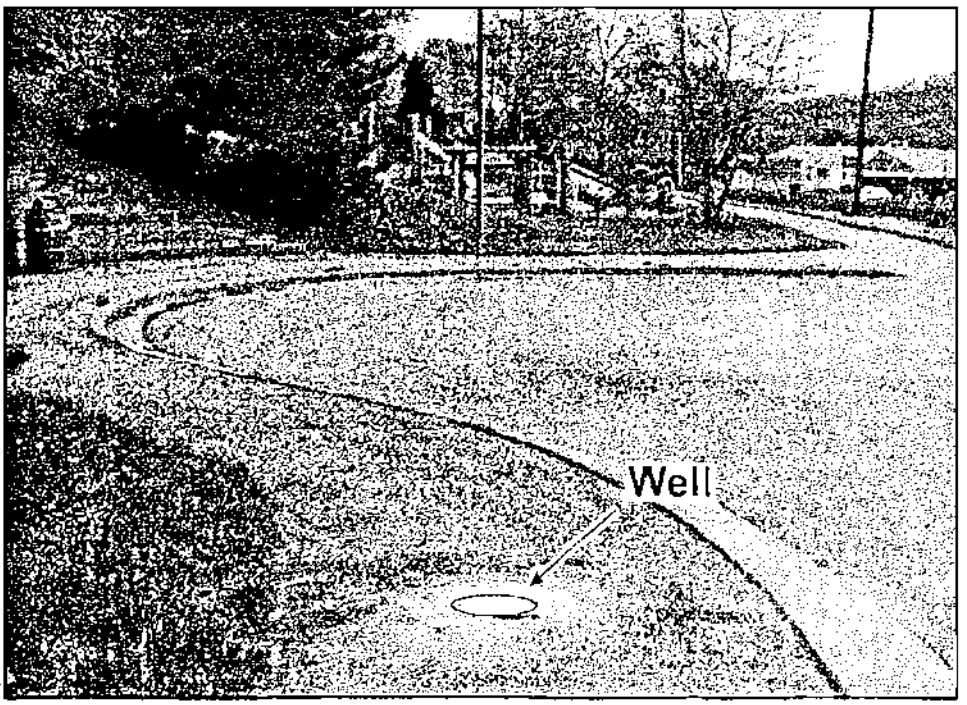
Purpose

- Identify extent of contamination in the one-mile stretch of the Miami-Erie Canal bed, including sediments in the beds of two ponds, a runoff hollow and the plant overflow creek emptying into the canal bed.



Miami-Erie Canal in City Park

- Determine the extent of migration of groundwater flowing beneath the canal bed into the Buried Valley Aquifer.
- Possible sources of contamination:
  - Runoff of plutonium-contaminated soils including the 1969 waste line break on-site
  - Diluted tritium discharged through plant drainage ditch from early 1960s until 1967, when tritium treatment facilities were built on-site



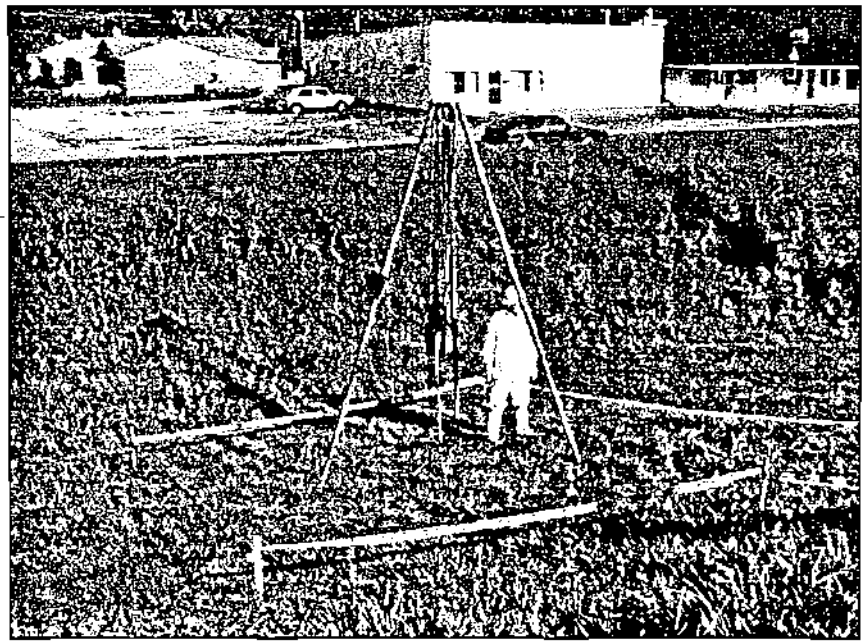
City Park with OU9 Well Installed

Primary Contaminants of Concern

- Plutonium-238 and tritium

Work Scope

Identify any concentrations of contamination in the canal bed and associated waterways, then decide on the appropriate course of treatment. In addition to proceeding with an an OU4 RI/FS, the possibilities for an early Record of Decision or a Removal Action are being considered.



Canal Sample Location in Downtown Miamisburg

Progress to Date

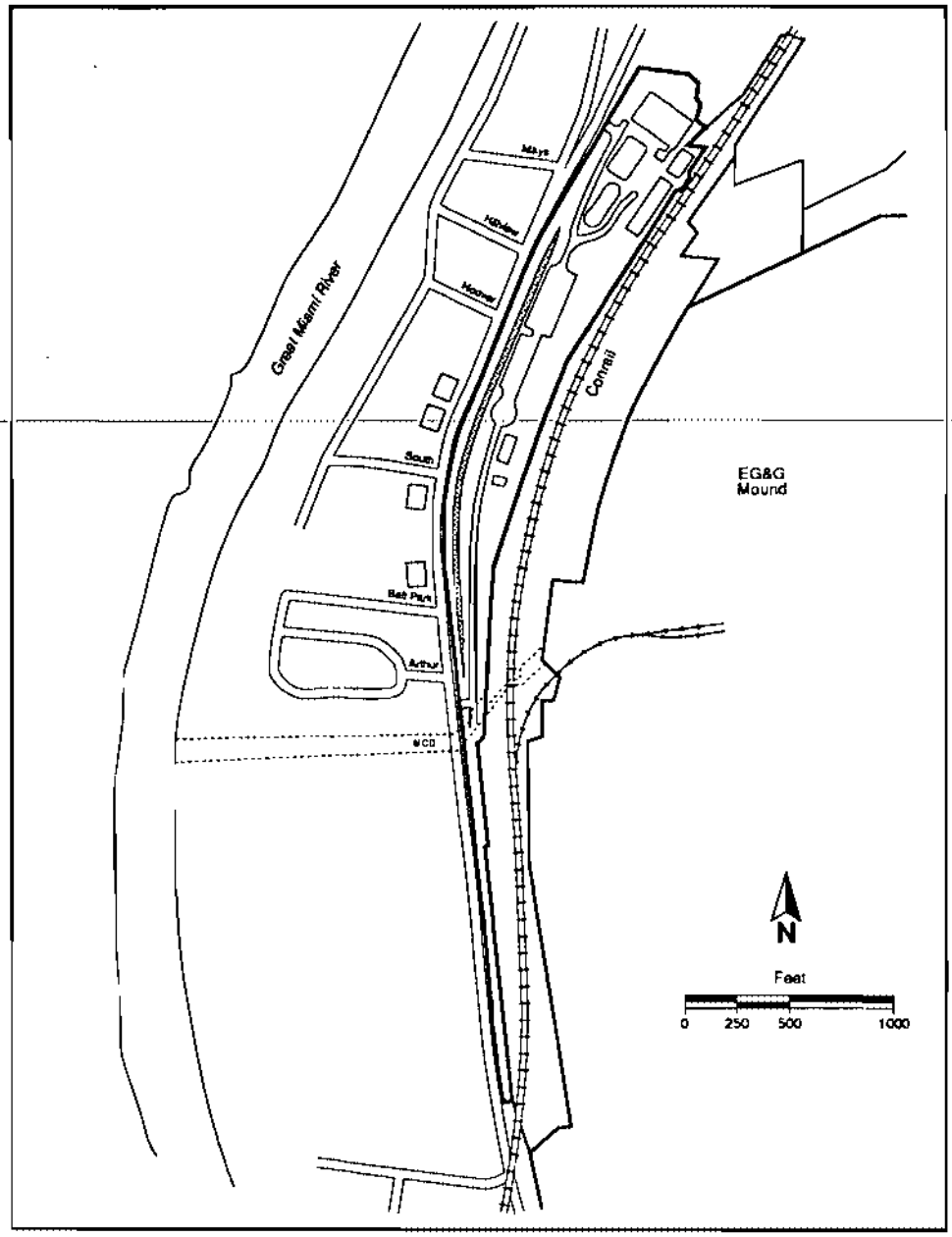
- Special canal sampling to confirm radionuclide levels and determine the presence of hazardous chemicals in the canal completed in February 1993.

Documents in Public Repository

Mound Laboratory Environmental Plutonium Study 1974. D.R. Rogers. (September 15, 1975).

Schedule for Remainder of FY93

Special Canal Sampling Report scheduled to be completed this summer; will be placed in the Public Repository when complete.



North Part of OU4 encompassing Community Park

MOUND

Environmental Restoration Program

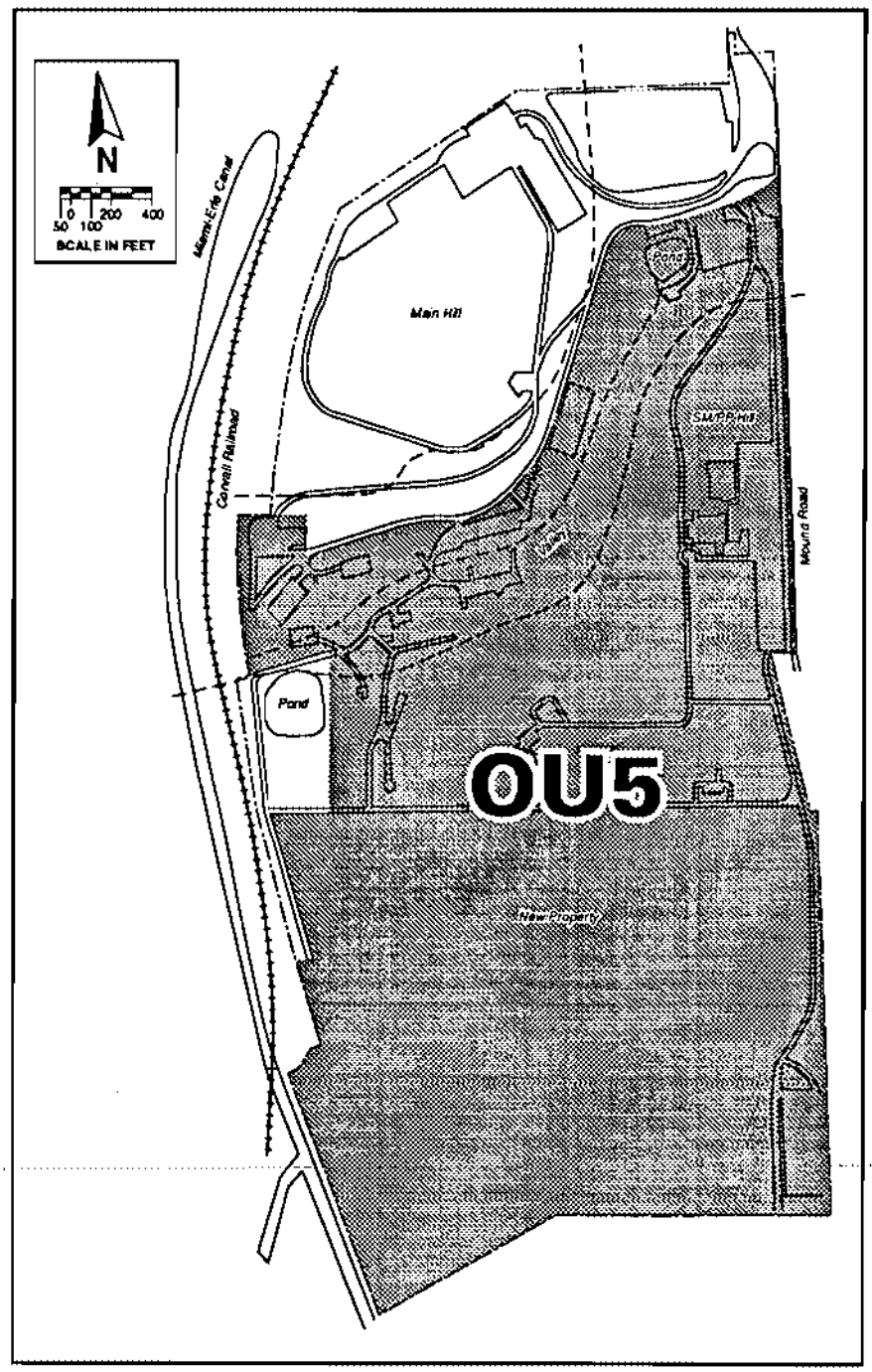
Operable Unit 5
South Property

June 1993

Addresses on-site soil areas in the southern portions of Mound Plant known or suspected to be contaminated by radioactivity or chemicals. It will fully characterize the sources of contamination and migration thoughout the OU5 geographical area.

OU5 contains three geographical areas: the SM/PP Hill, the Valley, and the New Property. Historically, plutonium operations and thorium redrumming were performed on the SM/PP Hill. The Valley area encompasses a number of buildings where explosive devices are tested, the Main Plant drainage ditch, and the plant's wastewater treatment facilities.

Available data indicate that most of OU5 is uncontaminated. However, within the Operable Unit, a number of areas are known to be contaminated with radioactive materials, principally thorium and plutonium. The areas were contaminated by disposal of contaminated soil or debris.



Purpose

- Confirm previous sampling in known areas of concern on plant's southern portions are clean or contaminated and determine the type and extent of contamination.
- Determine existence of unidentified areas of concern.
- Recommend remedial action alternatives and take action if warranted.

Primary Contaminants of Concern

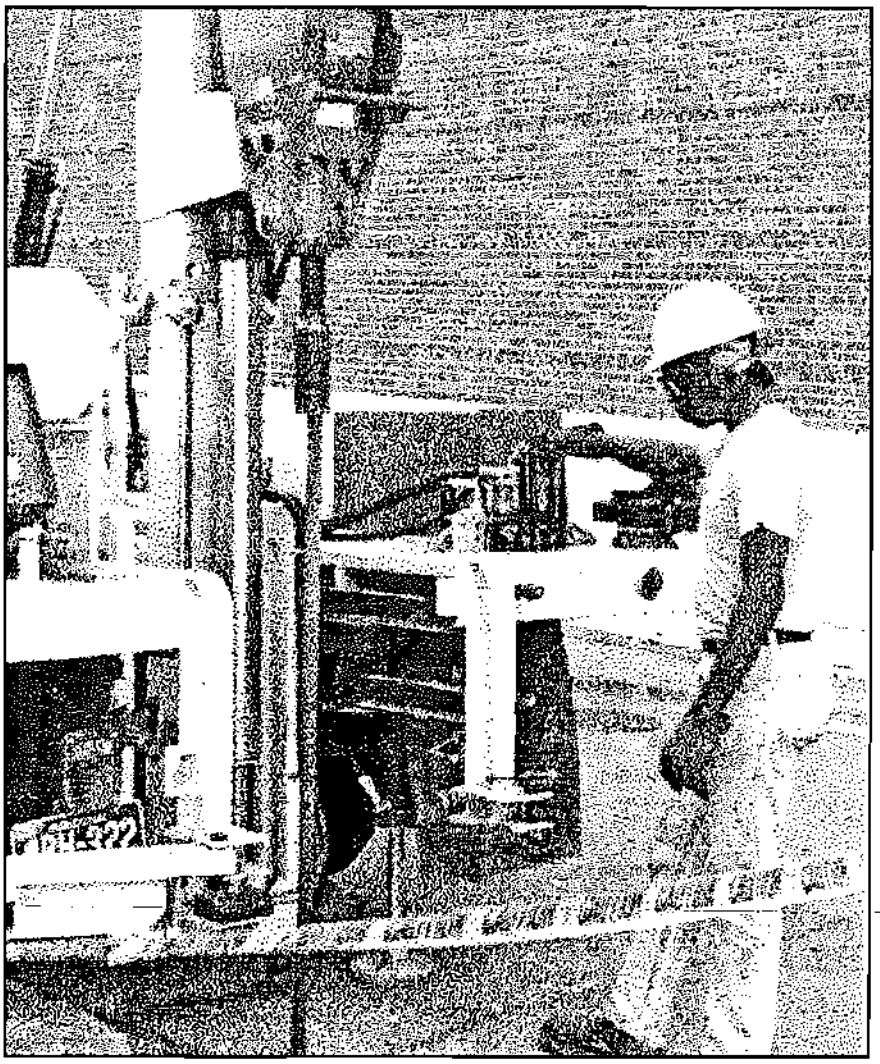
Thorium and plutonium, plus small amounts of various radionuclides and chemicals

Work Scope

- Identifying and assessing contaminated soil areas south of the Main Hill.
- Determine risk to human health and the environment due to OU5 sites.
- Identify possible remedial actions for OU5 sites.

Progress to Date

- A reconaissance soil gas study and geophysical investigation were completed in 1992.
- Draft Work Plan underway.
- RI/FS fieldwork is scheduled to begin in November 1993.



Soil Gas Fieldwork

Geophysical Survey Testing

Documents in Public Repository

Proposal for Additional Work–Soil Gas Survey and Geophysical Investigations, Mound Plant Main Hill and SM/PP Hill Areas (February 1992)

Reconnaissance Sampling Report; Soil Gas Survey and Geophysical Investigations, Mound Plant Main Hill and SM/PP Hill (February 1993)

Schedule for Remainder of FY93

RI Work Plan completion–August 2, 1993.

Future Schedule Milestones

(assuming full funding)

FY1994–97

RI Field Work

FY1997

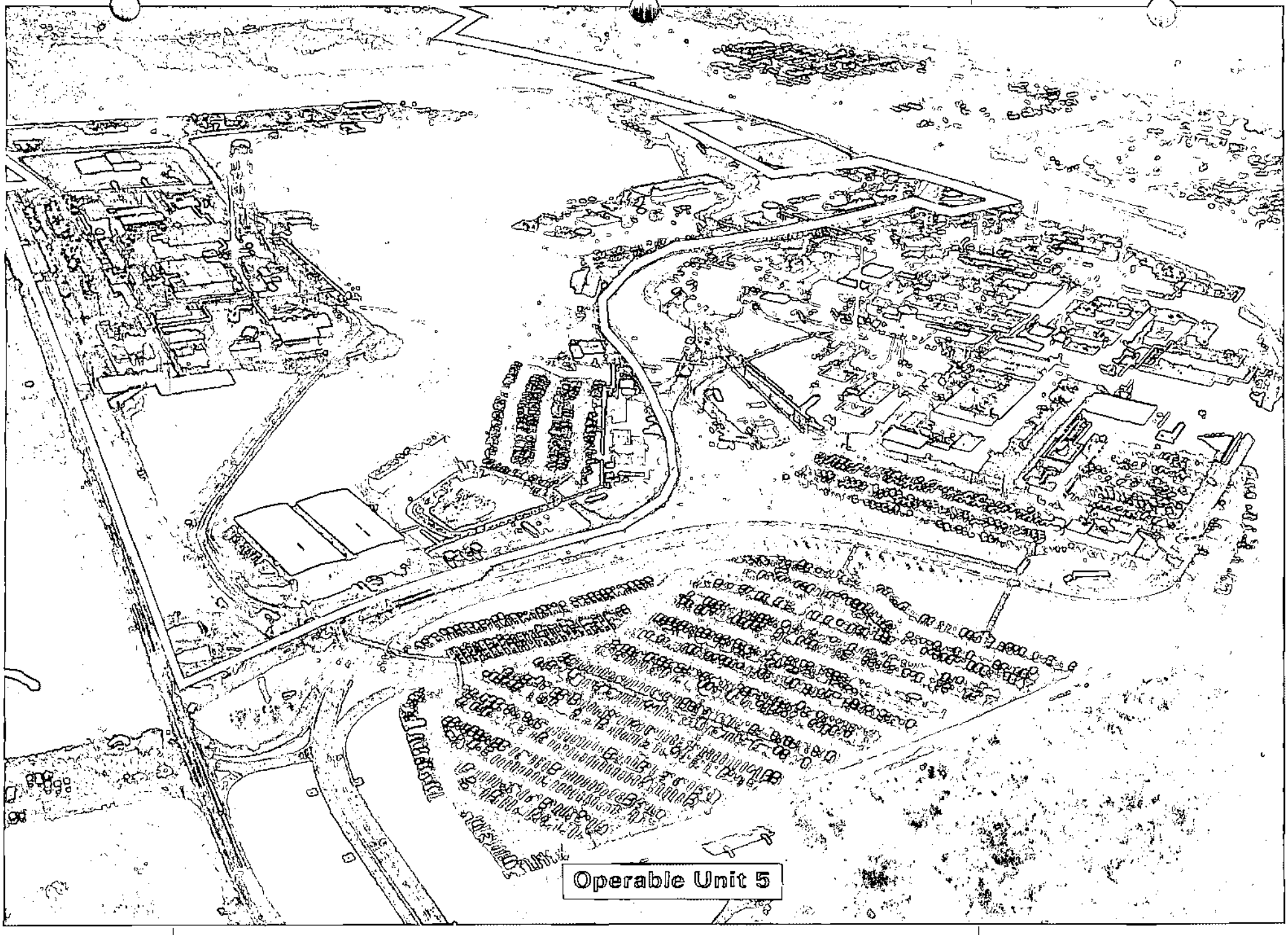
RI Report

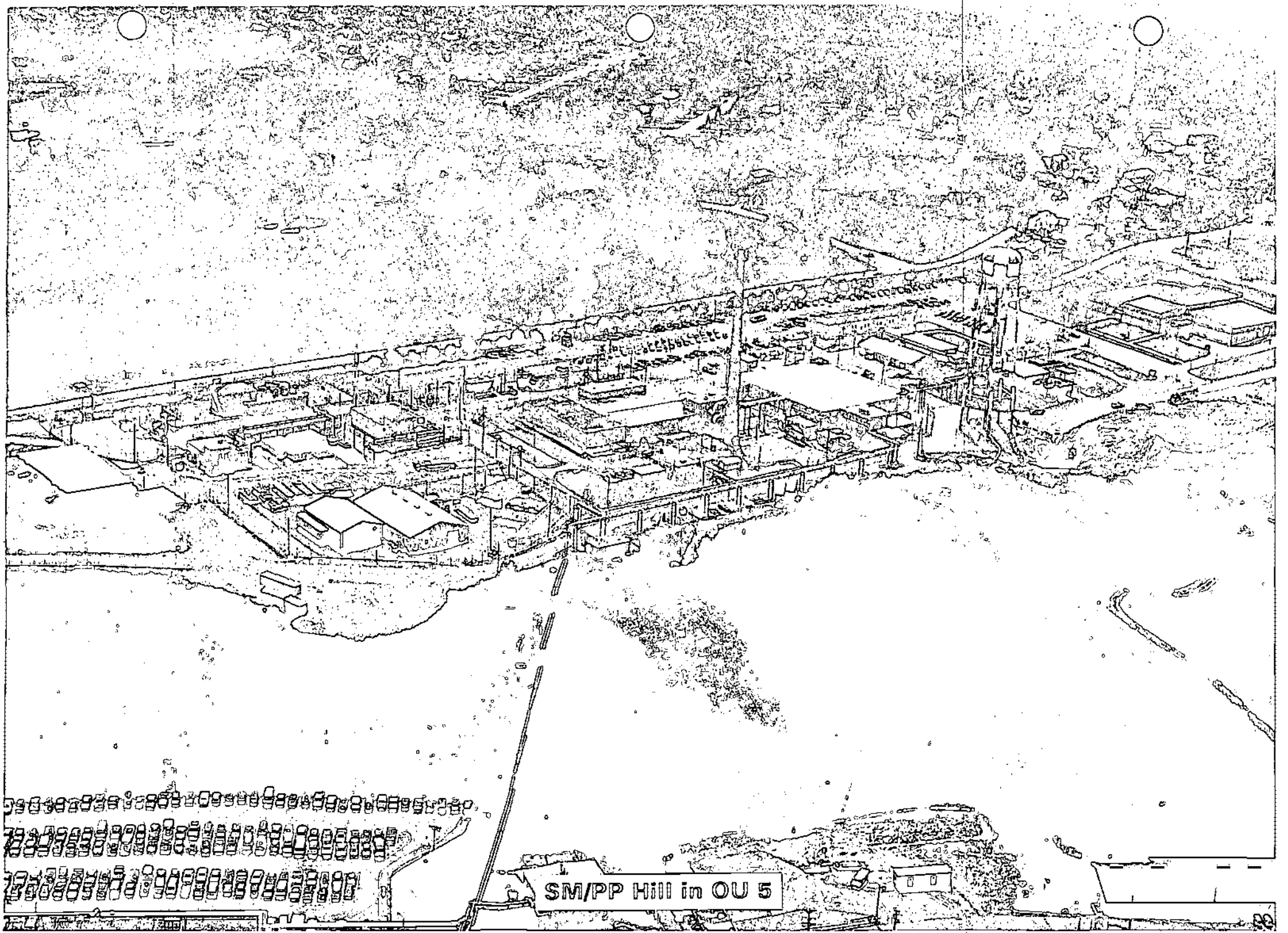
FY1998

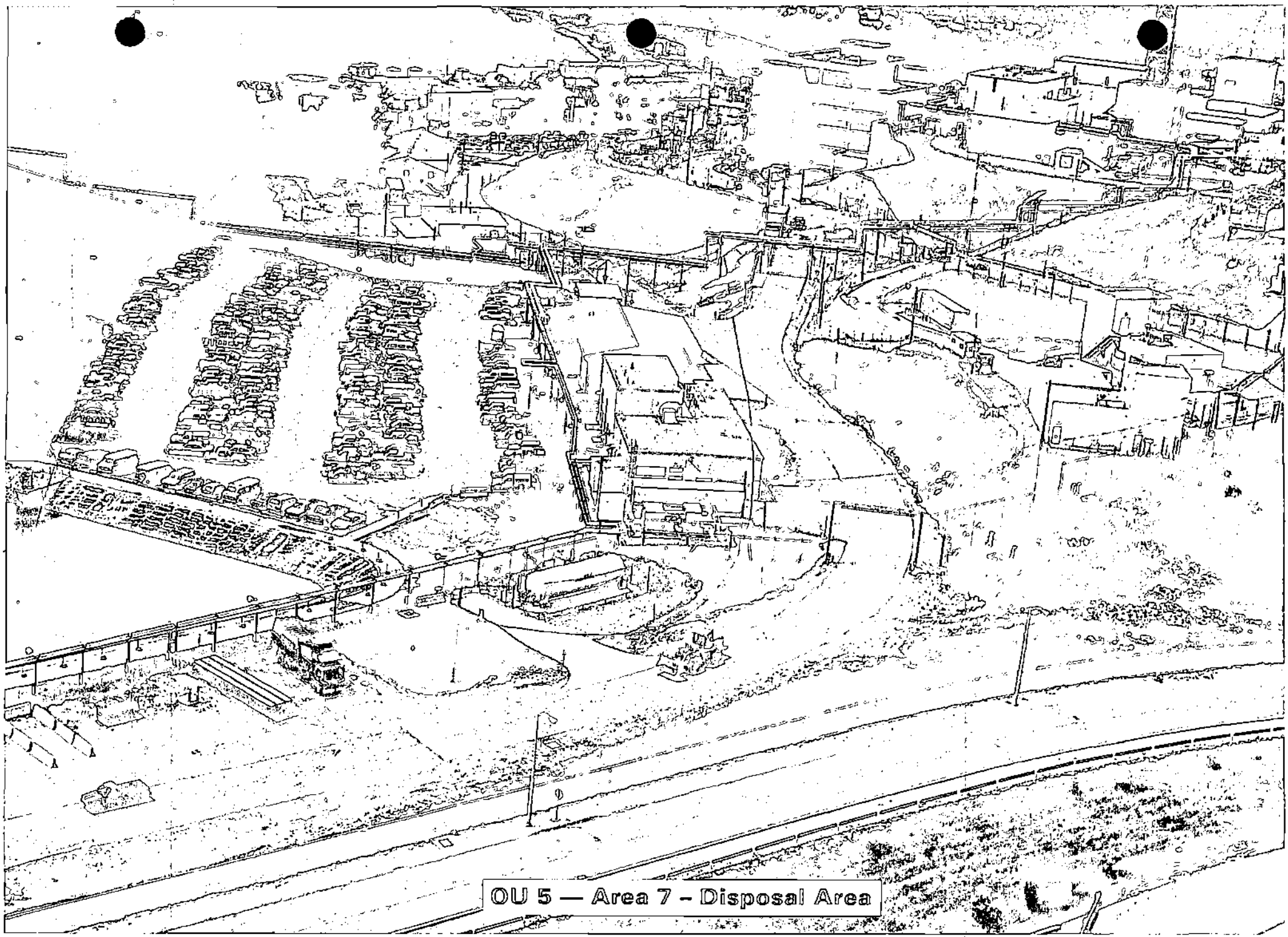
Feasibility Study Report

FY1999

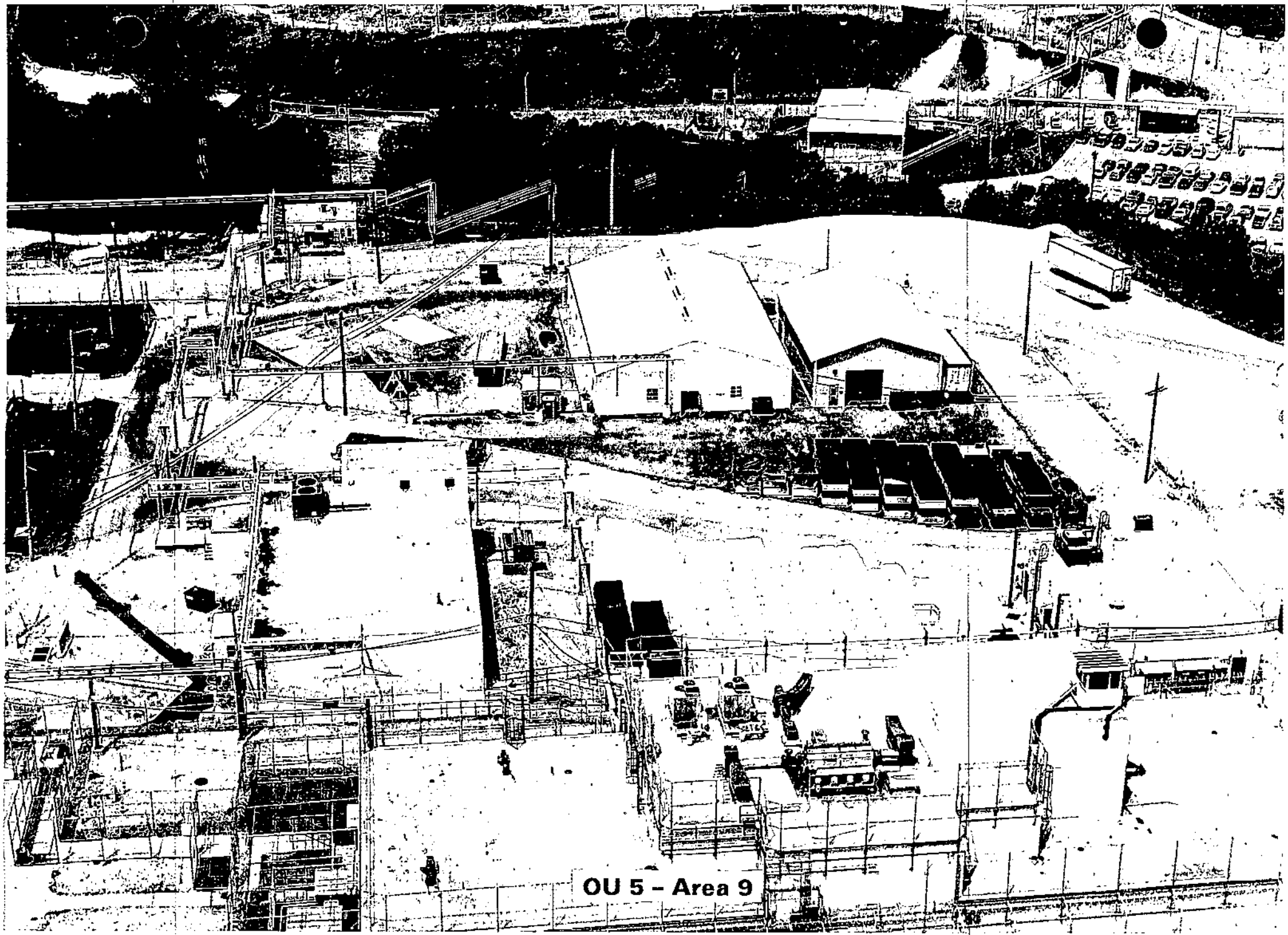
Record of Decision (ROD)


Operable Unit 5


SM/PP Hill in OU 5



OU 5 — Area 7 – Disposal Area


OU 5 – Area 9

MOUND

Environmental Restoration Program

Operable Unit 6

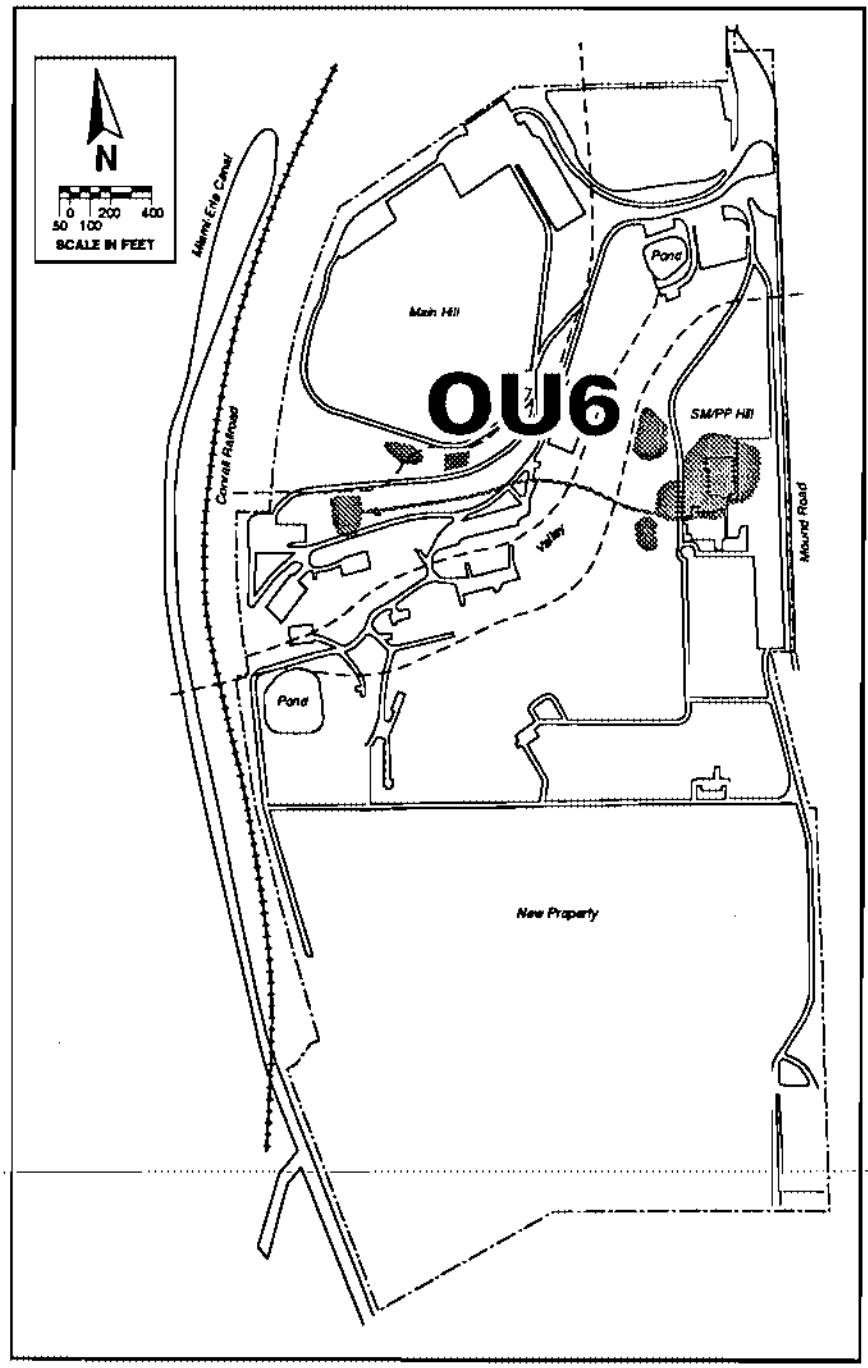
Verification of Sites Under the Management of the D&D Program

June 1993

Addresses residual contaminants left from Mound's ongoing Decontamination and Decommissioning (D&D) of unused radiological facilities on site. The current D&D Program at Mound began in 1978 and presently addresses surplus plutonium facilities and underground waste pipelines.

The land area covered by OU6 has changed only slightly from its original delineation to reflect D&D work done since the original Operable Units were defined.

The D&D Program is independent of the CERCLA Program and is not routinely subject to EPA oversight. However, upon completion of D&D activities, every site will be evaluated by the CERCLA Program under OU6.



Note: This map depicts only active D&D sites. Other areas will be added as the D&D Program at Mound progresses.

Purpose

- Determine whether completed D&D sites meet CERCLA cleanup requirements.
- Determine the risk to human health and the environment posed by residual soil waste left from D&D cleanups.
- Determine remedial methods for any residual wastes left from D&D cleanups and take remedial action if warranted.

Verification OU6 Soil Sampling with Hand Auger

Primary Contaminants of Concern

Principally plutonium and thorium in activities to date

- future activities could include other radionuclides and any hazardous chemicals.

Work Scope

OU6 verification will follow the completion of D&D activities at each D&D site.

- sample and determine residual concentrations of chemicals of concern.
- determine alternatives and remediate areas with unacceptable risk.

Progress to Date

- Verification of portions of Area 14 and Area 17 completed in 1992.
- Field work for Verification of Area D is completed; Verification Report is underway.
- Area 19 Sampling Plan in progress
- D&D of SM Building is in progress
- Planning for several D&D projects is in progress

Documents in Public Repository

OU6 Verification Work Plan, Volumes I and II (August 1992)

Area-Specific Sampling Plans: Area 14, Area 17, Area D.

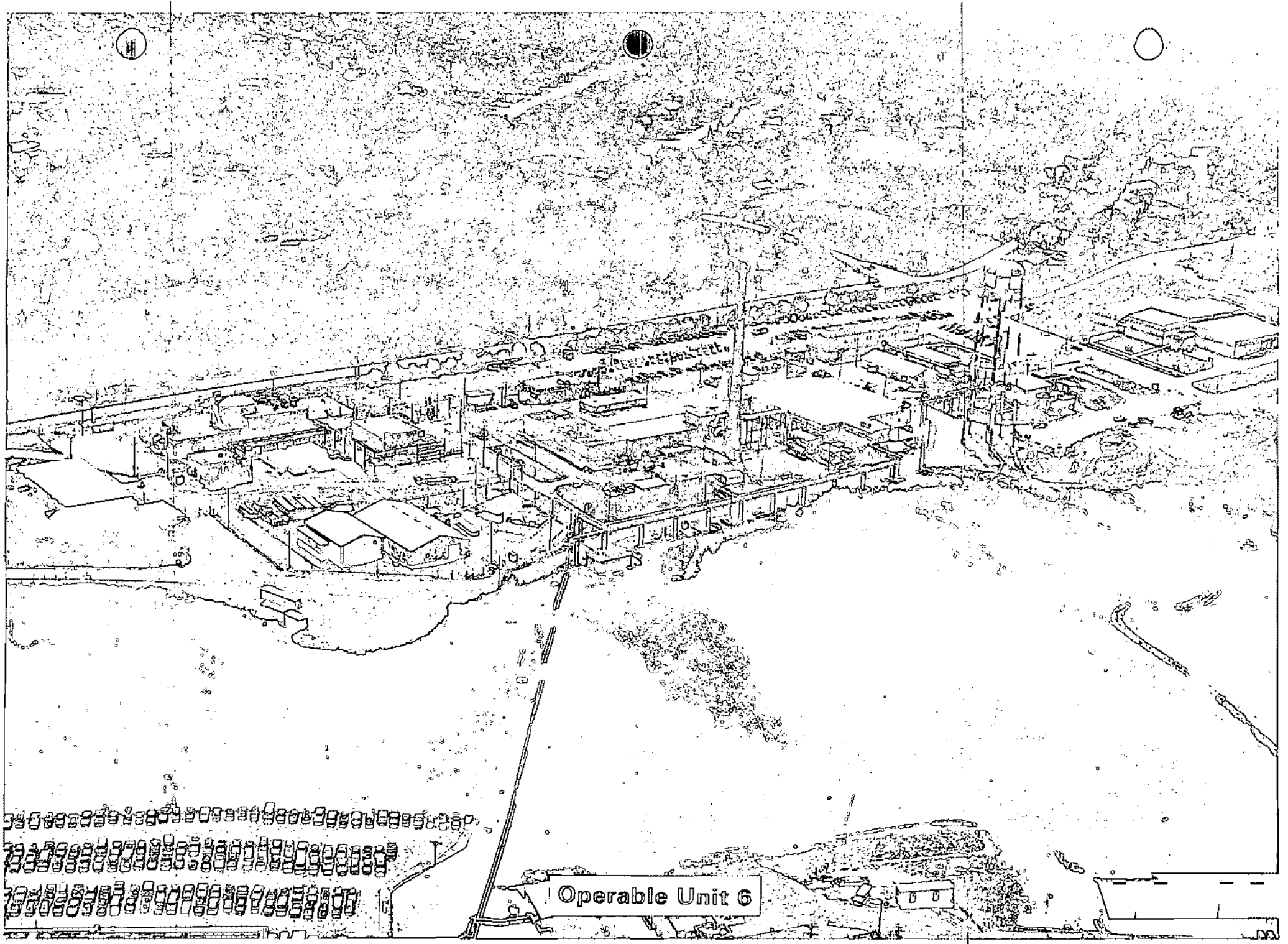
Area-Specific Verification Report: Area 14, Area 17

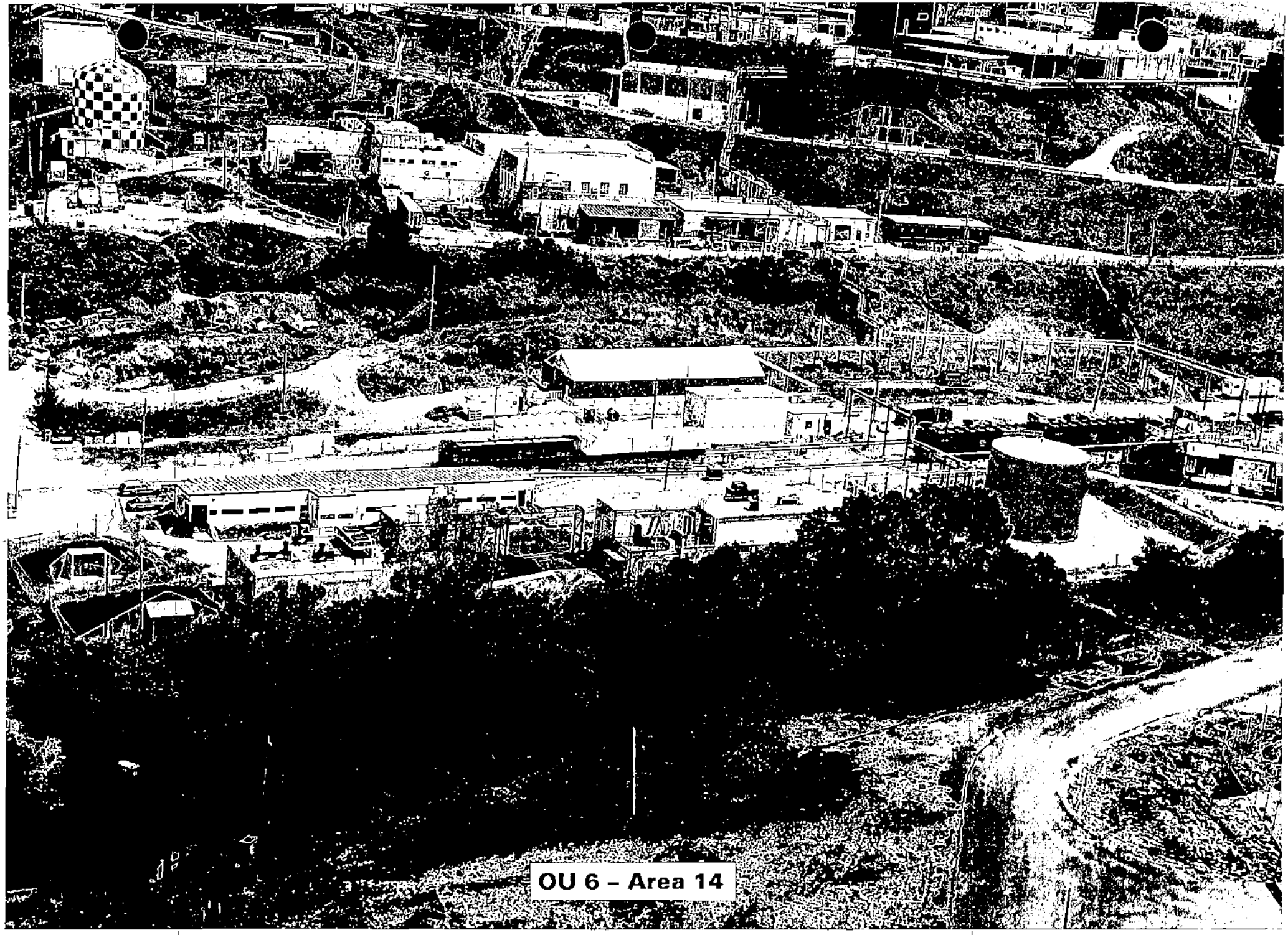
Schedule for Remainder of FY93

- Area D Verification Report in preparation
- Complete Area 19 Sampling Plan and start sampling
- Begin removal of WD-HH pipeline

Future Schedule Milestones

- Area D and Area 19 Verification Reports to be completed in 1994
- Continue work on SM Building
- Various verification efforts in 1995 through 1999


Operable Unit 6


OU 6 – Area 14

Area 16, SM Leach Field in OU 6

MOUND

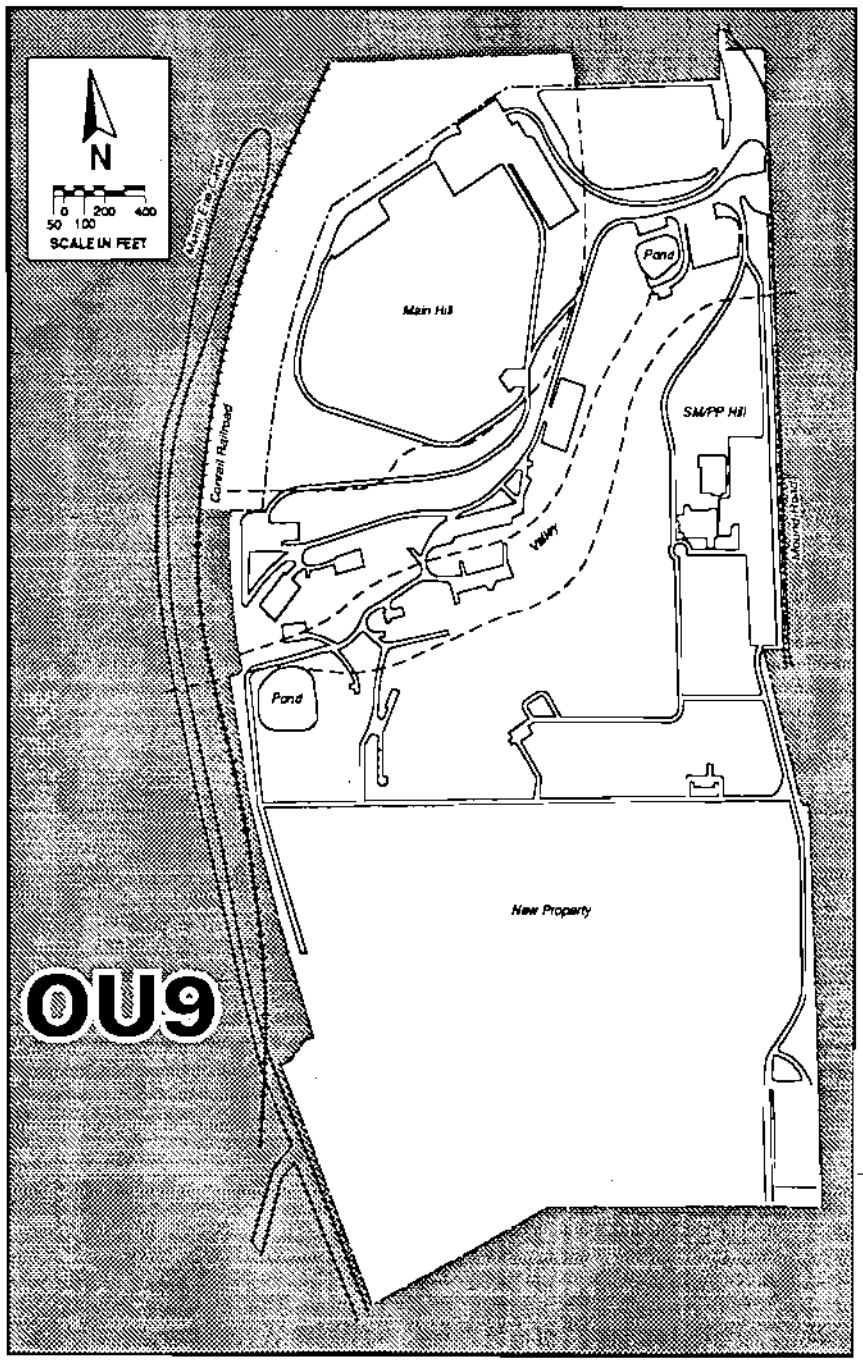
Environmental Restoration Program

Operable Unit 9
Site-Wide/Off-Site

June 1993

Addresses the total environmental effects of any contamination attributable to Mound Plant that may be found in the air, groundwater, soils, surface water and sediments; includes all ecological concerns. OU9 encompasses the cumulative impact of all other Operable Units on-site and in the off-site environment, including characterization of possible contamination in the Buried Valley Aquifer and the plant drainage system.

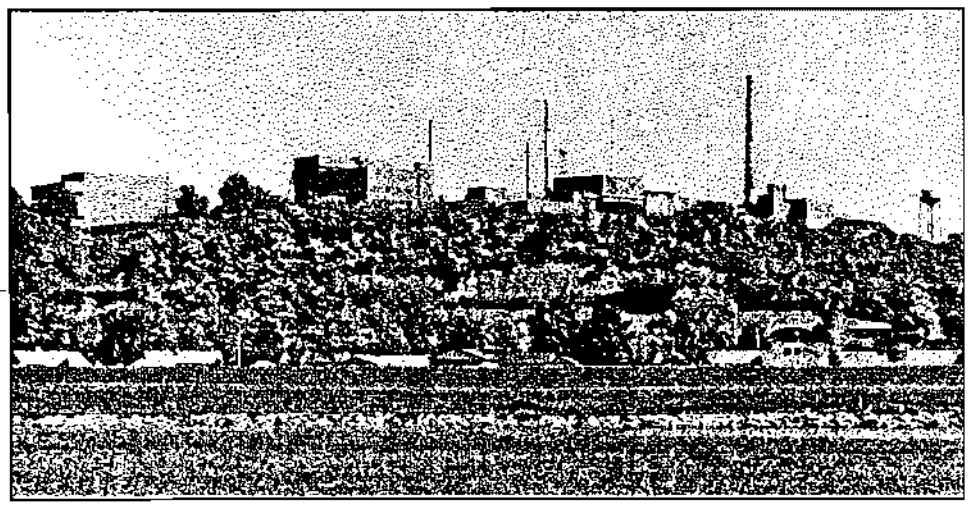
Presently, site-wide investigations encompass the entire plant and the area within a 20-mile radius of the plant.



Limited on-site OU9 investigations are not shown on this map.

Purpose

- Characterize and calculate risks and remediate off-site contamination, if appropriate.



View of Mound Plant from across Great Miami River

- Compile all Operable Unit data to complete the site-wide Risk Assessment and Site-Wide Record of Decision (ROD) after all other OU RODs are complete.
- Determine remedial actions for all contamination, particularly off-site contamination, not addressed by other Operable Units.

Contaminants of Concern

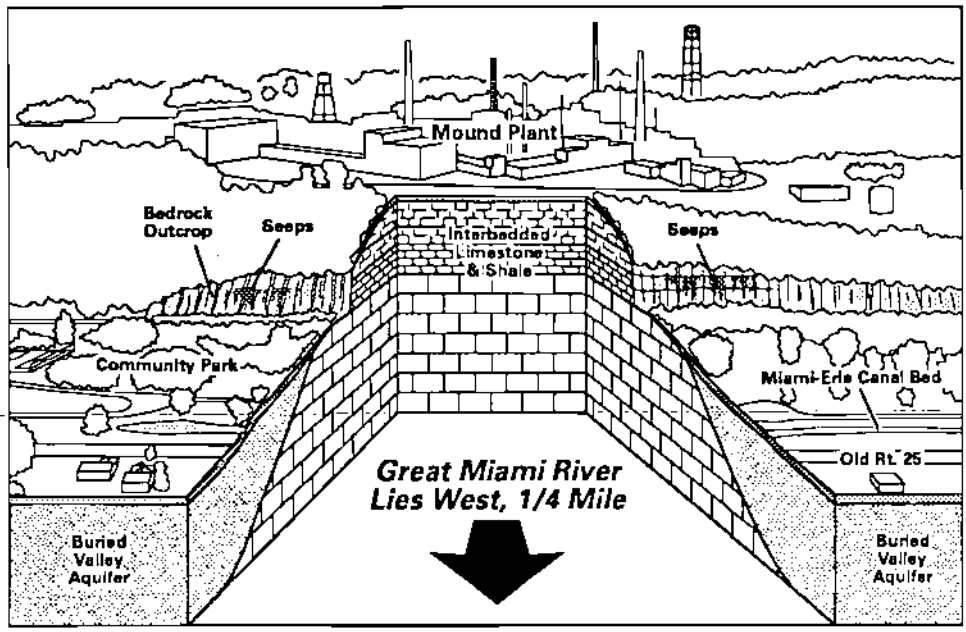
- Radionuclides, chemicals and other hazardous materials historically utilized by Mound Plant

Work Scope

- Focus on off-site contamination
  - Area within a 20-mile radius of the Mound Plant boundary.
- Characterization of the Buried Valley Aquifer
  - possible contamination originating from SM/PP Hill, Test Fire Valley or Main Hill.
- Limited on-plant, side-wide studies of potential contamination of the air, surface water, sediments, groundwater and soils
  - includes plant drainage system.
- Excludes off-site areas within OU4, Miami-Erie Canal.

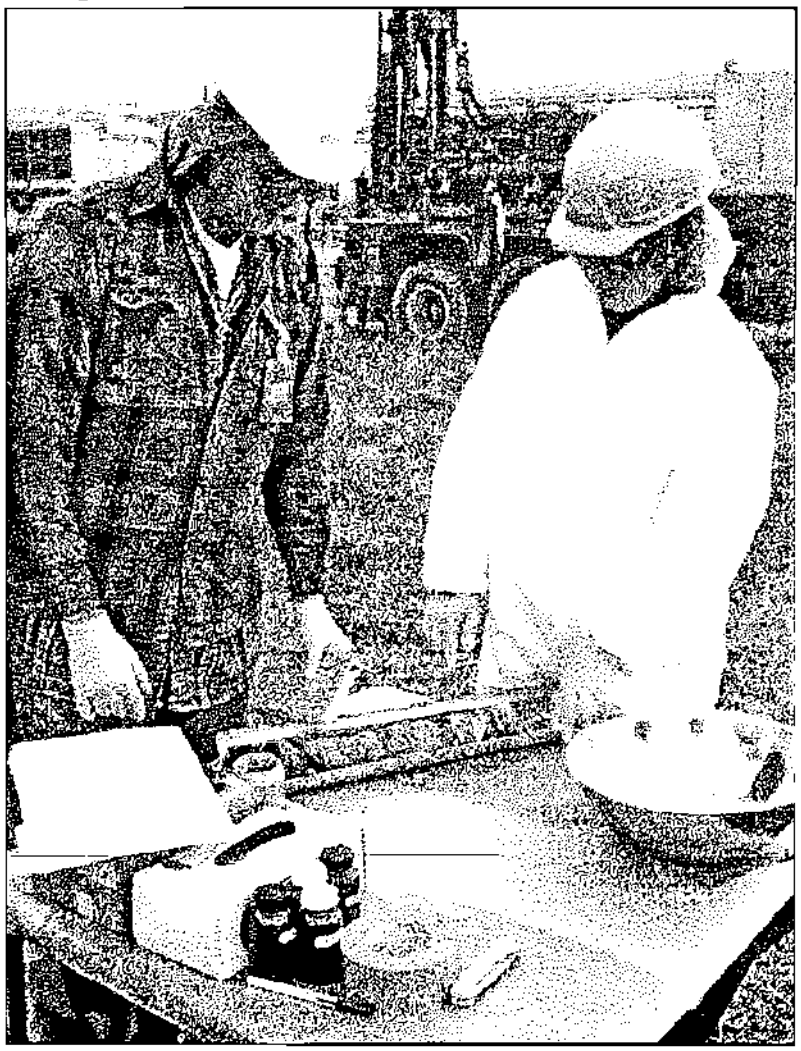
Progress to Date

- **Hydrogeological investigation** underway to determine subsurface soil, bedrock composition, geological site model depiction, groundwater flow patterns, and the presence of contamination in groundwater
  - completion of fieldwork in July 1993
  - 63 new monitoring wells and piezometers installed between January and April 1993.
- **Seismic refraction study** to determine underground bedrock features.
- **Residential well/cistern study** underway to determine presence of contamination in private drinking water wells.

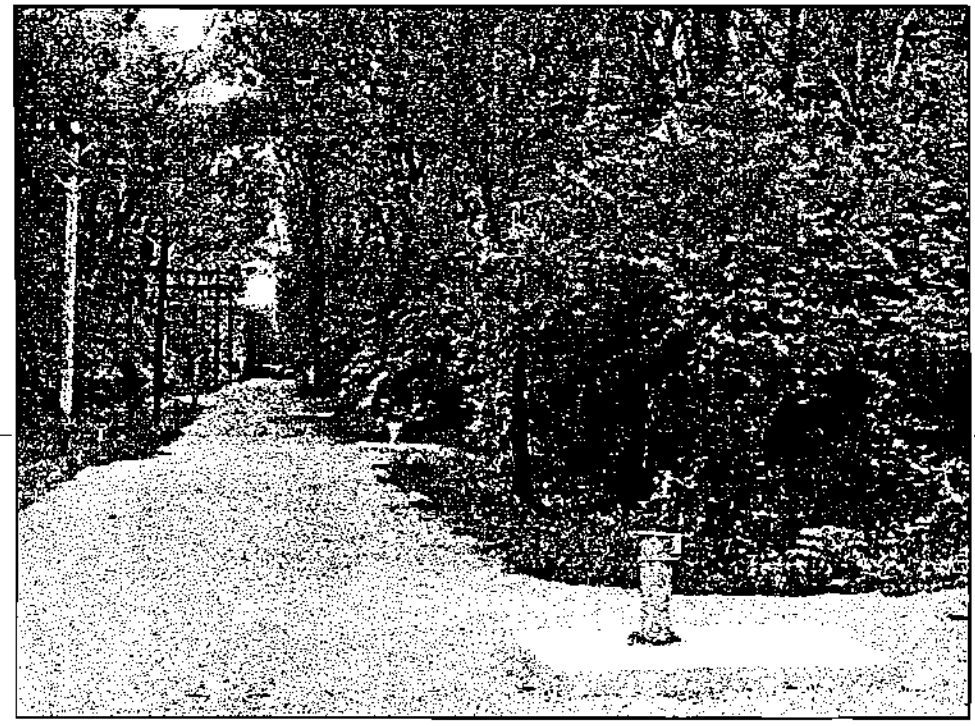


Buried Valley Aquifer

- **Ecological assessment** underway to identify species and populations of local plant and animal life for future determination of the effect of any potential contamination.
- **Background soils studies** underway to determine the naturally occurring chemical and radionuclide parameters in the soils.



Examining Soil Core



Conrail Property Wells

- The signing of **access agreements** for study within off-site properties continues. Access agreements currently signed between Mound and City of Miamisburg, Conrail, the Miami Conservancy District and more than 150 private property owners.

Identifying Wildlife on Mound South Property for Ecological Study

Documents in Public Repository

- Site-Wide Work Plan, Volumes 1 and 2 (May 1992)
- Site-Wide Scoping Reports, Volumes 1-11 (February 1992-February 1993)
    1. Groundwater Data
    2. Geologic Log and Well Information
    4. Engineering Map Series
    5. Topographic Map Series
    6. Photo History Report
    8. Environmental Monitoring Data
    9. Annotated Bibliography
    10. Permits and Enforcement Actions
    11. Spills and Response Actions
    - These volumes will be placed in the Repository in July
        3. Radiological Site Survey
        7. Waste Management
- Community Relations Plan (January 1993)

Schedule for Remainder of FY93

Fieldwork for Railroad Cut Mapping

Fieldwork for Background Soils Investigation, Phase I

Fieldwork for OU9 GW Sweep Sampling

Fieldwork for Access Agreements (Residential Well Investigation)

Future Schedule Milestones

FY1999

OU9 RI/FS Fieldwork Completion

FY2000

Remedial Investigation Report

FY2002

Feasibility Study/Proposed Plan

FY2002

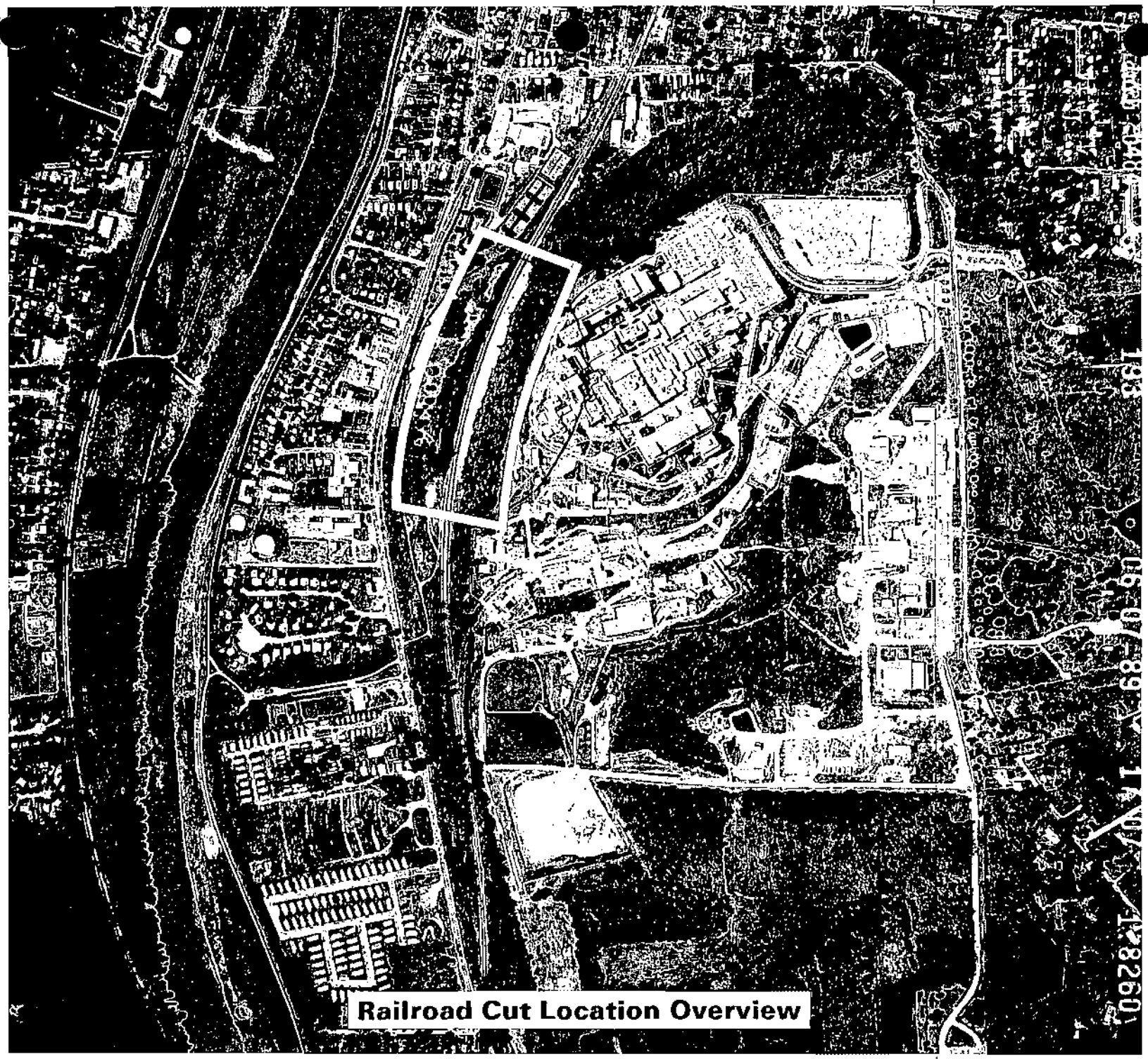
Treatability Study

FY2002

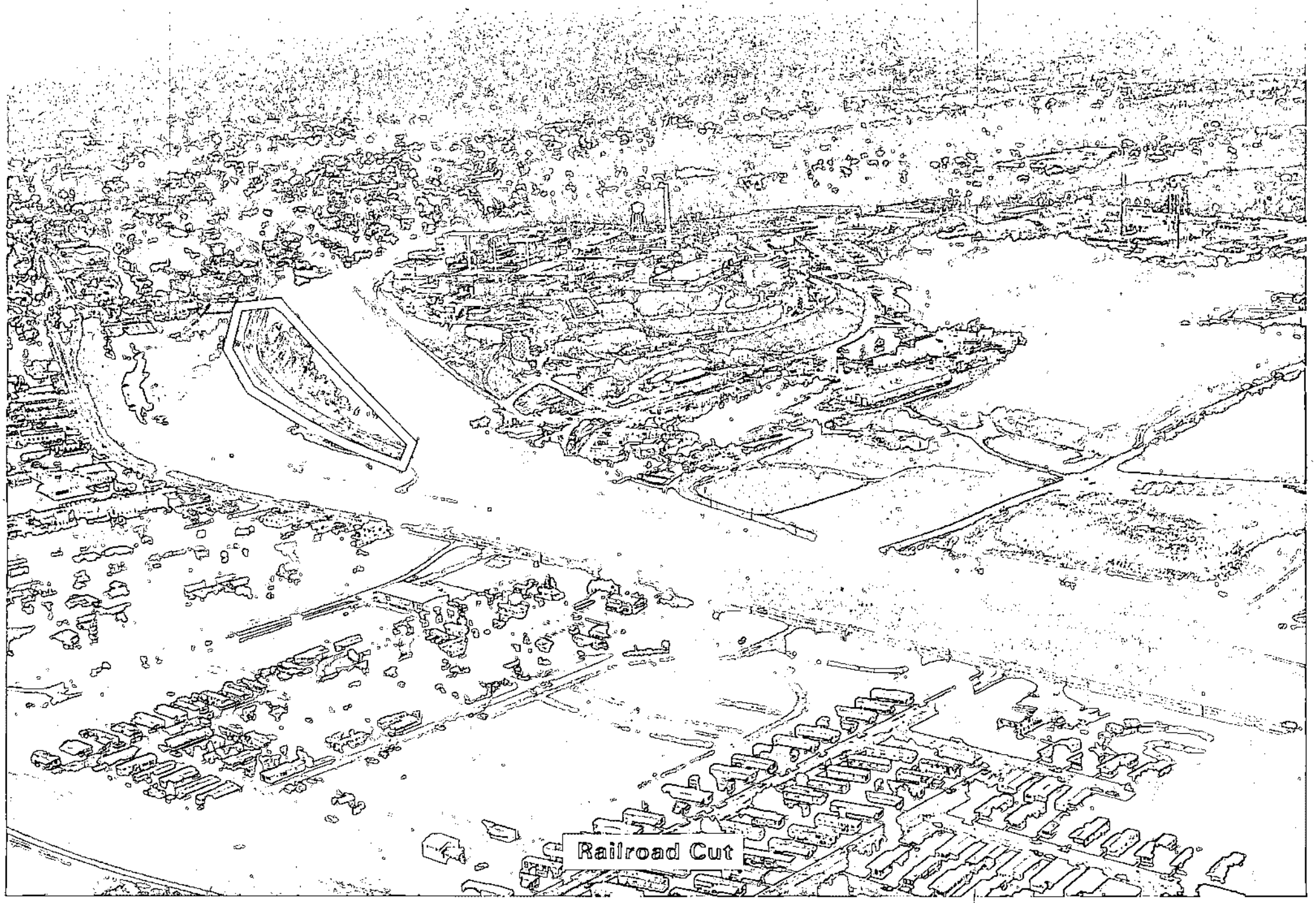
Record of Decision (ROD)

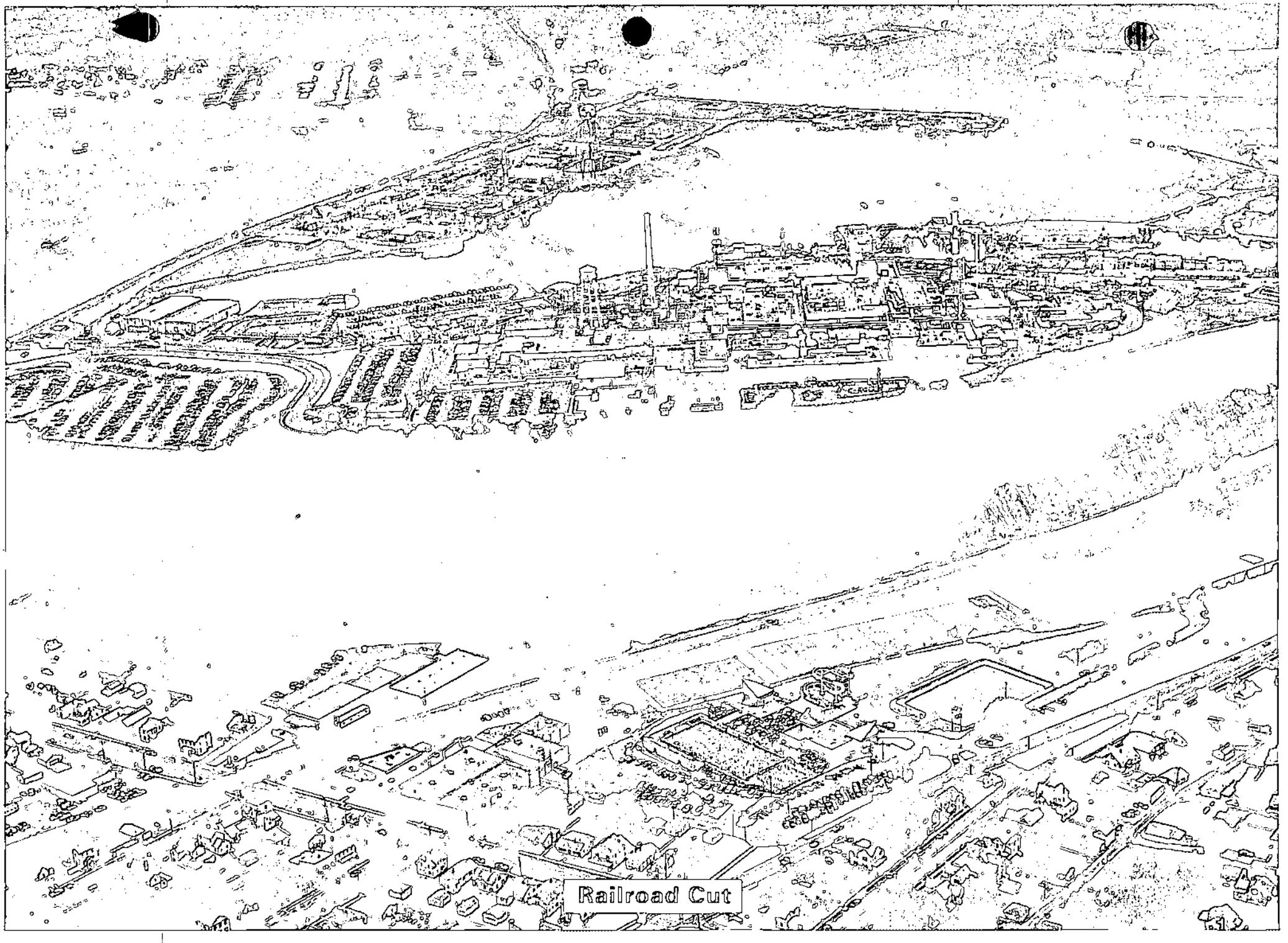
FY2002+

OU9 Remediation, Maintenance, Surveillance, etc.



Railroad Cut Location Overview


Railroad Cut


Railroad Cut

E. MOUND FACT SHEETS AND NEWSLETTERS

MOUND
Environmental Restoration Program

SUPERFUND Update

EG&G

April/May 1994

Risky Business

"As soon as there is life there is danger."

– Ralph Waldo Emerson

Life is a risky business. And since we cannot escape the inherent risks of life, we learn to coexist with them — sometimes with fear, outrage or denial, sometimes with ambivalence, and sometimes with exhilaration or full acceptance.

On a daily basis, we make decisions about which risks to take in life. Do we risk death for the physical challenge of climbing Mount Everest, risk our money on lottery tickets in the hopes of winning a million dollars, or risk our health by smoking tobacco?

Our perception of risk helps us make these decisions. A risk that may be acceptable to us, hang gliding for example, may be wholly unacceptable to our friends. Our physical condition, athletic skills and desire for excitement help shape our perception of this particular risk. Despite the potential for harm, we make a decision that it is better to hang glide than not to hang glide. In other words, the benefits of the risk outweigh the costs involved.

photo by Rich Strang

Accomplishment vs. injury: The risks involved in climbing are perceived differently by individuals.

Risk Perceptions

Perception of risk is a highly subjective matter. However, there are some general factors associated with human perceptions of risk. For example, risks that are consciously assumed or "voluntary" are generally perceived as lower risk than risks over which we have no control (**see chart at right**). Driving an automobile or smoking cigarettes fall into this low perceived risk category – even though both are statistically more risky than flying in an airplane. In fact, there have been no deaths in the United States from commercial air travel in the last two years.

For most people, hazardous waste sites fall into the high perceived risk category. When compared to non-hazardous waste sites, they do pose higher risks. However, this risk poses a significantly lower statistical cancer risk than exposure to the sun, cigarette smoking, and naturally occurring radon gas in homes (**see chart on page 3**).

When statistics butt heads with risk perceptions, or in other words when risks are perceived differently by experts and average citizens, controversy often arises.

Risk Perception Factors

LOW PERCEIVED RISK	HIGH PERCEIVED RISK
Voluntary	Involuntary
Natural	Man-Made
Familiar	Exotic
Common	Dreaded
Not Catastrophic	Catastrophic
Controlled by Individual	Controlled by Others
Fair	Unfair
Detectable	Undetectable
Visible Benefits	No Visible Benefits
Not Memorable	Memorable
Trusted Source	Untrusted Source
Amoral	Immoral

Ref: Slovic, Fischhoff, Lichtenstein

Experts evaluate risk through a complex statistical process called "risk assessment." The public evaluates risk through their own perceptions, which are shaped by background, education, the media, and opinions about government and science. If efforts aren't made to modify risk perceptions on one hand and acknowledge statistical uncertainties on the

(Please see Risk, Page 2)

In This Issue:

Risky Business 1
Why Evaluate Risk? 2
1993 – A Year of Changes 4
Bioremediation 5
Remedial Response 6
Public Comment Periods 6
Recap–March Workshop 7
Other Information 8

Why do we evaluate risk?

Risk is evaluated to determine three things:

- What potentially can go wrong?
- How likely is it to happen?
- If it does happen, what will be the consequences?

Society requires this knowledge in order to make informed choices about what to do, where to go and how to do things – whether it's climbing a mountain or cleaning up a hazardous waste site.

Risks are informally assessed on a daily basis. We make decisions to assume or reject risks based on our experiences and risk perceptions. Risks are formally assessed through actuarial statistics (based on an actual count of victims) or through a process called **risk assessment**.

Risk assessment emerged in the 1970s as a way of quantifying risks posed by technology, lifestyles and personal habits. The government currently uses this process to make most of society's risk-related decisions, which are passed on to us in the form of laws or regulations.

The scope and nature of risk assessments vary greatly. Some focus on a site-specific problem such as eating fish from Lake Erie; others focus on broad-based topics such as acid rain or global warming. Yet others focus on past or future harm, such as the risks generated by a Superfund site or those expected if a new AIDS drug is approved for use.

Environmental and food and drug-related laws normally require a risk assessment as part of the regulatory process. For example, the "Delaney clause" of the Federal Food, Drug, and Cosmetic Act bans the approval of any food additive that has been found to induce cancer in humans or animals. The Toxic Substances Control Act of 1976 screens new and existing chemicals and will ban or limit the use of those that are calculated to present an unreasonable health risk. This Act banned the use of polychlorinated biphenyls (PCBs), formerly used as an insulating fluid in electrical capacitors, because of their toxicity to laboratory animals, resistance to breaking down in the environment, and ability to accumulate in animal fat in higher and higher concentrations up the food chain.

Under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), risk assessment must be performed at all Superfund sites. This occurs at several stages in the process:

- **Hazard Ranking System** – qualitatively evaluates risks posed by a newly discovered hazardous waste site to determine whether it should be placed on the USEPA's National Priorities List for priority cleanup.
- **Baseline Risk Assessment** – evaluates the health and environmental risks posed by a hazardous waste site if it is not cleaned up and helps determine cleanup goals; conducted during the Remedial Investigation.
- **Remedial Risk Assessment** – evaluates the effectiveness of potential cleanup remedies by relating target cleanup concentrations to health risks.

Risk

continued from Page 1

other, then the controversy will remain unresolved.

Types of Risk

Risk is defined as the probability of loss or injury. There are two basic categories of risk:

- Personal activities – things we do in day-to-day living.
- Naturally occurring activities – floods, earthquakes, solar radiation, etc.

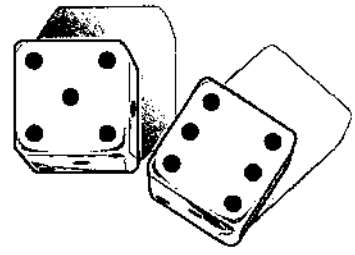
Risks from the first category are often self-imposed. Risks from the second category are generally imposed upon us, although we share some responsibility if we choose to live in a floodplain or on an earthquake fault.

Risks from chemical exposures fall into both categories. We can be exposed to chemicals (**including radionuclides**) through our natural environment, our jobs, and where we live.

Most risks are the result of a direct cause-and-effect relationship. An activity or event takes place, such as motorcycling or a hurricane, and a death or injury occurs that is directly correlated to it. Insurance companies, government agencies, industry and other groups use these actual numbers to determine estimates of risk associated with a particular activity or event. For example, the annual risk associated with motorcycling currently is about 2,000 deaths per 100,000 persons at risk.

Chemical Risks: Not like the others

A cause-and-effect relationship is nearly impossible to achieve for risks from chemical exposures because society does not test non-medical chemicals on humans. In general, human risk de-



terminations from chemical exposures are based on the results of laboratory animal research. Human data does exist for some poisons, drugs and acute occupational exposures, but animal data must suffice for most chemicals in the air, water, soils and food we eat.

All risk is generally expressed in the same numerical units; however, chemical exposure risks are determined in a different manner and cannot be compared to the other risks without an understanding of the following differences (see example below):

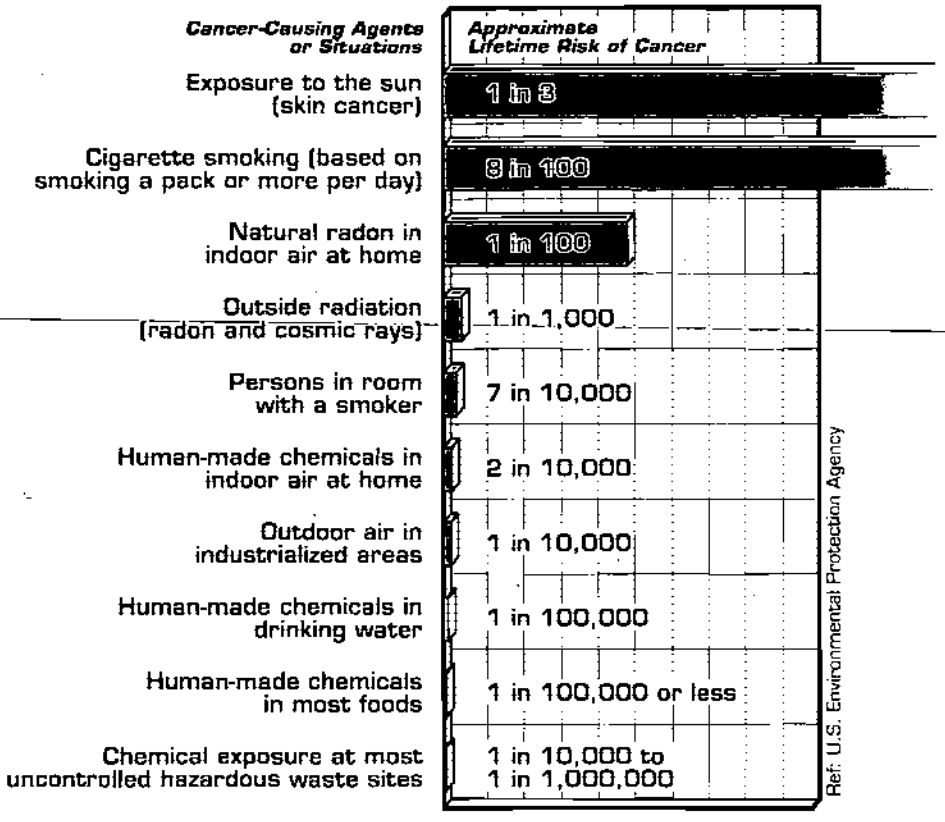
- **Chemical risk is based mainly on laboratory animal studies; little human data is available.**
- **Chemical risk is based on a worst-case exposure.**
- **Chemical risk is an average attributed risk.**

Inherent uncertainty

Needless to say, estimating human risk from chemical exposure is a controversial and confusing business. It becomes even muddier when one considers all the chemicals a person is exposed to over a lifetime. It is difficult to factor out all these inputs to determine whether a particular chemical caused a particular reaction in a human, especially when a response such as cancer may not show up for 20 or 30 years. Heredity, diet and lifestyle also cloud the issue. And on top of all that, data is often inadequate or missing, and scientists frequently disagree with each other's research conclusions.

The only certainty in the whole process is its inherent uncertainty. But the fact remains, we assess chemical risks to gain some understanding of our environment and to prioritize environmental concerns to make the best use of the resources available to us. While we may be unsure at times of how to interpret the results, the process at least attempts to put risk in perspective against other risks. And as scientific knowledge progresses, so too will the process of evaluating risk.

Comparative Cancer Risks



Cancer Risk Estimate – An Example

(from EPA journal, Jan/Feb/March 1993)

Cancer risks from normal municipal chlorinated drinking water – estimated at 0.8 persons per year per 100,000 people exposed

Hazard – Cancer

- Based on laboratory tests conducted on mice using various chlorinated compounds in massive doses.
- Assumed that humans will be similarly susceptible to these chlorinated compounds.

Estimate – Worst Case

- Based on a mathematical projection from the adverse effects in animals exposed at high dose levels to humans exposed at much lower levels (animals are exposed to high doses because there would be no effect at low doses unless the number of animals in the experiment was dramatically increased – for example to several thousand mice. This is impractical from a financial and space standpoint).
- Estimated at worst-case to ensure cancer risk is never underestimated (with cancer-causing chemicals, scientists assume a potential cancer risk exists no matter how small the dose).

Application – Average Person

- Assumed this risk applies to everyone on the average.
- Does not account for an individual's exposure to other carcinogens, heredity, diet or lifestyle.

Cancer risks for most regulated chemicals are estimated in this manner. Risks for chemicals that do not cause cancer but can affect other body functions are estimated by determining threshold levels below which no adverse health effects occur and then adding safety factors to ensure protection of human health.

1993 - A year of changes at Mound

1993 was an eventful year for the Mound CERCLA program. The Secretary of Energy announced Mound's defense mission would end in 1995, budget reductions forced renegotiation of the Fiscal Year 1994 work schedule, interim response actions (IRAs) were initiated to speed cleanup work, and the site's Public Reading Room was reorganized and moved to a new location.

Interim Response Actions

- Mound identified four IRA candidates in an effort to accelerate cleanup, protect the environment and save money. These included: the Miami-Erie Canal in Operable Unit (OU) 4, the B Building Solvent Storage Shed in OU2, and the Fire Fighting Training Area and Area 7 underground tank in OU5.

Demolition of the B Building Solvent Storage Shed

Public Participation

- Mound solicited citizen input on work priorities for Fiscal Year 1994 in light of recent budget reductions. The top five priorities identified by stakeholders in a formal opinion survey were included in the schedule negotiations and approved for Fiscal Year 1994.
- Mound established a Stakeholder Advisory Group for the Miami-Erie Canal in OU4 to help determine cleanup options. This group is made up of representatives from the DOE, the City of Miamisburg, and the regulatory agencies.
- The CERCLA Public Reading Room was relocated from the Miamisburg Public Library to the Miamisburg Senior Adult Center, 305 E. Central Ave. The room offers photocopying capabilities and on-duty staff.

Visitors to the new Public Reading Room.

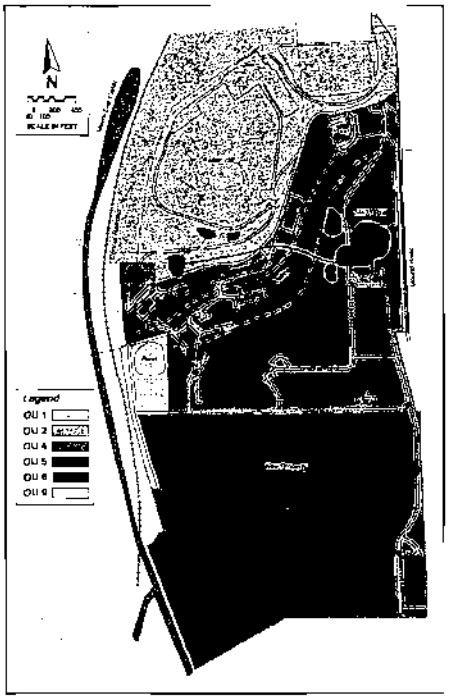
Regulatory

- A new tri-party Federal Facility Agreement for Mound was signed in July between the DOE and the U.S. and Ohio Environmental Protection Agencies.
- Mound successfully negotiated a new work schedule for Fiscal Year 1994 with the US and Ohio EPAs. The work schedule required renegotiation because of budget cuts in the Environmental Restoration Program.

Signing of the new Federal Facility Agreement.

Operable Units

- **Operable Unit 1**: Completed Remedial Investigation (investigative field work phase); initiated Feasibility Study (evaluation of potential cleanup methods).
- **Operable Unit 2**: Identified B Building Solvent Storage Shed for an interim response action; prepared to begin Remedial Investigation.
- **Operable Unit 3**: Eliminated from the program at large cost savings; sites either incorporated into other OUs or identified as requiring no further action.
- **Operable Unit 4**: Completed a Special Canal Sampling Report on the Miami-Erie Canal; established a Stakeholder Advisory Group for the Canal; identified the Canal for an interim response action.
- **Operable Unit 5**: Prepared to begin Remedial Investigation; identified Fire Fighting Training Area and Area 7 underground tank for interim response actions; decided to promote commercialization of the New Property.
- **Operable Unit 6**: Completed verification sampling in Area D, Acid Leach Bed and Drainline, and Area 19, Radioactive Waste Lines; began preparation of verification reports to verify compliance with CERCLA cleanup guidelines.
- **Operable Unit 9**: Continued Remedial Investigation field work, which included completion of hydrogeological field work, initiation of Residential Well Survey, completion of Phase I of the Ecological Survey, and completion of Phase I of the Background Soils Investigation.



Map of current operable units.

Bioremediation

Microscopic bugs that eat fuel.

That's what the Mound Plant plans to use to clean up petroleum contamination in soils at a former fire fighting training area. This method also may be used for other Mound sites.

Called bioremediation, the process involves the natural breakdown of organic (carbon-containing) materials by soil microoganisms. These bacteria or "bugs" are naturally found in most soils where they feed on organic materials such as petroleum products and convert them into environmentally benign byproducts – carbon dioxide and water. This conversion process, which normally occurs over time without the intervention of humans, can be sped up by adding oxygen and nutrients to the soil to stimulate bacterial activity.

To date, 45 Superfund projects nationwide have selected bioremediation as their preferred cleanup remedy. Bioremediation is popular because it is:

- A natural process enhanced by simple technology
- Avoids the transportation of contaminated soils to a landfill or incinerator for disposal

Bioremediation is conducted in either of two ways:

- **In-situ** – involves leaving contaminated soils in place in the ground and pumping air through them via a well system, or
- **Ex-situ** – involves digging up contaminated soils and treating them above ground in a similar manner.

Mound plans to use **ex-situ bioremediation** to clean up the Fire Fighting Training Area near Building 34 in Operable Unit 5 (South Property). The training area, which consists of two concrete pits, was used to train Mound personnel in fire fighting practices. Over time, diesel fuel and motor oil used to start the fires were released into underlying soils and through cracks in the concrete slabs. Mound officials decided to implement an interim response action to expedite the cleanup. Interim response actions are small-scale operations used to clean up isolated areas of contamination.

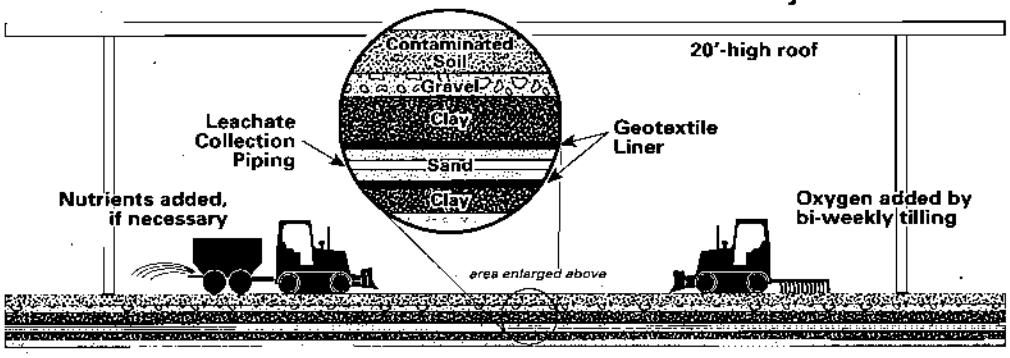
Mound currently is designing a permanent ex-situ bioremediation treatment system facility near the site and expects to begin actual cleanup work in late July. The project is described in a work plan, which should be placed in the Mound Plant CERCLA Public Reading Room in May 1994.

"We decided to make it a permanent facility so that it can be used for future response actions," said Monte Williams, manager of the Mound Environmental Restoration/CERCLA program.

"What 'permanent' means is that it will be used to treat other on-site soils after this interim response action is complete," added Alan Spesard, the Operable Unit 5 manager. "The Mound has a lot of potential bioremediation sites, for example volatile organic compound-contaminated-soils from Operable Unit 1 and soils adjacent to fuel storage tank sites, which are scheduled for removal beginning this fall."

Mound plans to dig up 250 cubic yards of contaminated soil from the Fire Fighting Training Area for treatment at the permanent facility. Located northeast of the training area, the open-walled facility will feature a 20-foot-high roof to keep out rain, snow and other precipitation. The soils will be spread out a foot thick across two treatment pads, with a total dimension of about 100 by 75 feet. The treatment pads will consist of several layers of natural construction materials, including clay, sand and gravel, to prevent contaminated liquids (leachate) from the soil piles from re-contaminating underlying soils and groundwater. A leachate collection system will be installed in the sand layer to collect any contaminated liquids and route them to a holding tank for eventual treatment at the Mound wastewater treatment plant.

Bioremediation Treatment Facility



The soils will be sampled regularly to determine how effectively the microbes are cleaning them up. Oxygen will be added through bi-weekly tilling, and nutrients such as nitrogen and phosphorus will be mixed in, if necessary, to enhance the process. The U.S. Environmental Protection Agency requires petroleum-contaminated soils to meet a regulatory cleanup level of 40 parts per million (or 40 milligrams of pollutant per kilogram of soil). Forty parts per million is roughly equivalent to 40 drops of gas in a full-size car's fuel tank. The cleanup must continue until pollutant levels are reduced to or below this level.

Once begun, the bioremediation process is expected to take about three months – mainly because the soils are not extremely contaminated and the contaminated portion is relatively small in terms of cubic yardage.

"If you didn't give them any nutrients, like oxygen or nitrogen, the microbes would still clean up the contamination, but it would take them longer – years versus months, for instance," Spesard said.

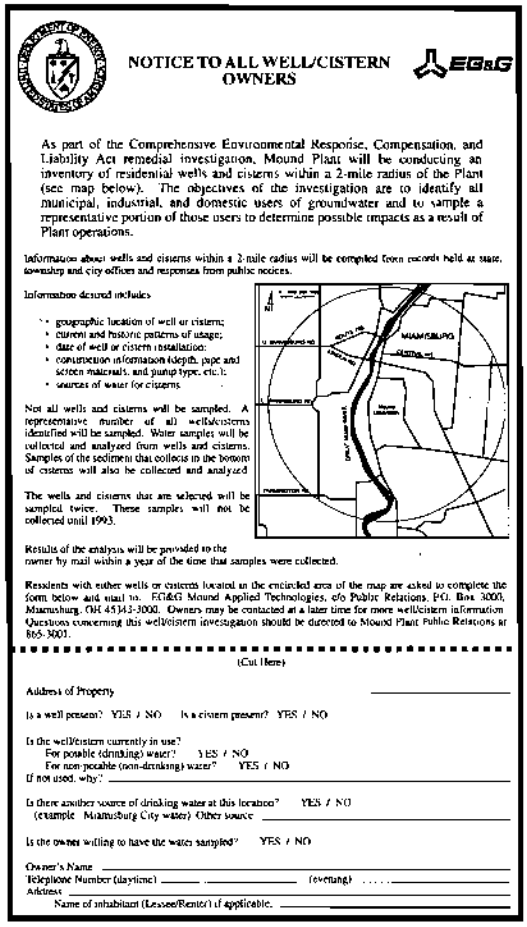
Remedial Response – Community Concerns

The first question was asked at the March 17, 1994, CERCLA Quarterly Public Meeting at the Miamisburg Senior Adult Center. The second question was asked at the ATSDR Public Health Forum on April 6, 1994, at the Carnegie Center. Both answers are from EG&G Mound Community Relations.

Q *Can area citizen groups request shelving space in the Mound Plant CERCLA Public Reading Room for display of their own informational materials?*

A Under CERCLA and USEPA guidance, federal facilities must provide a publicly accessible repository of information for reports, documents and other information pertaining to a Superfund cleanup. Mound recently opened a newly reorganized public reading room at the Miamisburg Senior Adult Center, 305 E. Central Ave., Miamisburg. DOE will consider any citizen request to include information believed to be pertinent to the Superfund process. Mound has already granted a request by Miamisburg Environmental Safety and Health (MESH) to display ATSDR toxicology reports on chemicals used at Mound, as well as comments on the NAREL Work Plan for the ATSDR Public Health Assessment from MESH's Technical Assistance Grant (TAG) consultants.

If you have a document you believe should be included in the public reading room, please submit your request in writing to Greg Sahad, Department of Energy, P.O. Box 66, Miamisburg, Ohio 45343.



NOTICE TO ALL WELL/CISTERN OWNERS

EG&G

As part of the Comprehensive Environmental Response, Compensation, and Liability Act remedial investigation, Mound Plant will be conducting an inventory of residential wells and cisterns within a 2-mile radius of the Plant (see map below). The objectives of the investigation are to identify all municipal, industrial, and domestic users of groundwater and to sample a representative portion of those users to determine possible impacts as a result of Plant operations.

Information about wells and cisterns within a 2-mile radius will be compiled from records held at state, township and city offices and responses from public notices.

Information desired includes

- geographic location of well or cistern;
- current and historic patterns of usage;
- date of well or cistern installation;
- construction information (depth, pipe and screen materials, and pump type, etc.);
- sources of water for cisterns.

Not all wells and cisterns will be sampled. A representative number of all wells/cisterns identified will be sampled. Water samples will be collected and analyzed from wells and cisterns. Samples of the sediment that collects in the bottom of cisterns will also be collected and analyzed.

The wells and cisterns that are selected will be sampled twice. These samples will not be collected until 1993.

Results of the analysis will be provided to the owner by mail within a year of the time that samples were collected.

Residents with either wells or cisterns located in the enclosed area of the map are asked to complete the form below and mail to: EG&G Mound Applied Technologies, c/o Public Relations, P.O. Box 3000, Miamisburg, OH 45343-3000. Owners may be contacted at a later time for more well/cistern information. Questions concerning this well/cistern investigation should be directed to Mound Plant Public Relations at 865-3001.

(Cut Here)

Address of Property _____

Is a well present? YES / NO Is a cistern present? YES / NO

Is the well/cistern currently in use?
For potable (drinking) water? YES / NO
For non-potable (non-drinking) water? YES / NO
If not used, why? _____

Is there another source of drinking water at this location? YES / NO
(example Miamisburg City water) Other source _____

Is the owner willing to have the water sampled? YES / NO

Owner's Name _____
Telephone Number (daytime) _____ (evening) _____
Address _____
Name of inhabitant (Lessee/Renter) if applicable. _____

August 1992 newspaper ad.

Q *How did Mound select the 32 residential and municipal water wells and cisterns sampled this past February as part of the Residential Well Investigation?*

A In August 1992, Mound placed advertisements in the *Dayton Daily News* (Aug. 16) and *Miamisburg News* (Aug. 20) asking municipal, industrial and domestic users of groundwater within a two-mile radius of Mound to contact the plant if they wanted to participate in a well sampling program. Twenty-three well users and nine cistern users responded to the ad out of about 230 known users within the two-mile radius. Sampling was conducted in February 1994 and will be conducted again in August of this year. Results will be made available to the public in later 1994 or early 1995.

Since February, a number of area residents that weren't part of the original sampling program have requested testing of their wells or cisterns.

If you are a well or cistern user in the Mound Plant vicinity (even if you live beyond the two-mile radius) and would like your well or cistern tested, please contact Mound Community Relations at 865-4140.

Public Comment Periods

How can stakeholders participate in the Mound Plant cleanup? One of the most important ways is to comment on proposed cleanup remedies during public comment periods.

Selection of an appropriate and cost-effective cleanup remedy is the most important and frequently the most difficult step in the CERCLA program. Months and often years of investigatory field and laboratory work to determine the nature and extent of contamination at a site culminate in this decision. Experts weigh many factors, including remedy effectiveness, protection of human health and the environment, and cost, in determining the best methods for site cleanup.

But the remedy selection process does not take place in a vacuum. Community acceptance of the remedy is another criteria that must be evaluated during the remedy selection process. Public opinion can and does influence the decision-making process. Under CERCLA, the public has the opportunity:

- to review all documents concerning the site cleanup
- to comment on all proposed remedy selections during a formal public comment period.

Final selection of a cleanup remedy is not made until after the public comment period has concluded. Significant comments or new information submitted by the public can result in a new or modified remedy. The public also is encouraged to submit positive comments on remedies they

(Please see Comment, Page 8)

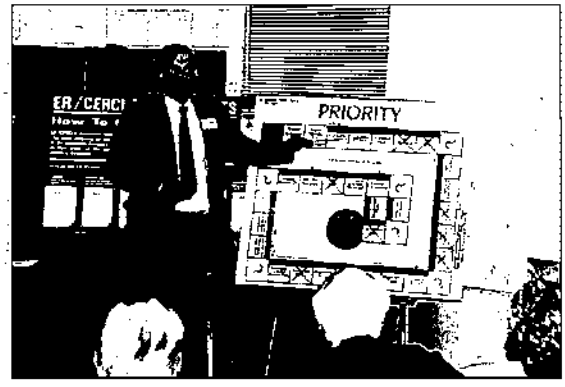
Recap – March Workshop

Eighteen community members attended the March 17, 1994, CERCLA Quarterly Public Meeting at the Miamisburg Senior Adult Center to discuss the new Mound Plant CERCLA Public Reading Room and the Mound's Fiscal Year '94 work schedule. The meeting also featured presentations on the Ohio EPA's new Office of Federal Facility Oversight and an overview of the U.S. Department of Energy's (DOE) budget formulation process.

A scheduled presentation on soil sampling results from the December 2, 1993, public meeting was postponed. Those results will be presented at the June 1994 public meeting.

Graham Mitchell, chief of the Ohio EPA's new Office of Federal Facility Oversight, began the meeting with a discussion about this new OEPA office. Located in Dayton, the office is responsible for overseeing environmental cleanup activities at Mound, the Fernald Environmental Management Project in Ross, and the Portsmouth Gaseous Diffusion Plant in Piketon, as well as several Department of Defense installations. The Mound group is headed by Brian Nickel, who was introduced at the meeting by Mitchell.

Tammy Lentz, Reading Room Supervisor, and two of her volunteers, George and Marcia Dunahue.



Art Kleinrath discusses results of the FY '94 work schedule negotiations.

Art Kleinrath, the DOE's on-scene coordinator for the Mound CERCLA program, followed with a presentation on FY '94 work schedule negotiations. He explained that the top five priorities identified by stakeholders in a December 1993 stakeholder opinion survey were approved as part of the work schedule (**see photo, lower left**).

Ralph Lightner, director of the Office of Southwestern Area Programs for the DOE Office of Environmental Restoration, followed with a general discussion on the DOE budget process. He also discussed the DOE's new environmental philosophy, as set forth in a mission and goals statement by Assistant Secretary of Energy Tom Grumbley (**see chart below**).

Wrapping up the evening, Monte Williams, manager of the Mound Environmental Restoration/CERCLA program for EG&G, introduced the Mound's new public reading room and described how to use it. Located in the Miamisburg Senior Adult Center, 305 E. Central Ave., the room is staffed 35 hours a week by Reading Room Supervisor Tammy Lentz and a group of volunteers (**see photo above**).

Department of Energy Mission Statement for Environmental Management:

1. *MANAGE AND ELIMINATE THE URGENT RISKS AND THREATS IN OUR SYSTEM*
2. *PROVIDE A SAFE WORKPLACE THAT IS FREE FROM FATALITIES AND SERIOUS ACCIDENTS, AND CONTINUOUSLY REDUCES INJURY AND HARMFUL EFFECTS*
3. *CHANGE THE SYSTEM SO THAT IT IS UNDER CONTROL MANAGERIALLY AND FINANCIALLY*
4. *BE OUTCOME ORIENTED*
5. *FOCUS THE TECHNOLOGY DEVELOPMENT PROGRAM ON DOE'S MAJOR ENVIRONMENTAL MANAGEMENT ISSUES WHILE INVOLVING THE BEST TALENT IN DOE AND THE NATIONAL (PUBLIC AND PRIVATE) SCIENCE AND ENGINEERING COMMUNITIES*
6. *DEVELOP STRONG PARTNERSHIPS BETWEEN THE DOE AND ITS STAKEHOLDERS*

Comment

continued from Page 6

support. However, the public must make their written or verbal comments within the stated comment period dates to ensure consideration of their information or concerns.

Public Comment Periods at Mound:

Fire Fighting Training Area (Operable Unit 5) Action Memorandum – Public comment period ran February 21, 1994 through March 21, 1994. No comments were received from the public on the proposed remedy – bioremediation.

B Building Solvent Storage Shed (Operable Unit 2) Action Memorandum – Public comment period ran March 21, 1994 through April 25, 1994. Proposed remedy is soil vapor extraction.

Miami-Erie Canal (Operable Unit 4) Engineering Evaluation/Cost Analysis – Public comment period tentatively scheduled for early summer 1994 on the proposed remedy – excavation and off-site disposal of radionuclide-contaminated soils.

Area 7, Underground Tank (Operable Unit 5) Action Memorandum – Public comment period tentatively scheduled for fall 1994.

Operable Unit 1 Feasibility Study – Public comment period tentatively scheduled for spring 1995.

Comments can be submitted by writing or calling Mound Community Relations, P.O. Box 3000, Miamisburg, Ohio 45343, (513) 865-4140.

Printed on Recycled Paper

Important phone numbers

EG&G Mound Applied Technologies
Environmental Restoration/
CERCLA Community Relations
Jolene Walker: 513-865-4140
U.S. Environmental Protection Agency
(Region V Headquarters, Chicago)
Diane Spencer: 312-886-5867
(Superfund Community Relations)
Cheryl Allen: 312-353-6196
Ohio Environmental Protection Agency
(Dayton office)
Jeff Smith: 513-285-6035
Ohio Department of Health
(Columbus): 1-800-523-4439
(Radiological Section)
Larissa Gilham: 614-644-2727

CERCLA mailing list

Mound maintains a mailing list for people interested in the Mound CERCLA program. People on the list receive twice-quarterly issues of *Superfund Update*, notification of CERCLA-related meetings, Site Specific/Five Year Plan meetings and other DOE-related public affairs activities. If you wish to have your name added to this list, sign up at any of Mound's public meetings or send your mailing address to:

EG&G Mound Applied Technologies
c/o CERCLA Community Relations
P.O. Box 3000
Miamisburg, OH 45343-3000

MOUND
Environmental Restoration Program

EG&G Mound Applied Technologies
CERCLA Community Relations/Environmental Restoration
P.O. Box 3000
Miamisburg, OH 45343-3000

MOUND
Environmental Restoration Program

SUPERFUND Update

EG&G

March 1994

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Budget Priorities Update

A new work schedule for Fiscal Year 1994 was negotiated in February between the Mound Plant and the U.S. and Ohio Environmental Protection Agencies.

The schedule reflects the impact of budget reductions that reduced expected funding for Mound Environmental Restoration activities. The budget cuts forced Mound to re-examine where and how to spend available funds.

The top five priorities selected by Mound stakeholders in a December 1993 opinion survey were included in the negotiations and have been approved and scheduled for Fiscal Year 1994. The survey allowed the public to indicate their preference on which Mound projects they believed were a priority and should be funded during the current fiscal year. Surveys were mailed to all local area stakeholders; about 23% were returned.

The work schedule as approved by the USEPA and OEPA for Fiscal Year 1994 is as follows (the top five stakeholder priorities from the opinion survey are indicated by an asterisk*):

■ OU1, Area B

- Complete Remedial Investigation Report*
- Complete Feasibility Study/Proposed Plan (will complete in FY95)

CERCLA Quarterly Public Meeting

Thursday, March 17, 1994
7:00 pm
Miamisburg Senior Adult Center
305 E. Central Ave.
Miamisburg, Ohio

You are invited to...

an Open House

at the Mound Plant CERCLA Public Reading Room

In January, the Mound Plant CERCLA Public Reading Room moved from the Miamisburg Public Library to the Miamisburg Senior Adult Center. This CERCLA Quarterly Public Meeting will be held at the new home of the Public Reading Room. Meeting topics will include the use and importance of the Public Reading Room, the results of the Miamisburg Public Library soil sampling demonstration and the results of the Mound work schedule negotiations for Fiscal Year '94.

■ OU2, Main Hill

- Conduct Interim Response Action at B Building Solvent Storage Shed
- Complete Remedial Investigation RI/FS Workplan
- Continue Remedial Investigation Fieldwork

■ OU4, Miami-Erie Canal

- Complete Engineering Evaluation/Cost Analysis for the Miami-Erie Canal Interim Response Action*

■ OU5, South Property

- Begin Fire Fighting Training Area Interim Response Action Process
- Begin Area 7 Underground Tank Interim Response Action Process
- Begin New Property Fieldwork
- Begin Phase I OU5 Fieldwork

■ OU6, D&D Sites

- Complete Area D Verification
- Complete Rad Waste Lines Verification*

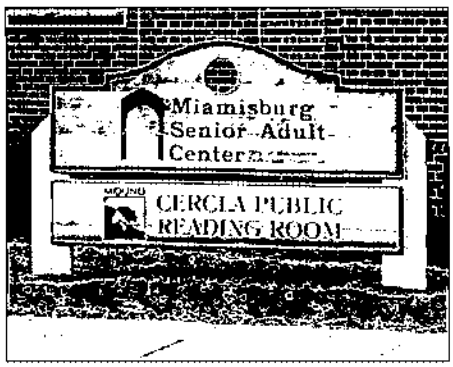
■ OU9, Off-Site/Site-Wide

- Complete Site Scoping Reports
- Complete Residential Well Sampling* (Phase I in FY94, Phase II in FY 95)
- Continue Groundwater Sweeps*
- Complete Ecological Assessment
- Continue Regional Soils Investigation
- Complete Hydrogeological Investigation
- Complete Background Soils Investigation

Administrative Record and Information Repository *What are they and how do they relate to stakeholders?*

The words **Administrative Record** and **Information Repository** are often heard in reference to the Mound Plant environmental cleanup, but what exactly do they mean and how do they relate to Mound stakeholders?

When the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) was first created by Congress in 1980, it included provisions to involve the public in the environmental cleanup process. The public was defined as any person concerned about a potential hazardous waste site in or near their community. The cleanup process was defined as the identification, evaluation, and remediation, if necessary, of hazardous wastes.



New sign for the CERCLA Public Reading Room

CERCLA's creators felt strongly that people have an inherent right to know when contamination is present in their community, what kind of contamination is there, and how it will be cleaned up. The public also has the right to participate in the cleanup process by openly expressing its concerns, opinions and ideas about how best to solve the problem.

With this philosophy in mind, CERCLA and its implementing regulations required the establishment of an Administrative Record and Information Repository at every Superfund site. Though different in content, both repositories contain the most current publicly available information on the site cleanup and decision-making process.

Most Superfund sites establish Information Repositories, which contain the Administrative Record, while others maintain two separate repositories in different locations. At the Mound Plant, the Administrative Record and Information Repository are located together in the Mound Plant CERCLA Public Reading Room. The U.S. Department of Energy (DOE) establishes Public Reading Rooms because they include additional information on DOE activities beyond the site-specific cleanup that are of interest.

Documents in the Public Reading Room are compiled by a number of sources: the On-Scene Coordinator/Remedial Project Manager, contractors, regulators and Community Relations staff. The Remedial Project Manager for each site is responsible for deciding which documents go into the Administrative Record. Once a document is placed in the Administrative Record, only the USEPA can remove it.

Administrative Record and Information Repository documents must be located in a publicly accessible location near the site and be available for public inspection and photocopying during reasonable weekday hours. An updated list of current documents in the repositories must be kept on file and updated frequently.

When major documents are added to the Administrative Record, the public is notified by advertisement in a major local newspaper of general circulation. Major documents include the Engineering Evaluation and Cost Analysis or Action Memorandum for interim response actions, and the Remedial Investigation/Feasibility Study and Proposed Plan for remedial actions. Public notification is made so the public can comment on these documents during a formal public

Mound Plant CERCLA Public Reading Room move

The sign is up, the documents are in place, and the door is open.

The Mound Plant CERCLA Public Reading Room — a coordinated effort between the Mound Plant and the City of Miamisburg — officially opened to the public January 10.

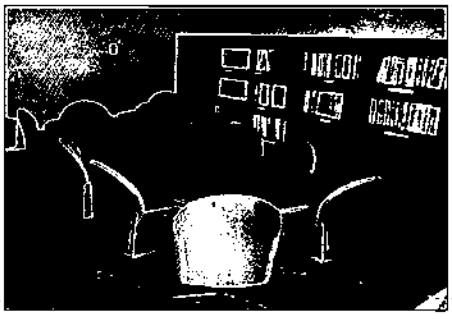
"The Mound Plant needed a new system for making information available to the public since the Miamisburg Public Library had become overrun with Mound and CERCLA documents," said Art Kleinrath, the U.S. Department of Energy's On-Scene Coordinator/Remedial Site Manager for the Mound Superfund cleanup. "Thanks to the cooperation of the City of Miamisburg, the new CERCLA Public Reading Room should make reviewing these documents much easier."

Miamisburg Mayor Dick Church (left) and Larry Kirkman, the DOE's Dayton Area Office Area Manager, cut the ribbon at the grand opening ceremony in January.

Located in its own room on the main floor of the Miamisburg Senior Adult

(Please see Move, Page 5)

Why should I visit the Mound Plant CERCLA Public Reading Room?



New Public Reading Room

The Mound Plant CERCLA Public Reading Room was established for you as a concerned community member and Mound Plant stakeholder. Its role is to provide a central location where you can learn about the Mound Plant environmental restoration and get involved in the decision-making process. The Public Reading Room contains information essential to reaching an informed opinion on the Mound Plant cleanup, and especially on remedy selections. During a Superfund cleanup, the public may comment, criticize or offer new information on the proposed cleanup remedy. The documents that "form the basis" for this selection, as well as other background and reference materials, are made available to the public in the Public Reading Room as soon as they are generated or received by the Mound Plant.

The following information can be found in the CERCLA Public Reading Room:

- CERCLA Notebook (contains information on Mound Plant history, Mound Plant Operable Units, the CERCLA program, the U.S. Agency for Toxic Substances and Disease Registry (ATSDR), a glossary and acronyms list, all *Superfund Update* newsletters to date and all Mound Plant Fact Sheets and Progress Reports to date)
- All area newspaper articles on the Mound Plant since January 1991
- Community Relations Plan for the Mound Plant
- Federal Facility Agreement between the Mound Plant, USEPA and Ohio EPA
- All site documents generated to date, organized by Operable Unit (i.e. Operable Unit 9 Remedial Investigation Workplan)
- Special Reports (i.e. Special Canal Sampling Report, Miami-Erie Canal)
- Site Scoping Reports (i.e. Site Scoping Report, Volume 3, Radiological Site Survey)
- ATSDR documents (i.e. Health Consultation on the Miami-Erie Canal) and guidance manuals
- Technical memoranda, reference books and related materials
- Non-CERCLA documents on Mound operations (i.e. Mound Plant Environmental Restoration and Waste Management Five-Year Plan)
- Non-Mound DOE documents (i.e. Public Comment, DOE Weapons Complex Reconfiguration Programmatic Environmental Impact Statement)

comment period, usually lasting 30 days or longer. The lead agency must respond to any significant public comments, opinions or new information, and the public comments and lead agency responses must be published in the Administrative Record. Public comments *can* and *do* influence the remedy selection.

Major additions to the Mound Plant CERCLA Public Reading Room are announced in the *Dayton Daily News* and *Miamisburg News*. The Mound's twice-quarterly environmental restoration newsletter — *Superfund Update* — announces the release of all new documents to the Public Reading Room.

Administrative Record

The Administrative Record is a compilation of major reports, documents, agreements, transcripts, records, comments submitted by the public, and lead agency responses to public comments that either relate to selection of a final cleanup remedy or document the decision-making process itself. The record is compiled during the cleanup process for two main purposes:

- to keep the public informed and involved in the site restoration
- to serve as the official legal and historical record of why and how decisions were made — from investigation of a site to selection of a final remedy.

All Superfund sites maintain two identical Administrative Records: one copy is for the public and the other is kept on site for legal purposes. At federal facilities (i.e. Mound), a third copy usually is provided to the regulators.

Information Repository

The Information Repository is where general CERCLA information, secondary sources or background materials are compiled. These documents — technical memoranda, reference materials, newspaper articles, U.S. Environmental Protection Agency Technical Assistance Grant application information, etc. — are relevant to the site cleanup, but are not specifically used to help select a cleanup method. These documents often lead up to and are incorporated into documents in the Administrative Record. When Information Repository and Administrative Record documents are located together, they often are placed on different shelves or are distinguished from each other in some manner. Mound Plant Administrative Record documents feature a blue dot on their spine.

How to use the Mound Plant CERCLA Public Reading Room

Visitors to the Mound Plant CERCLA Public Reading Room may feel a bit overwhelmed at first surrounded by bookshelves full of thick documents with long names and often complex text. They may not know exactly what they're looking for when they arrive or how to find the answer to a question without reading an entire document from cover to cover.

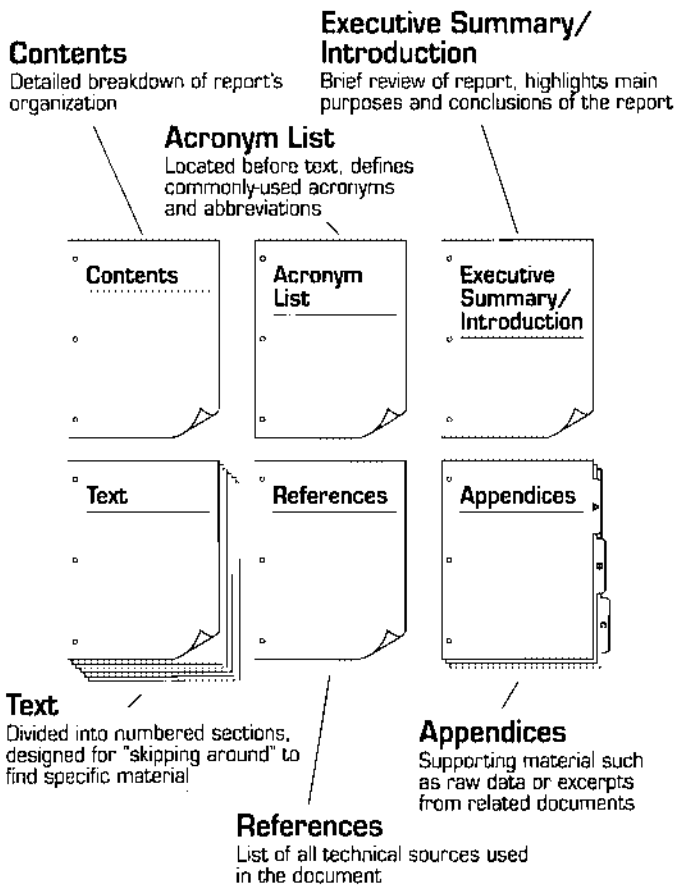
To help avoid frustrating searches, here's a guide for deciphering what's what in the Public Reading Room. Also, don't forget to consult the on-duty staff member if you have questions.

Documents in the Public Reading Room are separated into six different sections. The Administrative Record and CERCLA sections are organized mainly by Operable Unit number, while the other four sections are organized by subject matter. The sections include:

- Administrative Record documents (also identified by a blue dot on their spine)
- CERCLA documents
- ATSDR documents
- Non-CERCLA documents
- ER/WM Five Year Planning documents
- Nonnuclear Consolidation/Reconfiguration Study documents

The documents can be removed from the shelves for reading and photocopying during open hours, but they cannot be checked out overnight.

This is the basic structure of CERCLA documents:



Administrative Record Documents

The Administrative Record section is comprised mainly of CERCLA documents, which are published in blue three-ring binders or spiral notebooks with a DOE seal on their cover and spine. The Administrative Record file also contains the Federal Facility Agreement between the Mound Plant and the U.S. and Ohio Environmental Protection Agencies, Mound Plant press clippings, and a CERCLA Notebook.

CERCLA documents follow the same basic structure (see graphic) for quick access to specific information. They contain information derived from previous studies, Operable Unit fieldwork, laboratory data, and community interviews. Each document undergoes a rigid review cycle before being released to the public. Final documents are often revised during the course of a cleanup to reflect significant program changes. After regulatory approval, these documents are re-published and labeled Revision 1, 2, 3, etc.). Unrevised final documents are labeled Revision 0.

CERCLA Documents and ATSDR Documents

Documents in these two sections are part of the Mound Plant Information Repository. They include CERCLA documents such as special reports and site scoping reports, the ATSDR Health Consultation on the Miami-Erie Canal, technical reports, reference books and general background materials. While most of the documents follow no set structure, the CERCLA documents follow the same structure as indicated in the graphic.

Non-CERCLA Documents, ER/WM Five Year Planning Documents, and Nonnuclear Consolidation/Reconfiguration Study Documents

Documents in these three sections are not specifically related to the Mound Plant cleanup. They are included in the room by DOE request to keep the public informed about specific Mound and DOE activities. The documents include a 22-volume set on the DOE's reconfiguration of its nuclear weapons complex, Mound Environmental Restoration and Waste Management planning documents and environmental monitoring reports.

How to find a document – Example

Q *Where can I find out information on sampling activities in South Property, Operable Unit 5?*

A Since only the Administrative Record and CERCLA document sections contain information on Mound Plant Operable Units, scan them to locate the Operable Unit 5 section.

Once you've found the Operable Unit 5 documents, which are in the Administrative Record section, focus in on the document titles that could potentially address this question. If given a choice between the OU5 Work Plan, Health and Safety Plan and the Sampling and Analysis Plan, you would probably select the Sampling and Analysis Plan. Check the table of contents and executive summary to make sure it's the right document, then turn to the appropriate text section for review.

New Documents in the CERCLA Public Reading Room

As the Mound Plant cleanup progresses, new documents are generated and added to the CERCLA Public Reading Room. The most recent additions since January 1994 are:

- Operable Unit 5 South Property Remedial Investigation/Feasibility Study Work Plan
- Operable Unit 5 South Property Remedial Investigation/Feasibility Study Sampling and Analysis Plan, Quality Assurance Plan, Field Sampling Plan
- Operable Unit 5 South Property Remedial Investigation/Feasibility Study Health and Safety Plan
- Operable Unit 5 Action Memorandum/ Removal Site Evaluation Fire Fighting Training Area Site
- Operable Unit 2 B Building Solvent Shed Removal Action Memorandum

OU5 Work Plan

The purpose of the OU5 Work Plan is to outline Remedial Investigation fieldwork necessary to determine the nature and extent of potential contamination within OU5, to assess potential risks to human health and the environment, and to evaluate potential site remedies.

OU5 Sampling and Analysis Plan

The OU5 Sampling and Analysis Plan is a companion document to the Work Plan. It is part of the OU5 Quality Assurance Project Plan and contains the Field Sampling Plan. This plan describes quality assurance and quality control procedures that will be followed during sampling. It also dictates all field sampling locations and methods, sample handling and shipment methods, required laboratory analysis methods and detection limits, and data validation efforts necessary to meet Remedial Investigation objectives.

OU5 Health and Safety Plan

The OU5 Health and Safety Plan is a companion document to the Work Plan. It describes procedures for protecting on-site workers and the public from hazardous substances. It also details such topics as worker training, personal protection equipment, spill containment, and decontamination procedures. The plan complies with Occupational Safety and Health Administration (OSHA) requirements and must be read by all field personnel. A copy of the plan must be kept on-site at or near the work site.

OU5 Fire Fighting Training Area Site Action Memorandum/ Removal Site Evaluation

The Fire Fighting Training Area Site Action Memorandum/Removal Site Evaluation evaluates potential remedies for cleaning up the Fire Fighting Training Area. The purpose of the Action Memorandum is to select the remedy that is the most cost-effective, the most effective cleanup method and the most protective of human health and the environment. A Removal Site Evaluation was conducted as part of this Action Memorandum. The evaluation identified contamination in the form of petroleum hydrocarbons in the soils. The Action Memorandum is open to public comment from February 21 – March 23, 1994. Comments should be directed to Jolene Walker, EG&G Community Relations, P. O. Box 3000, OSE-245, Miamisburg, Ohio 45343-3000; (513) 865-4140.

OU2 B Building Solvent Storage Shed Removal Action Memorandum

The B Building Removal Action Memorandum evaluates potential remedies for cleaning up the B Building Solvent Storage Shed area. The purpose of the Action Memorandum is to select the remedy that is the most cost-effective, most effective at cleaning up the area and most protective of human health and the environment.

Move

continued from Page 2

Center, 305 E. Central Avenue, the Public Reading Room is staffed 35 hours a week by a city employee and volunteer staff who will answer questions, help locate documents, and assist in making photocopies.

Tammy Lentz, Miamisburg's Volunteer/Recreation Coordinator and CERCLA Room Supervisor, will staff the room 21 hours a week, and about 10 volunteers will cover the remaining hours. Ms. Lentz was hired by the city in August as a Recreation Coordinator for the Parks and Recreation Department (she works 19 hours a week there). A Miamisburg resident, she previously worked on the city's 175th Anniversary celebration.

The Public Reading Room was relocated from the Miamisburg Public Library in early January due to space limitations. The room features a conference-size reading table with 14 chairs, six bookcases, a copier machine for document photocopying and a staff desk.

It contains the Mound's Administrative Record and Information Repository, as well as U.S. Department of Energy and non-CERCLA Mound documents. The documents are compiled and indexed by an EG&G Mound Administrative Record Coordinator.

The Mound Plant CERCLA Public Reading Room hours are as follows:

Monday	12 pm – 8 pm
Tuesday	8:30 am – 1 pm; 4 pm – 8 pm
Wednesday	12 pm – 8 pm
Thursday	8:30 am – 1 pm
Friday	10:30 am – 4:30 pm

Closed Saturdays and Sundays

Residential Well Sampling at the Mound

About 32 residential and municipal water wells and cisterns were sampled in February as part of the ongoing Mound Plant Remedial Investigation.

The objective was to identify all municipal, industrial and domestic users of groundwater within a two-mile radius of Mound Plant and to sample a representative portion of those users to determine possible impacts from past Mound operations. A total of 216 wells and 14 cisterns were identified; twenty-three wells and 9 cisterns were sampled. Sediment samples also were taken from three of the cisterns.

A Mound contractor takes field measurements on the pH, conductivity, temperature, etc. of water sampled during the Residential Well Investigation

Mound contractors prepare to take water samples from a municipal well used to fill the Miamisburg Community Park swimming pool each summer. Most samples were taken from water spigots on the exterior of homes.

The sampled wells receive water directly from the Buried Valley Aquifer underlying the Miamisburg area. An aquifer is a layer of rock or soil below the ground surface that can supply usable quantities of water to wells and springs. The Buried Valley Aquifer supplies water to both private wells and municipal drinking water systems throughout the Miami Valley. While the well water is raw, the city water undergoes treatment prior to being pumped into homes and businesses.

The investigation, which was required by the Mound Plant Federal Facility Agreement between the DOE and the U.S. and Ohio Environmental Protection Agencies, began January 31 and ended February 23. Samples are currently being analyzed by the Weston Analytical Laboratory in Lionville, Pennsylvania, and the International Technology Corporation Laboratory in Oak Ridge, Tennessee.

Individual data packages for residents whose wells or cisterns were sampled will be available this summer. A second round of sampling of the same wells and cisterns will begin in August. All residents who participated in the survey signed an access agreement with the Mound Plant.

The overall results of the two Residential Well Investigations will be made available to the public in late 1994 or early 1995 in the Mound Plant CERCLA Public Reading Room, located in the Miamisburg Senior Adult Center, 305 E. Central Avenue, Miamisburg.

Remedial Response – Community Concerns

The following question was received by EG&G Mound CERCLA Community Relations via telephone in late February. The answer is from EG&G Mound CERCLA Community Relations.

Q *Why are there signs near the train trestles in the Miami-Erie Canal along Old 25 indicating that the area is hazardous and that residents should avoid the area?*

A Conrail workers recently placed signs on railroad property along the Miami-Erie Canal by Route 25 that warn Conrail employees to notify their employer before digging in the area. Conrail officials have informed Mound that the signs were posted for Conrail employees only. The signs do not warn residents away from the area.

The signs are similar to the ones erected by EG&G Mound in 1991. Those signs ask that any individuals or utilities intending to dig in the Miami-Erie Canal or Community Park contact the Ohio Utility Protection Service at a special 1-800 number. The utility service notifies Mound of any inquiries, which are followed up on only if they are in the specified area. The U.S. Department of Energy and City of Miamisburg also have a memorandum of understanding that requires the city to contact Mound concerning any digging operations planned in the park or canal area.

Conrail sign near Miami-Erie Canal

Fire Fighting Training Area Action Memorandum Out For Public Comment

The Action Memorandum for the Fire Fighting Training Area Site at the Mound Plant has been released for public comment (see Notice below). This document describes the physical location and characteristics of the site and the nature and extent of contamination — primarily petroleum products. It also evaluates cleanup alternatives and selects a proposed method — ex-situ biological remediation.

Located near Building 34 in Operable Unit 5 (South Property), the Fire Fighting Training Area consists of two concrete pits formerly used to train Mound personnel in fire fighting practices. Over time, diesel fuel and motor oil used to start the fires were released into underlying soils and groundwater through cracks in the concrete slab floors. While no immediate threat to human health or the environment exists, Mound officials decided to implement an interim response action to expedite the cleanup.

Fire Fighting Training Area (Bldg 34 in background, pit in foreground.)

The proposed cleanup technology – ex-situ biological remediation – involves three main steps:

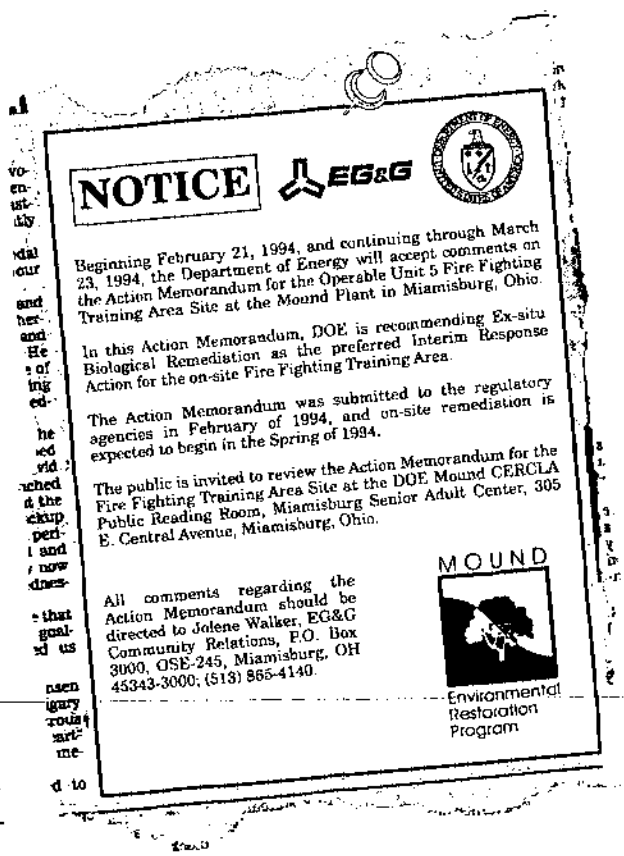
- Install a groundwater extraction well with an oil-water separator to pump out petroleum floating on the water table
- Remove the concrete pits and dig up the contaminated soils
- Place the contaminated soils in two piles and introduce microorganisms that will "eat" the petroleum, converting it over time into carbon dioxide and water; enhance this natural process with nutrients and oxygen if necessary.

The cleanup should begin this spring and be completed by November 1994.

What is a Public Comment Period?

The release of the Fire Fighting Training Area Site Action Memorandum for public comment is a significant event in the Mound Plant CERCLA Program. This is the first public comment period to be held on a CERCLA Program document. A public comment period is an important step in the cleanup process and is one of the ways in which you, the stakeholders, can have input to Mound Plant Environmental Restoration activities.

A public comment period is a designated time when comments from citizens are formally accepted by the lead agency responsible for a site cleanup. CERCLA requires public comment periods at certain points in the cleanup process, specifically after selection of a proposed cleanup remedy during a remedial or interim response action. The proposed remedy normally is documented in an Engineering Evaluation/Cost Analysis or Action Memorandum for interim response actions and in a Feasibility Study/Proposed Plan for remedial actions. Typically, the comment period lasts for a minimum of 30 days. During this time, the public can review the document in the site's Administrative Record file and submit either oral or written comments on the cleanup proposal to the lead agency. CERCLA also requires that a Responsiveness Summary be prepared by the lead agency that responds to the comments received and discusses how the comments were considered during the decision-making process. Both the comments and the Responsiveness Summary must be published in the site's Administrative Record.



NOTICE

EG&G

Beginning February 21, 1994, and continuing through March 23, 1994, the Department of Energy will accept comments on the Action Memorandum for the Operable Unit 5 Fire Fighting Training Area Site at the Mound Plant in Miamisburg, Ohio.

In this Action Memorandum, DOE is recommending Ex-situ Biological Remediation as the preferred Interim Response Action for the on-site Fire Fighting Training Area.

The Action Memorandum was submitted to the regulatory agencies in February of 1994, and on-site remediation is expected to begin in the Spring of 1994.

The public is invited to review the Action Memorandum for the Fire Fighting Training Area Site at the DOE Mound CERCLA Public Reading Room, Miamisburg Senior Adult Center, 305 E. Central Avenue, Miamisburg, Ohio.

All comments regarding the Action Memorandum should be directed to Jolene Walker, EG&G Community Relations, P.O. Box 3000, OSE-245, Miamisburg, OH 45343-3000; (513) 865-4140.

MOUND

Environmental Restoration Program

ATSDR news

The U.S. Agency for Toxic Substances and Disease Registry (ATSDR) is planning a public health forum to address community concerns as part of its ongoing Mound Plant Public Health Assessment.

Scheduled for **7 pm, April 6**, at the Carnegie Center, 426 E. Central Ave., Miamisburg, the forum will focus on door-to-door health surveys and other topics raised during the ATSDR public availability sessions in Miamisburg last November.

ATSDR currently is entering the second phase of its Mound Plant environmental sampling program, which is being conducted with the assistance of the U.S. Environmental Protection Agency's National Air and Radiation Environmental Laboratory (NAREL).

In December, ATSDR and NAREL surveyed property on and around Mound to identify sampling locations. This spring, ATSDR will collect surface soil, surface water and groundwater samples, and set up continuous air monitoring stations. Filters from the air monitors will be collected weekly and analyzed for six months. ATSDR currently is reviewing air data published in Mound Environmental Monitoring reports.

ATSDR, a branch of the Public Health Service within the U.S. Department of Health and Human Services, was created by Congress under CERCLA. Based in Atlanta, Georgia, ATSDR's major responsibilities include Public Health Assessments at National Priority List sites, toxicological research and a disease registry for persons exposed to toxic substances.

(The information in this article was supplied by ATSDR.)

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Important phone numbers

EG&G Mound Applied Technologies
Environmental Restoration/
CERCLA Community Relations
Jolene Walker: 513-865-4140
U.S. Environmental Protection Agency
(Region V Headquarters, Chicago)
Diane Spencer: 312-886-5867
(Superfund Community Relations)
Cheryl Allen: 312-353-6196
Ohio Environmental Protection Agency
(Dayton office)
Jeff Smith: 513-285-6035
Ohio Department of Health
(Columbus): 1-800-523-4439
(Radiological Section)
Larissa Gilham: 614-644-2727

CERCLA mailing list

Mound maintains a mailing list for people interested in the Mound CERCLA program. People on the list receive twice-quarterly issues of *Superfund Update*, notification of CERCLA-related meetings, Site Specific/Five Year Plan meetings and other DOE-related public affairs activities. If you wish to have your name added to this list, sign up at any of Mound's public meetings or send your mailing address to:

EG&G Mound Applied Technologies
c/o CERCLA Community Relations
P.O. Box 3000
Miamisburg, OH 45343-3000

MOUND
Environmental Restoration Program

EG&G Mound Applied Technologies
CERCLA Community Relations/Environmental Restoration
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MOUND
Environmental Restoration Program

SUPERFUND Update

EG&G

January/February 1994

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Reading Room Relocates

The Mound Plant CERCLA Public Reading Room has officially moved to the Miamisburg Senior Adult Center, 305 E. Central Avenue, Miamisburg. Previously housed in the Miamisburg Public Library, it relocated in early January due to space limitations.

The Reading Room contains the Mound's Administrative Record and Information Repository, which are required by CERCLA at all Superfund sites. The Administrative Record contains documents (identified by a blue dot) used in selection of cleanup remedies and serves as the official legal record of the Superfund cleanup. The Information Repository contains general CERCLA cleanup information. The Reading Room also contains U.S. Department of Energy documents relating to the Nonnuclear Reconfiguration and non-CERCLA Mound documents relating to Mound operations.

The Reading Room is staffed full-time by personnel who can answer questions from the public, help locate documents and assist in making photocopies.

The Reading Room hours are as follows:

Monday	**12 pm – 8 pm**
Tuesday	**8:30 am – 1 pm; 4 pm – 8 pm**
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Thursday	**8:30 am – 1 pm**
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Closed Saturdays and Sundays

Budget Prioritization at the Mound – An Update

Government-wide budget cuts have forced Mound Plant to re-examine where and how to spend available funds in Fiscal Year 1994 (Oct. 1, 1993 – Sept. 30, 1994). In turn, Mound Plant has asked its stakeholders to lend a hand in the decision-making process.

In early December, an opinion survey was prepared and mailed to everyone on the CERCLA mailing list. This survey allowed the public to vote on which Mound projects they believe are a priority and should be funded during the current fiscal year.

Of those survey cards mailed to local area stakeholders, 23% were returned. The following Operable Unit (OU) tasks received the highest prioritization. Those persons who requested results on their survey cards will receive the actual number results. If you would like to have these numbers, please contact EG&G Mound CERCLA Community Relations at (513) 865-4140.

- OU1 – Area B: Addresses on- and off-site migration of possible contaminants in groundwater.

Highest Priority:

- Complete Remedial Investigation Report
- Complete Feasibility Study/Proposed Plan

- OU2 – Main Hill: Addresses source and pathways of potential contamination on Main Hill.

Highest Priority:

- Interim Response Action At B Building Solvent Storage Shed
- Complete Remedial Investigation Work Plan

- OU4 - Miami-Erie Canal: Addresses potential off-site contamination of Canal and Community Park

Highest Priority:

- Complete Engineering Evaluation/Cost Analysis (EE/CA)

- OU5 - South Property: Addresses potential contamination of SM/PP Hill and new property to south

Highest Priority:

- None

(Please see Prioritization, Page 8)

Volatile Organic Compounds:
the everyday chemicals

Almost every day of our lives we come into contact with **volatile organic compounds**. Commonly known as VOCs, these chemicals are ingredients in our cars' gasoline, our nail polish and household cleaning solutions, and even some medicines. We may use a VOC alone to degrease engines or clean metal parts. In fact, VOCs are used in hundreds of common household and industrial products or as end products themselves.

VOCs contain the element carbon and often oxygen, hydrogen and chlorine. They evaporate readily and do not dissolve easily in water. Thousands of chemical compounds match this definition. Some of them are toxic, cancer-causing or contributors to air pollution.

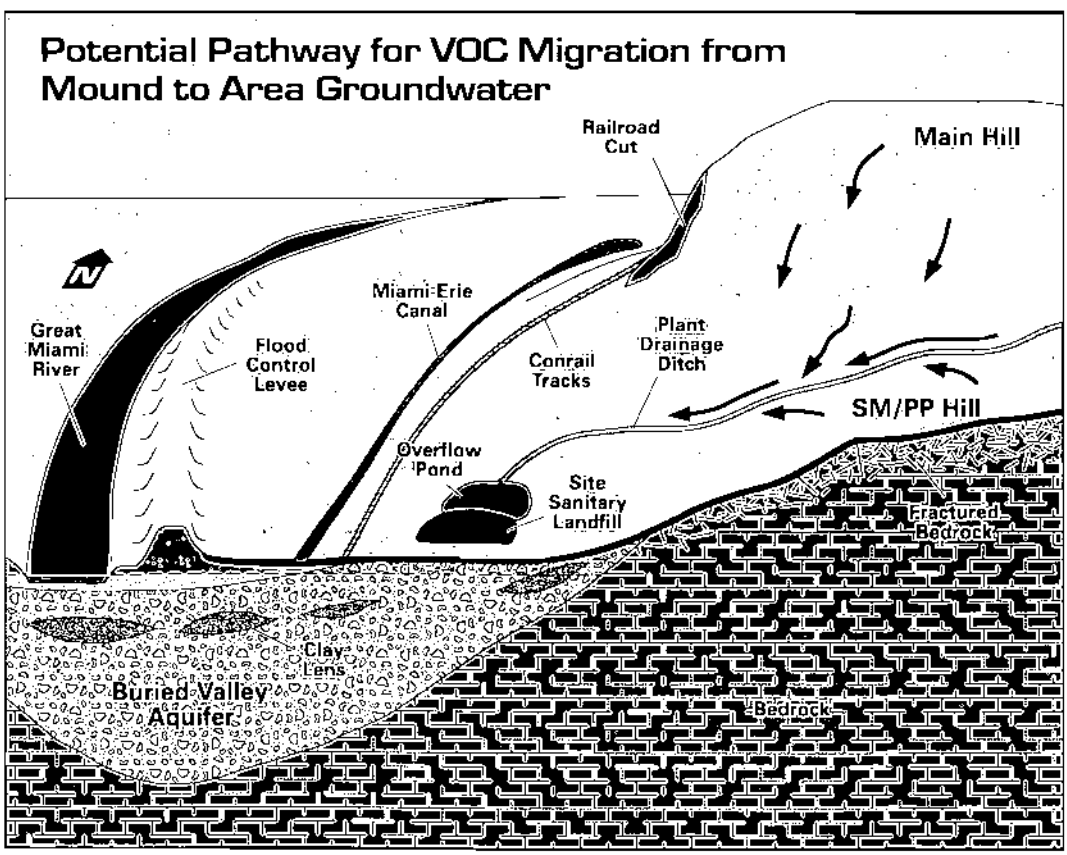
The CERCLA* statute currently considers 33 VOCs to be hazardous substances, which means they may pose a potential hazard to human health or the environment when improperly treated, stored, transported, or disposed. The Mound Plant was placed on the U.S. Environmental Protection Agency's National Priorities List (NPL) in 1989 due to the possibility of hazardous VOCs migrating into area groundwater (see graphic).

The following is an abbreviated list of VOCs on the CERCLA hazardous substances list. Commonly used by industry and consumers, these VOCs are frequently found as contaminants in the environment. Those in **bold type** have been used at Mound in the past to clean or degrease metal parts, tools, molds and other equipment.

- **Acetone** – used as an industrial cleaning solvent (liquid that dissolves away dirt) and in nail polish
- **Benzene** – used in oil-based paints, resins, laquers, plastics and gasoline and as an industrial solvent
- Bromodichloromethane – used as an industrial solvent
- Bromoform – used as an industrial solvent
- **Chloroform** – used as an industrial solvent and in the manufacture of pesticides and dyes
- 1,1 Dichloroethane – limited use as an industrial solvent
- **1,2-(cis and trans)Dichloroethene** – used as an industrial solvent
- **Freon 113** – used as an industrial solvent, refrigerant and fire fighting agent
- **Tetra or Perchloroethene** – used as an industrial solvent in dry cleaning and degreasing
- **Toluene** – used as a less toxic substitute for benzene
- **1,1,1-Trichloroethane** – used as an industrial degreaser (grease remover) and in the manufacture of adhesives and aerosols
- **Trichloroethene (TCE)** – used as an industrial solvent in dry cleaning, paints and adhesives and as a degreaser.

Mound Plant currently is investigating whether these VOCs have contaminated on-site soils and area groundwater. VOC contamination has been confirmed in the B Building Solvent Storage Shed area on Mound's Main Hill (Operable Unit 2). An interim response action is planned for March 1994 to remove VOCs from the soils (see Interim Response Action Update article).

VOCs are released into the environment through evaporation, accidental spills, leaks, or inadequate disposal methods. Leaching from old, unlined landfills or disposal pits is one of the more common pathways for VOC migration into groundwater. Leaching occurs when water from rain, snow or ice percolates down through a landfill and mixes with contaminants from the trash. Called *leachate*, this potentially hazardous mix-



ture seeps out the bottom of the landfill and can migrate through soil into underlying groundwater. New landfills usually are built with leachate collection systems and/or impermeable bottom liners to prevent leaching.

Drinking VOC-contaminated water, inhaling evaporated VOCs or absorbing VOCs through skin contact are the main exposure routes for humans and animals. Long-term exposure to low concentrations of VOCs can affect the nervous system, reproductive system, liver, kidneys, heart and blood. Some VOCs cause cancer in humans. Short-term exposure to high concentrations can result in temporary drowsiness, disorientation, headaches, blackouts and irritation to the eyes and lungs. To ensure safe drinking water, the federal Safe Drinking Water Act has established maximum contaminant levels for chemical compounds. Public drinking water supplies are regularly tested to ensure these levels are not exceeded. Miamisburg and Mound Plant drinking water is tested on a quarterly basis and has been found safe.

If VOCs are discovered in soil or water in concentrations above federal or state standards, then environmental laws such as CERCLA or the Resource Conservation and Recovery Act (RCRA) require cleanup action. There are a number of remedies for handling VOC contamination in soils and groundwater. Examples include: covering contaminated soils with caps to eliminate potential exposure routes; excavating soils and transporting them to a landfill or incinerator for disposal; treating soils in-situ (in-place) by soil vapor extraction or other innovative technologies; and pumping out VOC-contaminated groundwater for treatment and discharge to a water source or reintroduction to the aquifer.

**CERCLA stands for the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986. Commonly referred to as Superfund, the statute governs cleanup action at contaminated sites.*

VOCs in the Home

Many common household items contain volatile organic compounds (VOCs). These products are safe if they are handled and disposed of properly. Never use or dispose of any chemical product, even if it looks as friendly as furniture polish, without first consulting the label directions.

Since most VOCs evaporate readily, they can quickly fill an enclosed space with fumes. Avoid prolonged breathing of vapors, open windows and doors for adequate ventilation, keep products away from flame, and wear goggles/safety glasses or gloves.

If used improperly, VOC-containing products can cause serious health ailments. Short-term exposure to high concentrations can cause temporary drowsiness, disorientation, headaches, blackouts and irritation of the eyes and lungs. Long-term exposure to low concentrations can affect the liver, kidneys, heart, blood, reproductive organs, and nervous system. Some VOCs, such as benzene, are known carcinogens (cancer-causing agents).

The federal Occupational Safety and Health Administration has set limits for on-the-job exposures to various VOCs, but no limits exist for exposure at home. The following organic solvents are commonly present in household products. They should be used with great caution, following the guidelines above.

Methylene Chloride

- Degreasers
- Waxes
- Paints
- Paint removers
- Paint thinners
- Pesticide sprays
- Lubricants

Toluene

- Gasoline
- Some glues
- Some paints
- Thinners
- Paint Removers
- Some nail polishes

1,1,1-trichloroethane

- Drain cleaners
- Spot removers
- Shoe polish
- Insecticides
- Printing inks
- Degreasers

Glycol Ethers

- Antifreeze
- Some paints
- Some glues
- Adhesives
- Sealants
- Caulking compounds

n-Hexane

- Glues
- Paints
- Varnishes
- Printing inks

Petroleum Distillates

- Paints
- Paint thinners
- Furniture polish
- Adhesives
- Some pesticides
- Spot removers
- Caulking compounds

The National Priorities List and How Mound Got There

Mound Plant was placed on the U.S. Environmental Protection Agency's National Priorities List (NPL) in November 1989 to address potential contamination resulting from past plant operations.

Established under CERCLA, the NPL identifies sites warranting further investigation as potential human health or environmental risks. Sites are proposed for inclusion on the NPL if they achieve a score of 28.5 points or higher on the USEPA's Hazard Ranking System scale of 0-100.

Mound Plant currently is one of more than 1,100 total sites (and one of 123 federal facilities) on the NPL. The plant scored 34.61 points on the Hazard Ranking System, mainly due to the possibility of volatile organic compounds (VOCs) and other contaminants migrating into area groundwater known as the Buried Valley Aquifer. The Miami Valley, which includes Miamisburg and the Mound Plant, receives all of its drinking water from this groundwater supply.

The USEPA's ranking system, originally established in 1982 and then revised in 1991, evaluates the relative risks posed by hazardous substances. It is particularly sensitive to contamination or potential contamination of drinking water supplies. Scores are based on the following factors, which are determined through preliminary soil, surface water, groundwater and air sampling at the site:

- The likelihood that a site has released or has the potential to release contaminants into the environment
- The characteristics of the waste (toxicity and waste quantity)
- The people or sensitive environments affected by the release

Mound was scored under the original Hazard Ranking System, which was based on the same factors, but only used data from groundwater, surface water and air sampling. The revised system includes data from soil sampling.

Scores above 28.5 on the ranking

(Please see NPL, Page 5)

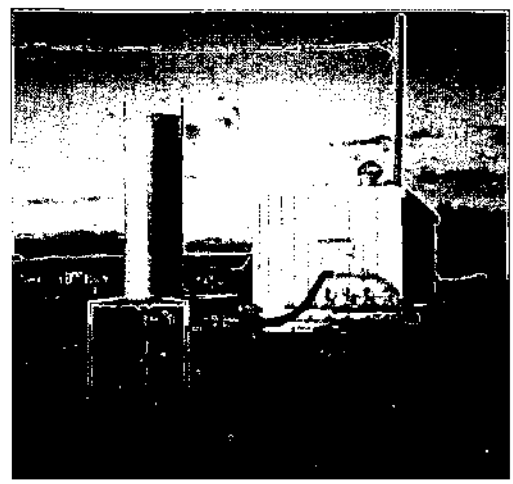
Sherwin-Williams Uses SVE to Clean Up Local Fire Aftermath

In May 1987, the City of Dayton's raw drinking water supply was threatened by volatile organic compound (VOC) contamination resulting from a fire at the former Sherwin-Williams Automotive Paint Distribution Center.

The fire buckled and cracked the concrete floor of the warehouse, located in an industrial park adjacent to the city's 830-acre Miami River Well Field. Unburned chemicals, part of a 1.5 million gallon inventory, spewed into the underlaying soils and onto the ground around the building.

Wide-spread contamination of the Buried Valley Aquifer was prevented by installation of a then new and relatively unproven treatment technology that removed contamination from the soils without removing the soils.

Called soil vapor extraction or vacuum extraction, this method has since been chosen as the cleanup remedy for more than 50 Superfund sites. Mound Plant recently selected soil vapor extraction (SVE) as the preferred remedy for cleaning up VOC contamination at the B Building Solvent Storage Shed area. See the November/December 1993 issue of *Superfund Update* for further details.



Soil vapor extraction system in place at Sherwin-Williams Automotive Distribution Center in Dayton

SVE has gained popularity because it treats contaminated soils in-situ or in-place. Soils remain undisturbed for future activities and the transportation and off-site treatment or disposal of hazardous wastes are avoided.

The basic SVE process involves installing extraction wells into contaminated soils, pumping out evaporated organic compounds trapped in the spaces between soil particles, separating out any residual groundwater for treatment and then filtering or destroying the vapors. Additionally, air vents or air injection wells can be installed to help increase air flow through the contaminated soils. SVE usually requires a pilot test, or treatability study, to ensure it will work effectively before being applied to an entire site.

At the Sherwin-Williams site, around 400,000 cubic yards of soils were treated using SVE with air injection wells — one of the largest SVE cleanups at the time. About 20 cubic yards of soil required removal from around the building's concrete footers because of inhibited air flow, but these soils were treated by SVE in on-site aboveground piles. The entire system operated for about two years, although most of the contamination was cleaned up in six months.

Mound's SVE cleanup begins in March in a 40-foot by 100-foot area surrounding the B Building Solvent Storage Shed and an outdoor drum storage area on the Main Hill (Operable Unit 2). Both sites historically were used for temporary storage of VOC-containing cleaning solvents and waste solvents from B Building, a metal part assembly center. The contamination – mainly trichloroethene (TCE), Freon 113 and 1,2-dichloroethene (cis) – probably accumulated from small spills or leaks associated with storing the solvents in 55-gallon drums or transporting them to and from B Building, according to Gary Coons, Operable Unit 2 manager.

The system will be operated for at least one year, with periodic sampling of soil vapors to determine cleanup progress.

NPL

continued from Page 4

system do not necessarily mean a site represents a health or environmental threat. In fact, the cutoff score originally was selected because it resulted in an initial NPL of at least 400 sites as suggested by CERCLA. The USEPA has never attached significance to the cutoff score as an indicator of a specific level of risk from a site nor does it imply the cutoff distinguishes between a "risky" and a "non-risky" site. The cutoff score simply functions as a management tool to identify those sites representing the highest priority for further investigation out of the tens of thousands of potentially contaminated sites in the United States.

NPL sites originate from the USEPA's Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS). This computerized inventory of all potentially hazardous sites includes more than 33,000 entrees.

All CERCLIS sites undergo a preliminary assessment, and if necessary, a more-indepth site investigation with environmental sampling. Sites can be dropped from further NPL consideration after completion of either initial examination or scored by the Hazard Ranking System. Sites not placed on the NPL remain on the CERCLIS list for informational purposes. They can be reevaluated at a later date for inclusion on the NPL. About 100 sites are listed on the NPL each year.

The term "Superfund" is commonly attached to NPL sites. It derives from the "Hazardous Substance Superfund," a multi-million dollar trust fund created under CERCLA to initially pay cleanup costs at NPL sites prior to recovery from responsible parties. Federal facilities on the NPL (i.e. Mound Plant) and non-NPL sites, however, must fund their own remedial actions.

All NPL sites must be investigated and remediated in accordance with CERCLA and its implementing regulations, the National Oil and Hazardous Substances Pollution Contingency Plan. Portions of other federal, state and local environmental laws and regulations also are followed in determining technical cleanup standards.

The Superfund cleanup at Mound Plant currently is in the Remedial Investigation phase, which involves indepth environmental sampling to determine the nature and extent of contamination. Several interim response actions also are planned in the near future (see Interim Response Action Update story).

CERCLA Profile: EG&G ER/CERCLA Engineering Manager

An engineer and former Operable Unit Manager, Monte Williams oversees all environmental restoration activities at the Mound Plant.

Mr. Williams has worked at the Mound since January 1983, and has been in the Environmental Restoration/CERCLA Program since March 1991. In his present position, Mr. Williams supervises the Operable Unit Managers, field engineers and administrative support staff for each Operable Unit and is responsible for ensuring that project milestones are met and restoration activities are completed in compliance with environmental laws and regulations. Mound Operable Units are groupings of potentially contaminated sites based on geographical location and types of contaminants. Each Operable Unit has its own staff and regulatory reporting requirements.

Monte A. Williams

"The mission of the EG&G ER/CERCLA organization is to reduce the risk to the environment, public and employees by effectively managing the CERCLA Program at Mound," Williams said. "This is accomplished by achieving the milestones outlined in the Federal Facility Agreement. In these times of reduced budgets and changing missions, a significant effort is being placed on prioritizing work within the program and obtaining stakeholder involvement in making decisions on what should be done."

Prior to his current position, Mr. Williams worked for one year as a Mound Operable Unit Manager, which involved directing environmental contractors in investigative field work, document preparation and review, and remedial activities. He also served as a maintenance supervisor in the Mound Facilities Maintenance and Utilities Department and as a project engineer.

Before coming to Mound, Mr. Williams worked several years as a Monsanto Company project engineer in St. Louis, Missouri.

Mr. Williams graduated in 1980 from the University of Missouri with a Bachelor of Science Degree in Mechanical Engineering. He earned a Master's Degree in Business Administration from Southern Illinois University in 1985 and is a registered Professional Engineer. Mr. Williams currently is the co-chairperson of the Miami Valley Regional Science Bowl, which the U.S. Department of Energy sponsors.

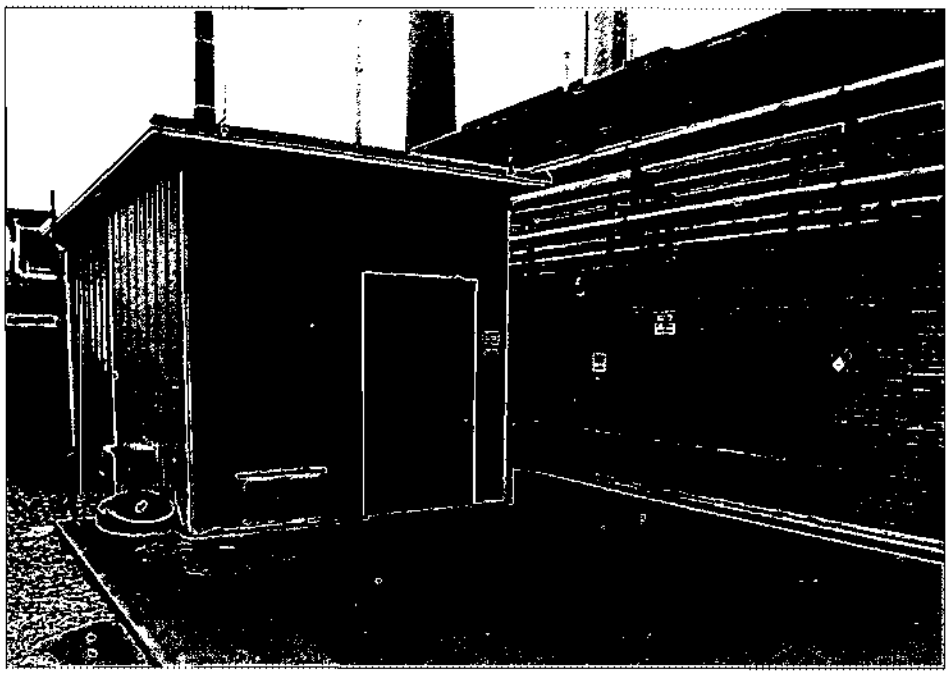
ATSDR

The U.S. Agency for Toxic Substances and Disease Registry will hold a public meeting in late March 1994 as part of its Mound Plant Public Health Assessment. Topics include the feasibility of conducting a door-to-door cancer incidence survey in Miamisburg. The time, date and place for the meeting will be announced in the March 1994 issue of *Superfund Update*.

Interim Response Action Update

Mound Plant plans to conduct a number of interim response actions (IRAs) during Fiscal Year 1994 and beyond to address small-scale areas of contamination. IRAs are used in conjunction with the long-term remedial action cleanup to expedite cleanup at Superfund sites or to quickly reduce potential risks to human health or the environment. IRAs are speedier and less costly than remedial actions because they involve minimal investigatory work. Two interim response actions currently are being planned at the Mound: the removal of volatile organic compounds (VOCs) from soils at the B Building Solvent Storage Shed in Operable Unit 2 and the removal of radionuclides from the Miami-Erie Canal in Operable Unit 4. Two additional sites, both in Operable Unit 5, are tentatively scheduled for future action. They include a Fire Fighting Training Area near Building 34, primarily contaminated by petroleum hydrocarbons, and an underground tank site located beneath the Building 29 parking lot with soil contamination by low-level radionuclides.

The status of these projects is listed below.



B Building Solvent Storage Shed scheduled for interim response action.

B Building Solvent Storage Shed (Operable Unit 2)

- Action Memorandum completed (Action Memorandum documents the selection of a cleanup method for a site)
- Soil vapor extraction selected as the cleanup remedy
- Preparatory work begun in January 1994 to dismantle shed and disconnect piping and electrical and sprinkler systems
- EG&G Mound and ICF Kaiser currently designing SVE system
- Bidding for SVE contractor to begin in February 1994
- Site cleanup expected to begin in March 1994

Miami-Erie Canal (Operable Unit 4)

- Engineering Evaluation/Cost Analysis (EE/CA) submitted to regulators on January 12 for review and comment (EE/CA evaluates cleanup alternatives for a site and selects a preferred remedy)
- Preferred remedy is excavation of contaminated soils for burial at an off-site facility
- Once EPA review is complete, EE/CA will be made available for public review and comment
- Start date for site cleanup depends on stakeholder prioritization of work and availability of funding

Fire Fighting Training Area (Operable Unit 5)

- Removal Site Evaluation/Action Memorandum tentatively scheduled for completion by end of January 1994 (Removal Site Evaluation documents nature and extent of contamination at a site)
- Preferred remedy will be identified in the Action Memorandum
- Site cleanup could begin as early as mid-1994

Underground Tank Site (Operable Unit 5)

- Removal Site Evaluation/Action Memorandum tentatively scheduled for completion in early 1994
- Preferred remedy will be identified in the Action Memorandum
- Site cleanup could begin as early as mid-to-late 1994

On the Trail Of...

...A Soil Sample

Laboratory data from soils removed from the Carnegie Center lawn on October 20, 1993, is still on the move. According to sources, Weston Analytical Laboratory of Lionville, Pennsylvania, analyzed the soils for various substances — including volatile organic compounds, metals, pesticides, polychlorinated biphenyls and radionuclides — and then compiled the results. The data was last seen on its way to Quantalex of Denver, Colorado, where validation of the laboratory procedures and analysis is known to be taking place. We hope to catch up to the final results in time for the next CERCLA Quarterly Public Meeting, scheduled for March 17, 1994.

Recap — December Workshop

Two Mound Plant issues — budget cuts and interim response actions — drew a crowd of about 60 people to the December 2, 1993, CERCLA Quarterly Public Meeting at the Carnegie Center.

Led by Chuck Friedman of EG&G Mound, the interim response action workshop focused on these small-scale cleanup actions as speedy and cost-effective means for expediting the Mound Plant Superfund cleanup.

The budget priority workshop, hosted by Art Kleinrath of the U.S. Department of Energy, featured an indepth discussion of Environmental Restoration Program budget cuts and prioritization of work scheduled for Fiscal Year (FY) 1994. Mound requires $28 million to complete all planned activities, but expects to receive only $17 million. Workshop attendees participated in an interactive board game called Priority, complete with non-legal tender money. Each square on the board represented a planned FY 1994 Operable Unit activity and its approximate cost. Participants were asked to select and pay for work they felt warranted the highest priority for funding.

Art Kleinrath discusses budget cuts and FY1994 work prioritization.

Chuck Friedman discusses Interim Response Actions vs. Remedial Actions.

Later, an opinion survey was sent to all Mound Plant stakeholders asking for their formal input on work priority selection. See the Budget Prioritization story for survey results.

The meeting was attended by members of the public and representatives from the U.S. Environmental Protection Agency, Ohio Environmental Protection Agency, U.S. Agency for Toxic Substances and Disease Registry, DOE and EG&G.

Remedial Response – Community Concerns

The following questions were asked during the December 2, 1993, CERCLA Quarterly Public Meeting for the Mound Plant. The answers are from EG&G Mound.

Q *Where can I find results of sampling done in the Miami-Erie Canal and under the Conrail train trestle?*

A These sampling results can be found in two separate documents, the Operable Unit 4, Special Canal Sampling Report, Miami-Erie Canal, Final (Revision 1), July 1993, and the Operable Unit 4, Conrail Excavation, Miami-Erie Canal, Final (Revision 1), October 1993. Both documents are located in the Mound Plant CERCLA Public Reading Room at the Miamisburg Senior Adult Center, 305 E. Central Avenue. See article on page 1 for room hours.

Q *When will the results be available from aquatic sampling, aquifer testing and seismic studies done in the Miamisburg Community Park?*

A The seismic study has been completed, and the results are being compiled in a technical memorandum. The aquatic sampling and aquifer testing results will be published in technical memoranda in late spring/early summer 1994. Technical memos are secondary or interim status documents generated for informational purposes. Their results generally are incorporated into primary documents, such as a Remedial Investigation Report. Copies of these memos will be available in the Mound Plant CERCLA Public Reading Room in the 2nd quarter of 1994.

Q *What are volatile organic compounds (VOCs) and which VOCs are a concern at Mound Plant?*

A See VOC article on page 2.

Prioritization

continued from Page 1

- OU6 – Verification of Decontamination and Decommissioning (D&D) Sites: Addresses sites that have been Decontaminated and Decommissioned by Mound's D&D Program

Highest Priority:

- Complete Rad Waste Lines Verification

- OU9 – Site-Wide and Off-Site: Addresses potential contamination site-wide and off-site and integrates all OUs

Highest Priority:

- Complete Residential Well Sampling
- Continue Groundwater Sweeps
- Complete Ecological Assessment
- Complete Hydrogeological Mapping
- Regional Soils Investigation

Tasks receiving the highest overall priority:

- OU9 – Complete Residential Well Sampling
- OU1 – Complete Remedial Investigation Report
- OU4 – Complete Engineering Evaluation/Cost Analysis (EE/CA)
- OU6 – Complete Rad Waste Lines Verification
- OU9 – Continue Groundwater Sweeps

The leading tasks from the stakeholder survey are being given top priority in Fiscal Year 1994 schedule negotiations with the USEPA and Ohio EPA.

Although no OU5 work received high priority votes in the survey, this work is seen by the Department of Energy and EG&G Mound as critical to the commercialization/privatization of the Mound Plant property and is being included in the schedule negotiations.

The final schedule of work for the remainder of Fiscal Year 1994 will be reported in the next *Superfund Update*.

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Important phone numbers

EG&G Mound Applied Technologies
Environmental Restoration/
CERCLA Community Relations
Jolene Walker: 513-865-4140

U.S. Environmental Protection Agency
(Region V Headquarters, Chicago)
Diane Spencer: 312-886-5867
(Superfund Community Relations)
Cheryl Allen: 312-353-6196

Ohio Environmental Protection Agency
(Dayton office)
Jeff Smith: 513-285-6035

Ohio Department of Health
(Columbus): 1-800-523-4439
(Radiological Section)
Larissa Gilham: 614-644-2727

CERCLA mailing list

Mound maintains a mailing list for people interested in the Mound CERCLA program. People on the list receive twice-quarterly issues of *Superfund Update*, notification of CERCLA-related meetings, Site Specific/Five Year Plan meetings and other DOE-related public affairs activities. If you wish to have your name added to this list, sign up at any of Mound's public meetings or send your mailing address to:

EG&G Mound Applied Technologies
c/o CERCLA Community Relations
P.O. Box 3000
Miamisburg, OH 45343-3000

MOUND
Environmental Restoration Program

EG&G Mound Applied Technologies
CERCLA Community Relations/Environmental Restoration
P.O. Box 3000
Miamisburg, OH 45343-3000

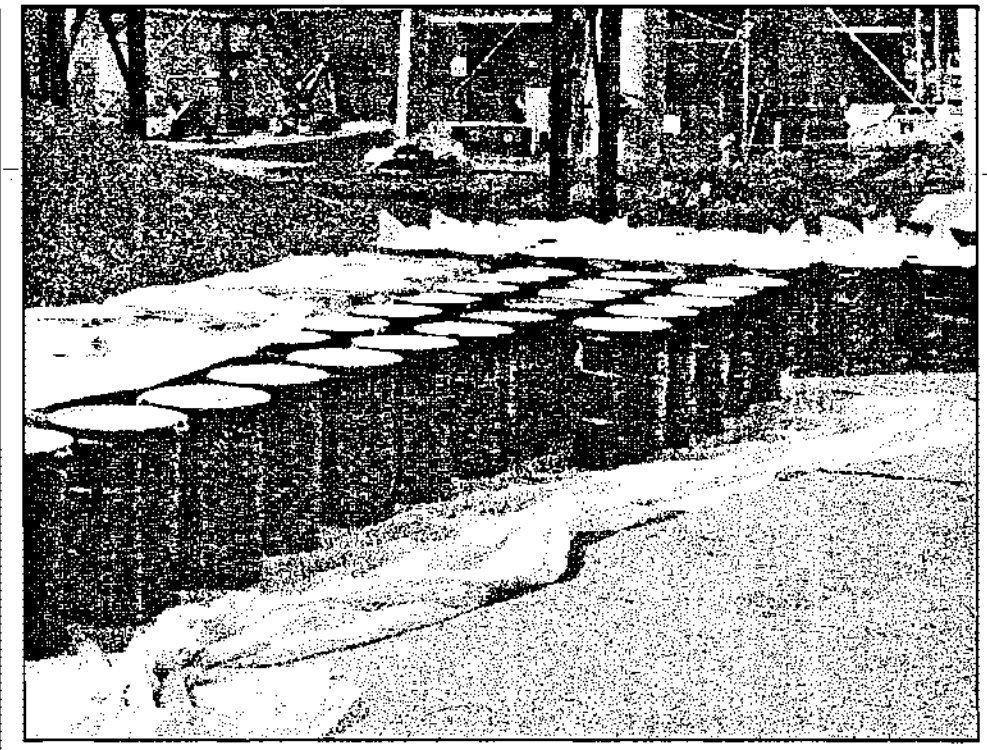
MOUND

Environmental Restoration Program

Interim Response Actions Fact Sheet

December 1993

Interim Response Actions are speedy, small-scale, and cost-effective cleanup actions conducted under CERCLA. They frequently are used in conjunction with the long-term Superfund cleanup (Remedial Action) to address isolated areas of contamination (i.e. accidental spills, leaking drums, highly contaminated soils) where the problems and solutions may be so obvious that detailed investigations are not necessary. These actions normally are planned for completion within a year and cost less than $2 million.



Drums containing PCB-contaminated soils from the Mound Plant's first Interim Response Action in 1991 await transportation to a hazardous waste landfill

Excavation of PCB-contaminated soils during a 1991 Interim Response Action at the Mound Plant Powerhouse

Purpose

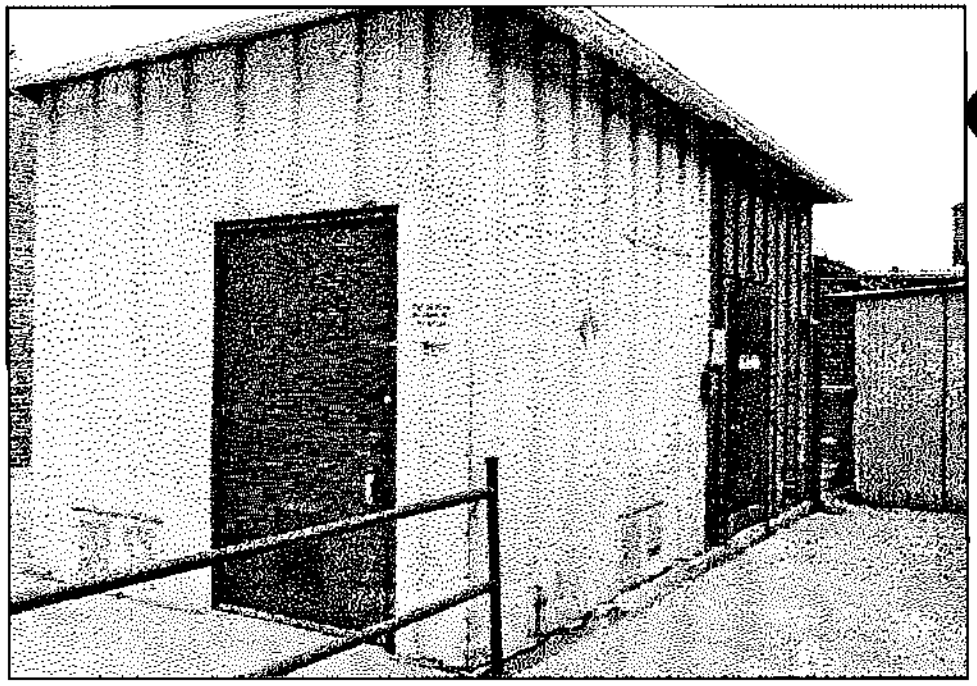
- Expedite cleanup at a Superfund site in a cost-effective manner
- Quickly reduce potential risks to human health or environment
- Examples include spill/chemical explosion response, drum removals, traditional site cleanup (i.e., digging up contaminated soils for disposal by landfill or incineration), on-site containment of contamination, or innovative site cleanup

Timing

- Can occur at any time during the long-term Superfund cleanup
- Can occur at a non-Superfund site
- Usually discovered during the initial investigation of a potential Superfund site or during the Remedial Investigation
- Evaluated during Feasibility Study to determine its effectiveness in terms of overall Superfund site remediation

Methods

- Provide alternative drinking water supplies to public if water supply is affected
- Put up fences or other warning signs to keep public away
- Dig up contaminated soils for landfill disposal, incineration or other remediation method
- Stabilize contaminants in place with chemical additives
- Treat contaminated soils in place



An Interim Response Action is planned for early 1994 at the B Building Solvent Storage Shed area

Remediation Process

- Initiated anywhere from a few hours to more than six months after deciding to proceed with an Interim Response Action
- Requires less advance planning and evaluation than the remedial action
- Exact process of documenting decisions and involving the public depends on whether planning period is more or less than six months

Public Participation

- Notify public of any planned Interim Response Actions
- If necessary, prepare an addendum to CERCLA Community Relations Plan to include public participation activities planned during the Interim Response Action
- Release decision documentation as it is generated to Administrative Record file for public review
- If planning period is expected to last at least six months, prepare and release an Engineering Evaluation/Cost Analysis Report (EE/CA) to Administrative Record file for public review; EE/CA evaluates potential cleanup remedies and selects a preferred remedy
- Hold a Public Comment Period

Interim Response Actions Planned For Fiscal Year 1994

- Operable Unit 2, Main Hill
  - Treatment of volatile organic compound (VOC)-contaminated soils in B Building Solvent Storage Shed area
  - Scheduled for early 1994
- Operable Unit 5, South Property
  - Treatment of contaminated soils at historic Fire Training Facility

MOUND
Environmental Restoration Program

SUPERFUND Update

EG&G

November/December 1993

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CERCLA Quarterly Public Meeting

Thursday, December 2, 1993
7:00 pm
Carnegie Center
426 E. Central Ave.
Miamisburg, Ohio

Everything has a price...

The upcoming CERCLA Quarterly Public Meeting will feature workshops on the current budget priorities affecting the Mound Plant cleanup effort and on Interim Response Actions.

Art Kleinrath, the DOE On-Scene Coordinator for the Mound Environmental Restoration/CERCLA Program, will conduct the Budget Priorities workshop. Discussion will center on the cause-and-effect of FY94 budget reductions, and in particular, the choices that must now be made on how and where to best use the money available.

Chuck Friedman, EG&G Manager of the Environmental Restoration/CERCLA Program, will lead a workshop focusing on Interim Response Actions as a cost-effective method to expedite the Mound Plant cleanup effort.

CERCLA Profile: DOE-Dayton Area Office Area Manager

As Area Manager of the U.S. Department of Energy's (DOE) Dayton Area Office, Larry D. Kirkman is responsible for overseeing the Mound Plant's operating contract with EG&G Mound Applied Technologies. Mr. Kirkman, who reports to the DOE's Albuquerque Field Office in Albuquerque, New Mexico, has held the position since January.

Larry D. Kirkman

"Like all of the DOE, the Mound is facing a lot of changes," he says. "Transition is inevitable and there is a lot of hard work involved to ensure that those changes will benefit Miamisburg. A lot of effort is being put into Mound's transition. This does not mean that our current commitments, like cleaning up the Operable Units, will be diminished. To the contrary, CERCLA efforts have to be supported now as much as ever. The cleanup process is mandatory in order to allow continued use of the site for the community."

(Please see Kirkman, Page 8)

CERCLA Profile: EG&G Mound President

President and General Manager of EG&G Mound Applied Technologies since September, Jack L. Clark has 31 years of nuclear experience and 18 years of management experience.

Jack L. Clark

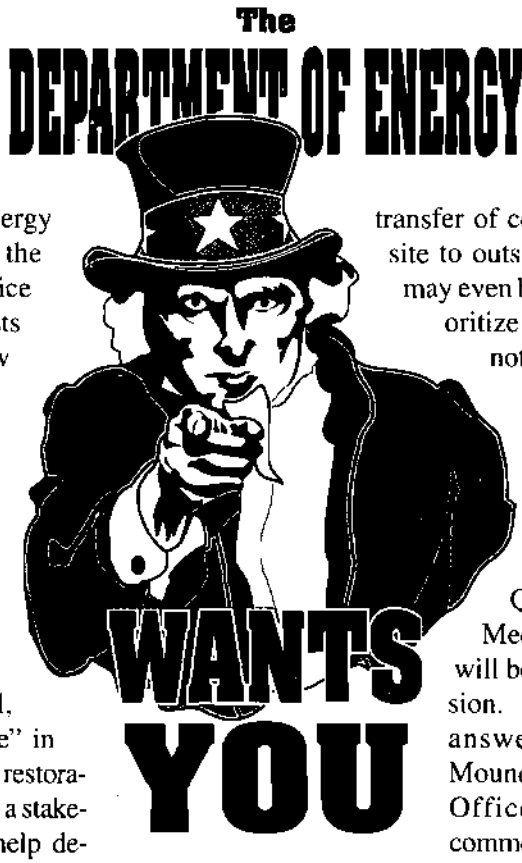
"While EG&G Mound will be playing a role in the Mound's conversion from defense to commercialization, we also will continue our environmental restoration efforts at the site in cooperation with the Ohio and U.S. Environmental Protection Agencies and stakeholders in the community," Mr. Clark says.

His career began in 1962 in the Environmental Safety and Health (ES&H) field at the Idaho National Engineering Laboratory. Mr. Clark worked for EG&G Idaho in ES&H and environmental restoration positions until 1988 when he became Director of Administration for EG&G Mound, which had just assumed the Mound Plant operating contract from Monsanto Research Corp.

(Please see Clark, Page 8)

Budget Prioritization at the Mound and You

Government-wide budget cuts are being felt at every federally owned site, and the Environmental Restoration Program at the Mound Plant also is being affected. This means that not all work scheduled for Fiscal Year 1994 can be accomplished.



The U.S. Department of Energy (DOE), through the Dayton Area Office at Mound, requests *your* input on how the work to be done should be prioritized for funding. If you live or work near Mound Plant or are an employee of EG&G Mound, you have a "stake" in the environmental restoration of the site. As a stakeholder, you can help decide the direction this program should take.

During the past summer, the July/August issue of *Superfund Update* discussed priorities in terms of overall risk and each Operable Unit (OU) was assigned a priority (**see sidebar**). Stakeholder input in this listing was taken at the June 1993 CERCLA Quarterly Public Meeting.

In subsequent discussions with the U.S. Environmental Protection Agency (USEPA), the Ohio Environmental Protection Agency (OEPA), the City of Miamisburg, and other stakeholders, it is apparent that many of the developments of the past six months have had an effect on stakeholder views of exactly how the cleanup work at Mound Plant should progress.

The DOE reconfiguration of its nuclear weapons facilities and the planned commercialization of the Mound Plant site has created a possible need to shift emphasis to on-site cleanup in order to speed up the planned transfer of certain areas of the site to outside businesses. It may even be necessary to prioritize work for funding, not by Operable Unit, but by individual pieces within each Operable Unit.

At the December 2 CERCLA Quarterly Public Meeting, this subject will be a topic of discussion. Questions will be answered by EG&G Mound and Dayton Area Office personnel and comments will be taken on suggestions for funding of work.

Shortly following the meeting, each person on the CERCLA mailing list will receive a postage-paid questionnaire designed to elicit stakeholder opinions on what work should be funded and in what order. Results of this survey will be shared with stakeholders in the next issue of *Superfund Update* and at future CERCLA Quarterly Public Meetings.

Current Funding Priorities for Operable Units (OUs)

High Priority – OU1 and OU9

Because both Operable Units deal primarily with the off-site movement of potentially contaminated groundwater, they were given highest priority for funding.

Middle Priority – OU4 and OU6

OU4 was assigned medium priority because the contamination in the Miami-Erie Canal bed, though located beyond the plant's western boundary, is not spreading. In addition, studies conducted since 1974, including the recently released U.S. Agency for Toxic Substances and Disease Registry (ATSDR) Health Consultation, have all concurred that it presents no immediate threat to human health and the environment.

Though assigned a middle priority, OU6 presently is scheduled to receive full funding because its cost demands are low compared to the other Operable Units and lack of funding could hold up the Mound Decontamination and Decommissioning Program (D&D).

Low Priority – OU2 and OU5

Because both of these Operable Units primarily address immobile on-site soil contamination and do not present any immediate threats to the public or the environment, OU2 and OU5 currently have the lowest funding priority.

Mound Funding – Fiscal Year 1994

FY94 Mound Plant Operable Units

■ OU1, Area B

Addresses on- and off-site migration of possible contaminants in groundwater

Progress to date:

- Fieldwork and Remedial Field Investigation Report complete
- Remedial Investigation Report almost complete
- Feasibility Study started

Planned for FY94:

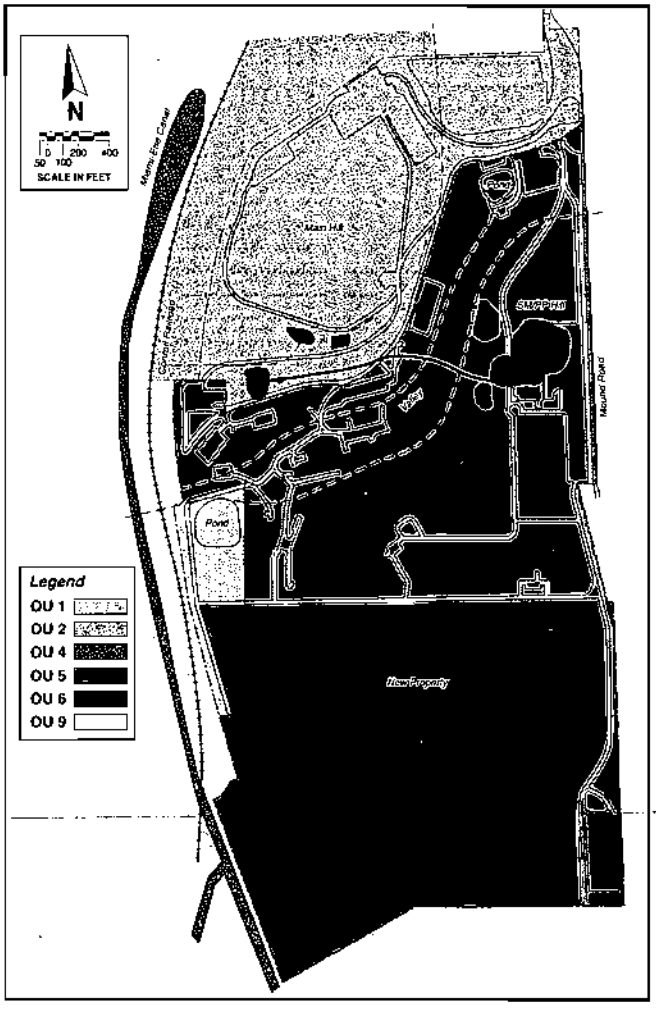
- Complete Draft Remedial Investigation Report
- Complete Draft Feasibility Study/Proposed Plan
- Begin Record of Decision/Responsiveness Summary

■ OU2, Main Hill

Addresses source and pathways of potential contamination on Main Hill

Progress to date:

- Polychlorinated biphenyl (PCB) Interim Response Action complete
- Remedial Investigation/Feasibility Study Workplan/ Sampling and Analysis Plan (SAP) in progress



Planned for FY94:

- Interim Response Action - B Building Solvent Storage Shed
- If Funded - Continue Fieldwork

■ OU4, Miami-Erie Canal

Addresses potential off-site contamination of Canal and Community Park

Progress to date:

- Special Canal Sampling Report complete
- Remedial Investigation Workplan/SAP pending

Planned for FY94:

- Evaluating potential Interim Response Action on Canal

■ OU5, South Property

Addresses potential contamination of SM/PP Hill and new property to south

Progress to date:

- Reconnaissance Sampling Report complete
- Remedial Investigation Workplan/SAP in regulatory review

Planned for FY94:

- Fire Training Facility Interim Response Action
- If Funded - Continue Fieldwork

■ OU6, Verification of D&D Sites

Addresses sites that have been Decontaminated and Decommissioned by Mound's D&D Program

Progress to date:

- Verification Workplan complete
- Reconnaissance Sampling Report complete
- Area 14 Verification Report complete
- Area D SAP complete
- Area 19 SAP complete

Planned for FY94:

- Submit Draft of Area 19 Verification Report
- Complete Area D Verification Report

■ OU9, Site-Wide and Offsite

Addresses potential contamination offsite and integrates all OUs

Progress to date:

- Remedial Investigation Workplan/SAP complete
- Eleven Site-Scoping Reports complete
- Preliminary Risk Assessment complete
- Environmental Assessment Draft complete
- Phase 1, Remedial Investigation Fieldwork complete

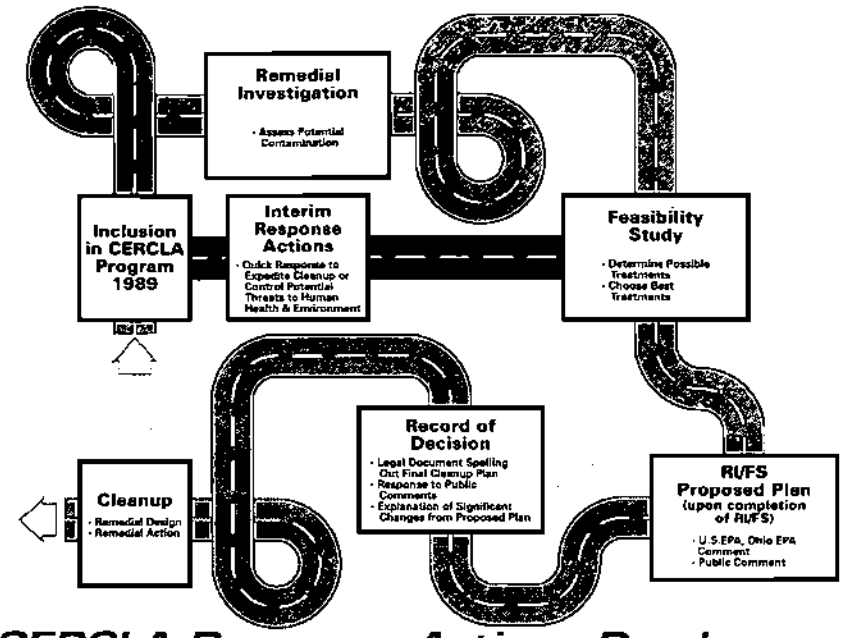
Planned for FY94:

- Residential Well Investigation
- Hydrogeological Spring Sweep Sampling
- National Pollutant Discharge Elimination System (NPDES) Outfall Soils Investigation
- Regional Soils Investigation
- Investigation Derived Material (IDM) Sampling

Interim Response Actions

Most people are familiar with the CERCLA* remedial action process. Currently underway at the Mound Plant, this lengthy and expensive program involves identification of potential sites, years of investigation into the type and extent of contamination, and design and implementation of long-term cleanup remedies.

But another type of response action exists under CERCLA to address isolated areas of contamination that may be cleaned up using a speedier and smaller-scale response than the remedial action. In these cases, the problems and solutions may be so obvious that detailed studies are not necessary. Called an *interim response action*, this short-term response can occur at any time during the course of a Superfund remedial action or at a non-Superfund site. These actions normally are planned for completion within one year and cost less than $2 million.



CERCLA Response Actions Roadmap – Remedial Action vs. Interim Response Action

The objective of an interim response action is to: 1) expedite cleanup at a site when sufficient information is available, or 2) to quickly reduce potential risks to human health or the environment if real danger exists. Interim response actions are expected to contribute to any ongoing remedial actions at the site. Examples include removing contaminants from soils, excavating contaminated soils for incineration or landfilling, providing alternative drinking water supplies to nearby residents, putting up fences or warning signs, and stabilizing contamination in place until it can be further studied and treated during a remedial action.

If the DOE, which is the lead agency for the Mound Plant Superfund cleanup, determines that an interim response action is appropriate, then cleanup activities are initiated. Because some sites require longer, more detailed planning periods and others do not, interim response actions are divided into two categories based on the urgency or complexity of the situation:

- Time critical
- Non-time critical

Time critical actions require the least advance planning and evaluation. Actual cleanup activities begin anywhere from a few hours to under six months after receiving DOE approval. Examples include spill/chemical explosion response, drum removals, or traditional site cleanup (i.e. excavation of contaminated soils).

Non-time critical actions require the most advance planning and evaluation. Actual cleanup activities begin at least six months after receiving DOE approval. Examples include on-site containment of contamination or innovative site cleanup. The planning time is used to prepare an Engineering Evaluation/Cost Analysis (EE/CA) Report, which evaluates potential cleanup remedies and selects a preferred remedy based on three factors: effectiveness, cost and implementability. Public input is also solicited during this time.

Community members are notified of any planned interim response action, but their level of public participation depends on the time element involved.

Typical public participation activities for time critical actions include: release of decision documentation to the public Administrative Record file, possibly preparing an addendum to the CERCLA Community Relations Plan to include activities planned during the interim response action, and possibly holding a public comment period for at least 30 days.

Typical public participation activities for non-time critical actions include: release of the EE/CA Report and other decision documentation to the public Administrative Record file, publishing a public notice (advertisement in major local newspapers of general circulation) announcing the availability of the EE/CA in the Administrative Record, preparing an addendum to the CERCLA Community Relations Plan, and holding a public comment period for at least 30 days on the proposed remedy.

After the interim response action is completed, the sites are monitored to ensure control measures are working properly.

**CERCLA stands for the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986.*

Interim Response Action at the B Building Solvent Storage Shed Area

An interim response action is being planned for the B Building Solvent Storage Shed area on Mound Plant's Main Hill (Operable Unit 2).

Scheduled for March 1994, the response action will address high concentrations of volatile organic compounds (VOCs) in the soils surrounding the shed and an outdoor drum storage area. Both sites historically were used for temporary storage of VOC-containing cleaning solvents and waste solvents from B Building, a metal part assembly center.

VOCs are carbon-containing compounds that evaporate readily. While thousands of chemicals fit this definition, only 35 are hazardous substances requiring cleanup under CERCLA. Most of the VOCs on the CERCLA list are commonly used by industry as cleaning solvents and degreasers and in paints, pesticides, resins, lacquers, aerosols, adhesives and gasoline.

High concentrations of six VOCs on the CERCLA list were discovered near the B Building Solvent Storage Shed during a 1992 Mound Plant soil gas survey, which involved pumping out chemical vapors in the soil and analyzing them for the presence of VOCs. Trichloroethene (TCE), Freon 113 and 1,2-dichloroethene (cis) were found in the highest concentrations. Toluene, 1,1,1-trichloroethane (TCA), and 1,2-dichloroethene (trans) also were present in lesser quantities.

The VOC contamination probably accumulated from small spills or leaks associated with storing the solvents in 55-gallon drums or transporting them to and from B Building, according to Gary Coons, Operable Unit 2 Manager. An automated system installed in the late 1970s pumped solvents into B Building where they were used to clean metal parts prior to assembly. The spent solvents then were pumped back into the storage shed for temporary storage before being hauled to Mound's hazardous waste storage area for eventual disposal.

"Once we start the cleanup process, we may discover that the VOCs are coming from underneath B Building, but that's unlikely" Coons says. "The soil gas survey found the highest VOC concentrations near the shed and outdoor drum storage area and the lowest concentrations near B Building. If the VOC source was underneath B Building, there should be higher concentrations of VOCs near the building."

The following cleanup options are being considered for the approximately 40-foot by 100-foot site:

- No Action – Leaving the site as is
- Concrete cap – Covering the site with concrete to eliminate potential exposure routes
- Soil Vapor Extraction – Pumping out soil vapors through extraction wells and treating them on-site with filters, biological gas treatment systems or intense heat
- Soil Washing – Excavating soils, then separating and scrubbing them to remove VOCs; clean soil is returned to site
- Thermal Desorption – Excavating soils, then thermally treating them to destroy VOCs
- Incineration – Excavating soils, then transporting them to a hazardous waste incinerator
- Landfilling – Excavating soils, then transporting them to a hazardous waste landfill

These options and the preferred remedy — soil vapor extraction — are described in further detail in a report, which currently is under review by the DOE, U.S. Environmental Protection Agency (USEPA) and Ohio EPA. Once the report is finalized, it will be publicly released to the Administrative Record file within the Mound Plant Public Reading Room. Public information meetings and/or factsheets will be provided and public comment will be accepted throughout the process.

"Each cleanup alternative is evaluated in terms of effectiveness, implementability and cost," Coons says. "What's preferred by the experts is in-situ treatment, which means treating soil contamination in place as opposed to excavating the soils and transporting them to an incinerator, landfill or other treatment system."

The DOE approved the interim response action after concluding that the area posed a potential exposure problem to humans and the environment and that sufficient prior knowledge existed and therefore no further study was needed. The B Building Storage Shed area has the highest concentrations of VOCs on site and could be a major contributor to the contaminated seeps on Mound's hillsides.

DOE and State of Ohio sign new Oversight Agreement

The U. S. Department of Energy (DOE) and the State of Ohio have entered into an Agreement-in-Principal (AIP) on oversight and monitoring of Environmental Restoration activities at three DOE sites in the state: Mound Plant in Miamisburg, Fernald Environmental Management Project in Ross, and Portsmouth Gaseous Diffusion Plant in Piketon. Under this agreement, the Ohio Environmental Protection Agency (OEPA) will focus on the review of DOE environmental monitoring programs, plan for response to on-site emergencies and develop public information programs related to environmental cleanup activities at the sites. The AIP also provides $11 million in grant monies for the OEPA to carry out independent monitoring and data collection necessary to ensure that cleanup activities adequately protect the public health and the environment. The grant, which covers a five-year period, supplements the $21.5 million already committed by the DOE for state regulatory activities. An office to coordinate the states activities will be established in Dayton as part of OEPA's Southwest District Office.

Soil Vapor Extraction

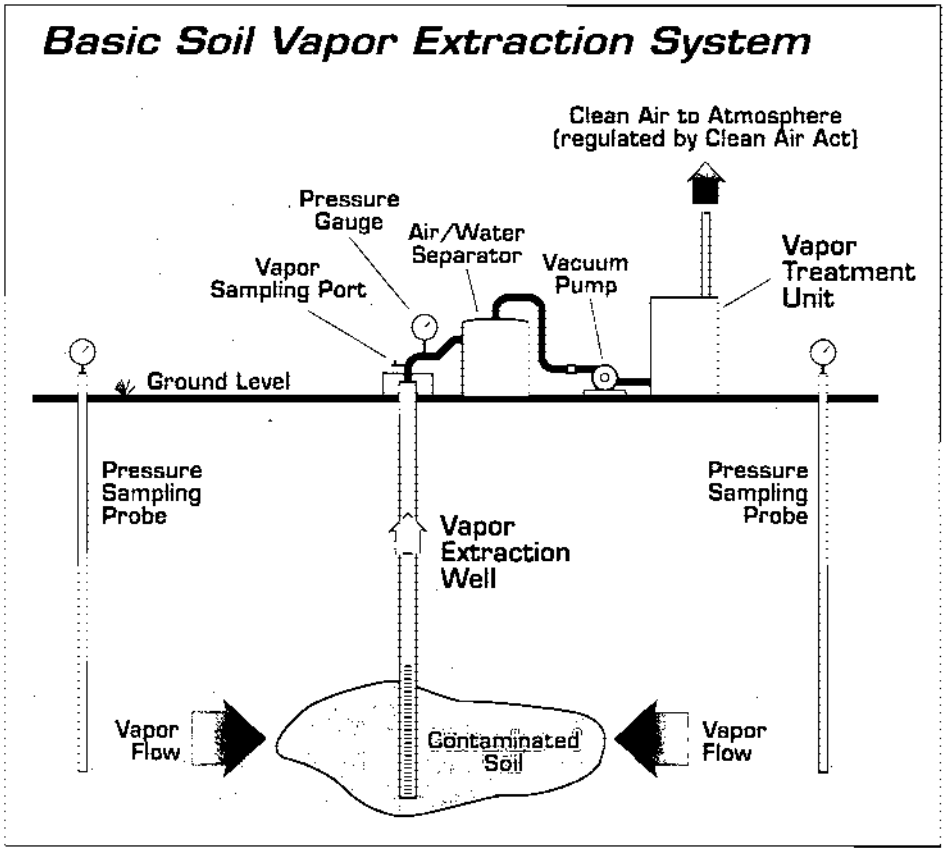
Soil vapor extraction (SVE), an on-site treatment method for soils contaminated by volatile organic compounds (VOCs), is the preferred remedy for the B Building Solvent Storage Shed area.

SVE technologies have been used since the 1970s to remove vapors from landfills, and since the early 1980s for remediating soils contaminated by leaking underground storage tanks. More recently SVE has been applied to Superfund sites and currently is one of the most commonly used innovative cleanup techniques. Innovative refers to newer, more experimental methods that are on the cutting edge of treatment technology. They typically are not as widely employed as older, established technologies (i.e. soil incineration or soil stabilization) but frequently are more effective and/or less costly.

The basic SVE process involves installing extraction wells into contaminated soils, pumping out the evaporated organic compounds trapped in the spaces between soil particles, separating out any residual groundwater for treatment and then filtering or destroying the organic vapors. Additionally, air vents or air injection wells can be installed to help increase air flow through the contaminated soils. SVE usually requires a pilot test, or treatability study, to ensure it will work effectively on local soils before being applied to the whole site.

According to the Engineering Evaluation/Cost Analysis Report, SVE is preferred in the storage shed area because it removes contaminants effectively without requiring excavation of soils and has a relatively inexpensive price tag (under $500,000). SVE has been selected as a cleanup remedy at more than 50 Superfund sites.

The SVE system would be operated for at least one year, with periodic sampling of soil vapors to determine cleanup progress. Emissions from the air treatment system used to filter or destroy the vapors would comply with federal Clean Air Act requirements.



Remedial Response – Community Concerns

The following question was asked during the U.S. Agency for Toxic Substances and Disease Registry (ATSDR) presentation at the October 20, 1993; CERCLA Quarterly Public Meeting. The answer is from Dr. William H. Taylor of ATSDR.

Q *What about the 1979 spill at the Mound Plant?*

A I know of no significant spills that occurred in 1979 at the Mound Plant. However, a spill did occur in 1972. This spill was referenced in the recently released ATSDR Health Consultation and perhaps is the one you are referring to.

In 1972, a water pipe broke at the Mound Plant and washed soil contaminated with plutonium-238 into the plant's drainage ditch. The Health Consultation mentions this spill because it is possible that contaminated soils from the ditch washed into the Miami-Erie Canal and contributed to already existing sources of plutonium-238 in the canal from the 1969 spill. However, ATSDR attributes no special health concern to the 1972 water pipe break. The Mound Laboratory Environmental Plutonium Study (Rogers Study) was conducted on the canals in 1974 and characterized the entire plutonium-238 burden from the 1969 spill and any other additional, minor sources (i.e. the 1972 spill or contaminated plant water discharges). From a health point of view, it makes no difference where environmental contamination comes from (although it does matter what form it is in and where it is found). ATSDR considered the entire plutonium-238 burden in the canals and Community Park — regardless of its sources — and found that the measured levels would not result in an health hazard to anyone in the area.

(This information was provided by ATSDR)

Recap – October Workshop

The CERCLA Quarterly Public Meeting held October 20, 1993, was well attended despite rainy skies. The cozy atmosphere and good acoustics of the Carnegie Center resulted in a casual and comfortable session. December's public meeting (see page 1) also is planned for the Carnegie Center.

Held in an informal workshop format, the October 20 public meeting covered two topics: recently completed fieldwork for the Mound Plant Hydrogeological Investigation and the soil sampling process. Hydrogeology studies the flow of water through underground rocks and soils. Soil sampling is the process of extracting soil from the ground and analyzing it in a laboratory for chemical and/or radionuclide content. Both presentations used posters and hands-on demonstrations, including soil sampling equipment and a groundwater model.

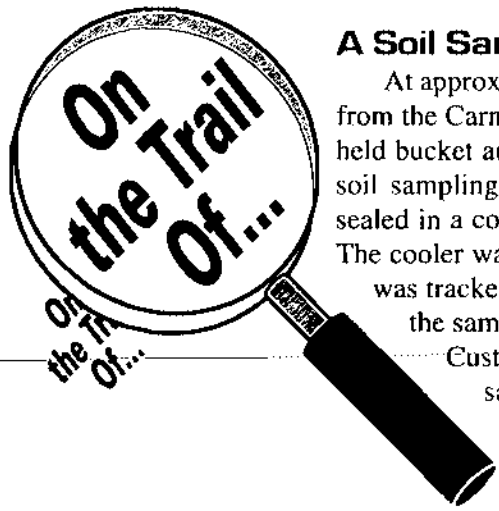
Prior to the soil sampling workshop, soil samples were collected from the Carnegie Center lawn, then prepared and packaged during the presentation. They were shipped off for laboratory analysis, and the results will be presented at a future public meeting.

The workshops were followed by an hour-long presentation from Dr. William Taylor of the U.S. Agency for Toxic Substances and Disease Registry (ATSDR), who discussed the recently concluded Health Consultation on the Miamisburg Community Park and Miami-Erie Canal. The Health Consultation Report was publicly released this fall to the Miamisburg Public Library. See the October 1993 issue of *Superfund Update* for further details.

The meeting was attended by members of the public and representatives from the U.S. Environmental Protection Agency, Ohio Environmental Protection Agency, U.S. Agency for Toxic Substances and Disease Registry, U.S. Department of Energy and EG&G Mound.

Dennis Gault, an EG&G Mound CERCLA Field Engineer, and Pete Ferron of Science Application International Technology, demonstrate the soil sampling process.

Alec Bray, a senior hydrogeologist at EG&G Mound, uses a groundwater model to demonstrate the rate and direction of groundwater flows.



A Soil Sample

At approximately 6:35 p.m.on the evening of October 20, 1993, soils were removed from the Carnegie Center lawn by a man in a hard hat and safety glasses using a hand-held bucket auger. Later that evening, during the CERCLA Quarterly Public Meeting soil sampling workshop, the soils were packaged into glass containers, labeled and sealed in a cooler along with a Chain Of Custody form showing origin of the sample. The cooler was wisked away late that night via overnight package delivery service. It was tracked to the Weston Analytical Laboratory in Lionville, Pennsylvania, where the samples had been logged in and checked against the corresponding Chain Of Custody form. Clues tell us that the laboratory has finished analyzing the samples for volatile and semi-volatile organic compounds, metals, inorganics, pesticides, polychlorinated biphenyls and radionuclides. The data is now being compiled and will be computer-generated.

Stay tuned for more on the trail of... a soil sample.

Kirkman

continued from Page 1

Prior to this appointment, Mr. Kirkman was Acting Area Manager of the Pinellas Area Office, which is responsible for overseeing the DOE Pinellas Plant contract with Martin Marietta Specialty Components, Inc.

Mr. Kirkman began his federal career in the early 1970s as an engineer for the former Department of Health, Education and Welfare and for the U.S. Army Corps of Engineers. Since then, he has worked for the DOE in management positions at the Albuquerque Field Office, Rocky Flats Area Office and Rocky Flats Plant in Denver, Colorado, and the Nevada Operations Office.

Mr. Kirkman earned a bachelor's degree in Mechanical Engineering from the South Dakota School of Mines and Technology in 1970 and is a registered Professional Engineer.

Clark

continued from Page 1

Mr. Clark's most recent positions were as Associate General Manager of EG&G Mound and Vice President of Facility Management.

Professional accomplishments include developing an environmental compliance program for EG&G Idaho and serving on the start-up staff for the Advanced Test Reactor.

Mr. Clark earned a bachelor's degree in mathematics from Idaho State University and is a registered Professional Engineer. He is active in Dayton area civic events.

Printed on Recycled Paper

Important phone numbers

EG&G Mound Applied Technologies
Environmental Restoration/
CERCLA Community Relations
Jolene Walker: 513-865-4140
U.S. Environmental Protection Agency
(Region V Headquarters, Chicago)
Diana Mally: 312-353-6287
Diane Spencer: 312-886-5867
(Superfund Community Relations)
Cheryl Allen: 312-353-6196
Ohio Environmental Protection Agency
(Dayton office)
Jeff Smith: 513-285-6035
Ohio Department of Health
(Columbus): 1-800-523-4439
(Radiological Section)
Larissa Gilham: 614-644-2727

CERCLA mailing list

Mound maintains a mailing list for people interested in the Mound CERCLA program. People on the list receive twice-quarterly issues of *Superfund Update*, notification of CERCLA-related meetings, Site Specific/Five Year Plan meetings and other DOE-related public affairs activities. If you wish to have your name added to this list, sign up at any of Mound's public meetings or send your mailing address to:

EG&G Mound Applied Technologies
c/o CERCLA Community Relations
P.O. Box 3000
Miamisburg, OH 45343-3000

MOUND
Environmental Restoration Program

EG&G Mound Applied Technologies
CERCLA Community Relations/Environmental Restoration
P.O. Box 3000
Miamisburg, OH 45343-3000

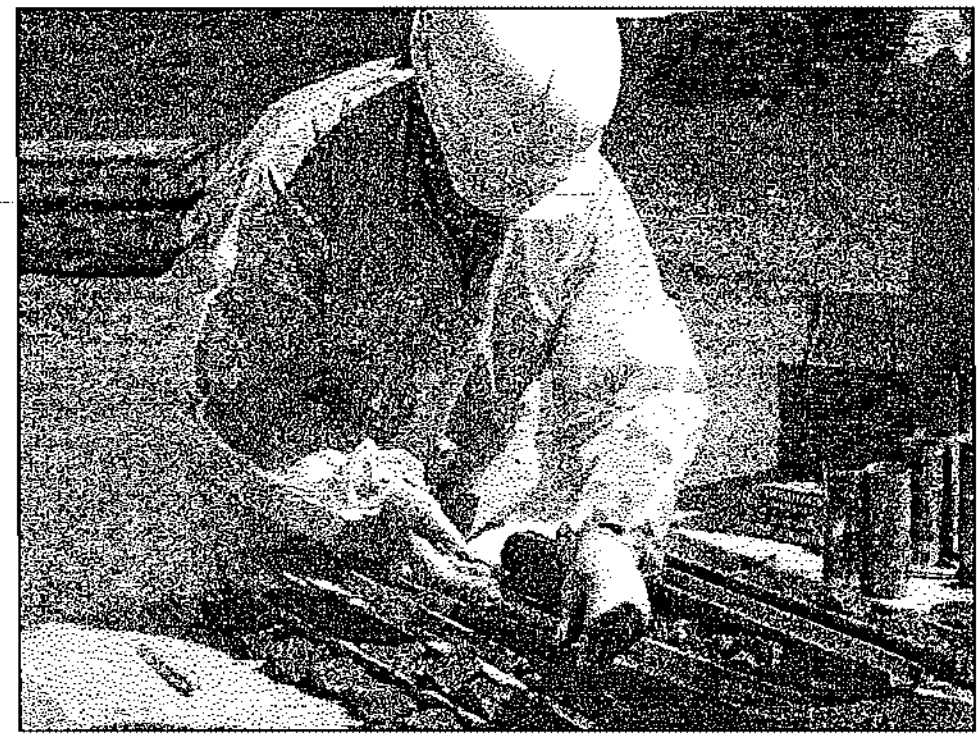
MOUND

Environmental Restoration Program

Soil Sampling Fact Sheet

October 1993

Soil sampling can be as simple as digging up dirt with a spade and hand trowel or as complex as drilling down hundreds of feet into the ground to take a core sample. Whatever the method, it's only one component in a lengthy and involved process. Preparations begin months beforehand to develop the sampling methodology, sampling locations, and health and safety measures in coordination with the USEPA and OEPA. The process ends after laboratory analyses are completed and evaluated, and a final report is prepared.



Examining soil cores from a split-spoon sampling device.

Soil sampling by hand auger—one of many sampling methods.

Purpose

- To answer the questions:
  - Is cleanup necessary?
  - If so, how should the cleanup proceed?
- How does sampling answer these questions?
  - Identifies which chemicals/radionuclides are present
  - Measures the quantity present
  - Identifies exact locations
  - Determines physical properties of soils to predict how fast materials move through it

Sampling Locations

- Determined by purpose of investigation
  - i.e. sampling in defined area of suspected or known contamination to characterize contaminants and their concentrations
  - i.e. sampling over broad regional area to determine whether a specific source contributed to contamination or to determine background levels of naturally occuring chemicals and radionuclides
- USEPA and OEPA scientific methodology used to determine frequency and actual locations for sample taking

Access agreements

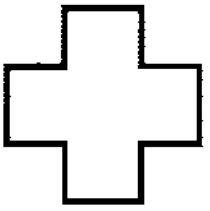
- Obtain permission from property owners to conduct soil sampling
- Includes private owners, City of Miamisburg, Miami Conservancy District and Conrail

Soil Samp

1 Preparation of Remedial Investigation Plans

- These plans describe types, methods, locations and health/safety measures for *all* field studies (i.e., soil, groundwater, surface water, ecological, air, etc.) scheduled during the Remedial Investigation.
- They are completed prior to beginning any fieldwork and are approved/reviewed by the USEPA and OEPA.

2 Site-Specific Training Just Prior to Beginning Fieldwork

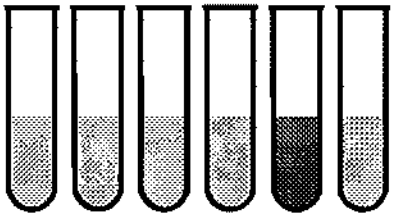


- On-site personnel must familiarize themselves with sampling methodology, appropriate safety attire and emergency procedures.
- "Tailgate" health and safety meetings are held daily prior to beginning sampling activities.

3 Sample Collecting

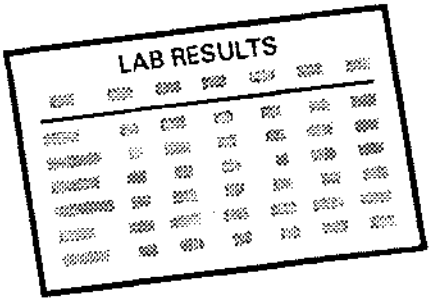
- Samples are co methods; samp decontaminate
- Depending on t samples and w usually can be couple of days
- If deep borehol must be plugge mixture; contar be replaced in b disposed of as

6 Laboratory Analysis



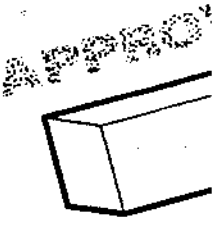
- Samples are analyzed for various chemicals and/or radionuclides per procedures specified in approved Sampling & Analysis Plan.

7 Lab Data Package Produced



- The lab completes its analysis.
- The results are prepared in a lab data package.

8 Analysis o Results



- The organizati the soil sampli results to ensu
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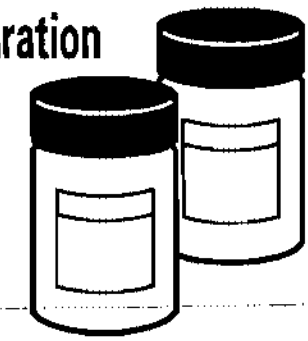
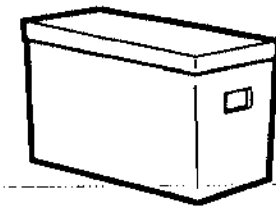
4 Sample Preparation



- Samples are prepared and labeled using approved methods.
- Duplicate samples and quality-assurance samples are prepared to ensure no new contaminants are introduced to soil samples at the site or during shipment to lab.
- Samples may be sent to Mound lab for quick analysis to ensure samples are safe for transport.

5 Sample Packaging



- Samples are packaged in an ice chest and maintained at 39°F to ensure integrity of samples.
- Chain-of-Custody Record is prepared to establish origin of soil samples; it accompanies samples to lab.
- Request for Analysis form is prepared to request laboratory analysis.
- All Department of Transportation (DOT) regulations for shipping the samples to the lab are followed.

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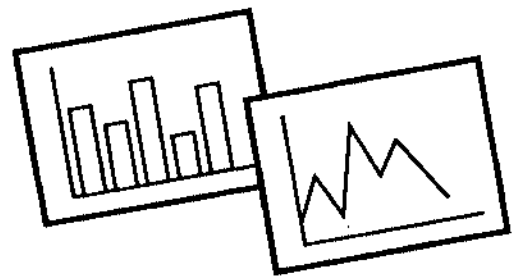
9 Preparation of Final Report

- A final report describing fieldwork and lab results is prepared.
- This report is made available to the public in the Public Reading Room/ Information Repository.

10 Interpretation and Use of Data



- The data is used in deciding if cleanup is necessary.
- The data is used in evaluating potential treatment technologies during the Feasibility Study.

Air monitoring during borehole drilling with a photo ionization detector used to detect volatile organic compounds (VOCs).

Sampling Methods

- Hand-powered tools (i.e. spade and hand trowel or hand auger) for surface or near surface sampling (0–1 feet)
- Tripod with hand-powered split-spoon sampling device for below-surface sampling (0–5 feet)
- Hydraulic-powered drill rig with sampling device (i.e. hollow-stemmed auger with split-spoon sampler) for deeper sampling (less than 80 feet)
- Hydraulic-powered drill rig and sampling device (i.e. rotary drill with split-spoon sampler) for deepest sampling (greater than 80 feet)

Health and Safety Measures Used During Soil Sampling

Pre-Fieldwork:

- Contact utility protection service to identify the location of buried utility lines.
- Conduct site survey to document any existing hazards (i.e. power lines, steep terrain, high chemical/radionuclide concentrations, etc.)
- Verify training and certifications of all on-site personnel (i.e. drillers, geologists, etc.)
- Hold a site-specific training meeting that details health and safety rules, emergency procedures, sampling plans, etc.

Fieldwork:

- Keep first-aid supplies on location; set up CB radio, mobile phone, walkie-talkie, etc., or know location of nearest phone; post emergency contact list.
- Rope or fence off work area to prevent unauthorized access. At suspected radiation sites, workers and equipment must be checked for radiological contamination before being allowed to leave the work area.
- During the drilling and sampling process, monitor air with special equipment for detecting volatile organic compounds and combustible gas (i.e. methane), as well as radioactivity if sampling at a suspected radiation site. If excessive levels are indicated, stop work and evaluate situation before proceeding.
- Hold daily "Tailgate" health and safety meetings

MOUND
Environmental Restoration Program

SUPERFUND Update

EG&G

October 1993

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CERCLA Quarterly Public Meeting

Wednesday, October 20, 1993
7:00 pm
Carnegie Center
426 E. Central Ave.
Miamisburg, Ohio

Upcoming Public Meeting Goes Underground...

Recent investigations into groundwater and soils will be discussed and demonstrated at the October 20 public meeting using a working groundwater model, illustrations, and equipment used in sampling fieldwork.

The fieldwork to be discussed was conducted for the Hydrogeologic Investigation and the Site-Wide Soils Investigations. Both of these investigations are important steps in the identification of possible contamination and the ways it could move through the local environment.

After a short break following the workshop, Dr. William Taylor of the U.S. Agency for Toxic Substances and Disease Registry (ATSDR) will present the findings of ATSDR's recently completed Health Consultation. The Health Consultation examined the possible health risks posed by contamination in the Miami-Erie Canal and Community Park.

CERCLA Profile: DOE On-Scene Coordinator for Mound

Arthur W. Kleinrath has managed the U.S. Department of Energy's CERCLA Program at the Mound Plant since its inception in 1990.

As On-Scene Coordinator/Remedial Project Manager, Mr. Kleinrath oversees the Superfund cleanup by EG&G Mound. His primary responsibilities include: planning and implementing removal and remedial actions, ensuring regulatory compliance on all cleanup activities, and negotiating with federal/state/local agencies and Mound Plant personnel on cleanup issues. He is assigned to the DOE's Dayton Area Office.

Arthur W. Kleinrath

"In contrast to many DOE sites, Mound is basically clean. As much of our characterization effort is in demonstrating areas are clean as is in determining the areas that are contaminated," states Mr. Kleinrath. "The Area Office has the unique and difficult task of balancing the environmental issues, budget issues, and conversion of Mound's Mission."

Before coming to the Mound Plant, Mr. Kleinrath worked five years as a Remedial Project Manager for the U.S. Environmental Protection Agency's Chicago office (Region V). While there, he negotiated the first Federal Facility Agreement under the reauthorized CERCLA statute and initiated the first incineration of PCB-contaminated materials in the state of Minnesota.

Mr. Kleinrath also has worked for a natural gas utility and several environmental consulting firms.

He earned a B.S. in Resource Systems Management from the University of Michigan in 1972 and an M.S. in Environmental Engineering from the University of Florida in 1974.

Mr. Kleinrath regularly attends Mound CERCLA quarterly public meetings to make presentations, lead discussions and answer questions or take comments on cleanup activities.

ATSDR Completes Health Consultation, Prepares for Public Health Assessment

The U.S. Agency for Toxic Substances and Disease Registry (ATSDR) was asked by the U.S. Department of Energy in May 1992 to conduct a Health Consultation on the Miami-Erie Canal and Miamisburg Community Park. The objective was to determine whether soil and surface water contamination in those areas posed a health threat to the Miamisburg community.

The consultation was conducted using city records, interviews and historical Mound Plant environmental data. It resulted in the following determinations, which are outlined in further detail in the consultation report.

- Levels of plutonium-238 are not a public health hazard.
- There are insufficient environmental data on non-radioactive wastes (i.e. heavy metals, pesticides, etc.) and radioactive materials other than plutonium-238 to determine whether a public health hazard exists.
- There are insufficient environmental data on fish in Community Park's South Pond to determine whether a public health hazard exists. There is no indication that any non-radioactive contamination or other radioactive contamination is present in the park.

Based on these determinations, the consultation report recommends the following:

- Conduct additional tests on surface soils, surface waters and air.
- Prohibit fishing in South Pond until the fish have been sampled, analyzed and determined to be safe for consumption. Miamisburg has not allowed fishing in the South Pond since the spring of 1993.

Contamination reached the canal and park areas following a 1969 underground pipe rupture at the Mound Plant. Before the cleanup could be completed, heavy rains washed soils contaminated with plutonium-238 off the plant property and into the canal area. Other plant run-off over the years may have further contaminated the canal.

ATSDR currently is planning its CERCLA-mandated Public Health Assessment of the Mound Plant. This in-depth health assessment will kick-off with public availability meetings scheduled from 10:00 am – 2:00 pm and 4:30 pm – 8:00 pm, Tuesday, November 9 and 10:00 am – 2:00 pm, Wednesday, November 10, 1993 at the Carnegie Center in Miamisburg, Ohio.

Miami-Erie Canal looking south. Cul-de-sac at left is in Community Park.

ATSDR documents to be released this fall

The Health Consultation Report and the Radiation Survey Work Plan will be released this fall. Both reports will be made available to the public in the CERCLA Information Repository at the Miamisburg Public Library. Dr. William Taylor of ATSDR will discuss the Health Consultation Report following the CERCLA quarterly public meeting on October 20, 1993.

Also planned are a Mound area radiation survey by the National Air and Radiation Environmental Laboratory and an analysis of existing community health data by personnel from the Boston University School of Public Health. The radiation survey will involve collection and analysis of groundwater, surface water, air and vegetation samples from areas with public exposure potential.

After completion of the survey and health data analysis, the Public Health Assessment will be prepared by ATSDR. Before it is finalized, a public comment release copy will be made available to the public.

ATSDR, a branch of the Public Health Service within the U.S. Department of Health and Human Services, was created by Congress under the 1980 CERCLA statute. Its major responsibilities include Public Health Assessments at National Priority List sites, toxicological research, emergency response in public health emergencies, and a registry of diseases/illnesses in persons exposed to toxic substances. Based in Atlanta, ATSDR also performs Health Consultations in response to specific health questions.

(This information supplied by ATSDR.)

☑ Progress Report—Hydrogeologic Investigation

The recently completed Hydrogeologic Investigation fieldwork was an extremely important part of the Mound's CERCLA Program as a whole. Hydrogeologic *describes studying the interaction of groundwater with underground soil and rock. The Mound's ongoing Hydrogeologic Investigation concentrates on finding and assessing any contaminated groundwater possibly flowing into the Buried Valley Aquifer (BVA), a vast deep layer of water-permeable sand and gravel deposited atop local bedrock during the Ice Age. The BVA underlies the Miami Valley and supplies drinking water to regional communities, including Miamisburg.*

Purpose

Groundwater moving from localized areas on the Mound Plant site and entering the BVA is a significant "pathway" through which contaminants from Mound could come in contact with the community. Understanding the nature of local groundwater requires not only measuring flow direction and rate, but also "mapping" sub-surface features—bedrock, soil, sand and other materials—through which the water flows.

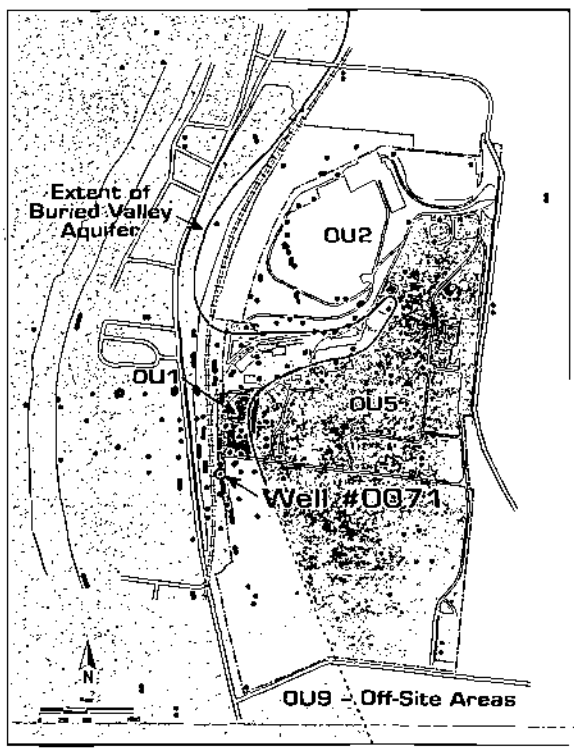
Years of groundwater monitoring at Mound have provided substantial information on the hydrogeologic features beneath Mound Plant and its vicinity. Yet further study was necessary to clarify the hydrogeology of many areas important to Mound's CERCLA Program.

Well Installation

A total of 99 monitoring wells and piezometers were installed on and around Mound Plant within two of Mound's cleanup study areas—Operable Units 1 and 9 (see map, below).

The wells are being used to characterize the aquifer, a task that required more data than was available from previous studies. "Characterization" means forming a detailed picture of the physical makeup and possible contaminants within a given environmental system. Characterization undertaken by the Mound Hydrogeologic Investigation includes the study of:

- composition and layering of bedrock underlying and surrounding the Buried Valley Aquifer
- other subsurface influences on groundwater flow
- water quality within a suspected contaminated groundwater plume originating from an old open burning disposal area in OU1 (see map)
- water quality in areas of the BVA with no suspected contamination from Mound Plant to determine "background" levels.



The Hydrogeologic Investigation will provide data for four Operable Units. Shown are many of the wells in Mound's network and the capture well (#0071) used in the OU1 Aquifer Test (see page 4), as well as the local extent of the Buried Valley Aquifer.

Investigative Activities

Drilling, installation and equipping of the newest group of wells began in October 1992 and was completed in April of this year. After boreholes were drilled, the wells themselves were installed. Finally, certain wells were equipped with electronic instrumentation that provides groundwater data used in the calculation of the rate at which groundwater moves beneath the areas being tested.

Soil and rock samples obtained during drilling are being analyzed for their physical properties, as well as for the presence of chemicals and radionuclides; results will be published in 1994.

After the wells were installed, an aquifer test began (see **OU1 Aquifer Test**, page 4). Regular sampling of newly installed off-site wells began during September. Water quality analysis from these wells will be used to determine whether slow movement

(Please see Investigation, Page 4)

Testing Wells Defined

Monitoring Well

A well installed into an aquifer, from which samples are collected to test water quality. A monitoring well typically has a diameter of four inches and may be sampled from and pumped to test water quality.

Piezometer

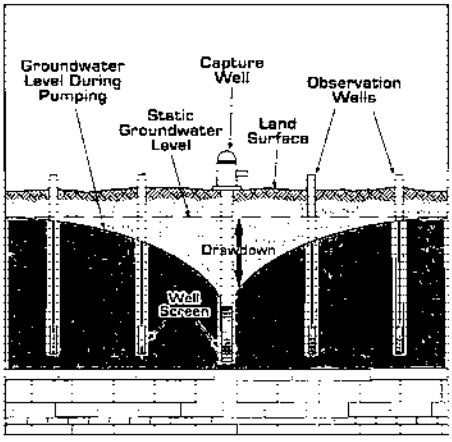
A tube or pipe installed into an aquifer used to measure the elevation of the water table. A piezometer typically has a diameter of two inches. Water quality samples may be taken from some piezometers, but piezometers are generally not pumped.

Investigation

continued from Page 3

of contaminants into the aquifer from areas within Mound plant is occurring. Additionally, water levels in ten Operable Unit 9 wells will be monitored continuously by the electronic instrumentation installed on them to assess long-term and seasonal rates of groundwater flow.

Information from the Hydrogeologic Investigation eventually will be used in the investigations of additional Mound Operable Units. Background levels for water quality established by OU9 will be compared to quality levels measured in the future for the investigations into OU2, Main Hill; and OU5, South Property. Along with OU1, these two Operable Units cover the entire area within the Mound Plant (see map, previous page).



During the OU1 Aquifer Test, groundwater was pumped from one well and the effects on the water table were measured by surrounding observation wells.

OU1 Aquifer Test

The Aquifer Test began in mid-May for use in the investigation of Operable Unit 1, Area B. One special well measuring approximately two feet in diameter was pumped continuously for 30 days. This well is referred to as the *capture well*.

Up to 800 gallons of groundwater per minute were drawn from the capture well, located on-site near Mound's western boundary, during the continuous pumping period. This water was

(Please see Investigation, Page 8)

Remodeling the Buried Valley Aquifer

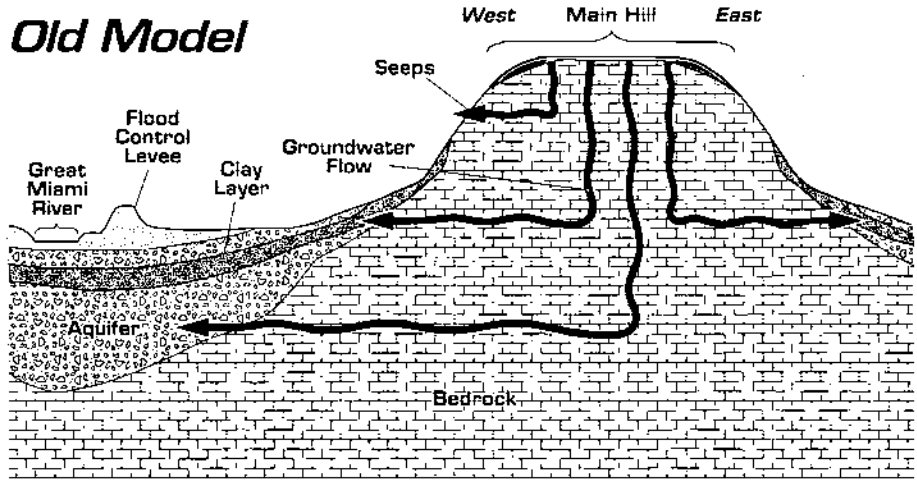
Early results of the Hydrogeological Investigation include an important rethinking of the Buried Valley Aquifer in the vicinity of Mound Plant.

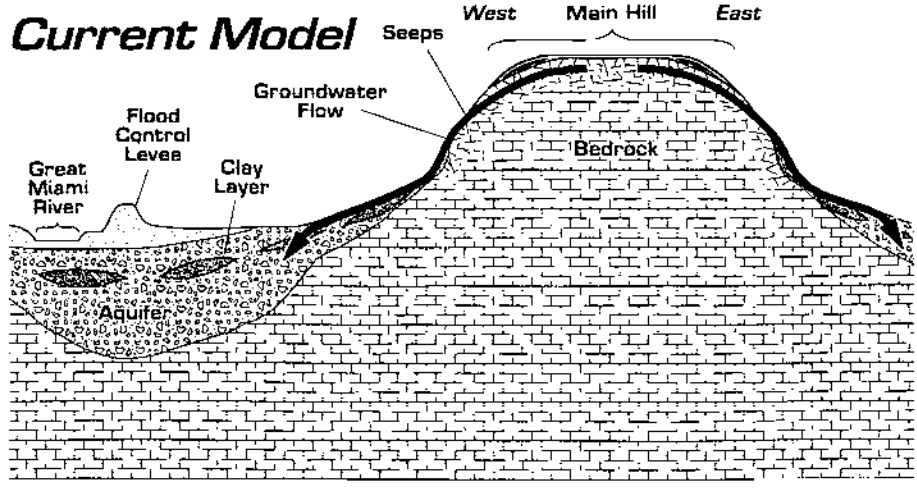
Until this year, the conceptual model of the BVA, postulated from years of previous testing, showed that groundwater moving downward through soils on the plant's Main Hill entered the aquifer through fractures in the underlying bedrock in addition to seeping through the surface at several places on the hill. The model also divided the aquifer area into an upper and lower aquifer separated by an impermeable layer of hard clay.

This year's well drilling has produced information contradicting the old groundwater model. Significant differences include:

- Fractures in the bedrock decrease with depth, meaning potentially contaminated groundwater seeping from the Main Hill does not reach the aquifer directly through bedrock, as previously thought.
- The clay layer does not restrict movement of groundwater between the deeper and shallower portions of the aquifer. Instead, there is one huge aquifer partially underlying a portion of the Mound, and not two layered aquifers.

These new conclusions affect the way potential contaminant transport through groundwater will be evaluated in future investigations. These investigations will determine how much contamination possibly is being carried from Mound into the BVA, where the contamination might enter the BVA and how it might move from the BVA into the Great Miami River.



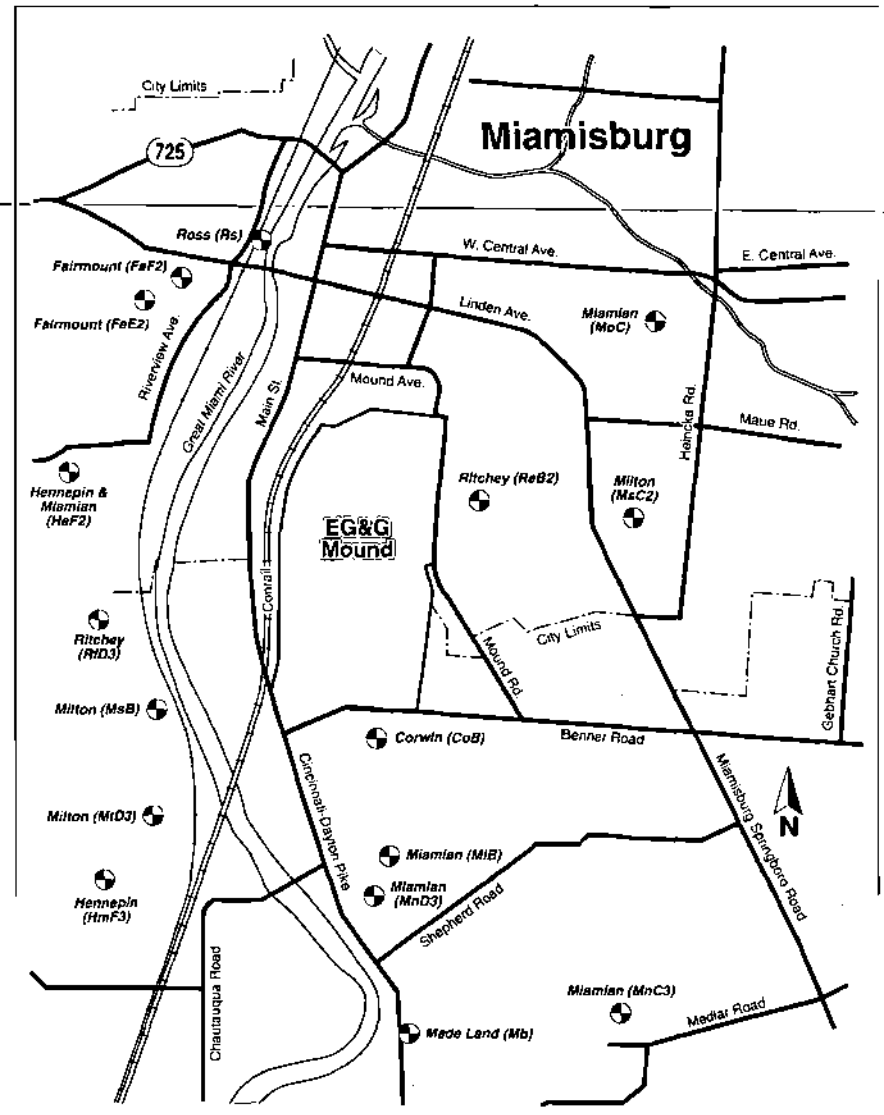


Background Check—Area Soils

The background soil sampling conducted this summer marks an important step in Mound's Remedial Investigation. It is the first of four off-site soil investigations in the effort to assess the nature and extent of possible contamination that may have resulted from past operations at Mound Plant.

"Background" describes the normal conditions of an area's environment. The establishment of background levels is a necessary part of any environmental investigation into the effects of possible contamination. The Background Soils Investigation at Mound seeks to establish the normally occurring levels of several important chemicals and radionuclides in regional soils. Samples were taken from soils thought to be unaffected by Mound's operations. The settling of air emissions from plant stacks is the primary way that Mound's past operations could affect the composition of radionuclides in local soils.

Mound has conducted background soil sampling and results are published in the annual Mound Site Environmental Report. The current CERCLA sampling is much more extensive and looks at a long list of non-radioactive chemicals.



Sixteen locations of recent background soils sampling and corresponding soil types.

Varying Backgrounds

Establishment of local background levels is necessary because soil composition can vary widely among regions. Differences in the concentrations of naturally occurring chemicals and naturally occurring radioactive elements, in addition to materials placed in soils by man-made sources such as industry and agriculture, determine an area's soil background. Even a potential contaminant like plutonium occurs in soils due to fallout from nuclear testing.

The Mound Site-Wide Soils Investigation used U.S. Department of Agriculture references to identify 8 different soil types and 16 different mapping units within the study area.

Background and Cleanup

Cleanup decisions under CERCLA are made based on any excess risk posed to human health and the environment by contaminants in concentrations above the background level. It is important to note that background levels are not contaminant-free. Few environments today are wholly "clean" (as a result of modern life). Background levels are accepted as normal conditions and for practical purposes must be the starting point for investigations into excess contamination.

Scientists specializing in risk assessment then calculate the potential for any excess contaminants to reach people and wildlife through the environmental "pathways" found in the community. Soil is considered a potential pathway because food is grown from it, animals and children may eat it and people such as farmers are in regular contact with it.

Background Sampling Fieldwork

A total of 96 soil samples were taken regionally in July and August by the Mound CERCLA Program to establish background levels. At each of the 16 mapping units, 3 surface soil samples were collected and 3 subsurface samples were

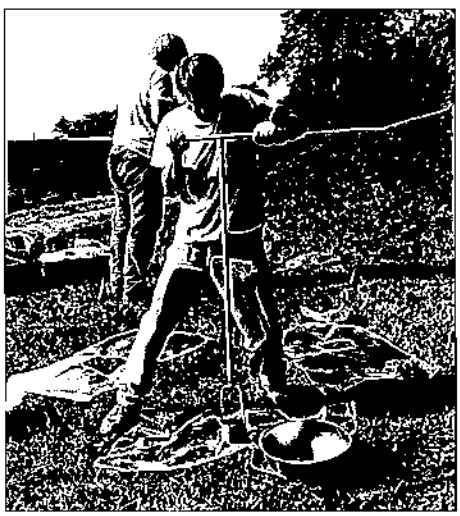
(Please see Soils, Page 6)

Soils

continued from Page 5

collected from a depth of 2 feet (See sampling locations map, previous page). Sampling locations were chosen after a study of wind directions and depositional patterns to avoid soils containing material deposited from Mound's stacks.

Samples were collected at depths from 0-2 feet using stainless steel spades or hand augers, as shown below. Some samples for the Background Soils Investigation were collected in conjunction with the Ohio EPA, which will analyze its samples independently to check against the results of Mound's analysis.



Surface soil sampling with a hand auger.

Analysis of Background Levels

Samples collected for the Background Soils Investigation are currently being analyzed to determine normal perameters for the following constituents:

chemicals

pesticides, PCBs, inorganic compounds, bismuth, fluoride, organic carbon, nitrate/nitrite, chloride, sulfate, pH

radionuclides

isotopic plutonium, thorium, uranium; tritium; strontium-90; gamma emissions

Background analysis and data validation will be completed in mid-1994.

Special Canal Sampling Report Released

The Special Canal Sampling Report was issued in July 1993 and is available for review in the CERCLA Information Repository at the Miamisburg Public Library.

As part of the CERCLA investigation, a special sampling of the Miami-Erie Canal was conducted in 1992. The objective was to determine whether mixed waste is present in the Canal. Mixed waste contains both radioactive and hazardous waste.

Using split-spoon soil sampling, 88 separate samples were taken at depths from zero to five feet. These samples were analyzed for:

- Volatile Organic Compounds (VOCs) – Carbon containing compounds that evaporate readily at room temperature. These include paint thinners and strippers, Benzene and Acetone.
- Semi-Volatile Compounds (SVOCs) – Similar to VOCs above, these include Freon and coal tar.
- Pesticides - Any of many chemicals used to destroy pests; both insect and animal.
- PCBs – Polychlorinated biphenyl. Any of a group of compounds containing chlorine and the biphenyl molecule previously used in industry and manufacturing.
- Metals – Includes lead, copper, nickel, and chromium, among others.
- Selected radionuclides – Plutonium, tritium, thorium, uranium, and others that were known to have been onsite at Mound.

All sampling activities followed EPA, DOE, and Mound Environmental Restoration standards, procedures and guidelines.

The results show there are no significant amounts of mixed wastes in the Canal. The location and amounts of radiological contamination are consistent with the findings of earlier studies conducted since the waste line break in the late 1960s. Low concentrations of non-radiological chemicals were found in both the North and South Canal.

Other findings of interest: there were no VOCs detected in the Canal. The low levels of other potentially hazardous chemicals found in isolated locations in the Canal are not believed to have originated from Mound Plant. Slightly elevated levels of lead found along the western edge of the Canal are thought to be from traffic on State Route 25. The report states, "Because lead is a byproduct from internal combustion engines, it is assumed that the canal contamination is the result of automobile emissions from Dayton-Cincinnati Road traffic".

What is Mixed Waste?

Mixed waste contains both hazardous and radioactive waste in any combination or ratio. However, this combination of hazardous and radioactive waste does not increase the risk to health or the environment. Rather, the problems posed by mixed waste begin after cleanup.

Because they are controlled by separate regulations and agencies under federal law, radioactive and hazardous wastes require different methods of treatment and disposal. Mixed waste must be stored in special containers, transported under special arrangements and permits, and disposed of at specialized facilities, of which there are few. The cost and difficulty of handling and treating mixed waste make it a special environmental problem. Thus, when the possibility of mixed waste exists on a cleanup site, special testing must be performed before the contamination may be cleaned up. It is because mixed waste was suspected in the Miami-Erie Canal that the Special Canal Sampling project was conducted.

Public Reading Room – An Upcoming Change

Due to space limitations and increased numbers of documents being received from the Department of Energy at the Miamisburg Branch of the Dayton-Montgomery County Library, the DOE Public Reading Room, which includes the Information Repository and Administrative Record, will be moving in the near future.

The vast amount of documents coming in and the limited space in the library has necessitated a move of the operations.

EG&G Mound Applied Technologies is currently working with the City of Miamisburg to open a new Public Reading Room at the Miamisburg Senior Adult Center, located at 305 E. Central Avenue in Miamisburg.

In order to transfer current documents from one site to another, it may be necessary to close the Public Reading Room for a short period of time. When this action is to be taken, an advertisement will be placed in the *Miamisburg News* and the *Dayton Daily News* with a planned opening date of the new room and hours of operation.

Questions on the Public Reading Room should be directed to Mound CERCLA Community Relations at (513) 865-4140.

Two New Site-Scoping Reports Available in Library

Two new Site-Scoping Reports were completed during 1993. This brings the total of scoping report volumes now available to 11. New Site-Scoping Reports Volumes 3 and 7 can be found for review in the Information Repository at the Miamisburg Public Library.

Beginning an environmental restoration of an area brings two questions immediately to mind. The first: "How do program planners know what to look for?" Secondly: "Where do they look?" To begin to answer these questions the Site-Scoping Reports were generated. The purpose of these reports is to collect all existing data in one place, analyze the data and use the information when developing work plans, planning sampling, or defining potential hazards. Specifically, these reports identify:

- potential contaminants that should be looked for in the CERCLA Program
- specific areas that have potential for contamination

Data for these reports was obtained through extensive review of plant records, including studies, reports, proposals, correspondence and engineering records and through interviews with employees, both current and retired. The various production processes used at Mound were examined to determine chemicals that may have been used in these processes and thus become candidates for inclusion in the investigation.

Site-Scoping Report Volume 3, "Radiological Site Survey," summarizes possible radiological contamination derived from the polonium, plutonium, thorium, uranium, radium, and tritium programs at Mound. Volume 3 summarizes the radiological characterization completed during the Mound Site Survey Project. The Site Survey Project, conducted from 1982-1985, was undertaken in response to a DOE request to estimate the cost and time required to stabilize or remove radioactively contaminated soils within the Mound Plant boundary. The survey only documented exposed land areas and did not study buildings. Record searches and employee interviews identified 19 original areas of concern. The Site Survey Project Report was issued in 1988.

Volume 3 gives an overview of the Mound areas used for the processing, treatment, storage, and disposal of radioactive materials and what level of contamination, if any, was identified by the Site Survey Project.

Site-Scoping Report Volume 7, "Waste Management," provides a detailed, historical background of Mound operations with a focus on waste generation, treatment, storage, and disposal over the life of the plant, from its beginnings in the 1940's to its operations in the late 1980's. These discussions include both historical and current practices, methods and locations.

The report contains descriptions of waste activities involving the main projects and the plant support facilities. Volume 7 includes details about the projects summarized in Volume 3, and other scoping reports, and includes:

- overview of the project activity, including dates for all activities
- descriptions of methods and processes used in these projects
- wastes generated and disposal practices

In addition to major projects that generate waste, Volume 7 discusses the wastes generated by support facilities and operations, such as power and water facilities, plating and paint shops, maintenance shops, heating and cooling, sanitary wastewater treatment, photoprocessing, analytical laboratories, Decontamination & Decommissioning Program, and the Environmental Monitoring Program.

Site Scoping Reports available for review in the Information Repository currently located at the Miamisburg Public Library:

Volume 1, Groundwater Data
Volume 2, Geologic Log and Well Information Report
Volume 2, Addendum, Stratigraphic and Lithologic Logs
Volume 3, Radiological Site Survey
Volume 4, Engineering Map Series
Volume 5, Topographic Map Series
Volume 6, Photo History Report
Volume 7, Waste Management
Volume 8, Environmental Data
Volume 9, Annotated Bibliography
Volume 10, Permits and Enforcement Actions
Volume 11, Spills and Response Actions
Volume 12, Site Summary Report (under development)

Investigation

continued from Page 4

routed through a plant effluent line and discharged under permit to the Great Miami River.

Pumping the capture well temporarily lowers the water table, and the amount of this "drawdown" is measured at neighboring wells installed in the aquifer. Also, the rate that the water table returns to normal after pumping ceases is measured. To measure the rate of groundwater flow during pumping, a non-toxic "tracer" chemical was introduced into the aquifer from an on-site well and monitored at the capture well. Samples to test the quality of groundwater moving to the capture well were taken throughout the pumping.

This aquifer test was conducted using a network of 52 monitoring wells and piezometers on or near Mound's western side. The aquifer test ended June 28 and marked the end of fieldwork for the OU1 Remedial Investigation.

If a remedial action is necessary, the results of the Aquifer Test will be used in selecting the appropriate remedial action or cleanup process.

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Important phone numbers

EG&G Mound Applied Technologies
Environmental Restoration/
CERCLA Community Relations
Jolene Walker: 513-865-4140
U.S. Environmental Protection Agency
(Region V Headquarters, Chicago)
Diana Mally: 312-353-6287
Diane Spencer: 312-886-5867
(Superfund Community Relations)
Cheryl Allen: 312-353-6196
Ohio Environmental Protection Agency
(Dayton office)
Jeff Smith: 513-285-6046
Ohio Department of Health
(Columbus): 1-800-523-4439
(Radiological Section)
Larissa Gilham: 614-644-2727

CERCLA mailing list

Mound maintains a mailing list for people interested in the Mound CERCLA program. People on the list receive notification of CERCLA-related meetings, Site Specific/Five Year Plan meetings and other DOE-related public affairs activities. If you wish to have your name added to this list, sign up at any of Mound's public meetings or send your mailing address to:

EG&G Mound Applied Technologies
c/o CERCLA Community Relations
P.O. Box 3000
Miamisburg, OH 45343-3000

MOUND
Environmental Restoration Program

EG&G Mound Applied Technologies
CERCLA Community Relations/Environmental Restoration
P.O. Box 3000
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MOUND
Environmental Restoration Program

SUPERFUND Update

EG&G

July/August 1993

Mound Faces Budget Cuts

Because of broad reductions in federal spending, Mound Plant is expecting to receive from DOE only 60 percent of the funding requested for its Environmental Restoration/CERCLA Program. Of $27 million requested for Fiscal Year 1994, Mound is expected to receive approximately $17 million.

Risk-Based Priorities

This shortfall will affect the scheduling of investigative and cleanup activities. To compensate, Mound's Operable Units (OUs)—geographic divisions of the total cleanup project—have been ranked in high, middle and low priority categories for funding. (See Page 2 for map of Mound's Operable Units and chart showing schedule impacts of the expected cuts.)

High Priority—OU1 and OU9

Because both Operable Units deal primarily with the movement off-site of potentially contaminated groundwater, they were given highest priority for funding.

OU1 addresses potential contamination from the part of Mound Plant known as Area B, which contains an historic landfill, the site's sanitary landfill and a retention pond for excess stormwater moving though the plant drainage system. OU9 addresses all off-site contamination not addressed by other Operable Units and all ecological concerns. OU9 also integrates the work from all other OUs to represent the impact of the total site-wide cleanup project.

The Remedial Investigation and cleanup of OU1 is planned to continue as scheduled before the funding cuts were expected. The overall OU9 budget would not be cut under the current plan; however, the final completion date for OU9 would be extended because of delays resulting from funding cuts in other Operable Units.

Middle Priority—OU4 and OU6

Operable Unit 4 was assigned medium priority because the contamination in the Miami-Erie Canal bed, though located beyond the plant's western boundary, is not spreading. In addition, studies conducted since 1974 have all concurred that it presents no imminent threat to human health and the environment. Investigative fieldwork for OU4 will continue through FY94 to confirm these conclusions.

Though considered middle priority, OU6 will receive full funding as previously scheduled because its cost demands are low compared to the other Operable Units and lack of funding could hold up the Mound Decontamination and Decommissioning (D&D) Program. OU6 involves verifying the cleanup of facilities on-site under the D&D Program, which is run by DOE and is not part of the Superfund Program. However, sites remediated under D&D must meet cleanup standards established by Superfund under the terms of the Federal Facilities Agreement signed by DOE, USEPA and Ohio EPA.

(Please see Funding, Page 2)

CERCLA Profile: OEPA Site Coordinator for Mound

Jeffrey R. Smith became the Ohio Environmental Protection Agency (OEPA) Site Coordinator for Mound in July. He replaces Martha Hatcher, who has been Mound's OEPA Site Coordinator since 1990. Ms. Hatcher has taken another position within OEPA.

Jeffrey R. Smith

As Site Coordinator, Mr. Smith reviews all CERCLA Program documents and decisions, evaluating their compliance with CERCLA and applicable state laws. He will continue to supervise OEPA's periodic oversight of sampling activities related to the Remedial Investigation. As did Ms. Hatcher, Mr. Smith will regularly attend Mound's quarterly CERCLA public meetings to answer questions and take comments on OEPA's role in the

(Please see Profile, Page 7)

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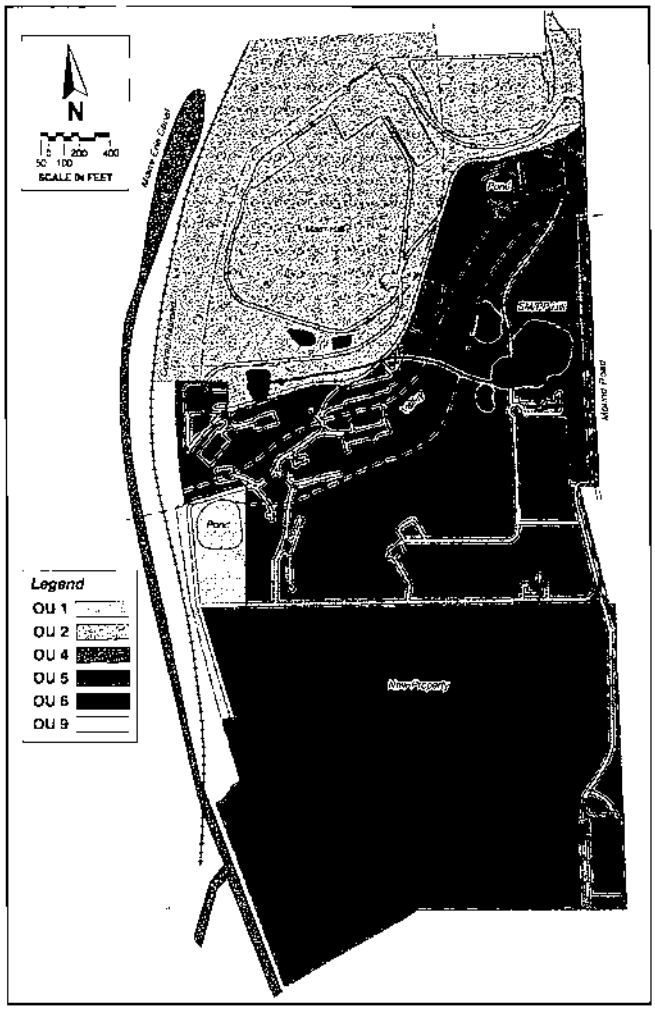
CERCLA Operable Units 1993



Mound Not Alone in Budget Cuts

The budget cuts expected at Mound are being felt at other DOE cleanup sites as well. Cleanup programs at Defense Department sites and other federally funded cleanup programs are experiencing similar budget restrictions. The budget cuts result from overall cuts in federal spending intended to reduce the federal defecit.

The cuts will ultimately be made by Congress based on the budgets proposed by DOE and other federal departments. A Congressional Conference Committee met to evaluate differences between the House and Senate versions of the federal budget for Fiscal Year 1994 before it was passed by Congress in early August.

The DOE and other federal departments have made proposed cleanup budget cuts matching the recommendations of a special study group convened to address public participation in federal environmental programs. Called the Federal Facilities Environmental Restoration Dialogue Committee, this group recommended in its February 1993 report that if cuts need to be made in cleanup budgets, all sites within the federal department administering the cleanups should receive proportional cuts in the interest of fairness. (For more on the findings of the FFER Dialogue Committee, please see "A Stake in the Future of Mound," page 6.)

Funding

continued from Page 1

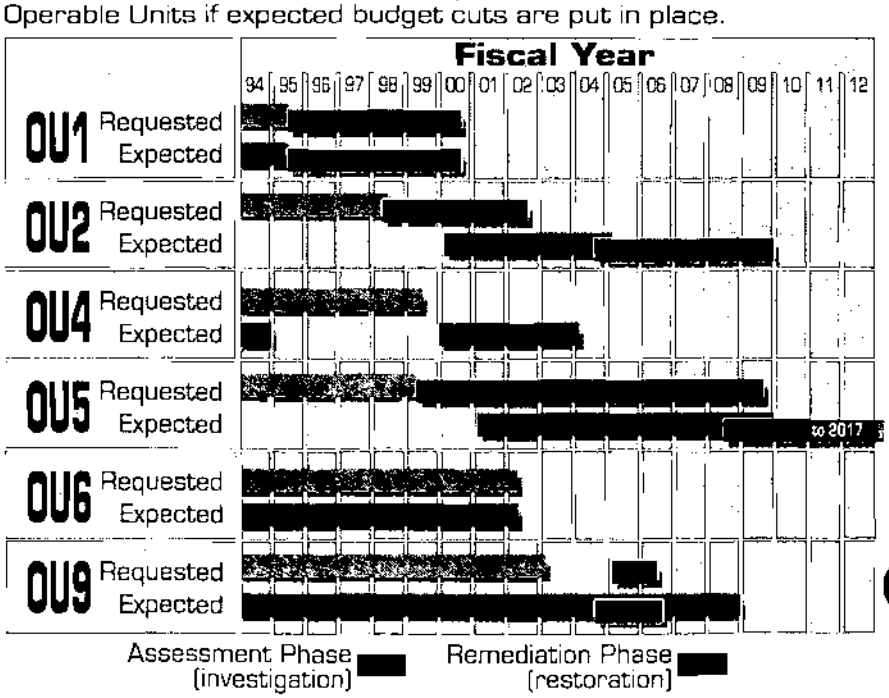
Low Priority—OU2 and OU5

Because both of these Operable Units primarily address mostly immobile on-site soil contamination and do not present any imminent threat to the public or the environment, OUs 2 and 5 have received lowest funding priority; their investigation and cleanup could be delayed several years.

OUs 2 and 5 cover all land area within Mound Plant except for Area B, which is covered by OU1, and the isolated areas on-site covered by OU6. The seeps on the Main Hill are located in OU5 and are considered potential sources of contaminated groundwater migration. However, these seeps are constantly monitored and the risk of potentially harmful migration of contaminants from these OUs is considered lower than the potential risk posed by the other OUs ranked higher in priority.

Schedule Impacts Expected From FY94 Budget

This chart shows the possible delays in work in the Mound Operable Units if expected budget cuts are put in place.



ATSDR to Release Health Consultation on Canal & Park

The Agency for Toxic Substances and Disease Registry (ATSDR) plans to release its Health Consultation for the Miami-Erie Canal and Community Park in the near future. This report will discuss whether contamination of the Canal from Mound Plant operations may have resulted in public health problems. The Health Consultation's release will be advertised and a public meeting will be held to discuss its conclusions.

ATSDR Health Consultations are conducted through analysis of previously existing environmental data. The agency has not conducted field work independent of the ongoing Remedial Investigation under CERCLA. For the Mound Plant Health Consultation, ATSDR used data supplied by DOE, the USEPA, local newspaper articles and other sources.

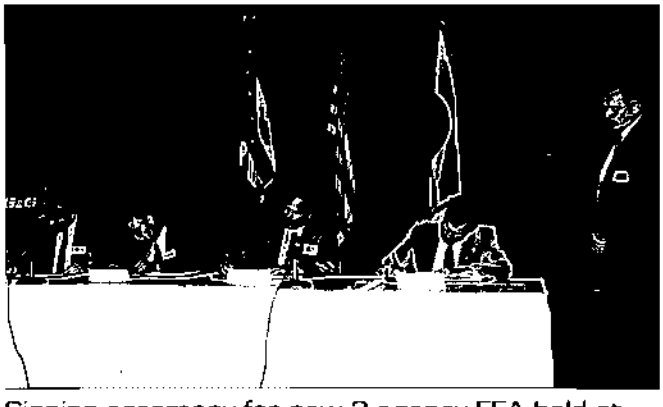
Dr. William H. Taylor of ATSDR, profiled in the March issue of "Superfund Update," has regularly attended Mound quarterly public meetings and has discussed health concerns with community members, including officials from the City of Miamisburg and the Miamisburg Environmental Safety and Health (MESH) group.

ATSDR was created in 1980 by Superfund

(Please see Health Consultation, Page 7)

Historic Miami-Erie Canal bed between Old Route 25 (left) and Community Park (right).

Ohio EPA Signs 3-Agency Federal Facilities Agreement (FFA) for Mound



Signing ceremony for new 3-agency FFA held at EG&G Mound.

On July 15, 1993 the Department of Energy (DOE), U.S. Environmental Protection Agency (USEPA), and the Ohio Environmental Protection Agency (OEPA) met to sign a Federal Facilities Agreement (FFA) for the Mound Plant Superfund site in Miamisburg. The agreement is based on the existing two party agreement signed in 1990 by the USEPA and DOE. The new agreement includes OEPA as a full participant in a formal manner.

The Mound cleanup activities are conducted under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980. Known as "Superfund," CERCLA is the federal government's environmental cleanup law for addressing the results of past practices that may not be compatible with current standards. The FFA defines the responsibilities of all parties involved in the Superfund cleanup.

The general purpose of this agreement remains the same as the original FAA: to ensure that the environmental impacts associated with past and present activities at the plant are thoroughly investigated and appropriate remedial action is taken to protect public health, welfare and the environment; establish a procedural framework and schedule for developing, implementing, maintaining and monitoring appropriate response actions at the site; and facilitate cooperation, exchange of information and participation between DOE, USEPA, and OEPA.

DOE will provide funding to OEPA for both past and future oversight and monitoring expenses related to governmental cleanup activities. It is estimated that future oversight and monitoring cost will total $5.5 million dollars for the five-year period beginning with FY93.

The USEPA is accepting public comments on the Mound Plant Superfund Site Federal Facilities Agreement with DOE and OEPA. Written comments on this agreement will be accepted from July 30, 1993 postmarked no later than August 29, 1993 addressed to:

Diane Spencer
U.S. Environmental Protection Agency
77 West Jackson Blvd.
Chicago, Illinois 60604
312/886-5867
or Toll-Free 1-800-621-8431

Copies of this agreement, related documents, and the Administrative Record are available for review at: Miamisburg Public Library, 35 South 5th Street, Miamisburg, OH 45342.

Monitoring the Air

At the last public meeting in June, a community member had many questions about air monitoring at Mound. Air monitoring is an important part of both the day-to-day operations of Mound Plant and the Remedial Investigation of possible contamination under CERCLA.

Air quality monitoring is part of Mound's overall Environmental Monitoring Program, which also includes monitoring of groundwater (including drinking water from public and private wells), river and pond sediments, vegetation, fish and foodstuffs.

Overview

Since 1971, Mound's current network of air monitoring stations has been established at the plant perimeter, in the Miamisburg area and in a wider regional area. Prior to that time air sampling was accomplished with a mobile unit. Today's off-site sampling stations have been arranged to favor prevailing downwind directions, which carry plant emissions roughly north-northeast (perimeter and off-site locations are shown on the accompanying maps).

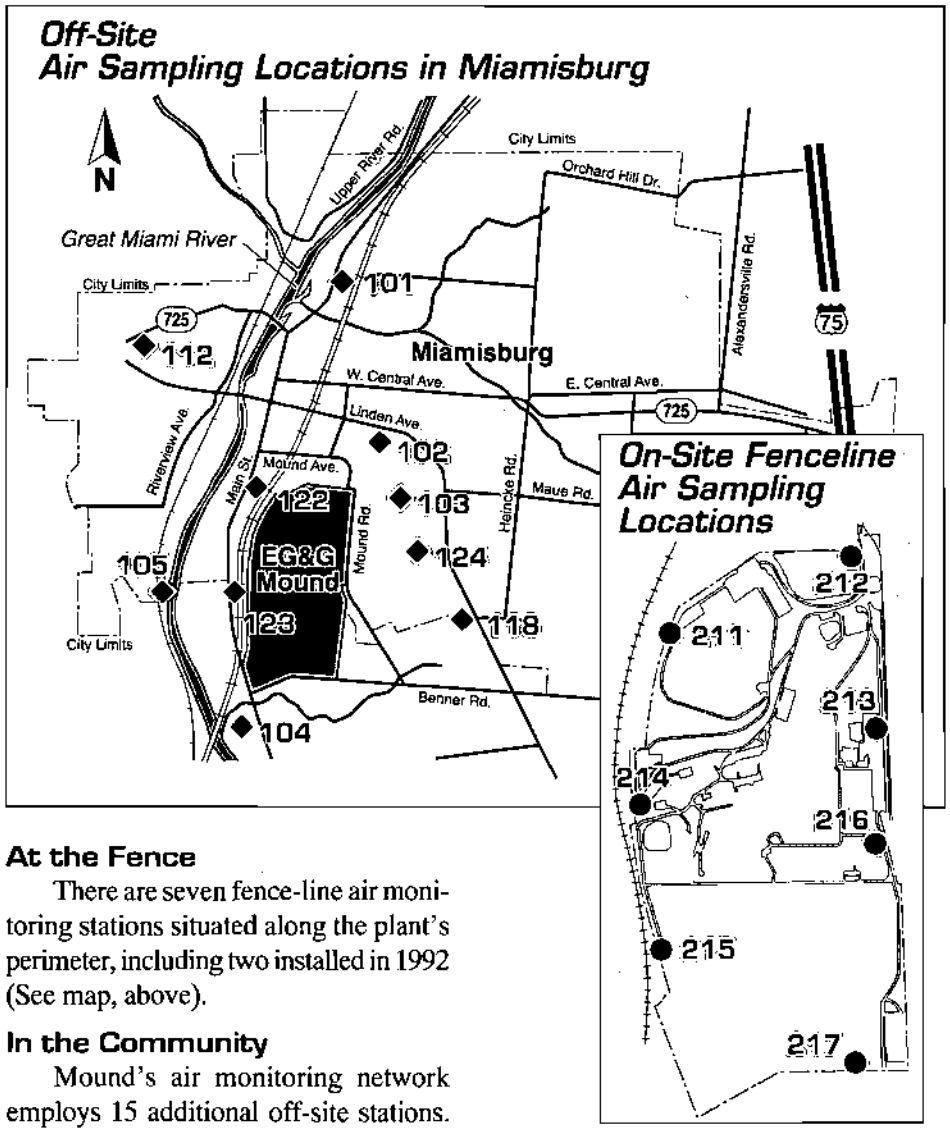
The air monitoring stations operate continuously (24 hours/day, 7 days/week) and are sampled weekly. They have equipment to collect airborne contaminants of concern released by Mound, both radioactive and non-radioactive.

At the Source

Work areas for the tritium and plutonium operations at Mound are monitored and equipped with alarms and containment systems to minimize untreated releases from reaching the outside air.

The ten stacks on-site are monitored for tritium, plutonium, uranium and non-radioactive particulates. These exhaust systems contain high-efficiency filters to keep pollution (in the form of tiny chemical particulates) from entering the atmosphere in potentially harmful concentrations under normal operating conditions. Tritium is not trapped by the high-efficiency filters. A chemical process is used to remove tritium from waste gas streams.

Sources of non-radioactive air pollution at Mound include occasional burning of fuel oil at the plant's steam power plant, the spray booth at the plant paint shop, destruction of explosives and firefighter training exercises. All of these operations are carried out under an air permit from RAPCA.



At the Fence

There are seven fence-line air monitoring stations situated along the plant's perimeter, including two installed in 1992 (See map, above).

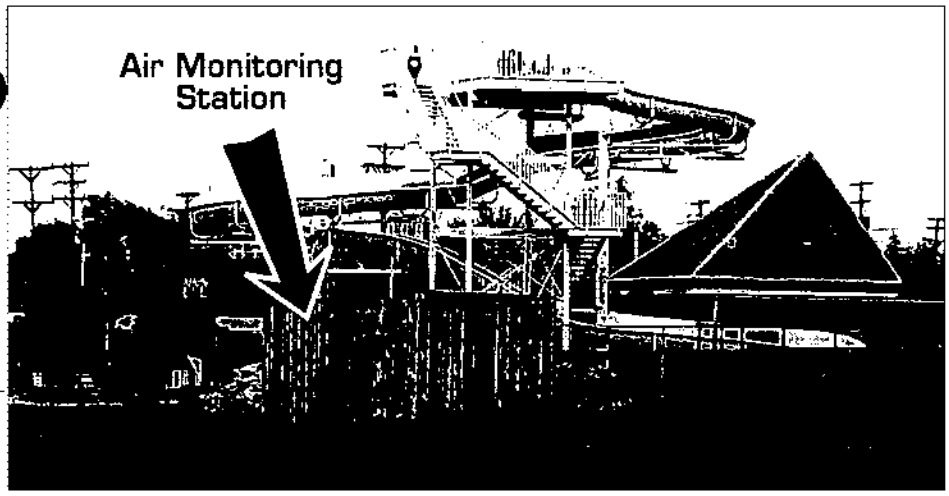
In the Community

Mound's air monitoring network employs 15 additional off-site stations. Ten of these are in the Miamisburg area. Four are located in downtown Dayton, Germantown, Franklin and Centerville to assess any regional influences on air quality resulting from Mound operations. A final station is located 28 miles from Mound Plant in New Paris, Ohio, to collect air samples unaffected by Mound's emissions.

Stations on the plant perimeter and off-site monitor for airborne tritium as well as plutonium and non-radioactive pollution in the form of tiny, invisible airborne particulates. Unlike the stack monitors, they do not monitor for uranium because stack emissions of uranium are too low to contribute significantly to any radioactive dose imparted by Mound Plant.

Sample Collection and Analysis

Samples are collected weekly from the stations in Mound's air monitoring



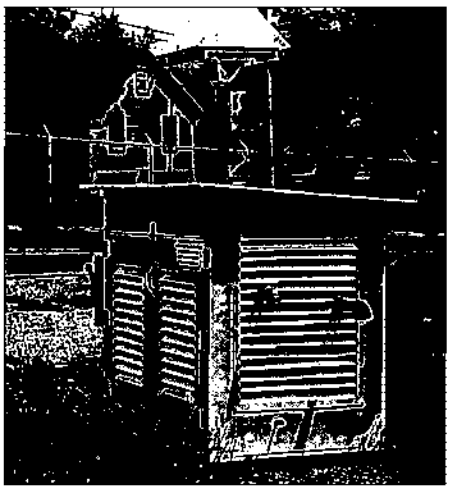
Off-site monitoring station (No. 122—behind protective fence, foreground) in Miamisburg's Community Park. Public pool's water slide is in the background.

network. Mound personnel collect samples from the stations on the plant's perimeter; Mound has a contract with the Regional Air Pollution Control Agency (RAPCA) to collect samples at its off-site stations and to maintain the stations.

All samples are analyzed at Mound Plant. Tritium and non-radioactive particulate samples are analyzed weekly. Plutonium samples, though collected weekly, are analyzed in a monthly composite for three of the stations and in a quarterly composite for the other 12 stations.

Concentrations of air pollutants originating from Mound are obtained by subtracting background levels estab-

(Please see Monitoring, Page 8)



On-site air monitoring station (No. 216) on plant perimeter. Houses in background are on Mound Road near Miamisburg Mound State Park.

How Air Sampling Works

Mound's air monitoring stations are wooden shelters with a large hooded intake for airborne particulates and a second, smaller intake for gaseous tritium samples. Both intakes stick up from the top of the shelter, and an exhaust pipe for the particulate sampler protrudes from one side. Most off-site stations are surrounded by fences to prevent tampering.

There are two basic methods of collection for the pollutants tested for in Mound's air monitoring network. The first is a disc-shaped fiberglass filter that traps tiny, invisible particulates of plutonium and non-radioactive pollution as air is sucked in through the high-volume collector at the top of the station.

Tritium, which mainly moves through the environment in water vapor, is collected through the use of a device called a bubbler. Outside air pumped through the narrow copper intake tube is forced through a collecting liquid, trapping the vapor, which is later analyzed. Mound's air monitors use ethylene glycol, which essentially is anti-freeze, to collect tritium samples in all weather.

Operable Units Update

☑ OU1, Area B

- Remedial Investigation Fieldwork is complete.
- Remedial Investigation Report (RIR) started (completion date – March 1994).

☑ OU2, Main Hill

- Work Plan for the Remedial Investigation under review.

☑ OU4, Miami-Erie Canal

- Special Canal Sampling Report finalized.

☑ OU5, South Property

- Work Plan for the Remedial Investigation in final stages of completion.

☑ OU6, D&D Program Sites

- Area D (Acid Leach Bed) – Data from soil sampling is being validated.
- Area 19 (RAD Waste Line) Verification Sampling and Analysis Plan is under development.

☑ OU9, On-Site/Off-Site

- Eleven Scoping Reports are complete and in the Public Repository; Volume 12, Release Site Database, is underway.
- Seismic Refraction Study Report is in review.
- Ecological Fieldwork has been completed except for fall aquatic sampling and analysis is in progress; report is due in early 1994.
- Background soils sampling within one mile of site is underway.
- Sweep Sampling of groundwater monitoring wells will begin in late August/early September.

Recap—June Workshop

The CERCLA public meeting held June 14 was well attended and well received by community members. The workshop format used at the meeting will be continued in future public meetings; however, a meeting place with better acoustics for small group meetings ill be used.

The workshop discussed the redefinition of the Mound CERCLA Program's Operable Units (OUs), which are management divisions of the investigation and cleanup based on geography. Then followed a discussion of how the OUs were ranked in priority to address expected decreases in funding for Fiscal Year 1994.

The workshop was held in the Community Room of the Miamisburg Civic Center. Community members split into small groups for sit-down discussions with the Operable Unit managers and CERCLA Program managers. Also in attendance were representatives of the US and Ohio EPAs, the Agency for Toxic Substances and Disease Registry (ATSDR) and the DOE.

Redefined Operable Units

"Redefinition" of the Operable Units involves making changes in either the scope of work or the land area covered by an OU. These changes respond to increased knowledge about confirmed and possible site contamination since the OUs were originally defined in 1990.

Details on the redefinition are explained in the May/June issue of "Superfund Update."

Budget Priorities

Art Kleinrath, DOE Manager of Environmental Restoration for Mound, led a discussion on expected cuts in Mound's cleanup budget request. Attending members of the public expressed their views on the prioritization of OUs. While opinions varied on the OUs given medium and low priorities, the workshop attendees voiced consensus on the OUs assigned highest priority for funding. These priorities are explained in "Mound Faces Budget Cuts," page 1.

A Stake in the Future of Mound

CERCLA managers at Mound are beginning to look at the formation of a Site-Specific Advisory Board, or SSAB. The Mound SSAB will address the collective concerns of the main "stakeholders" in Mound's environmental future and economic development.

Basics of an SSAB

A Site-Specific Advisory Board is composed of representatives from the various groups interested in the cleanup of a federal site. Through regular communication with cleanup planners, the SSAB studies a broad range of site-related issues and makes recommendations to the decision-making agencies—DOE, USEPA and OEPA.

The object of an SSAB is to reflect the views of all major "stakeholders" so that balanced recommendations can be made. Recommendations on issues such as cleanup priorities, future land use, funding allocations and schedules stand to affect both community environmental standards and the site's eventual commercialization.

Findings of an SSAB are considered recommendations, but not regulatory decisions. Under the Federal Facilities Agreement (FFA) signed in July, 1993, between DOE, USEPA and OEPA, these three agencies share responsibility and accountability for final decision-making.

Recommendations of the SSAB will become part of the Administrative Record, the legal file containing pertinent information on cleanup decisions.

Working on Details

DOE, USEPA, OEPA and the Mound must resolve many important issues before an SSAB can begin work. These issues include legal and procedural decisions on the number and composition of board members, the amount and source of funding, and the development of a charter for the SSAB.

When preliminary issues have been resolved, a public meeting will be held to collect input from interested groups and individuals. Work among the responsible agencies is still in its early stages; no date has been set for the public meeting.

The Keystone Report

Interim guidance on the establishment and purview of SSABs was released in February 1993. Called the "Keystone" Report (the committee met at the Keystone Center in Keystone, Colorado), this guidance was written by a study group established by the USEPA to address the improvement of decision making and priority setting at federally owned cleanup sites. The group, called the Federal Facilities Environmental Restoration Dialogue Committee, was composed of representatives from federal and state environmental and health agencies, DOE and other federal departments owning uncontrolled waste sites, Native American governments, citizens advocacy groups and labor organizations.

The findings in the Keystone Report are recommendations, not official requirements. The Keystone Report stresses the need for organized public input into federal environmental decisions, especially in view of expected funding cuts resulting from government downsizing. Given smaller cleanup budgets, federal departments must work hard to establish priorities so that the most urgent environmental problems may be addressed. The current budget cuts Mound faces are an example of this trend.

The Future of Federal Cleanups

Stakeholder participation in federal cleanups under Superfund is expected to increase during the Clinton administration, which has expressed agreement with the Keystone Report's recommendations.

DOE is looking into establishing SSABs at all of its sites. DOE Superfund sites with SSABs already established include Rocky Flats Plant near Denver and Hanford Plant in Washington State.

Remedial Response

Answers to Community Concerns

The following questions and comments were received at the June 14 CERCLA public meeting. They are reprinted exactly as submitted, with answers from Mound's CERCLA Program.

Q *Would be interested in seeing the radionuclide data to tell what levels are in the NPDES outfall and thus potentially discharged to the river.*

(Note: NPDES stands for the National Pollutant Discharge Elimination System, a program for issuing, monitoring and enforcing permits for direct discharges of effluent into a body of water.)

A There are two NPDES outfalls from Mound which reach the Great Miami River. Outfall #5001, which reaches the river via a buried twelve-inch pipe, and outfall #5002, which discharges to the abandoned Miami-Erie Canal and eventually to the river. Both of these outfalls have automatic samplers that collect the effluent on a regular basis. Every working day the samples are picked up and transferred to the Mound laboratory, where they are tested daily or weekly, depending on the parameter being measured. The concentrations of radionuclides in these two discharges are well within Department of Energy guidelines. The data is summarized in the table below.

Q *Concerned with run off (wash off storm rain water) which did and does travel down hill (Mound Hill) to drain at the end of Sixth/Mound (not only the ditch beside road but also lower parking lot on East and North side.*

A No water used by Mound is discharged to this drain. Sampling of the plant boundary in this vicinity in the past did not reveal any elevated contaminants. We would not expect to see any contaminants other than the normal ones observed in runoff from any parking lot (e.g., grease, tar, oil, etc.).

Q *Concerned about the open burning in the open cage at old landfill which occurred in the '50s etc. (OU1). What about the soot and ash which settled afterward? Wasn't rad waste material also burned at this site?*

A The old landfill was not used for the burning of radioactive material. Soot and ash from the open burning of trash would have been mingled with that from other open burn areas in the community that were normal in that timeframe. There is, however, one known incident of radioactive material being disposed of in the landfill. This is reported in the OU9 Site Scoping Report, Volume 7, Waste Management. A small quantity (one quarter of an ounce) of Pu-239 was accidentally placed in the landfill area with some trash. All the material was reportedly recovered with the soil and placed in drums for proper disposal.

Mound Radionuclide Releases into the Great Miami River, 1992

	Pu-238		Tritium	
Out-Fall	Concentration	% of Guideline	Concentration	% of Guideline
#5001	0.05 pCi/L	0.12	6300 pCi/L	0.31
#5002	0.63 pCi/L	1.6	2000 pCi/L	0.10

average results from 1992

Health Consultation

continued from Page 3

legislation to monitor public health at Superfund sites and is part of the U.S. Department of Health and Human Services (DHHS) and the U.S. Public Health Service. ATSDR conducts public health activities at DOE Superfund sites through a special Memorandum of Understanding.

Profile

continued from Page 1

CERCLA Program.

Before being assigned to Mound, Mr. Smith served as an inspector of hazardous waste sites in the Southeast District Office. Among his tasks were ensuring the compliance of these sites with state and federal regulations; upgrading non-complying facilities; investigating complaints; and advising government officials, industries, consultants and citizens on hazardous waste regulations.

These prior duties included the monitoring of waste management activities at the DOE Portsmouth Gaseous Diffusion Plant. Mr. Smith has a B.S. in Hazardous Materials Management.

During the time Ms. Hatcher was Mound's Site Coordinator, she received an OEPA Outstanding Performance Award in 1991. In 1992 she received an Honorable Mention Teamwork Award for her role in the developing and negotiating of the Agreement in Principle between DOE and OEPA that led to the formal inclusion of OEPA in the Federal Facilities Agreement for Mound in July. Before working on Mound, Ms. Hatcher served as the Site Coordinator for other Ohio Superfund Sites. She also coordinated the OEPA investigation into the 1986 CSX train derailment fire in Miamisburg.

Ms. Hatcher is now assigned to OEPA's Division of Solid and Infectious Waste.

Monitoring

continued from Page 5

lished at the remote monitoring station in New Paris (northeast of Eaton) from the levels found in the on-site, local and regional stations. Thus the concentrations reported are called "incremental concentrations."

Reporting of Results

The results of Mound's air monitoring and other related programs are reported annually in the Mound Site Environmental Report. This report has been made available to the public for more than 20 years. The report for 1992 will be released shortly and will be placed along with reports since 1988, in the Mound Information Repository in the Miamisburg Public Library.

Mound Air Quality Trends

The five-year trend in air quality measurements shows that Mound's emissions of radioactivity contribute minimally to the average dose received by area residents as a result of natural radiation, medical procedures, consumer products and other everyday radiation sources.

These trends also show that Mound's emissions of non-radioactive air pollutants closely approximate the levels found throughout the region and thus have minimal impact on ambient air quality.

Next Public Meeting

The next CERCLA public meeting will be scheduled in early fall. If you have topics you would like to discuss, please contact the Public Affairs Office at EG&G Mound at the address in the box below.

Printed on Recycled Paper

Important phone numbers

EG&G Mound Applied Technologies	
Environmental Restoration/	
CERCLA Community Relations	
Mark Becker:	513-865-3001
U.S. Environmental Protection Agency	
(Region V Headquarters, Chicago)	
Diana Mally:	312-353-6287
Diane Spencer:	312-886-5867
(Superfund Community Relations)	
Cheryl Allen:	312-353-6196
Ohio Environmental Protection Agency	
(Dayton office)	
Jeff Smith:	513-285-6046
Ohio Department of Health	
(Columbus):	1-800-523-4439
(Radiological Section)	
Larissa Gilham:	614-644-2727

CERCLA mailing list

Mound maintains a mailing list for people interested in the Mound CERCLA program. People on the list receive notification of CERCLA-related meetings, Site Specific/Five Year Plan meetings and other DOE-related public affairs activities. If you wish to have your name added to this list, sign up at any of Mound's public meetings or send your mailing address to:

EG&G Mound Applied Technologies
c/o Public Affairs/CERCLA
P.O. Box 3000
Miamisburg, OH 45343-3000

MOUND
Environmental Restoration Program

EG&G Mound Applied Technologies
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Thinking Fast

A Removal Action Under CERCLA

MOUND
Environmental Restoration Program

June 1993

"Removal Action" is the Superfund term for the short-term cleanup of a contaminated area that could pose a risk to human health and the environment. Removal actions may last only a few days or may require long-term measures.

The CERCLA Program at Mound could use Removal Actions in some Operable Units. Removal Actions may not involve the actual "digging up" or "pumping out" of the contamination. In some cases, they involve containing the contamination in its present place in the environment to prevent its spread until it can be studied further and treated.

Removal Actions *with a planning period of six months or more* require a study called an Engineering Evaluation/Cost Analysis (EE/CA). The EE/CA:

- Explains health/environmental risk posed by the contamination
- Describes possible alternatives for treating the contamination
- Recommends the most cost-effective treatment method

PCB Removal Action on Main Hill, 1991

Courses of Action

After preliminary assessment of contamination at a site, cleanup managers must make the following decisions for individual areas of concern:

No Action:

The site poses no threat to human health or the environment

Remedial Action:

The site may pose an eventual threat. Because the threat is uncertain and not thought to be immediate, it will be studied further, then cleaned up if needed

Removal Action:

The site may pose a threat or the cleanup of a release may be so obvious that detailed studies are not required. Possible impacts will be evaluated, short-term methods to prevent the spread of contaminants will be chosen and undertaken, usually through physical removal. Studies may follow after completion to assess the need for further long-term cleanup.

Public Participation

Community members will be notified of any planned Removal Action. Any Removal Action scheduled to last longer than 30 days will have documents placed in the public reading room and in the Administrative Record. For a Removal Action that exceeds six months planning and thus has an EE/CA prepared, an addendum to the Community Relations Plan will be written to cover public participation acitivities.

EE/CAs are released for public inspection and formal comment. Significant comments from the public must be responded to in writing before the recommendations in the EE/CA can be enacted. As with any CERCLA document, written or oral comments on an EE/CA will be taken through EG&G Mound Public Affairs. Also, Mound will hold a special meeting to ensure maximum opportunity for public input on any EE/CA completed.

EG&G

MOUND
Environmental Restoration Program

SUPERFUND Update

EG&G

May/June 1993

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Quarterly CERCLA Public Meeting – Operable Units Workshop

Monday, June 14, 1993, 7:00 pm
Community Room in the Miamisburg Civic Center
10 N. First Street
Miamisburg, Ohio

The upcoming CERCLA Quarterly Public Meeting will feature a workshop format. Holding the meeting as a workshop will allow for more discussion of program issues between the public and program planners. This interactive format was initiated in response to comments by members of the public who regularly attend CERCLA quarterly meetings. The topic of the workshop will be the newly defined CERCLA Operable Units (OUs), including cleanup priorities and budgets for Fiscal Year 1994.

Chuck Friedman, Manager of the Environmental Restoration/CERCLA Program, will lead the workshop, which will feature Mound's Operable Unit managers. Art Kleinrath, Environmental Restoration Manager for the U.S. Department of Energy, will also attend, as will representatives from the US and Ohio EPAs.

The newly defined Operable Units reflect progress in the CERCLA Remedial Investigation since 1990, when the OUs were originally defined. These changes, along with plans for future work and FY 94 budgets, will be explained by the Operable Unit managers.

Attending members of the public will receive information packets on the Operable Units. The workshop format will allow more time for discussion in which members of the public direct attention toward issues of concern. Refreshments will be served.

Note that the public workshop will be held in the Community Room of the Miamisburg Civic Center and not in the Council Chambers.

CERCLA Profile – Energy Secretary Hazel O'Leary

Energy Secretary Hazel R. O'Leary has indicated that DOE will link cleanup with economic growth during the Clinton Administration. In her January confirmation hearing before the Senate Committee on Energy and Natural Resources, O'Leary stressed the need for efficient cleanup, nuclear weapons reduction and development of renewable energy sources.

Hazel R. O'Leary

O'Leary told the Senate committee that commitment to cleanup demonstrates DOE's commitment to overall efficiency. Nuclear weapons reduction has moved DOE's mission toward energy research, but DOE's commitment to peacetime initiatives relies on cleanup of past contamination at its sites nationwide. In an early February address to DOE Headquarters, O'Leary affirmed this message, saying, "We've got to settle these issues and satisfy citizens who are living nearby. We've got to satisfy ourselves and our own employees that it is safe to work in those places."

Ms. O'Leary's experience includes serving as Executive Vice President of Northern States Power Company in

(Please see Profile, Page 8)

The announcement made by Secretary O'Leary on May 27 that Mound Plant will cease production has no effect on the Environmental Restoration Program. The CERCLA cleanup will continue as scheduled.

Operable Units Redefined

Operable Unit (OU): In a CERCLA Program, a grouping of potentially contaminated areas based on the geographical location or types of suspected contaminants

The Mound Operable Units have been redefined by CERCLA Program managers to reflect progress in the Remedial Investigation since the original OU definition in 1990. The new Operable Units better divide the site geographically, ensuring they include possible release sites identified since the Remedial Investigation began. The newly-defined OUs are also easier for members of the public to understand.

As part of the OU redefinition, OU3–Miscellaneous Sites–has been eliminated and the investigative areas within it distributed among other Operable Units (See OU3 Eliminated, page 4). Because each Operable Unit has its own management staff and reporting requirements, the elimination of unnecessary OUs saves the CERCLA Program millions of dollars in management costs. It also signifies the finding of no harmful contamination at many suspected release locations on-site.

Remaining release sites are now grouped into six OUs. The following are the new definitions for the Mound OUs, including an explanation of changes from the original definition.

■ Operable Unit 1: Area B

Addresses possible chemical contamination of the portion of the Buried Valley Aquifer which underlies the southwest corner of the original Mound site. The main concern in OU1 is volatile organic compounds migrating in groundwater. It is belived that such contamination originates from the area that was formerly used for open burning and waste disposal. Crushed empty thorium drums and waste from cleaning filters in Mound's Waste Disposal Building are also included in OU1.

OU1 covers four acres on-site and includes an historic landfill and the overflow pond.

■ Operable Unit 2: Main Hill

Addresses the source and pathways of possible groundwater contaminants on Mound's Main Hill. Historical tritium releases have been tracked since the 1970s; the extent of VOC contamination is uncertain. Off-site groundwater seeps on Mound's North Hillside are included in OU2.

The land area encompassed by OU2 has increased in size from its original delineation. OU2's enlargement results from its shift in focus to all hydrogeology and possible release sites on the Main Hill, not only the source of the Main Hill seeps. Also, former OU3 and OU5 areas on the Main Hill will be addressed by OU2.

■ Operable Unit 4: Miami-Erie Canal

Addresses contamination of the old Miami-Erie Canal bed in Miamisburg resulting from plant runoff, including an accidental plutonium spill in 1969. The 1974 Rogers Study, conducted when the plutonium was discovered and supported by the US and Ohio EPAs and the Ohio Department of Health, concluded that the plutonium in the Canal posed no imminent threat to human health and the environment. Tritium is also a contaminant of concern in the canal and was studied in the late 1970s by the Potable Water Project. All drinking water supplies in the area are in compliance with the Safe Drinking Water Standard for tritium.

The land area covered by OU4 has not changed from its original delineation.

■ Operable Unit 5: South Property

Addresses on-site soil areas in the southern portions of Mound Plant known or suspected to be contaminated by radioactivity or chemicals. It will fully characterize the sources of contamination and migration throughout the OU5 geographical area.

The land area now covered by OU5 has increased to include the valley between the Main and SM/PP Hills. In addition, former OU3 and OU8 sites south of the Main Hill will be addressed by OU5. Former OU5 areas on the Main Hill now are addressed by OU2.

■ Operable Unit 6: Verification of Sites Under the Management of the D&D Program

Addresses residual contaminants, primarily in soils, left from Mound's ongoing decontamination and decommissioning of unused radiological facilities on-site. The current D&D at Mound began in 1978 and primarily addresses surplus plutonium facilities.

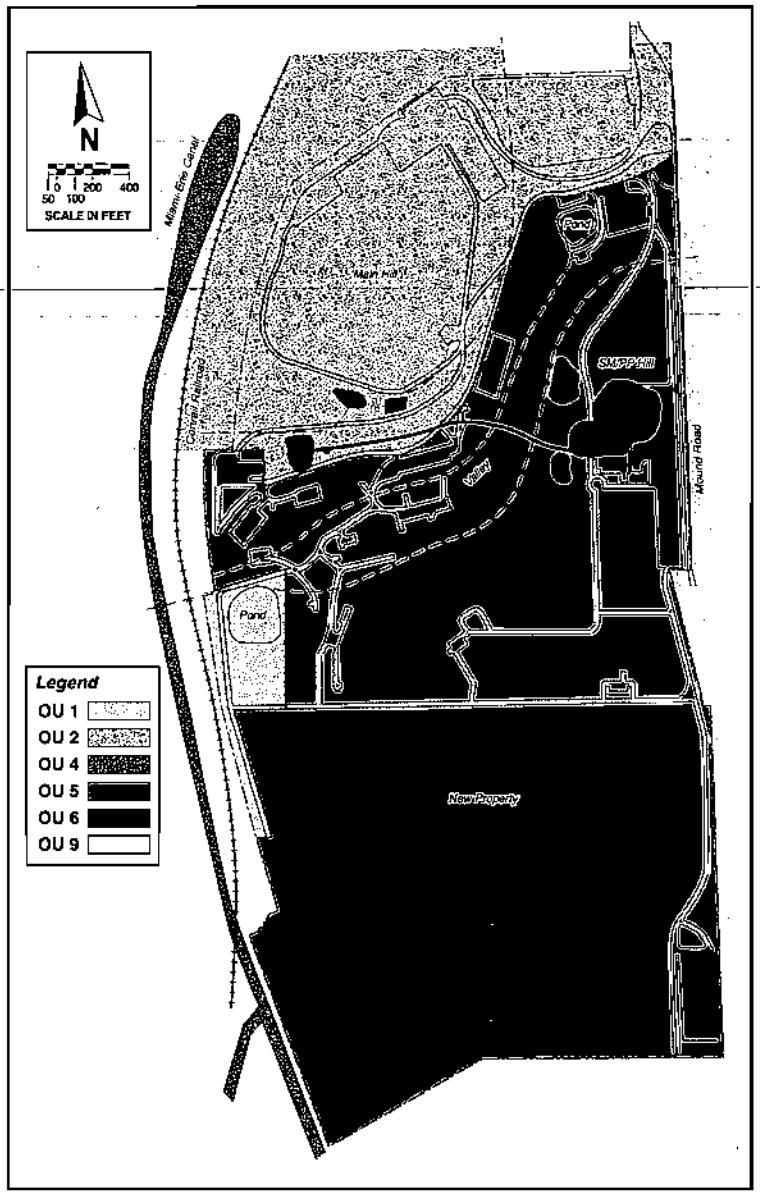
The land area covered by OU6 has changed only slightly from its original delineation to reflect D&D work done since the original Operable Units were defined.

■ Operable Unit 9: Site-Wide/Off-Site

Addresses the total environmental effects of any contamination attributable to Mound Plant that may

(Continued on Page 3)

Mound Operable Units 1993



"Boom" Not a Danger

On Monday, May 17, a loud explosive sound resulted from the burning of waste explosive materials at Mound Plant. The "boom" carried to many parts of the surrounding community, but was not heard at some locations, including portions of the Mound itself. Smoke accompanying the explosion was also visible in some parts of the community. No human, environmental or structural harm was reported as a result of the explosion.

The burn operation is a routine, controlled method to rid Mound of explosives that may be outdated. On May 17, 4.8 pounds of explosive waste was burned inside a building covered with a mesh roof to prevent the escape of any fragments. The building is located in a remote area on-site. Employees involved in the burn operation followed all applicable safety procedures.

Mound's permit for this type of burn operation is issued through the Regional Air Pollution Control Agency (RAPCA). The permit covers the burning of up to 8 pounds of material.

The burn operation is not related to the CERCLA Program.

Mound regrets the creation of any cause for concern by residents of the community as a result of this incident.

be found in the air, groundwater, soils, surface water and sediments; includes all ecological concerns. OU9 encompasses the cumulative impact of all other Operable Units on-site and in the off-site environment, including characterization of the Buried Valley Aquifer, SM/PP Hill, and the plant drainage system.

Presently, site-wide investigations encompass the entire plant and the area within a 20-mile radius of the plant.

CERCLA Testing – Nothing Fishy

[routine biological testing is not killing local minnows]

At the March CERCLA public meeting, one community member expressed concern that minnows in the Miami-Erie canal were being killed during CERCLA testing. The only testing similar to this concern was the bioassay testing performed by the Ohio EPA in 1989. *Bioassay* describes the response of a given species or tissues to potential toxins. In the 1989 laboratory test, specimens of local aquatic species were exposed to a mixture of river water and Mound effluent water. Of these specimens, all ceriodaphnia (an aquatic insect) and fathead minnows died. However, the OEPA concluded that "it appears that the toxicity originated somewhere other than the USDOE (Mound) effluent."

Since October 1992, Mound has performed similar testing and has not observed any mortality to minnows.

Report–Regroup, Eliminate OU3 Sites

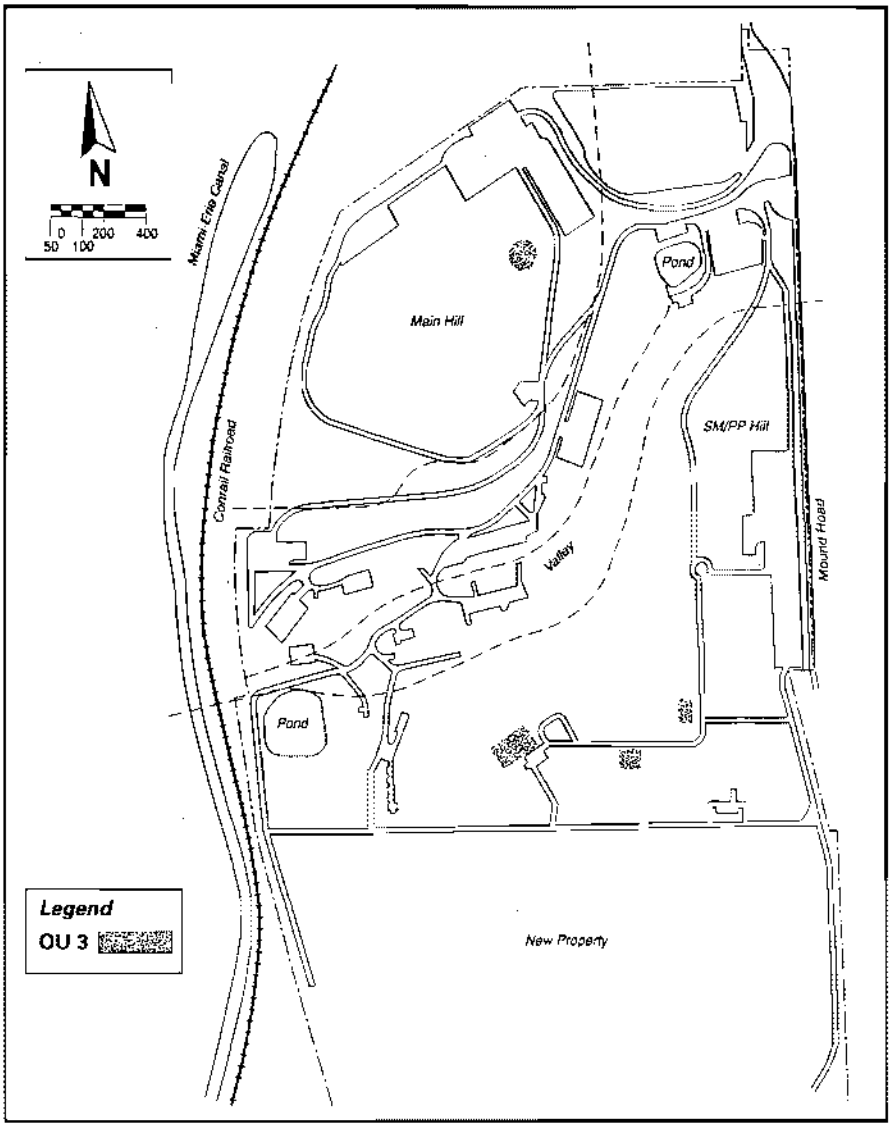
The report on the Limited Field Investigation of Mound's OU3 recommends the regrouping or elimination from further investigation or action several previously uninvestigated areas of possible contamination. OU3 addressed 32 potential release sites throughout Mound Plant on which little or no prior data had existed.

A Limited Field Investigation is undertaken to gain enough information on uninvestigated sites to "scope" them properly. In the language of CERCLA, "scope" is a preliminary understanding of the extent of possible contamination and its potential exposure "pathways" to people and the environment.

After testing for a variety of hazardous chemicals and radioactive waste during 1991 and 1992, the OU3 Limited Field Investigation found no need for further CERCLA investigation at 23 of 32 potential release sites.

The OU3 Limited Field Investigation Report recommends further investigation into nine of the 32 potential release sites. These 9 sites will be divided between OU2, Main Hill, and OU5, South Property. One site, the Waste Disposal Glass Melter Sump, will be reassigned to OU6, Decontamination and Decontamination (D&D) Program Sites.

The Limited Field Investigation Report is undergoing final review by USEPA and OEPA. Once approved, it will be released to the public. Final decisions on the regrouping and elimination of OU3 sites will be made at a later date.



Previously Eliminated Operable Units

Upon the elimination of OU3, six of Mound's original nine OUs will remain. OUs 7 and 8 were eliminated previously. OU7 had addressed suspected release sites at which previous inspections found no evidence of a release. OU7 was eliminated in 1990 after current information was evaluated under CERCLA and it was determined the sites do not warrant further investigation.

OU8 had addressed underground storage tanks on-site. Some tanks were added to their geographically appropriate Operable Unit and the remaining tanks were placed in other regulated Mound programs. OU8 was eliminated in January, 1993.

OU3 Documents in the Information Repository

The following documents on OU3 are now available for public inspection in the Mound Information Repository at the Miamisburg Public Library, 35 S. Fifth St., Miamisburg:

- Letter Report: Preliminary Results of Reconnaissance Magnetic Survey; Mound Plant–Areas 2, 6, 7 and C (November 1990).
- Operable Unit 3; Miscellaneous Sites; Quality Assurance Project Plan (November 1991).
- Operable Unit 3; Miscellaneous Sites; Limited Field Investigation Work Plan; Health and Safety Plan (November 1991).
- Closure Report; Building 34; Aviation Fuel Storage Tank (August 1992).
- Closure Report; Building 51; Waste Storage Tank (August 1992).

Remedial Response

Answers to Community Concerns

Resetting the Clock

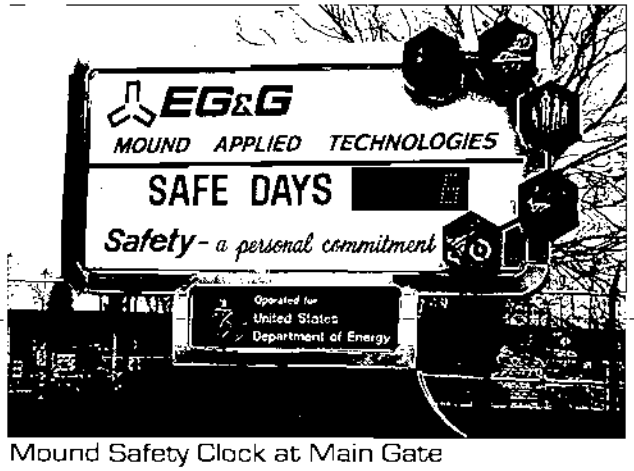
[Mound Safety Clock returns to zero for lost work days, not environmental accidents]

At the March 11 CERCLA meeting, community members expressed confusion about the meaning of the Safety Clock, which displays the Mound's consecutive safe days. The Safety Clock is located outside the plant's main gate.

When the Safety Clock returns to zero, it does not mean that an environmental release has occurred at the Mound, nor does it mean that the plant has been forced by an accident to shut down its operations for the day.

The Safety Clock displays the number of consecutive days the plant has gone without an employee's suffering work-related illness or injury that resulted in the loss of working days. When a lost work day is reported, the Safety Clock is reset to zero days.

Businesses subject to injury and illness recordkeeping are required by the federal Occupational Safety and Health Administration (OSHA) to record and report worker injuries and illnesses. OSHA tracks these statistics and makes them available to the public on request. Mound Plant openly displays its consecutive safe days through the Safety Clock to show the plant's commitment to occupational safety and health.



Mound Safety Clock at Main Gate

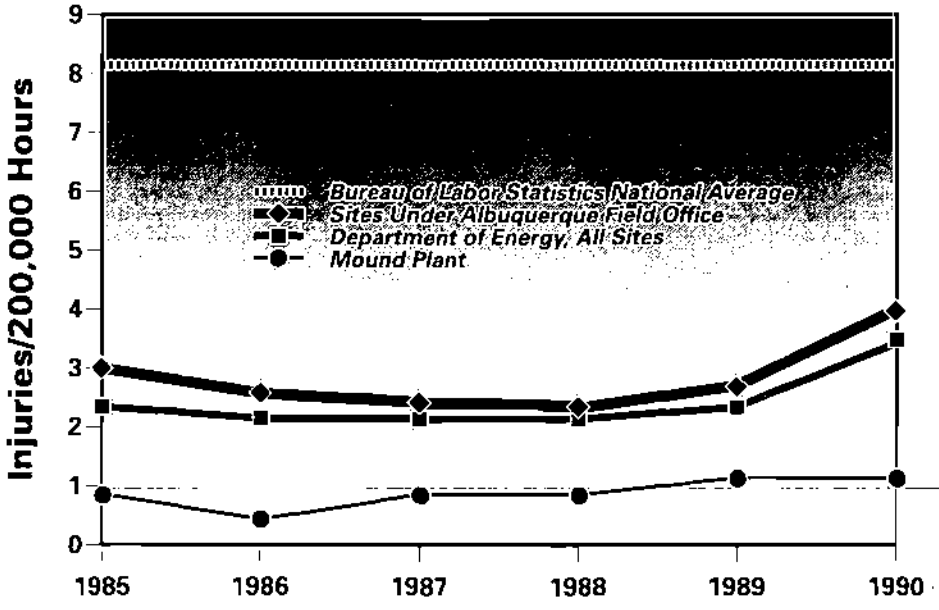
Mound workers injured on the job are taken to the facility's medical department. Depending on the injury's severity, the worker might be transported to an area hospital. Based on the attending doctor's diagnosis of the injury, Mound's Radiological and Industrial Safety Department classifies the injury within one of several OSHA categories. Slight injuries, such as scrapes and cuts, that require first aid only do not require a formal report to OSHA and are called non-recordable. Recordable injuries are those that receive medical attention. Injuries that limit the work the injured person can perform are labeled Restricted. For example, a Mound worker who strains his or her back may be restricted temporarily in the amount of weight he or she may lift on the job. Restricted injuries result in the resetting of the Safety Clock if they result in a worker's having to take days away from work.

In addition to reporting to OSHA, Mound Plant also reports its injury and illness statistics to DOE's System Safety Development Center (SSDC). SSDC's quarterly Occupational Injury and Property Damage Summary publishes these statistics, including the number of incidents and the amount of work time lost, for Mound Plant and all other DOE sites. Mound's lost work day average is better than industry in general in comparable categories and is also better than the DOE average *(See graph)*.

In May, 1993, EG&G Mound Applied Technologies was presented with an Achievement Award by the Dayton/Miami Valley Safety Council and the Ohio Bureau of Workers' Compensation, Division of Safety and Hygiene. This award is presented to each company that decreases its incident rate by at least 25% from the previous year and is recognition of the Mound employees' effort to reduce accidents.

Changes in the Safety Clock occur when the decision is made to classify an injury as a lost work day case with time away from work. Because this decision may occur after the day the injury occurs, a change in the Safety Clock does not always indicate an injury on the day of the change.

Total Recordable Injury Rate



Note: This graph describes all recordable injury cases, not just lost work day cases, and does not include illnesses.

Remedial Response – CERCLA Program Q&A

The following questions were presented by Miamisburg for Environmental Safety and Health (MESH) before the March CERCLA Quarterly Meeting and were answered by Environmental Restoration/CERCLA Manager Chuck Friedman at the meeting. The questions below appear exactly as presented to Mr. Friedman.

Q *Why were the railroad switches replaced after having been disconnected for a period of time? Meaning the switches which direct the train cars into the hill?*

A No work on Conrail switches was done because of any Mound Plant operation. We do not know why Conrail replaced switches near the site.

Q *What has happened to the deer? Any idea on the size of the deer population?*

A The CERCLA Program has conducted several deer counts as part of its ecological assessment. The most recent count found 12 deer on or near Mound property, indicating a probable total of 18 deer in the area. This number was confirmed by a resident along Mound Road who has counted deer coming off Mound property over the years.

Q *In regards to the sampling in the canal bed. One large area in the southern part was taped off and surrounded with tin (?) for an extended period of time. Purpose and reason?*

A As part of the ecological assessment under CERCLA, a drift fence was installed in the south canal bed to obtain population counts for animals there. Animals moving along the fence are trapped in shallow collection buckets buried at both ends. Counts are made each day and the animals are released unharmed.

Q *At this date, what is the amount of tritium in well #92 (the well in the park which is used to fill the pool) in relationship to the present level in city water?*

A To our knowledge, there is no well designated #92. However, the well used by the city to fill the swimming pool in Community Park is well #913. The most recent data show the concentration of tritium in well #913 to be 1.8 nCi/L (1.8-billionths of a Curie per liter of water) and 0.5 nCi/L in city water. The EPA drinking water limit for tritium in water is 20 nCi/L.

Q *Could you simplify the process of how tritium gets into tomatoes? (veggies)*

A Tritium is a radioactive form of hydrogen. Though it is much less abundant, tritium behaves in nature just as non-radioactive hydrogen. Just as plants absorb hydrogen in water (the H_2 in H_2O), they absorb tritium in tritiated water (HTO). Like any living thing, vegetables excrete water as well as absorbing it, so concentrations of tritium in vegetables remain the same as concentrations in their environment.

Q *What type of pipe replacement recently took place in the south end of community park?*

A For the installation of monitoring wells for the Mound Hydrogeological Investigation, it was necessary to construct an access road from Community Park onto Conrail Property. A discharge pipe had to be lowered so the road could be laid atop it. Mound has been given a permit by the OEPA for this discharge pipe. The pipe discharges water from well #912 to the Great Miami River.

Q *Someone noted and asked why standing water in the area of the major pipe replacement was milky.*

A Any discoloration of standing water might have been caused by welding materials. During the pipe lowering and the access road construction, continual monitoring for radionuclides and hazardous chemicals was conducted; no abnormal readings occurred.

Q *Has anyone at Mound or DOE considered placing contamination signs in community park?*

A We believe that there is no reason to place contamination signs in the park because both the Ohio Department of Health and the US EPA determined in the mid-1970s that plutonium discovered in the nearby canal bed caused no imminent health threat. We do have signs posted in the canal bed that note an Ohio Utility Protection Service number to call before doing any digging. We receive notice from this service of all digging activities from as far as Germantown to the Dayton Mall and from Moraine into the Franklin-Springboro area. We respond to activities in the vicinity of Community Park. The Ohio Utility Protection Service is used by DP&L, Ohio Bell and construction companies. We have responded to less than half a dozen inquiries.

Q *In which documents or through what process does one go to find out how much tritium and tritium waste is stored (presently) at the Mound site? What physical form is tritium?*

A The amount of tritium at Mound is classified. Tritium waste at Mound amounts to 25,000 cubic feet in low-level waste, most of which is liquid solidified with cement in 55-gallon drums. Elemental tritium occurs in nature as a gas (T_2) or mixed with hydrogen and oxygen as water and water vapor (HTO). Information on Waste Management at Mound can be found in Volume 7 of the Site-Wide Scoping Report, a CERCLA document released in March of this year and available at the Miamisburg Public Library.

Q *Why does, at times, the Mound glow a faint red about dusty dark. Have you ever heard of this phenomenon happening at any other DOE sites?*

A We believe that what you see is the plant's lighting system, possibly reflected by low clouds, during red sunsets. The Mound has a large system of tall, bright, peach-colored lights for security and safety. We have not heard of such a phenom-

enon occurring at other DOE sites, but it could under similar conditions.

Q *The glass incinerator? Is it operating? What are the plans for the future?*

A What you are referring to is the glass melter, a large furnace used in the past to reduce the volume of certain types of hazardous waste before disposal. The glass melter is not currently operating. It may be used in the future upon the granting of applicable permits by the Ohio EPA.

Q *Why did the safety clock go back to zero recently?*

A The Safety Clock is returned to zero when there is a lost-work-day case. At the time of your inquiry, the clock returned to zero because an employee suffered a back injury while lifting some heavy material. This is a common industrial accident. (For more on the Safety Clock, see **Resetting the Clock**, page 5).

Mound Participates in

EG&G Mound Applied Technologies joined more than 80 other regional businesses and organizations from the health and environmental fields in the second annual Preserve Planet Earth Expo, held at the Dayton Mall April 23-25.

The EG&G booth featured the DOE Roadshow, the Department's traveling Environmental Restoration Program exhibit, staffed by DOE officials from the Oak Ridge Field Office in Tennessee and Headquarters in Washington, DC. A volunteer staff from the Mound was also on hand to explain the facility's operating missions and environmental programs.

The DOE Roadshow staff expressed satisfaction with the high level of public interest in the environment and DOE's cleanup efforts. Informational materials from Mound and DOE were distributed to interested members of the public.

Organizers of the Preserve Planet Earth Expo called the event a "tremendous success." More than 100,000 people were estimated in attendance at the three-day event. EG&G Mound also participated in the first Preserve Planet Earth Expo in 1992.

Recap–March Public Meetings

CERCLA Quarterly Meeting

The CERCLA Quarterly Meeting on March 11 at the Miamisburg Civic Center was attended by approximately 12 community members and 40 representatives from DOE, USEPA, Ohio EPA, EG&G and CERCLA contractors. The following summarizes topics covered.

DOE Environmental Restoration/ CERCLA Documents–Identified by their blue three-ring binder, ER/ CERCLA documents are the primary sources used in planning and carrying out CERCLA Program tasks. They are organized to provide general summaries followed by detailed information.

All final versions of ER/CERCLA documents, including the multi-volume Site-Wide Scoping Report, are available for public inspection at the Miamisburg Public Library.

Off-site Fieldwork–Off-site monitoring well and piezometer installation continued throughout the late winter and early spring on private property, City of Miamisburg properties, Conrail property and Miami Conservancy District property along the Great Miami River. A seismic refraction study of local bedrock formations was completed during the winter.

The ecological assessment required by CERCLA will continue during the spring. Sampling of surface waters and sediments will begin late this summer. Also this summer, a soil study will be undertaken to determine "background" levels of contaminants in the regional environment, covering areas within a 20-mile radius around Mound Plant.

DOE Five-Year Plan & Meeting–The DOE Environmental Restoration and Waste Management Five-Year Plan (FYP) for 1994-1998 was explained. The FYP is DOE's primary planning and budgeting guide. The public may comment on the annual FYP for 60 days after its release. These comments will be responded to by early spring and will be incorporated into the final FYP. Similar to the FYP, the Mound Site-Specific Plan (SSP) may also be commented on.

A special public meeting to take comments on the FYP and SSP was also announced at the quarterly CERCLA meeting.

Questions and Answers–Many questions were posed by community members and answered at the meeting. These included several questions posed in advance of the meeting by Miamisburg for Environmental Safety and Health (MESH). Answers to these questions are provided in **Remedial Response**, page 5.

DOE Five-Year Plan Meeting

No comments were offered on the FYP and SSP at the special public meeting held March 25 in the Miamisburg Civic Center. A discussion on site-related issues took place between Mound staff members, DOE representatives and five attending members of the public. At the end of the 60-day comment period, March 31, only the Ohio EPA had submitted comments.

Clarifications

Tritium

The March 1993 "Superfund Update" identified tritium as a beta-radiation emitter, then said that beta radiation can pass through human tissue, thus delivering an external radiation dose. Please note that not all radionuclides emitting beta radiation are powerful enough to deliver an external dose. Tritium is a very weak beta emitter and cannot penetrate the skin. Tritium delivers an internal dose when breathed in or swallowed.

Risk Figures

The figure appearing on page 6 of the March "Superfund Update" which depicted the increased risk of cancer associated with exposures to the maximum allowable doses for both radiation workers and the general public contains an editing error. The relationships appearing in the figure are correct; the percentage sign (%) was inadvertently included. The numbers given are the probability in decimal form; the percent form would have the decimal point moved two places to the right.

Profile

continued from Page 1

Minnesota, at which time she chaired DOE's State Energy Advisory Board; Vice President and General Counsel to O'Leary Associates, an international energy consulting firm; a presidential appointee to DOE under President Carter and the Federal Energy Administration under President Ford; a law partner at Coopers and Lybrand; Assistant Attorney General for the State of New Jersey; Assistant Prosecutor for Essex County, New Jersey; and General Counsel of the U.S. Community Services Administration.

Important phone numbers

EG&G Mound Applied Technologies
Environmental Restoration/
CERCLA Community Relations
Mark Becker: 513-865-3001

U.S. Environmental Protection Agency
(Region V Headquarters, Chicago)
Diana Mally: 312-353-6287
Diane Spencer: 312-886-5867
(Superfund Community Relations)
Cheryl Allen: 312-353-6196

Ohio Environmental Protection Agency
(Dayton office)
Martha Hatcher: 513-285-6357

Ohio Department of Health
(Columbus): 1-800-523-4439
(Radiological Section)
Larissa Gilham: 614-644-2727

CERCLA mailing list

Mound maintains a mailing list for people interested in the Mound CERCLA program. People on the list receive notification of CERCLA-related meetings, Site Specific/Five Year Plan meetings and other DOE-related public affairs activities. If you wish to have your name added to this list, sign up at any of Mound's public meetings or send your mailing address to:

EG&G Mound Applied Technologies
c/o Public Affairs/CERCLA
P.O. Box 3000
Miamisburg, OH 45343-3000

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MOUND
Environmental Restoration Program

ER/CERCLA Documents

Most community members receive important information on Mound Plant and the CERCLA Program through local news media. Others receive additional information–newsletters and fact sheets–as members of the Mound CERCLA mailing list. To learn more about the program's progress and major issues, many community members also attend the quarterly public meetings offered by EG&G Mound Applied Technologies and the U.S. Department of Energy. Some people might even see first-hand the CERCLA environmental testing now underway in the Miamisburg area.

All these ways of receiving information derive in some way from ER/CERCLA documents that program planners generate and use in studying the Mound's possible impacts on community health and the environment and in planning the CERCLA technical programs. The documents are also indispensable sources for persons or groups seeking detailed scientific or policy information on the Mound's CERCLA Program.

How to identify ER/CERCLA documents

ER/CERCLA documents are published in blue three-ring binders or spiral notebooks with blue covers. Their spines and covers have the DOE seal. The title identifies the kind of document–work plan, report, decision document–and the Operable Unit, or investigative area of the site, to which the document applies.

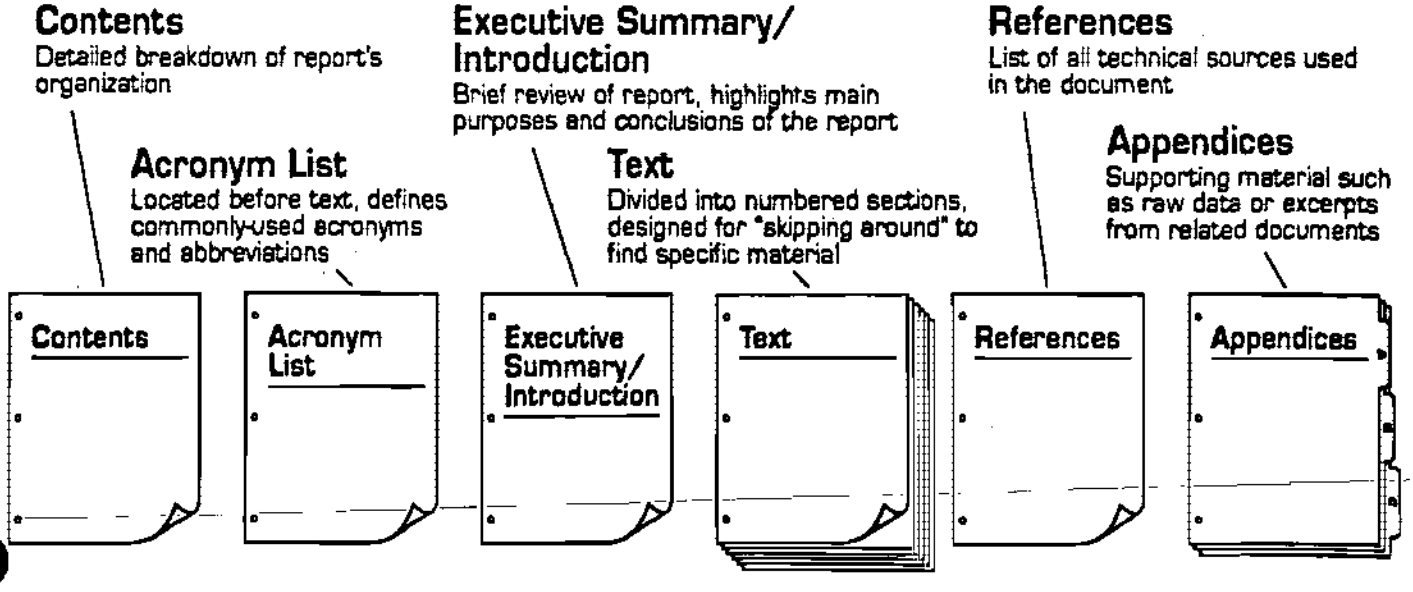
Where to find them

Mound ER/CERCLA documents may be inspected at the Miamisburg Public Library by any interested person or group. Certain copies may be checked out by card-holders.

How to use them

ER/CERCLA documents have a structure that allows for many levels of inspection. The basic purposes for and conclusions of the documents are summarized up front in the Executive Summary or Introduction. Documents are sectioned off in detail by topic areas, so the contents pages provide quick access to specific information within a document.

Here is the overall structure of ER/CERCLA documents:



EG&G

From the field to final document

Information for ER/CERCLA documents comes from previous studies, current fieldwork, laboratory data and expert knowledge from EG&G and its contractors. To ensure quality in these often-complex documents, they must pass through a rigid review cycle before they are released, so several months commonly elapse between the first draft, or working draft, and the publication of an ER/CERCLA document.

These are the four basic stages every ER/CERCLA document must pass through before being approved for publication:

1. **Working Draft**–Months of research, fieldwork, data analysis and writing often go into the Working Draft of an ER/CERCLA document. Once prepared, the Working Draft is revised internally by Mound technical experts and the DOE Dayton Area Office.

2. **Draft**–After internal revision, a Mound ER/CERCLA document is sent in Draft form to the DOE Albuquerque Field Office (the DOE management center to which Mound Plant is assigned), DOE Headquarters, the Ohio EPA and the US EPA for review and comments. Only rarely do draft documents get released to the public.

3. **Final Draft**–DOE and EPA comments on the Draft are responded to at Mound and a Final Draft is prepared for the US EPA. Under the terms of the Mound Federal Facilities Agreement and the requirements of CERCLA, the US EPA must give final approval to all Mound ER/CERCLA documents before their publication.

4. **Final**–Once approved by US EPA*, the document is published and released to the public in its characteristic blue binder with official logos. It is labeled Final on the cover.

Final documents may need to be revised to reflect significant CERCLA Program changes after publication. Revised documents require US EPA approval before their republication. Revised documents indicate their revision number on the cover; new documents are labeled Revision

*Though not yet signatory to the FFA, the Ohio EPA also reviews and comments of all documents before publication.

Speaking of documents...

Operable Unit 9 Site Scoping Report

The Site Scoping Report is the starting point for the CERCLA Program's intensive Remedial Investigation into possible contamination in the environment around Mound Plant. The multi-volume report compiles and evaluates many previous environmental studies by DOE, EG&G and Monsanto Research Company–the Mound's previous operator. These reports also collect information and data from many other sources, such as employees, historical reports and correspondence, etc. The Remedial Investigation fieldwork now underway at Mound and in the Miamisburg community will expand on the information in the Site Scoping Report. This information will lead to the formation of a conceptual site model, meaning data on the nature and extent of the contamination, plus the specific environmental "pathways" along which contamination travels. The following volumes of the Operable Unit 9 Site Scoping Report are currently available at the Miamisburg Public Library:

1. Groundwater Data
2. Geologic Log and Well Information
4. Engineering Map Series
5. Topographic Map Series
6. Photo History Report
7. Waste Management*
8. Environmental Monitoring Data
10. Permits and Enforcement Actions
11. Spills and Response Actions

These volumes will be completed and available in the near future:

3. Radiological Site Survey
9. Annotated Bibliography

*available as of 3-5-93

MOUND
Environmental Restoration Program

SUPERFUND Update

EG&G

March 1993

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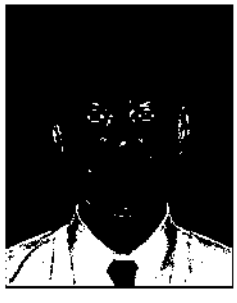
CERCLA PROFILE– Dr. Bill Taylor of ATSDR

Dr. William H. Taylor is the Mound CERCLA Program's federal watchdog for site-related community health. Dr. Taylor is a health assessor for the Agency for Toxic Substances and Disease Registry (ATSDR). Along with a Ph.D. in chemistry and a B.A. in economics, Dr. Taylor's expertise in physical chemistry, pharmacology and environmental health was developed through post-graduate studies and experience at the U.S. Food and Drug Administration and the U.S. Army Medical Research Institute of Infectious Diseases. Dr. Taylor also spent a year in Australia as a visiting scholar. He joined ATSDR in 1991.



ATSDR was created in 1980 through CERCLA to monitor public health at CERCLA sites. The Atlanta-based agency is a division of the U.S. Department of Health and Human Services.

Through Dr. Taylor, ATSDR will monitor community health throughout Mound's CERCLA process. Dr.

(Please see Taylor, Page 8)

Quarterly Public Meeting
Thursday, March 11, 1993, 7:00 pm
Council Chambers of the Miamisburg Civic Center
10 N. First Street
Miamisburg, Ohio

Quarterly Public Meeting

The U.S. Department of Energy and EG&G Mound Applied Technologies will hold the quarterly CERCLA meeting to update the community on the progress of investigative fieldwork and discuss new documents placed in the public reading room. The meeting will also include an open discussion and opportunity to update or sign out CERCLA Notebooks.

Investigative Fieldwork

The Mound Plant is currently conducting a Remedial Investigation, an initial stage of a CERCLA cleanup. The RI is a lengthy, comprehensive effort to identify contaminants and assess their potential risk to human health and the environment. Fieldwork in this stage involves environmental sampling and the identification of sensitive land areas and species. At the meeting, special attention will be focused on off-site testing on properties belonging to the City of Miamisburg, Conrail, the Miami Conservancy District and private citizens.

New Documents

Several new documents have been added to the Information Repository at the Miamisburg Public Library. These will be listed and a discussion on the major documents will be held.

Open Discussion

There will also be time set aside for community members to ask questions or raise concerns about any aspect of the Mound's Environmental Restoration/CERCLA Program. EG&G technical experts, as well as representatives from DOE and EPA, will be on hand to respond, or, if a matter needs further study, to record questions for later response.

CERCLA Notebooks

Community members who have already received CERCLA Notebooks are encouraged to bring them to the meeting for the newest materials. Persons wishing to obtain a CERCLA Notebook may sign one out at the meeting. The notebooks contain fact sheets and other information on Mound's CERCLA Program from 1990 to the present.

For further information, call Mark Becker of EG&G Mound Public Affairs at (513) 865-3001.

At a Glance—Off-Site Groundwater Sampling

Mound's off-site CERCLA testing is presently assessing the possible migration of contaminants from the Mound to the environment at large. As part of this effort, nearly 100 new monitoring wells and piezometers are being installed in and around the Mound.

Drilling for Facts

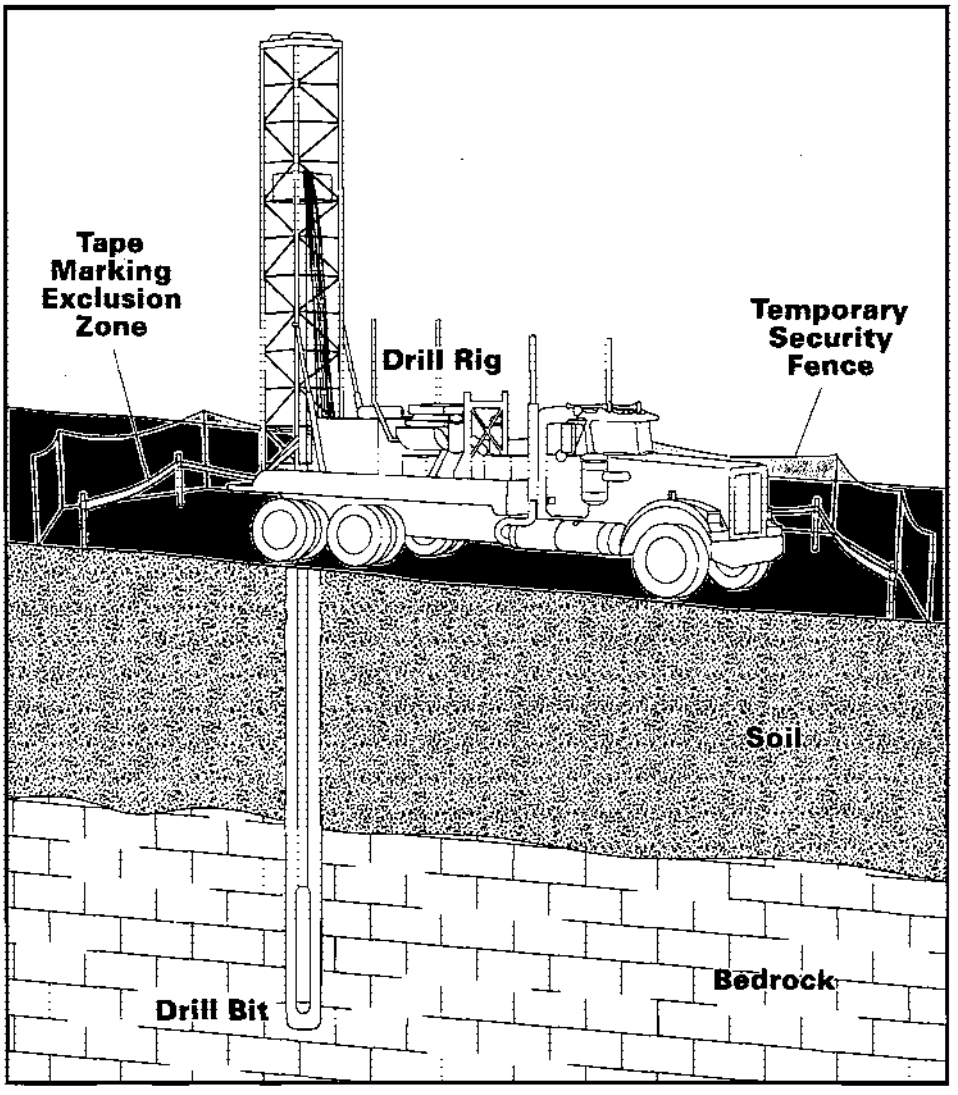
Only one kind of off-site testing—well installation—will "raise a ruckus" with the use of heavy equipment. A drill rig mounted on a semi-truck is required to install **monitoring wells** and **piezometers**. If you have seen current monitoring well and piezometer installations in and near Community Park, you might have wondered what was happening. Here is a look at what these testing wells are, what they do, how they are installed, and what health-and-safety procedures protect workers and the public nearby.

What They Are

Monitoring wells and piezometers are wells drilled into the subsurface to determine contaminant levels, depth or flow of area **groundwater**. Groundwater is one of the principal "pathways" through which contaminants may be spread to the environment. Monitoring wells and piezometers are being installed on city property (including one in Community Park), Conrail property near Community Park and lands along the Great Miami River owned by the Miami Conservancy District. They are also being installed on private property throughout Miamisburg and the Miami Valley within a 2-mile radius of Mound. Another purpose of off-site groundwater testing is to establish **background levels**, or normal levels of chemicals and radionuclides, away from any possible impact from Mound Plant.

How They're Installed

Different drill rigs are used to install monitoring wells and piezometers. For this testing, **Rotasonic™** and **cable tool** drilling methods are being employed. Rotasonic drilling uses a vibrating bit at the bottom of the drill stem to advance into the soil and bedrock. Cable tool drilling uses a heavy weight which is raised and dropped repeatedly on a chisel-like tool that cuts into soil and rock. The boreholes are then encased with pipe, sealed in place and anchored around the top with cement.



Both monitoring wells and piezometers can be installed so that they extend above the ground surface up to three feet. In public areas like Community Park, monitoring wells and piezometers will be installed flush with the ground surface and secured with a locking manhole cover.

Safety Procedures

During all well fieldwork, environmental monitoring devices, including air-monitoring equipment, are set up to warn workers about the potential for elevated levels of contaminants. During all excavations, the work area is surrounded by a **temporary security fence**. Within that fence, an **exclusion zone** is taped off. No workers, equipment or samples can leave the exclusion zone before undergoing a field test for contamination. These measures ensure the safety of workers and the general public.

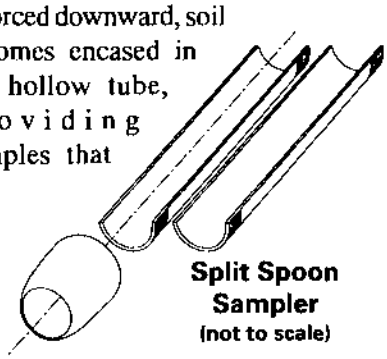
What They Do

Monitoring wells are generally 2 inches in diameter or larger (4-6 inch diameters are most common). Groundwater samples are drawn from monitoring wells to test for water quality. Piezometers are generally 2 inches in diameter or smaller and are used to measure groundwater levels. Both monitoring wells and piezometers are used to determine the direction and speed of groundwater flow.

Soil and bedrock samples will be collected during drilling to map subsur-

face layers. Like groundwater samples, they are sent to a laboratory for analysis for potential chemical and radiological contamination. Soil samples are taken from the entire depth of the well using a **split spoon sampler**, which is a steel tube, approximately two feet long and two inches in diameter, split lengthwise and held together at the top and bottom by threaded "caps."

One end of the split-spoon sampler is attached to the drill rod. As the device is forced downward, soil becomes encased in the hollow tube, providing samples that show the composition and depths of subsurface features. A similar device, called a **core barrel**, is used to collect bedrock core samples.



Split Spoon Sampler
(not to scale)

Environmental Sampling

The groundwater samples collected from monitoring wells, plus the soil and bedrock samples collected during the installation of monitoring wells and piezometers, are some of the many kinds of environmental samples being collected during Mound's CERCLA Remedial Investigation. These samples will help program scientists determine the possible spread of contamination at Mound. This section details the many stages of sample analysis.

Field Testing

A variety of analyses are performed on samples in the field, at the time and place they are taken from the environment. Groundwater samples will undergo several field tests for water quality. These include specific conductance, temperature, pH, dissolved oxygen and oxidation-reduction potential. Field evaluations of hazardous substances in groundwater will include testing for combustible gases, organic vapors, low-energy gamma radiation and alpha radiation. Soil samples are screened for low-energy gamma radiation.

Field tests give a preliminary indication of environmental conditions. They can alert the Mound to possible problems, but are not considered final assessments. Field sampling results must be later verified in a laboratory.

Packing the Samples

Mound field crews have standard procedures to follow to ensure samples are properly preserved on their way to analytical laboratories. Before being placed in their final shipping containers, the containers are cleaned, sealed in plastic and packed with ice inside a cooler. A chain-of-custody document is placed on each sample container and inside the cooler; the cooler lid is taped shut and a signed chain-of-custody seal is attached to the outside.

Samples are screened for radiation levels before they can leave the site. To ensure public safety, the shipping of samples follows procedures set by the U.S. Department of Transportation and the International Air Transportation Association.

"Chain of Custody"

After samples have been prepared for shipment to outside analytical laboratories, a chain-of-custody document is prepared. This document identifies the sample, its collection date and location, as well as its condition. This document is used to create an accurate written record that can be used to trace the possession and handling of the sample from the moment of its collection through analysis and introduction as evidence. The multiple chain-of-custody identification described above ensures that the thousands of samples collected during fieldwork will be kept in proper order.

Laboratory Analysis

A small portion of all on-site and off-site groundwater and soil samples collected during monitoring well and piezometer installation will be screened for radionuclides by the Mound Plant Sample Screening Facility before they are released to the independent analytical laboratory. The results will be included along with the samples when released to the laboratory. This will be done to inform the outside laboratory of potential radiological levels present in the samples and to maintain health and safety levels.

The Mound sends environmental samples to several different laboratories to ensure accurate results. All outside laboratories have been approved by EPA and follow EPA-certified procedures.

Quality Control

Quality control checks are used to evaluate the accuracy and precision of field screening, field measurements, sampling techniques, and laboratory analyses. In addition to DOE quality requirements, Mound has its own quality control procedures that all field crews and laboratory crews follow. Outside labs have their own quality control procedures.

Quality control requirements for field screening and field measurements are met through multiple readings and by frequent calibration of instruments. Duplicate samples are also taken to ensure the precision of the sampling.

Sampling by Regulators

Occasionally, the Ohio EPA or the US EPA will be present during sampling. These agencies evaluate Mound's sampling procedures and may also take their own samples for analysis in separate labs to check the accuracy of the CERCLA Program's results.

Results

Because of the extensive quality control at analytical labs, final results are not available until several months after the sampling. If samples show indications of having unacceptable levels of contamination before the process of analysis is completed, the labs are required to notify the Mound. In the case of off-site sampling, Mound will notify the property owner. If high levels are detected, final analysis may be expedited for the samples of concern.

Verified sampling data becomes part of the CERCLA Program's Administrative Record, the legal file that details Mound's compliance with CERCLA regulations. As with all information in the Administrative Record, verified data is open for public inspection.

Understanding Radiation

Radiation is among the best understood natural phenomena. Its health effects have been studied for nearly a century, and radiation exposure standards were among the first occupational and public health regulations to be set by the government. This article explains the basics of radiation, our everyday exposure to it and the standards set to protect our health.

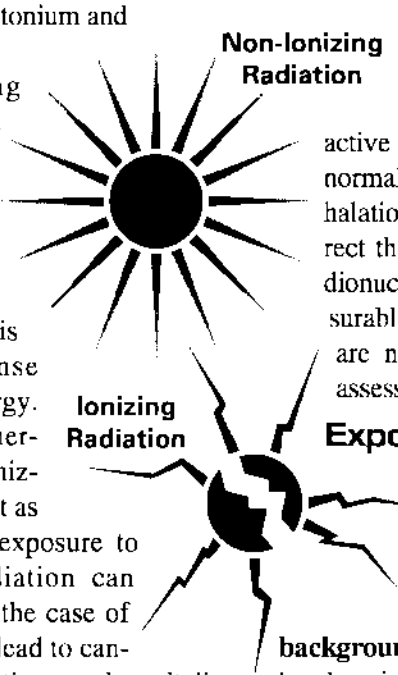
The Basics

Radiation is among the best understood and most used of all natural phenomena. "Radiation," in fact, is a general term describing all movement of electromagnetic energy through space. This means that radio waves, the microwaves we cook with, x-rays, light and heat, along with the radiation produced by nuclear reactions, are all forms of radiation. The "radiation" we commonly refer to is actually **ionizing radiation.** Ionizing radiation causes atoms which it strikes to become electrically charged or "ionized."

Ionizing Radiation

Ionizing radiation is created by the disintegration, or decay, of elements that have unstable atomic structures. These elements, as you might have seen, are referred to as **radionuclides** in Mound's CERCLA Program. The main radionuclides of concern in Mound's cleanup include tritium, plutonium and thorium.

Non-ionizing radiation is emitted evenly over a wide area—sunlight and radio waves are examples of this. Ionizing radiation is emitted in intense "packets" of energy. Most energy generated from non-ionizing radiation is lost as heat. Excessive exposure to non-ionizing radiation can burn tissue (as in the case of sunburn) and can lead to cancer. Ionizing radiation can deposit disrupting energy in tissue, creating burns in extreme doses and the possibility of cancer at normal levels.



Radiation Dose

Dose is the measurement of the radiation absorbed into a body. Dose is measured in terms of **rads (radiation absorbed dose)**.

Dose Equivalent

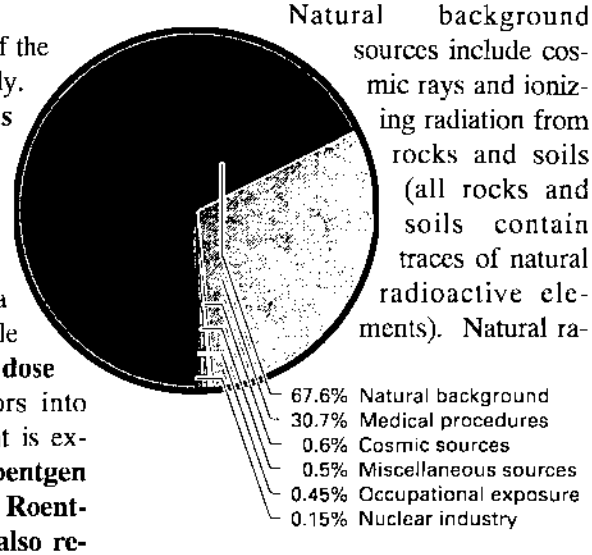
Depending on the kind of radiation involved (see Kinds of Ionizing Radiation, Page 5), a dose of radiation will affect people differently. Another unit, the **dose equivalent**, takes these factors into consideration. Dose equivalent is expressed in terms of **rem (Roentgen equivalent man, after William Roentgen, who discovered x-rays; also referred to as rad equivalent man)**. When regulators form dose limits, they use a measurement called the **effective dose equivalent (EDE)**.

Mound's annual Environmental Monitoring Report reports dose equivalents in **committed effective dose equivalent (CEDE)**. The CEDE accounts for the dose to an individual from internally deposited radioactive materials. These materials normally enter the body through inhalation or ingestion. External (direct through skin) exposures to radionuclides from Mound are immeasurably low for the community and are not considered significant in assessing health effects.

Exposure

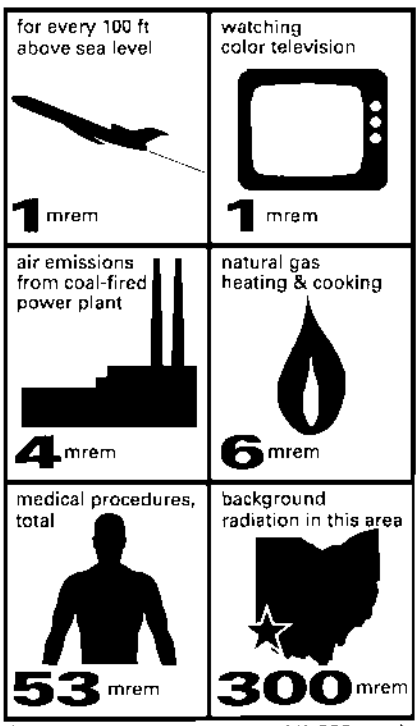
Background Sources

Our bodies absorb radiation from a variety of everyday exposures, known as **background** sources. As can be seen by the pie-chart above, nearly all our exposure to radiation comes from background sources, and most of our background sources are naturally occurring.



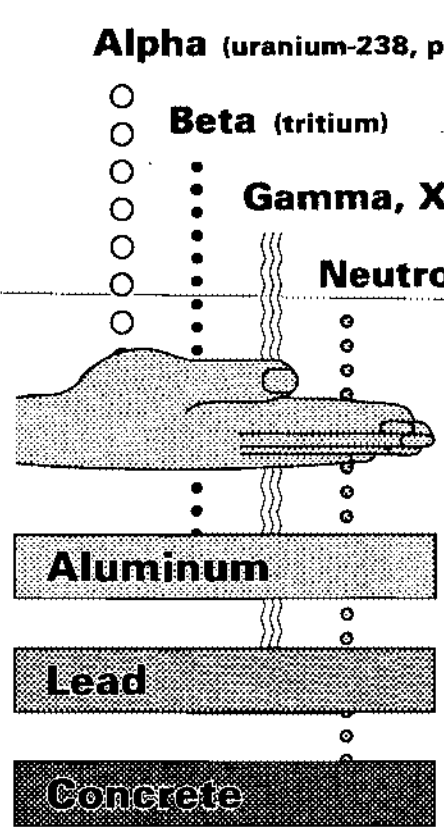
Natural background sources include cosmic rays and ionizing radiation from rocks and soils (all rocks and soils contain traces of natural radioactive elements). Natural radon, produced from the decay of thorium and uranium in the earth, accounts for our largest single source of ionizing radiation. Radon, which disperses harmlessly in nature, is trapped by our energy-efficient homes and accounts for thousands of cancer cases every year.

some common yearly radiation doses...



(note: mrem = millirem, or 1/1,000 rem)

Kinds of Ionizing Radiation



The atomic disintegration of radionuclides gives off radiation in several forms. This radiation can disrupt the molecules in living things, causing biological damage. Depending on the kind of radiation being emitted, the effects of exposure to radionuclides vary. This is important to know because it explains why different radionuclides in the environment produce different potential hazards.

Some radionuclides emit just one kind of radiation; most others emit more than one kind, but with varying intensity. Usually, a radionuclide will be a principal emitter of one kind of ionizing radiation, with trace emissions of other kinds. The principal kinds of radiation emitted by different radionuclides determines their penetrating power.

Alpha Radiation [α]

Positively-charged particles emitted during the decay of certain radionuclides. Alpha particles are, in the context of atoms, large particles. External exposure to alpha radiation poses no significant danger to people because skin or a sheet of paper will stop any alpha particle. The danger of alpha emitters comes through internal exposures—in other words, when they are breathed in or swallowed. Uranium-238 and plutonium-238 are alpha emitters.

Beta Radiation [β]

Electrons from an unstable atom emitted during decay. Beta particles can pass though human tissue. When external radiation passes through tissue, it deposits energy in that specific location. In other words, if a person's hand were irradiated externally, the exposure would stay in the hand and not move to other parts of the body. Tritium is a beta emitter.

Gamma Radiation [γ]

A stream of energy released during the decay of certain radionuclides. Gamma radiation can easily penetrate tissue, but in general is not as damaging as particle radiation. Concrete or lead are commonly used to stop gamma rays. Common gamma emitters include cobalt-60 and cesium-137.

Used in many common medical procedures, X-rays share identical properties with gamma rays, except that they can be generated electrically (without radionuclides).

Neutron Radiation

As opposed to alpha and beta radiation, neutrons are uncharged particles and can penetrate nearly anything thinner than a heavy concrete wall. Neutron radiation generally occurs as a by-product of atom-splitting (fission) in nuclear reactors or in particle accelerators.

Radon accounts for nearly 200 mrem of our 300 mrem background exposure.

Other background sources of radiation include fallout from atmospheric nuclear testing (now banned), extra cosmic rays from airline travel and combustion of fossil fuels—coal, oil and natural gas—for energy. Hundreds of common consumer products—optical glass, color televisions, plastic wrap, tobacco products, smoke detectors, lighted exit signs and luminous paints—emit radiation. So do fertilizers, road construction materials and most building materials. Mineral springs (including bottled mineral water), often regarded as medicinal, contain elevated levels of natural radioactivity. We regularly ingest natural radioactivity in foods, especially those containing potassium, which is an essential nutrient (our bodies also contain trace amounts of radioactive elements). Regular exposure to radiation in medical care—from routine x-rays to radiation therapy—is considered to be part of our background exposure.

Setting the Standards

Radiation Health Effects

Many people carry images of horrible burns and mutations resulting from exposure to radiation. Severe, direct exposures can burn or kill at doses millions of times higher than any from Mound. High-level direct exposures to large numbers of people have occurred only in the A-bomb attacks on Japan and the 1986 reactor fire at Chernobyl. The main focus of radiation health protection concerns the long-term effects of exposure to low-level radiation doses.

Radiation is a known **carcinogen**, meaning that it can cause cancer. Cancer risk increases proportionately with exposure in high doses and is assumed to do so in low doses.

The average lifetime probability of contracting some form of cancer in the United States—from all possible sources, environmental and hereditary—is between 25% and 33%. The goal of

(Please see Understanding, Page 6)

Understanding

continued from Page 5

radiation exposure standards is to keep the increased risk posed by radiation sources acceptably low. "Acceptable" risk levels to workers and the general public are set by federal policy-makers for many industries. Based both on risk projections and statistical health studies, standards set for radiation protection are comparable with those in other regulated industries. For all industries, 9 additional deaths in a population of 100,000 as a result of industry operations is broadly considered to be the average risk. For the nuclear industry, the best estimates place increased mortality at 4–5 in a population of 100,000.

Maximum Permissible Exposure

Worldwide, many scientific organizations conduct extensive studies that government agencies use to set standards. Chief among these is the International Council on Radiological Protection (ICRP). ICRP studies of radiation health effects are used in standards set by the U.S. Environmental Protection Agency and the U.S. Nuclear Regulatory Commission.

Maximum permissible exposure standards have evolved from decades of radiation health studies. Much of our knowledge comes from studies done on miners, workers with radium paints in the 1920s and '30s, A-bomb survivors in Japan and studies of modern radiation workers.

Maximum limits for workers are higher than those for the general public. This is true of all industries for which federal regulations allow higher risk to a worker—because the worker accepts increased risk voluntarily, whereas the public does not. Standards for workers and the general public, measured in allowable dose equivalents per year, are based on extremely conservative assumptions for exposure. Maximum permissible exposure limits assume that community members spend all their time on-site, breathing air containing the highest recorded radiation levels found on-site, as well as drinking water and eating foods having the maximum concentrations found off-site. Each year's maximum allowable dose also assumes that those affected will receive this same exposure continuously for 50 years.

The Bottom Line

Even if workers and the general public absorb their respective maximum permissible doses, their chances of contracting a cancer as a result are increased only fractions of a percent.

Here are the exposure limits from industrial sources of ionizing radiation...

Maximum Exposure Limits/Year	
4 mrem	EPA drinking water limit for man-made radionuclides
10 mrem	DOE limit for airborne emissions to general public
100 mrem	Exposure limit to general public from DOE operations
5,000 mrem	Occupational exposure limit

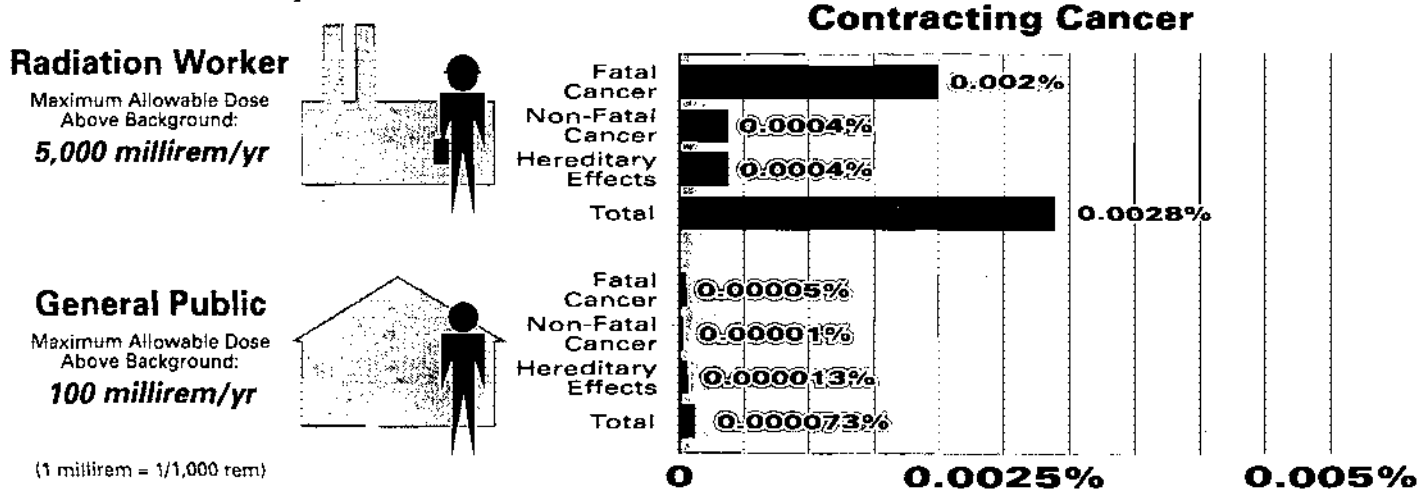
Source: U.S. Department of Energy

Compare these dose limits with doses producing radiation health effects...

Health Effects per Dose Equivalent	
1,000 mrem	5–6 excess cancers in population of 10,000
*20,000 mrem	detectable effect on blood cells
*100,000 mrem	vomiting, nausea (rarely fatal)
*400,000 mrem	fatal to 50% of untreated population
*4 million mrem	fatal within 48 hours

*one-time, immediate exposure

Additional Exposure Limits... ...and the Additional % Chance of Contracting Cancer



Based on additional cancer risks per rem determined by the International Council on Radiological Protection (ICRP). Risks presented above for workers and the general public assume that both groups receive their respective maximum allowable yearly dose. Note that the graph above spans five one-thousands of 1% calculated additional risk; at this graph's scale, an exposure yielding a full 1% additional cancer risk would be 52 feet long.

DOE News

New Energy Secretary Sworn In

Hazel R. O'Leary was confirmed by the Senate January 21 and sworn in at a White House ceremony on January 22, 1993.

Five-Year Plan and Site-Specific Plan Released

The DOE has released its **Environmental Restoration and Waste Management Five-Year Plan for Fiscal Years 1994-1998.** It is available at the Miamisburg Public Library for public review and comment. Written comments will be accepted through March 30, 1993. Formal oral comments will be taken at the Public Meeting on March 25. Send written comments to EG&G Mound Public Affairs.

The final 1994-1998 Five Year Plan will consist of three volumes. Volume I covers strategic program activities and outlines of the most important Environmental Restoration and Waste Management programs at its sites nationwide. Volume II describes cleanup activities at 37 DOE sites, including Mound. Volume III, not yet published, will provide a detailed discussion of all comments received during the public comment period.

To ensure your input, review the documents at the library and attend the public meeting on March 25.

The **Site-Specific Plan** for Mound is also available at the library. Comments on the Site-Specific plan will also be taken at the March 25 public meeting and may be made in writing until March 30.

Clarification

The January 1993 "Superfund Update" mentioned in an article that none of the 14 transuranic elements occurs in nature and in a glossary that one transuranic element is found in nature. Trace amounts of one transuranic element have been found in ancient rocks in West Africa, but the element is thought not to occur naturally today. Thus, most radiation scientists do not consider it a natural transuranic element.

Remedial Response

Answers to Community Concerns

The following issues were raised by community members at the January 5, 1993, Miamisburg City Council meeting at which the city approved the granting of an access license for Mound CERCLA Program testing on several parcels of city property.

Meeting Matters

(CERCLA meetings are separate from Miamisburg City Council meetings)

Some community members expressed some confusion over public announcements on the meetings in which the access licenses were discussed and voted upon, saying they received no advance notification of the meeting from Mound's CERCLA Program.

The reason the Mound did not send announcements of the meeting is that it was not a CERCLA Program public meeting, but a regular meeting of the Miamisburg City Council. The access agreement between the city and the Mound involved the passing of a city ordinance. The city gave the usual advance notification for any business to be conducted at a Council meeting.

Miamisburg City Council meeting agendas are sent in advance to local news media and are available the Friday before the Tuesday of the meeting at the city's administrative offices in the Civic Center. The Miamisburg City Council meets the first and third Tuesday of the month in the Council Chambers in the Miamisburg Civic Center, 10 N. First Street, Miamisburg. The meetings are open to the public and are broadcast on Dayton cable channel 11.

As required by law, the Miamisburg City Council first holds a reading of a proposed non-emergency ordinance before it is voted upon. After the reading, the public may ask questions and make comments on the proposed ordinance. Council votes on the ordinance at its next regular meeting (held on the first and third Tuesday of each month) or at a specially scheduled meeting. Special sessions are used to consider pressing business and are announced the same ways as regular sessions.

The Mound CERCLA Program holds quarterly public meetings, also in the Council Chambers of the Civic Center. They are announced in advance through many sources. As appears in this issue, CERCLA meetings are announced in the program's newsletter. Additional advance announcements are published as graphic advertisements in the *Miamisburg News* and the *Dayton Daily News*. News releases are also sent to these newspapers and other local news media.

In My Back Yard?

(Choosing locations for off-site environmental sampling)

At the Miamisburg City Council meeting, one community member asked how the locations for sampling on city property were chosen. Like all off-site sampling locations, the locations within the eight city parcels were selected by a team of scientists. The choices were based on existing information on possible sources of contamination and scientific principles on the distribution of contaminants throughout environmental "pathways."

Project engineers, geologists, ecologists, chemists and soil scientists worked with computer-aided models of environmental transport to determine how contaminants released into the air and groundwater might move through the environment. The sampling locations concentrate on the Miamisburg area but also encompass a 20-mile radius around Mound Plant. They were adjusted in response to comments from scientists at the U.S. and Ohio EPAs.

Secondary locations were also selected and approved for use in case of problems in the arrangements for sampling at primary spots. In a few cases, the CERCLA program could not con-

(Please see Response, Page 8)

Taylor

continued from Page 1

Taylor's presentation on ATSDR at the November 12, 1992, public meeting marked his second trip to Miamisburg. Because members of the Miamisburg community have expressed interest in ATSDR's role in the CERCLA process, Dr. Taylor plans further visits to the area.

ATSDR scientists first analyze environmental and health data from other government agencies, such as the U.S. and Ohio EPAs and the Ohio Department of Health. Also, ATSDR representatives meet with community members to elicit any health concerns. If health assessors find increased rates of illnesses, they may conduct further evaluations to determine whether the illnesses are tied to the site's contamination.

Later this year ATSDR will release a health consultation on the contamination in the Miami-Erie Canal and the Community Park area. Dr. Taylor plans to hold a public meeting in Miamisburg to explain the report.

For more information, Dr. Taylor can be reached at ATSDR, 1600 Clifton Road NE E-56, Atlanta, GA 30333, or by phone at (404) 639-6035.

Response

continued from Page 7

tact residential property owners or owners denied the program access to their properties.

Currently access agreements have been signed with the City of Miamisburg, Conrail, and the Miami Conservancy District. Over seventy percent of residential property owners contacted have signed access agreements.

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Important phone numbers

EG&G Mound Applied Technologies	
Environmental Restoration/	
CERCLA Community Relations:	513-865-4450
Mark Becker:	513-865-3001
U.S. Environmental Protection Agency	
(Region V Headquarters, Chicago):	
Diana Mally:	312-353-6287
Diane Spencer:	312-886-5867
Ohio Environmental Protection Agency	
(Dayton office):	
Martha Hatcher	513-285-6357
Ohio Department of Health	
(Columbus):	1-800-523-4439
(Radiological Section)	
Larissa Gilham:	614-644-2727

CERCLA mailing list

Mound maintains a mailing list for people interested in the Mound CERCLA program. People on the list receive notification of CERCLA-related meetings, Site Specific/Five Year Plan meetings and other DOE-related public affairs activities. If you wish to have your name added to this list, sign up at any of Mound's public meetings or send your mailing address to:

EG&G Mound Applied Technologies
c/o Public Affairs/CERCLA
P.O. Box 3000
Miamisburg, OH 45343-3000

MOUND
Environmental Restoration Program

EG&G Mound Applied Technologies
Public Affairs/Environmental Restoration
P.O. Box 3000
Miamisburg, OH 45343-3000

MOUND
Environmental Restoration Program

SUPERFUND Update

EG&G

January 1993

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Off-Site Testing Underway

The detection, assessment and treatment of contaminants within plant boundaries is not enough to guarantee full environmental *remediation*. Further efforts must be made to determine whether contamination has spread into the area surrounding the plant. Mound has begun a new round of *CERCLA*-required testing to find and evaluate any possible off-site contamination. The testing will also establish "background," or normal, levels for chemicals and *radionuclides* in the area.

To carry out off-site testing, Mound's Environmental Restoration Program has sought and received formal access agreements from property owners in the Miamisburg community. They include private citizens, City of Miamisburg, and Conrail. The off-site locations were chosen after scientific analysis of factors influencing the potential migration and impact of possible contaminants at Mound Plant. These factors include land and waterway usage, local geologic features, weather patterns and the distribution of human and wildlife populations in potentially affected areas. Off-site testing locations center on the

(Please see Off-Site, Page 4)

Public Meeting Recap

Many Miamisburg residents braved the wind and rain to attend the most recent CERCLA Quarterly Public Meeting on November 12, 1992. A summary of the meeting's events follows.

CERCLA Manager Chuck Friedman opened the meeting with a description of **opportunities for public participation** in Mound's CERCLA program. Superfund legislation was written on the premise that environmental issues are best resolved if people in affected communities are informed and active in the effort. Thus, CERCLA encourages two-way communication between cleanup officials and the public.

Besides attending the quarterly public meetings, there are many convenient, accessible ways to monitor the progress of the plant's Environmental Restoration Program—and to voice your ideas directly to program planners. Mound's CERCLA Community Relations Program is designed to provide any interested person or group with easy access to facts and explanations. For more information, please call EG&G Mound Public Affairs at (513) 865-4450.

Dr. Dan Carfagno of EG&G Mound discussed the areas at the site where radioactive **thorium-containing ore** had

(Please see Meeting, Page 5)

Types of Off-Site Environmental Testing

Six kinds of testing are being performed at off-site locations as part of the Remedial Investigation phase of the Mound Plant's CERCLA cleanup. The CERCLA program will investigate possible environmental impacts within a 20-mile radius of the site.

■ ***Hydrogeologic* studies** look for contamination in area groundwater, including the vast groundwater system underlying the area. (See **The Buried Valley Aquifer**, Page 2.)

- *Monitoring wells* and *piezometers* will be installed. During their installation, core samples are taken to map the depth of subsurface layers of soil, sand, silt, clay and rock.
- Off-site outcrops of *bedrock* along Mound's northwest side will be mapped.
- Stream gauges will be placed at three locations along the Great Miami River.

■ **Seismic refraction studies** map rock layers through a process similar to radar.

- Sledge hammers striking a metal plate or small explosive charges send sound waves through the ground. Because different materials bounce sound waves back to the surface at different speeds, the sensitive receiving equipment can plot the consistency and depth of different subsurface layers.

■ **Soil studies** look for soil types and contaminant levels in area soils.

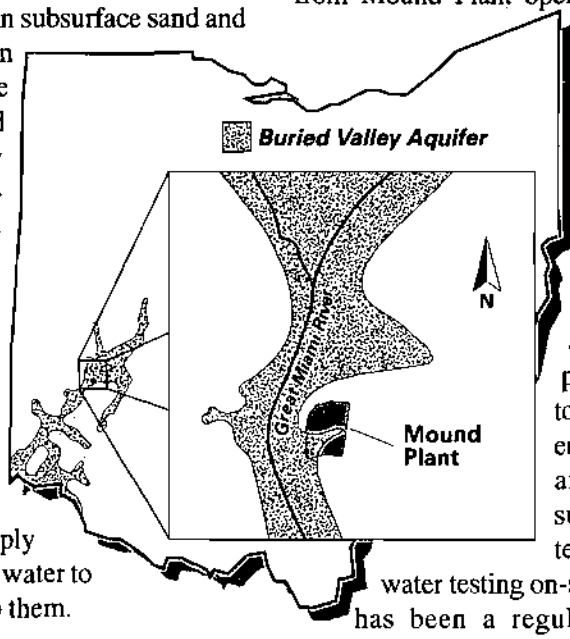
- Surface soil samples taken from within a 20-mile radius around Mound will characterize the distribution of contamination that may have been dispersed by winds.

(Please see Testing, Page 7)

(NOTE: all terms in *italics* appear in the Glossary, Page 4)

The Buried Valley Aquifer

Beneath and around the Great Miami River basin is a vast system of *aquifers*—millions of gallons of groundwater accumulating in subsurface sand and gravel deposited in the area during the Ice Age. Called the Buried Valley Aquifer, this system is by far the largest of three sole-source aquifers in Ohio, covering a 13-county area in the southwest region of the state. "Sole source" refers to aquifers that supply all of the drinking water to communities atop them.



The City of Miamisburg, as well as neighboring communities, draws its drinking water from the Buried Valley Aquifer (BVA). The numerous private wells in the area also draw water from the BVA. Mound Plant sits partially atop this aquifer system. There are six major public water wells and numerous industrial water users within a 5-mile radius of Mound.

Upcoming testing

Because any contamination released from Mound Plant operations has the potential to affect local water quality, Mound's CERCLA investigation requires additional testing to verify the accuracy of previous monitoring data and to ensure suspected areas of exposure are being tested. Groundwater testing on-site and off-site has been a regular feature of Mound's Environmental Monitoring Program, the results of which are published yearly and are available for public inspection at the Reading Room.

Mound has more than 60 active groundwater *monitoring wells* and *piezometers* on-site and off-site, installed as part of its regular monitoring program and previous water quality projects. Currently Mound's Environmental Restoration/CERCLA Program is arranging for a new round of groundwater testing on neighboring properties belonging to private citizens, City of Miamisburg, Conrail and the Miami Conservancy District. This new testing will include the installation of 43 new monitoring wells and 42 new piezometers.

Hydrogeological testing both on-site and throughout the region will help map the local portion of the BVA, especially the "tongue" that runs beneath Mound Plant. It will also detail the depth and flow of local groundwater. As part of this testing, groundwater sampling will identify potential areas of concern and determine the normal, or "background," levels of chemicals and radionuclides in area water.

Other recent water quality projects were undertaken by Mound in 1990 (for DOE Environmental Restoration Program Report), 1987 (for DOE Environmental Survey) and 1975-76

(Please see BVA, Page 4)

Waterways as Pathways

Communities depend on waterways for sustenance, power and pleasure. In an ecological sense, waterways interact with land and the populations living near them. Because of this interaction, waterways are often primary "pathways" on which contaminants travel from their source to the environment at large.

Surface waters—which include ponds, creeks, streams, rivers and lakes—are the most recognizable waterways. Water also "flows" below the surface of the earth. Subsurface water, called groundwater, moves slowly through soils, sand, gravel, rock layers and other subsurface features. The volume of groundwater within the earth's land masses exceeds by far the volume of surface water upon them.

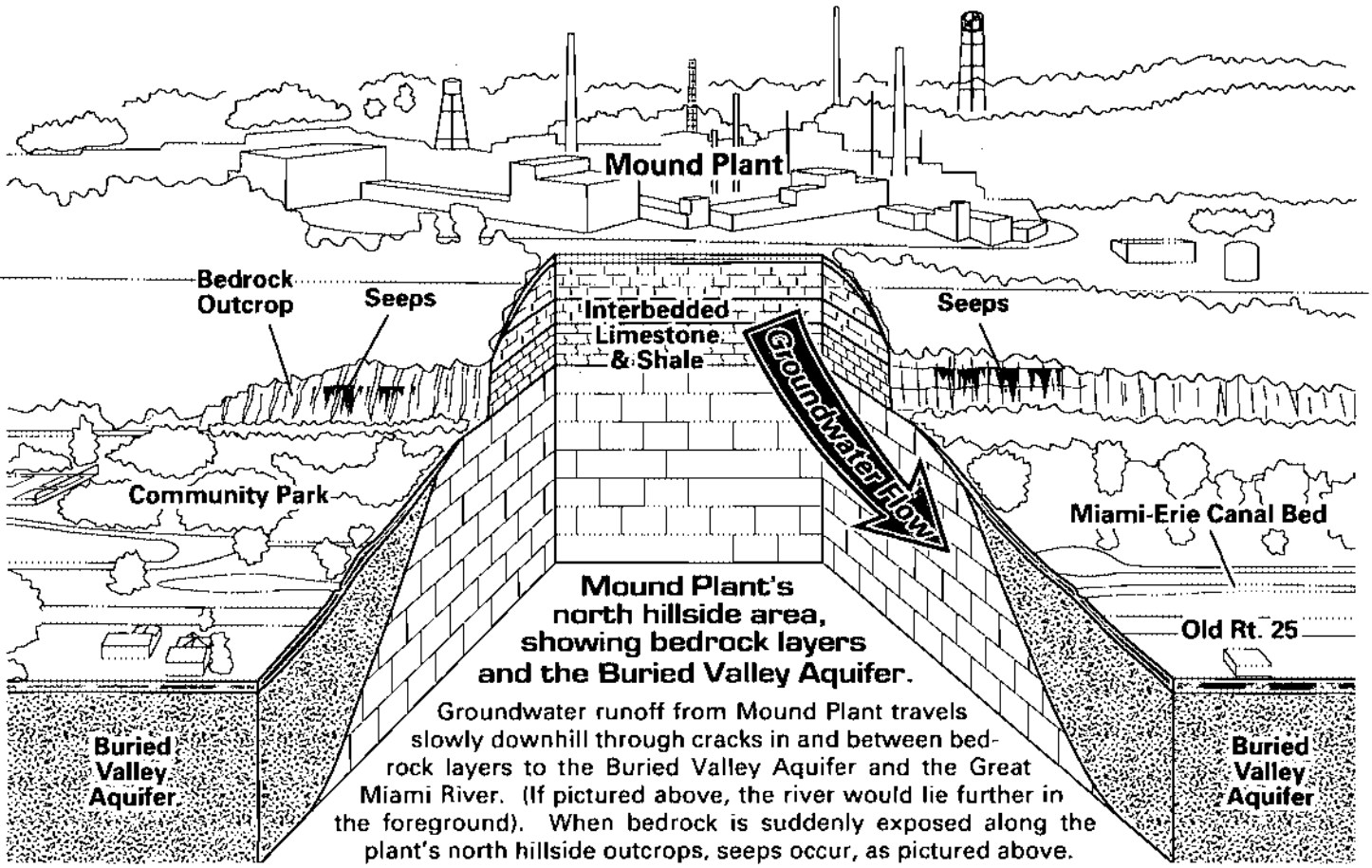
Surface water and groundwater systems interact to distribute water throughout communities. Groundwater seeping through the earth feeds streams and rivers, which can carry contaminants from one community to others. In turn, surface water seeps into the surrounding earth, recharging aquifers and underground streams. Evaporation from groundwater and surface water is in turn redeposited as precipitation locally or far away, depending on weather patterns.

Also, water and anything carried in it may move through many organisms and great distances by way of the food chain. Thus water-borne contaminants can have a wide cycle of distribution. In contrast, water may move only inches a year through dense subsurface features, such as tiny cracks in bedrock. This condition can localize contamination, making it easier to track, but it can also lead to heavy accumulation.

New hydrogeological testing underway for Mound's Environmental Restoration will increase knowledge of the ways groundwater moves beneath the area. If testing uncovers potentially harmful levels of contamination in area water, this knowledge will facilitate the tracking of the contaminants and the treatment of affected areas.

(NOTE: all terms in *italics* appear in the Glossary, Page 4)

The Buried Valley Aquifer
Geologic Cutaway



Mound Plant's north hillside area, showing bedrock layers and the Buried Valley Aquifer.

Groundwater runoff from Mound Plant travels slowly downhill through cracks in and between bedrock layers to the Buried Valley Aquifer and the Great Miami River. (If pictured above, the river would lie further in the foreground). When bedrock is suddenly exposed along the plant's north hillside outcrops, seeps occur, as pictured above.

Ancient Sea, Modern Aquifer

The origin of the Buried Valley Aquifer can be traced back 600-million years. At that time, known geologically as the early Paleozoic Age, most of what is now the eastern United States was covered by a shallow sea.

The Dayton and Miamisburg area was on relatively high ground. Slow fluctuations in the sea's depth left the area alternately above and below sea level for nearly 400-million years. When the sea covered the area, the calcium-rich bodies of tiny prehistoric sea creatures amassed on the bottom. Over the course of millions of years, geologic forces turned them into limestone. When the area was above sea level, mud and silt sediments from ancient river valleys were eventually turned into shale.

The shallow sea retreated approximately 230-million years ago, marking locally the end of the Paleozoic Age. Yet as a result of the sea's repetitious rise and subsidence, the area's bedrock is composed of overlying layers of limestone and shale. For nearly all the geologic time between then and now, slow, steady erosion of surface features took place, deepening and expanding the ancient river valleys.

Then, between one million and 15,000 years ago, huge glaciers advanced from Canada into the northern United States. As the mile-high ice fronts advanced and retreated, torrents of water coursed from them, flooding and further expanding the existing valleys until one wide main valley was formed. Vast amounts of sand and gravel suspended in the rushing water settled into the area. Called "outwash," this permeable material was then covered by debris from the glaciers as they retreated overland. The glacial debris, called "till," is the foundation for today's soils.

As groundwater moves between rock layers and through cracks in the bedrock, it collects in the beds of outwash that underlie the region. Miami Valley communities draw their drinking water from the vast water reserves of the BVA, a convenience brought about by hundreds of millions of years of geologic change.

(NOTE: all terms in *italics* appear in the Glossary, Page 4)

Glossary

Words in *italics* in the text appear here.

aquifer—A rock layer or deposit of permeable material within a rock layer that absorbs water and allows it to pass freely through; a saturated zone in the ground.

bedrock—Solid rock that underlies soil or other land surface material.

CERCLA—Stands for the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended by the Superfund Reauthorization and Amendments Act of 1986. A federal law, CERCLA governs the environmental restoration of uncontrolled waste sites that qualify for program regulation and funding. Mound Plant has been a CERCLA site since November, 1989.

decay—In radioactive elements, the atomic disintegration into new radioactive forms, which continue to disintegrate until reaching an atomically stable stage. This process is known as the *decay chain*. During decay, energy is released in the form of electromagnetic waves of varying power.

half life—The time period in which half the unstable atoms in a radioactive substance decay or disappear.

hydrogeologic(al)—Pertaining to the study of the interaction of water with land features.

limited field investigation—A field investigation with a smaller scope than normally undertaken on an Operable Unit.

monitoring well—A narrow borehole drilled into a groundwater supply, from which samples are collected to test water quality.

permeable—Describes a substance that can absorb water or through which water can travel.

piezometer—A narrow borehole, drilled into a groundwater supply, that is used to measure water depth to surface.

radionuclide—An element that undergoes radioactive decay because it has an unstable atomic structure.

remediation—The long-term process of controlling contamination at a site and lowering to acceptable levels the risk to human health and the environment.

RI/FS—Stands for Remedial Investigation/Feasibility Study, the CERCLA phase that identifies contaminants and cleanup methods.

sediments—Solid particles and grains of rock that have been transported (e.g., by a river) and deposited in another location.

seeps—Spots where water oozes from the earth, sometimes (though not at Mound area) forming the source of a small stream.

transuranic—Describes 14 known elements with a greater atomic number than uranium-238, all but one of which occur only when made by man. Some transuranic material, most commonly plutonium, is used as nuclear fuel. Atomic number is the number of electrons orbiting an atom's nucleus.

Off-Site

continued from Page 1

immediate community, but also cover a 20-mile radius around Mound Plant. Sampling locations have been approved by the Ohio EPA and US EPA.

More than 200 off-site areas have been targeted for six kinds of testing. Generally, owners agreeing to participate will have one kind of testing conducted on their property. On certain City sites and on the Conrail property, several different kinds will be done. Currently the Mound CERCLA Program is in the process of finalizing agreements with many area home-owners. The testing began this summer and will continue through 1994 as new access licenses are signed. Testing results will be supplied to the participating property owners. The access agreements are good for one year, but may be renewed for future testing.

BVA

continued from Page 2

(for Buried Valley Aquifer Evaluation Project and Potable Water Standards Project).

Water quality

Principal contaminants of concern in Mound's groundwater testing are tritium and two chemical compounds. Tritium is a relatively short-lived radionuclide used at Mound for the nuclear weapons, aerospace and medical industries. The chemical compounds, trichloroethene and tetrachloroethene, are used in industrial solvents common in Mound's operations and those of heavy industry.

Concentrations of off-site contaminants appear to be highest along Mound's western border and north hillside. Several private wells draw drinking water from the BVA between Mound Plant and the river, but previous testing by Mound and regulatory agencies has shown that the water there is within safe levels set by the federal government.

Further information on contaminants yielded through the current CERCLA testing of the BVA will enable Mound's Environmental Restoration Program to determine any long-term, water-borne risks to the community—and to remediate them accordingly.

(NOTE: all terms in *italics* appear in the Glossary, Page 4)

Remedial Response—

Answers to Community Concerns

The following are responses to questions and comments by community members during the November, 12, 1992 CERCLA Public Meeting.

Decay Chain

(Several hundred billion years in the life of a thorium-232 isotope)

A question was raised concerning a thorium dump at Mound. At the November meeting, Dr. Dan Carfagno of Mound Plant explained that materials—including empty barrels, soils and some equipment—contaminated by thorium were buried at several areas on-site. However, there is not and there has never been a large-scale thorium "dump" at Mound Plant. Levels of thorium-232 for Mound Plant are within applicable safety standards. The following presents some background on thorium-232.

The nuclear industry uses refined thorium-232 as reactor fuel. Thorium-232 is a naturally occurring radionuclide, found throughout the world. A *radionuclide* is any material which emits energy because it has an unstable atomic structure. As it emits energy, a radionuclide decays and eventually turns into a series of other radioactive materials until its structure stabilizes, having expended all its energy.

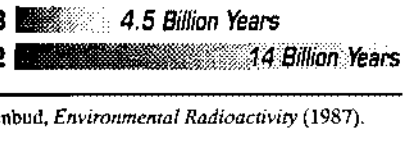
Thorium-232 decays very slowly. Radioactive decay is measured in terms of *half lives*, or the time required for half of the radionuclide to decay or disappear. Thorium-232 has a half life of 14 billion years (See **Half Lives chart**, this page).

Thus, in the normal life of thorium-232, some quantity of the element would be present in increasingly small concentrations for several hundred billion years. As thorium-232 decays, it forms a series of 9 other radionuclides whose half lives are much shorter—from 6.7 years as radium-228 to 3 ten-millionths of a second as polonium-212. The ultimate, stable form of thorium-232 is lead.

This process of transformation is known as the *decay chain*. Thorium-232 is the first step, or parent, in the decay chain; the elements that occur when thorium-232 decays are known as daughters.

It will take billions of years for the thorium-232 to yield appreciable quantities of stable lead. In the time since it was shipped to Mound (approximately 40 years), the thorium-232 has added, at most, 2 parts of lead per trillion to on-site soils. This is an undetectable amount—the average lead content in area soils is more than 15-million times higher.

Half Lives of Four Radionuclides



Source: Merril Eisenbud, *Environmental Radioactivity* (1987).

Remedial action to be taken on the buried thorium-232 barrels, part of Mound Operable Unit 6, will be decided in upcoming CERCLA evaluation.

The U.S. Transuranium and Uranium Registries

(bodies of knowledge)

One community member commented at the November meeting that she had heard of "body snatching" by the Department of Energy to test radiation levels in its deceased workers. In fact, a much less ghoulish DOE-sponsored program does exist to determine buildups of certain radionuclides in nuclear workers everywhere —using autopsies performed on donor organs or entire corpses. The program is called the U.S. Transuranium and Uranium Registries (USTUR).

(Please see Response, Page 7)

Meeting

continued from Page 1

been stored. Thorium-containing ore was shipped to Mound in the mid-1950s for use in a planned nuclear fuel refinery. This project was cancelled in its early stages, and the material was shipped from Mound Plant in the mid-1970s.

However, crushed barrels that once held thorium-containing ore remain on-site, buried at Mound Plant under a parking lot on the SM/PP Hill and on the margin of the old landfill. Regular sampling at these areas keeps track of residual thorium (See **Decay Chain**, this page).

ATSDR—the Agency for Toxic Substances and Disease Registry—is a federal agency created by CERCLA to monitor public health at designated CERCLA sites. Dr. William H. Taylor, from the agency, explained to meeting attendees that ATSDR mainly studies health data obtained from other government agencies, such as the Ohio Department of Health. If ATSDR public health experts find abnormal rates of illness, they then try to determine whether any correlation exists between the illness and possible site contamination.

ATSDR will release a report in 1993 on its initial findings for Mound Plant and the Miamisburg community. The agency will also monitor health issues that are raised throughout the course of the CERCLA program at Mound and will provide support when needed.

More than 30 **CERCLA Notebooks** were distributed at the November 12 meeting. These notebooks contain the CERCLA program's accumulated fact sheets and newsletters since its beginning in 1990. Updated periodically, CERCLA Notebooks are a handy way to track program developments. They can be obtained at any CERCLA public meeting or by calling EG&G Mound Public Affairs at 865-3001.

The next CERCLA public meeting will be held on March 11, 1993. Exact time, place and topic will be announced in the next **Superfund Update**.

(NOTE: all terms in *italics* appear in the Glossary, Page 4)

Operable Unit Update

To assist in the coordination of Mound Plant's *Remedial Investigation/Feasibility Study (RI/FS)*, plant and community areas potentially affected by contamination have been divided into search groups, called Operable Units. Mound's eight Operable Units (OUs), grouped by geographical proximity or type of suspected contamination, cover approximately 125 locations of actual or suspected releases.

The following is an update on work progressing in each Operable Unit.

■ Operable Unit 1, Mound Plant Area B

To test for migration of contaminants through groundwater from Area B to the Great Miami River and Buried Valley Aquifer, 11 monitoring wells and 9 *piezometers* are being installed. Lab analysis of surface and subsurface soils collected in 1992 continues.

■ Operable Unit 2, Seeps

To look for migration of contaminants carried by groundwater through cracks in the limestone cliffs along Mound Plant's north hillside, a Work Plan for sampling is being developed.

■ Operable Unit 3, Miscellaneous Sites

After a preliminary investigation of 16 potential non-radioactive releases on-site, a *Limited Field Investigation* Report was completed and submitted to US EPA and Ohio EPA for review.

■ Operable Unit 4, Miami-Erie Canal

To assess radioactive and non-radioactive contamination in the old Miami-Erie Canal bed, validation of previously collected samples continues. Possible action on plutonium-contaminated soil in the Canal bed is being studied.

■ Operable Unit 5, Radioactively Contaminated Soils

To assess the extent of chemical and radioactive contamination in on-site soils, the drafting of a Work Plan continues.

■ Operable Unit 6, Decontamination and Decommissioning Sites (D&D)

To assess and verify the clean-up accomplished under the DOE D&D program. Sampling data verification reports were approved by US EPA for Areas 14 and 17. Data verification for Area 19 continues. Verification Sampling and Analysis Plans for Area 19 and Area 12 are in progress.

■ Operable Unit 8, Inactive Underground Storage Tanks (USTs)

To facilitate the investigation into possible contamination from inactive USTs, some of the inactive tanks previously grouped as OU8 are being reassigned to other Operable Units, and OU8 will be eliminated. Others of the inactive USTs in OU8 have been found to be structurally sound.

■ Operable Unit 9, Site-Wide RI/FS

To characterize the geological and ecological features of all *RI/FS* areas, a varied battery of testing is being planned for locations on-site and off-site.

Access agreements for off-site testing of rock, groundwater, soil and sediment and area wildlife are being finalized with property owners: the City of Miamisburg, private citizens, Conrail and the Miami Conservancy District. Some on-site ecological testing was slowed by the freezing of two ponds. An access road from Mound Plant to Conrail property is under construction.

NOTE: With the upcoming elimination of Operable Unit 8, Mound Plant will have seven Operable Units, numbered 1-6 and 9. (See **Operable Unit 8 Eliminated**, below.)

Operable Unit 8 to be Eliminated

Operable Unit 8 was originally established to address possible leaks from underground storage tanks (USTs) on the Mound site. The USTs once contained volatile liquids such as gasoline and fuel oil. All tanks, both active and inactive, were evaluated. Tanks needing further action were placed in the Operable Units where they are geographically located or placed in the Mound active UST program.

Because each Operable Unit requires a separate battery of testing, documentation and administration, the regrouping will save the CERCLA program at Mound several million dollars. Operable Unit 8 will cease to exist after the upcoming publication of the report, "Mound Plant Underground Storage Tank Program Plan and Regulatory Status Review." Like all CERCLA documents, it will be available for public review.

Mound Plant will now have seven Operable Units, numbered 1-6 and 9. Operable Unit 7 had addressed suspected release sites at which previous testing found no contamination. OU7 was eliminated in 1990 after current information was evaluated and it was determined the sites do not warrant further investigation at this time.

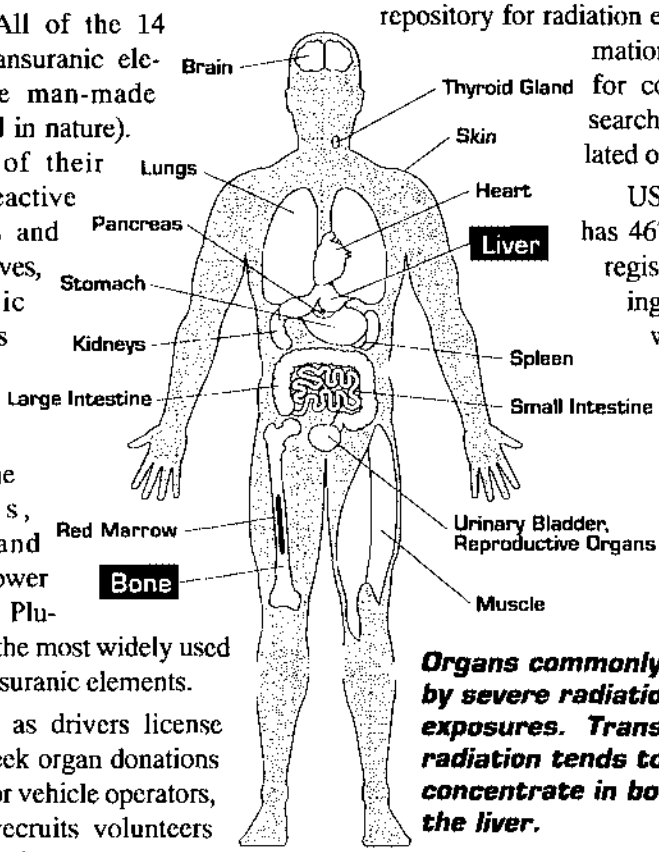
(NOTE: all terms in *italics* appear in the Glossary, Page 4)

Response

continued from Page 5

Run by Washington State University through a grant from DOE, the registries seek donations of tissues or, in some cases, whole bodies from nuclear workers exposed to certain kinds of radioactivity, including uranium and the *transuranic* elements.

Transuranic refers to elements with a higher atomic number than uranium-238 on the Periodic Table of the Elements. All of the 14 known transuranic elements are man-made (not found in nature). Because of their special reactive properties and long half lives, transuranic materials are used to make nuclear fuels for the weapons, space and electric power industries. Plutonium is the most widely used of the transuranic elements.



Organs commonly affected by severe radiation exposures. Transuranic radiation tends to concentrate in bones and the liver.

Much as drivers license bureaus seek organ donations from motor vehicle operators, USTUR recruits volunteers from DOE sites and commercial nuclear sites across the country, asking them to sign a donor release effective upon their death. Autopsies done on the organs or whole bodies provide scientists with knowledge of the health effects of residual and sudden radiation exposures.

This knowledge serves several important purposes. Researchers can determine the actual distribution and concentrations of transuranic radiation in the organs of exposed workers, then compare it to estimates and theoretical models of radiation exposure used by policy makers. USTUR also works to establish connections, if any, between health problems in donors and their specific radiation exposure. This knowledge helps to form protection standards governing allowable concentrations and lengths of radiation exposures.

Another objective of the USTUR program is to compare the results of animal experiments with human tissues in order to find species that react to radiation exposures as humans do. This knowledge can further the scope of radiation testing. Also, USTUR acts as a repository for radiation exposure information and a center for cooperative research with other related organizations.

USTUR currently has 467 living donor registrants, including more than 20 whole-body registrants. Since its beginning in 1968, the program has received organs from 265 donors, including nine whole-body donors.

Of these, there are 17 living registrants from Mound Plant; autopsies already have been performed on four Mound workers. The number of Mound workers in the program is on the decrease because Mound's handling of transuranic radionuclides has decreased over the last 20 years.

USTUR has cooperative agreements with researchers in the United Kingdom and several labs and universities in the United States. It is working to secure similar agreements with the National Institutes of Health and study groups in Germany.

Testing

continued from Page 1

- Surface soil samples taken from 32 off-site locations will determine the background levels of chemicals and radionuclides in area soils.

■ **Well/cistern studies** test quality of drinking water supplies within a two-mile radius of Mound.

- After a records search and a public notice in local newspapers, Mound has located all known municipal, industrial and domestic wells within two miles of the facility. Of these, many will be tested to monitor drinking water quality in the Miamisburg area.

■ **Surface water and sediment studies** test for contamination in the community's surface waterways.

- Samples will be taken from local rivers, streams, ponds and other surface-water sources.

■ **Ecological assessments** will determine any affects of Mound's operations on plants and animals.

- Ecological assessments are an EPA requirement for Superfund sites.
- Biologists will determine wild animal populations in the area, with special concentration on rare and endangered species. This will be done through observation, animal calls and live trapping (animals are returned to their environment). Surveyed animals include small mammals (e.g., mice and shrews), reptiles and amphibians, fish, aquatic insects and macroinvertebrates (e.g., crayfish), birds and larger animals (e.g., deer).
- Biologists will also conduct similar surveys of regional plant life and sensitive environments, such as wetlands, floodplains and breeding areas.

(NOTE: all terms in *italics* appear in the Glossary, Page 4)

ATSDR Information at Reading Room

The Agency for Toxic Substances and Disease Registry (ATSDR) has sent the following documents to the Mound Reading Room in the Miamisburg Public Library, 35 S. 5th St., Miamisburg:

ATSDR Public Health Statements (ATSDR)

Preventing Lead Poisoning in Young Children (CDC)

Environmental Issues in Primary Care (Minnesota Department of Health)

Hazardous Substances & Public Health (ATSDR quarterly newsletter)

ATSDR was created by CERCLA to monitor public health at Superfund sites. CDC stands for the U.S. Centers for Disease Control, a federal health agency addressing all public health issues.

Library hours are noon to 8:30 pm Monday through Friday, noon to 5:30 pm on Saturday. The library's phone number is (513) 866-1071.

Important phone numbers

EG&G Mound Applied Technologies	
Environmental Restoration/	
CERCLA Community Relations:	513-865-4450
Mark Becker:	513-865-3001
U.S. Environmental Protection Agency	
(Region V Headquarters, Chicago):	
Diana Mally:	312-353-6287
Diane Spencer:	312-886-5867
Ohio Environmental Protection Agency	
(Dayton office):	
Martha Hatcher	513-285-6357
Ohio Department of Health	
(Columbus):	1-800-523-4439
(Radiological Section)	
Larissa Gilham:	614-644-2727

CERCLA mailing list

Mound maintains a mailing list for people interested in the Mound CERCLA program. People on the list receive notification of CERCLA-related meetings, Site Specific/Five Year Plan meetings and other DOE-related public affairs activities. If you wish to have your name added to this list, sign up at any of Mound's public meetings or send your mailing address to:

EG&G Mound Applied Technologies
c/o Public Affairs/CERCLA
P.O. Box 3000
Miamisburg, OH 45343-3000

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MOUND
Environmental Restoration Program

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Miamisburg, OH 45343-3000

MOUND

Environmental
Restoration
Program

Presentation to the
Miamisburg City Council on

CERCLA Sampling Planned for City of Miamisburg Property

January 5, 1993

EG&G

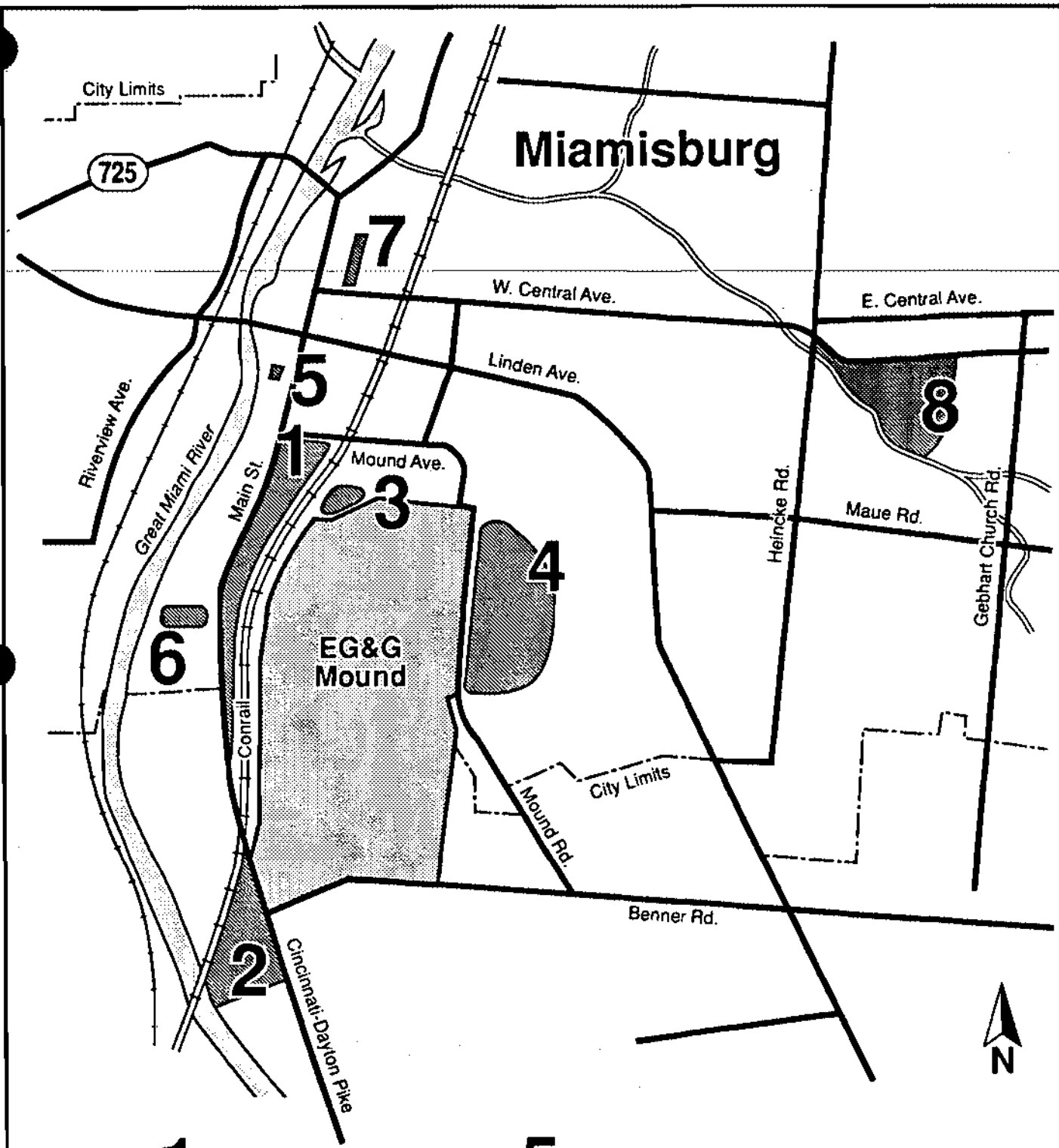
Objective:

MOUND
Environmental Restoration Program

- Meet the requirements for CERCLA sampling within a 20+ mile radius of Mound.
- Look for organic, inorganic, and radioactive materials that can be found in these areas.
  - As a result of Mound operations
  - Establish background levels

EG&G

City Property Access Areas



1 Community Park

2 Overflow Creek Area and Parking Lot

3 North Hillside (Seeps)

4 Mound State Memorial & Mound Golf Course

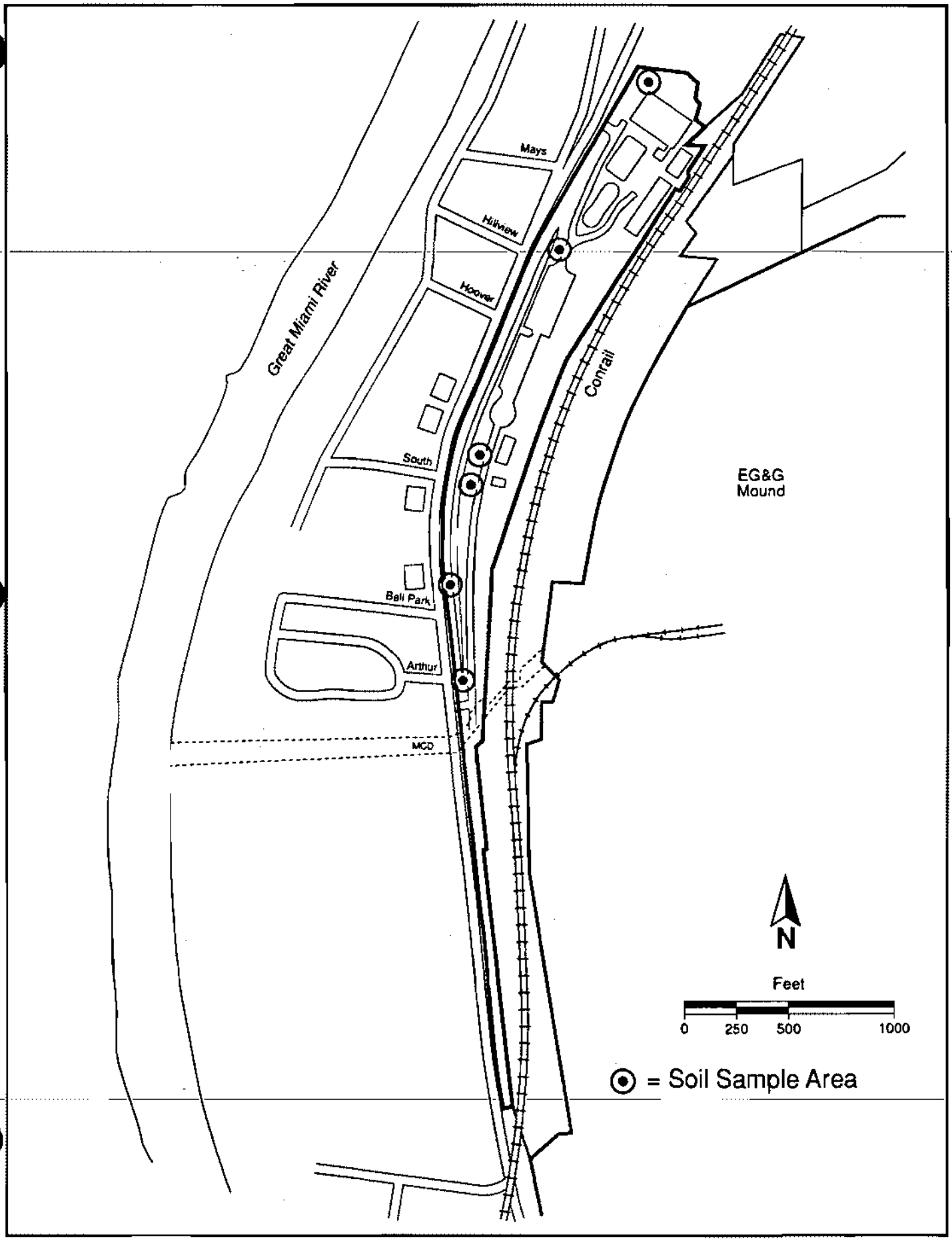
5 Daniel Gebhart Tavern Museum

6 Bell Civic Area

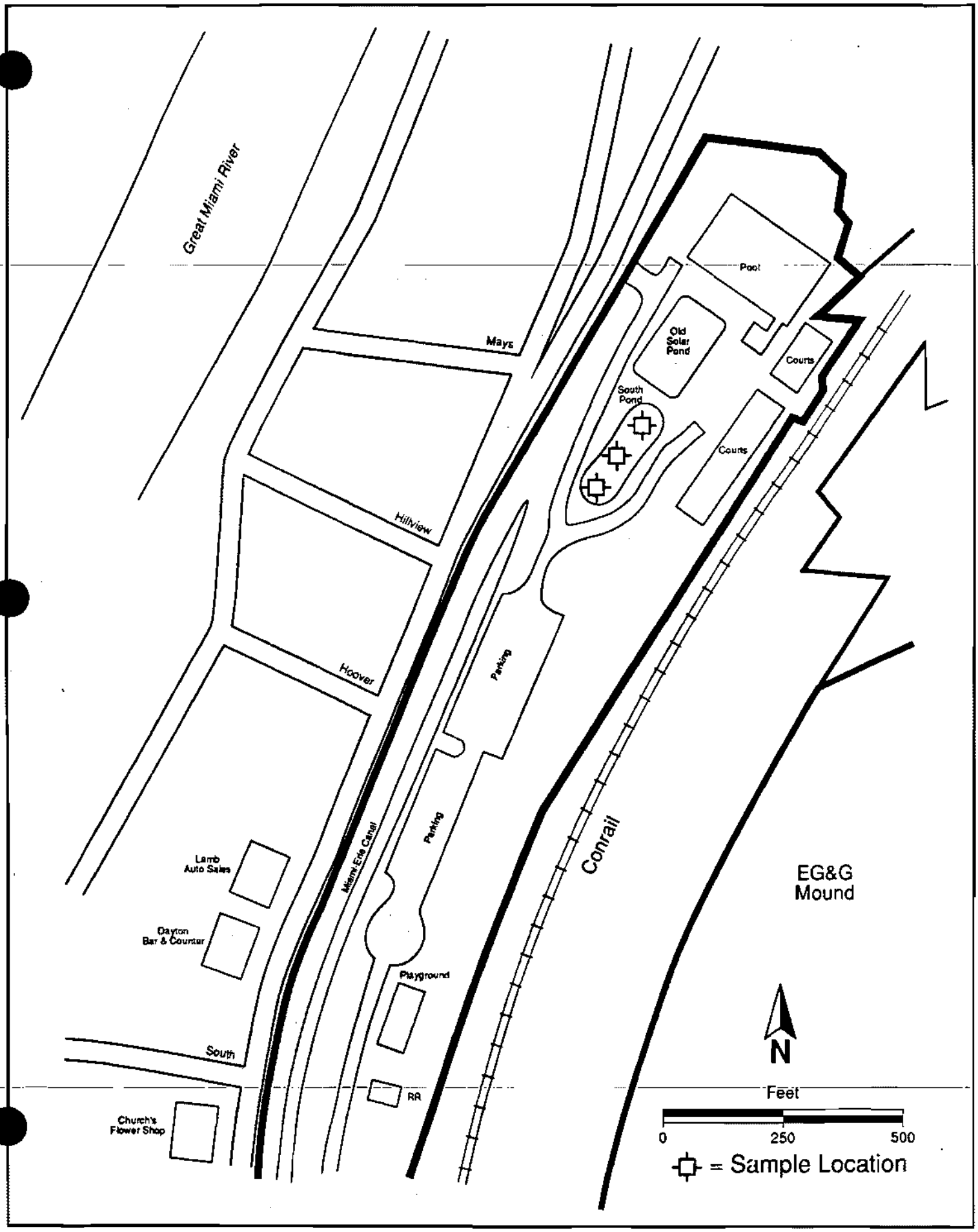
7 Miamisburg Civic Center

8 Sycamore Trails Park

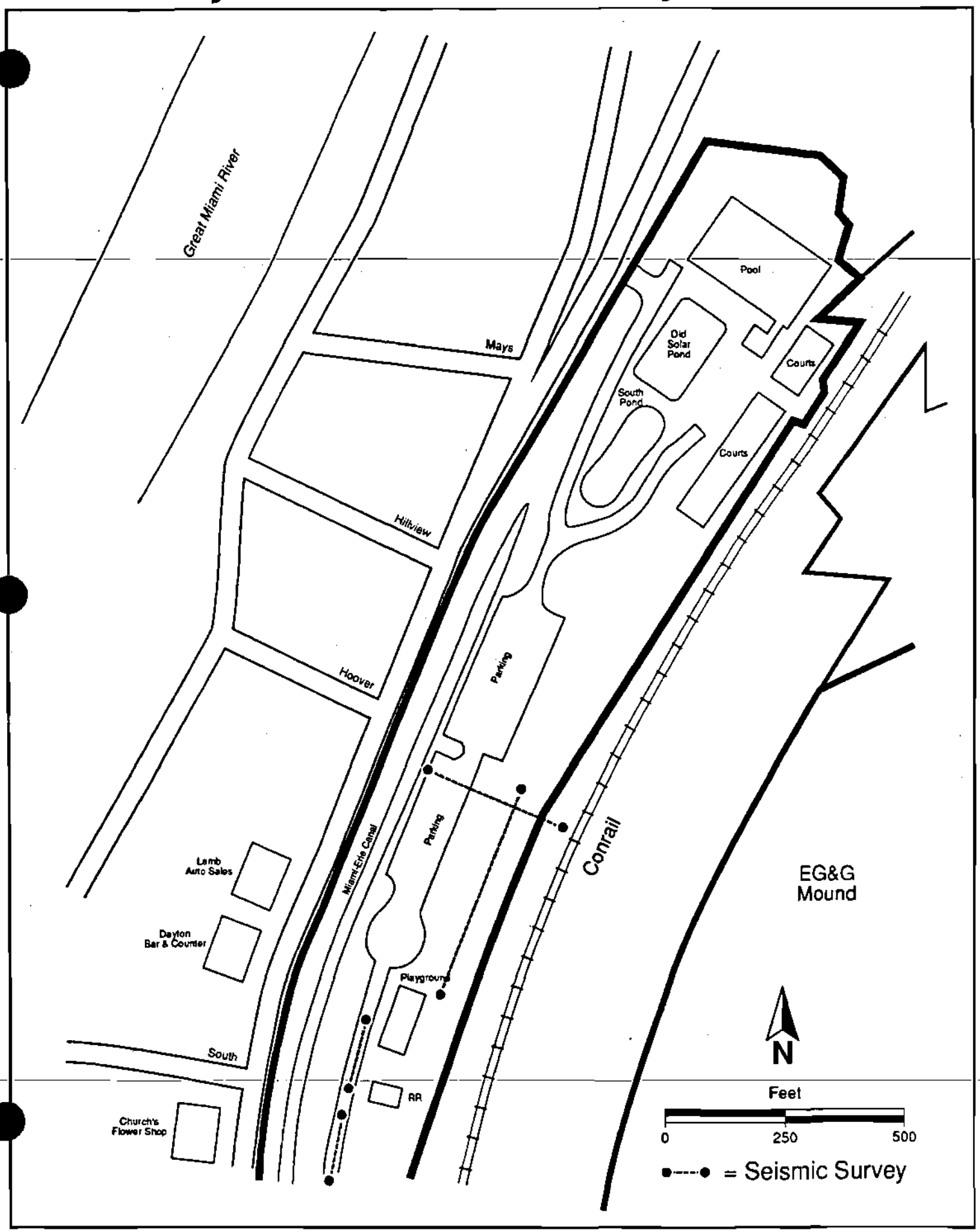
Community Park – Soil Sampling



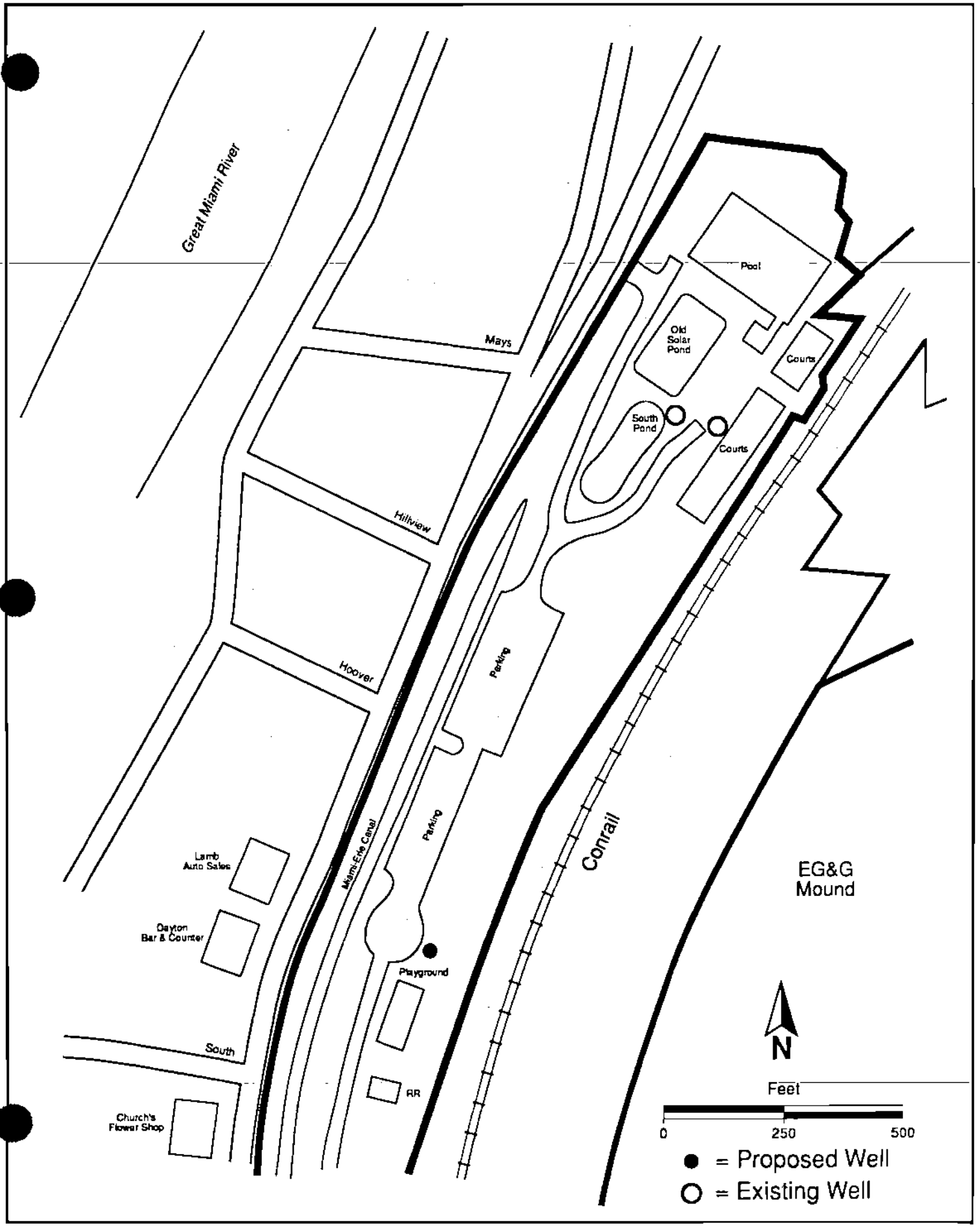
Community Park Surface Water and Sediment Sampling



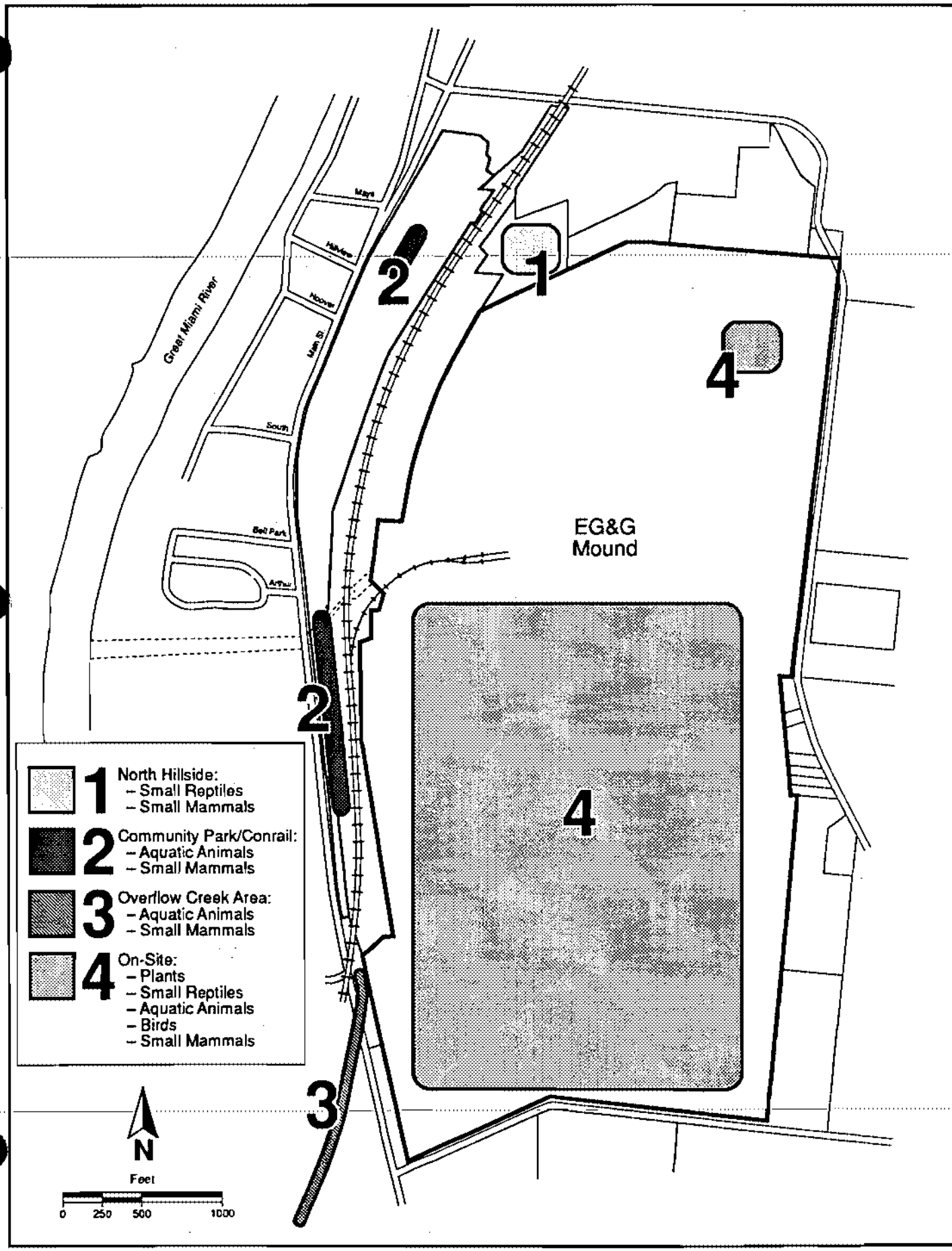
Community Park – Seismic Survey



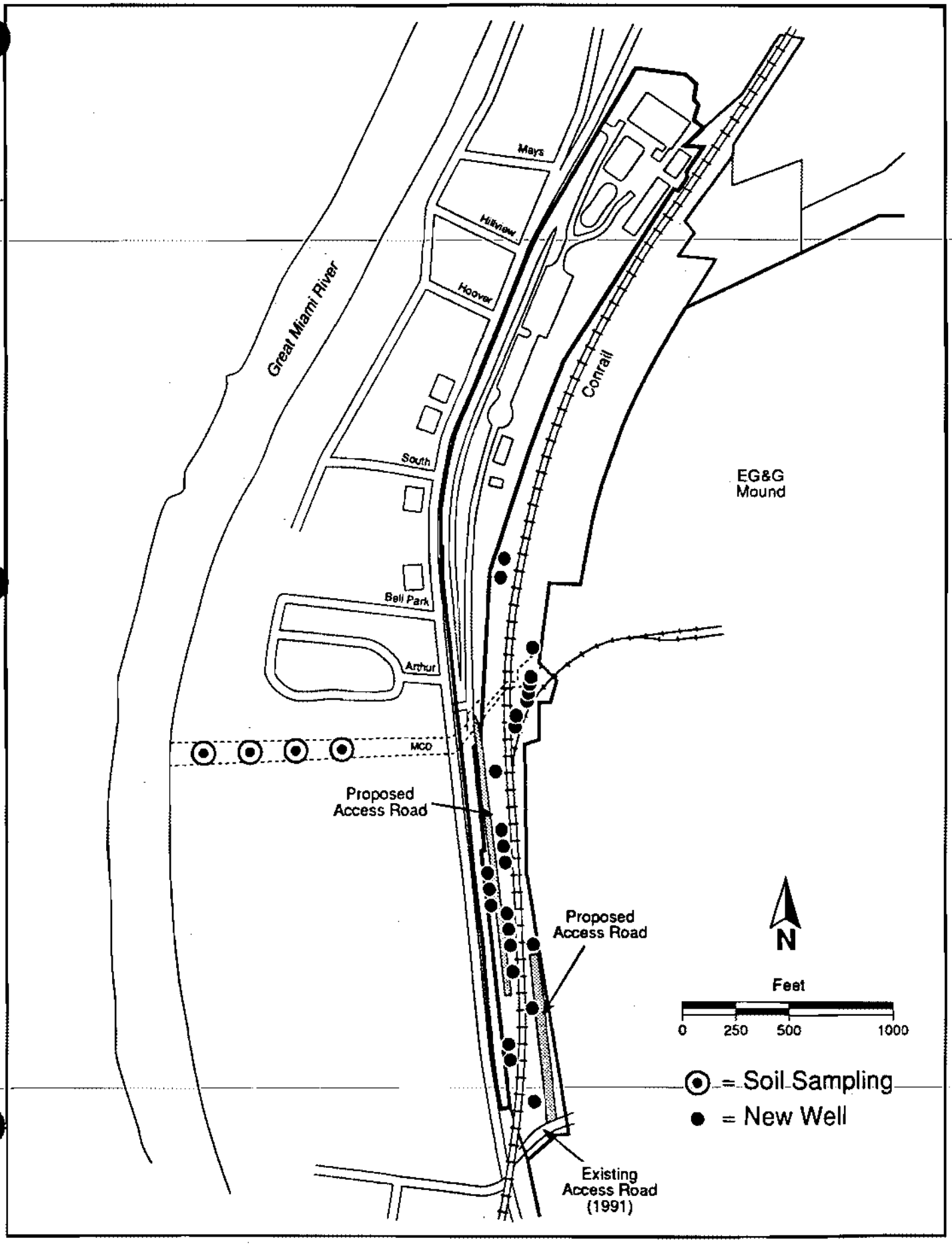
Community Park – Well Placement



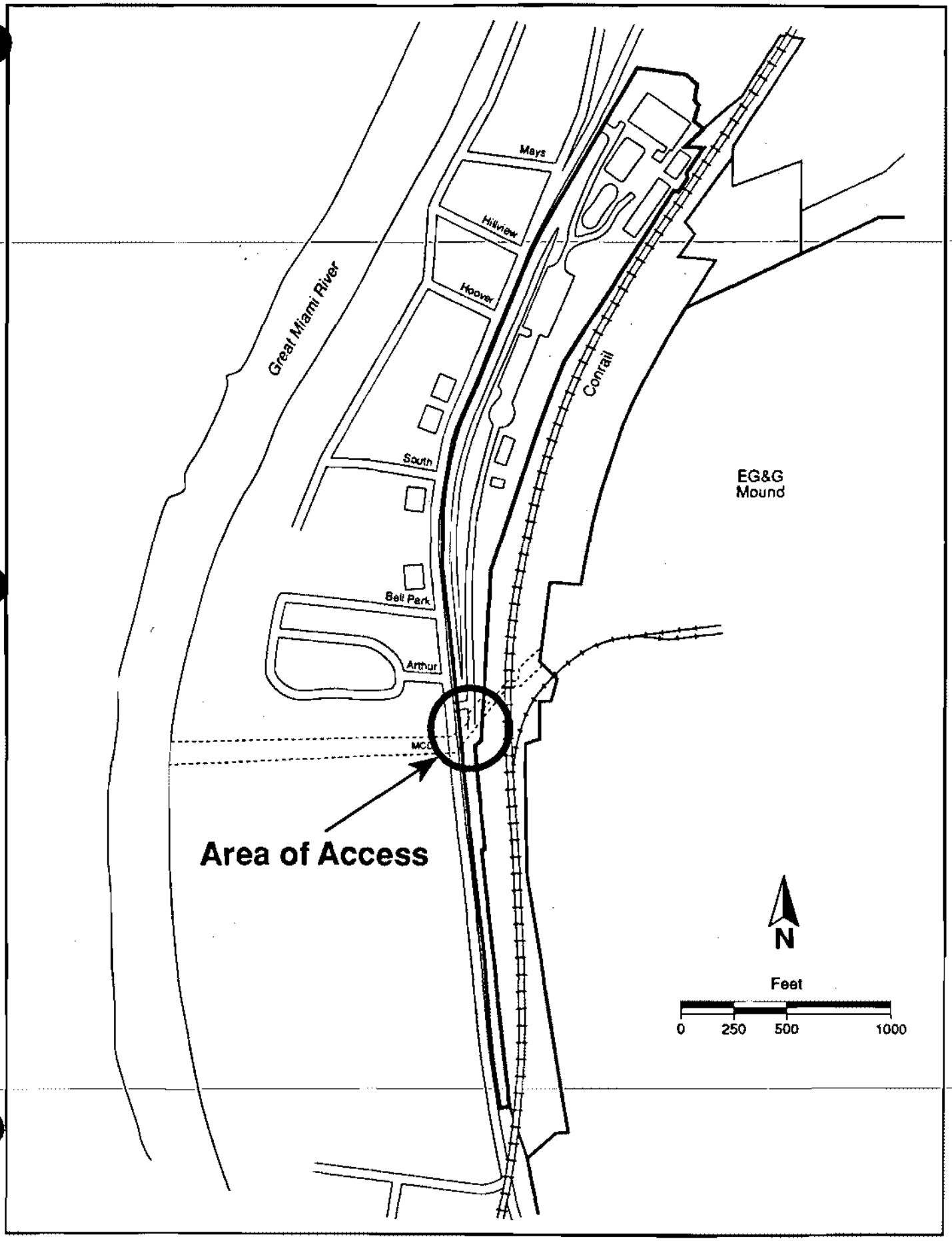
Ecological Assessment Locations



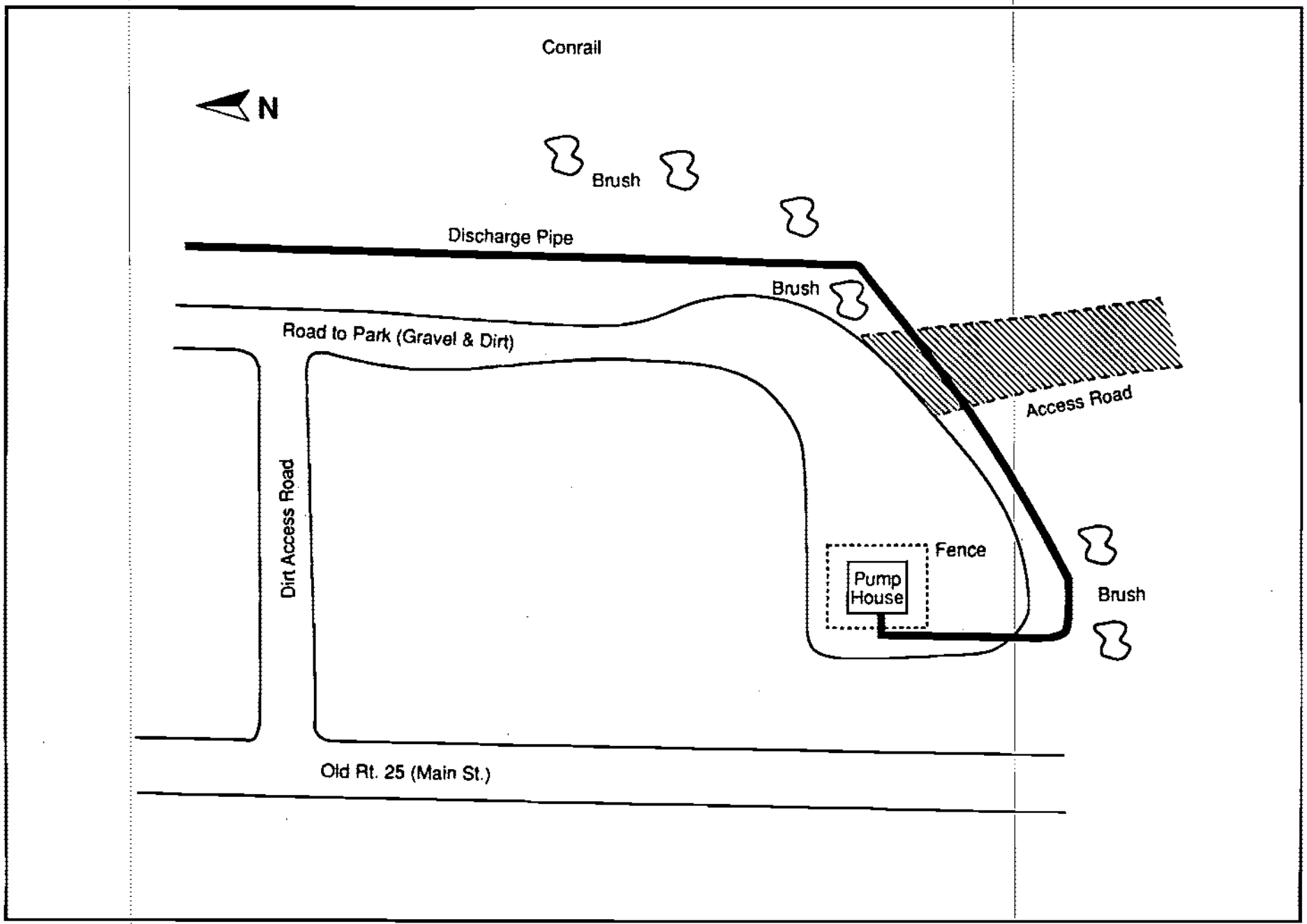
Conrail Wells & MCD Sampling



Community Park Area – Access Road to Conrail



Conrail Access Road Placement



MOUND

Environmental
Restoration
Program

Health & Safety Procedures and Field Activities

EG&G

Standard safety procedures, described below and designed to protect the public, the environment and the workers, will be followed during all field investigation activities.

General Health and Safety Procedures

Each Operable Unit at Mound is required to have a Health and Safety Plan (HSP) which must comply with requirements of the Occupational Safety and Health Administration (OSHA). In addition, these HSPs are reviewed by EG&G, DOE, USEPA and safety officers of the various subcontractors.

The HSPs are designed to protect workers and the general community through the following procedures:

- minimum training requirements for workers and supervisors
- controlled access to the sites where work is being conducted
- routine periodic air monitoring
- control and containment of contaminants
- audits and inspections

Federal law specifies the **minimum training requirements** for workers involved in environmental investigations and remediation. In general, workers are required to have a minimum of 40 hours of safety training on dealing with hazardous materials. This training includes both classroom time and hands-on exercises. After receiving the 40-hour training, workers are required to have an additional 24 hours of closely supervised on-the-job training. Supervisors are required to have an additional 8 hours of supervisory-level training. All workers and supervisors must have a minimum of 8 hours of refresher training annually. Specialized training for certain tasks is also required by federal law or agency and company policy.

Control of access to work areas serves to ensure the safety of the general community. Access may be controlled through the use of warning signs and barricades. Work areas are secured during non-working hours.

Monitoring of the air surrounding the work sites will be conducted throughout the investigation. Air monitoring will be conducted for chemical compounds in the ground which, if present, may be released into the air during these investigations (these fumes would quickly disperse into the air and would not affect the general population). Radiation meters will also be used to monitor the work area and to screen samples for increased levels of ionizing radiation. Decibel meters may be used to monitor noise levels during the use of heavy machinery such as drill rigs. Dust monitors will also be used to monitor concentrations of airborne dust if conditions are appropriate.

Potential contaminants will be controlled and contained through safe operating practices. These practices call for decontamination of sampling equipment and tools, maintaining strict control of samples and containing wastes generated during site activities. All site-generated wastes will be removed at the completion of work.

Site activities will be **inspected and audited** by safety professionals from DOE, EG&G and subcontractors to ensure compliance with HSPs. All workers are required to read the HSPs and sign an acknowledgement that they understand and will comply with the HSP. Daily safety meetings are conducted to review procedures.

Field Activities

Field investigation activities, on property belonging to the City of Miamisburg, are planned to assess the existing environmental, geological and ecological conditions in areas surrounding the Mound Plant.

The field investigation activities scheduled to be conducted include:

- shallow soil samples
- water samples from seeps
- install and sample a groundwater monitoring well
- water and sediment samples from surface water bodies
- seismic survey to determine depth to bedrock
- ecological assessment.

The following descriptions are a general summary of the Field Investigation activities. Specific activity at each job location will vary depending on conditions at the site.

MOUND

Environmental Restoration Program

Soil Sampling

City Access Factsheet

Sampling Locations

Community Park, Overflow Creek, Mound North Hillside, Mound Golf Course and Mound Memorial Park, Gebhart Tavern Museum, Bell Civic Park, Sycamore Trails Park

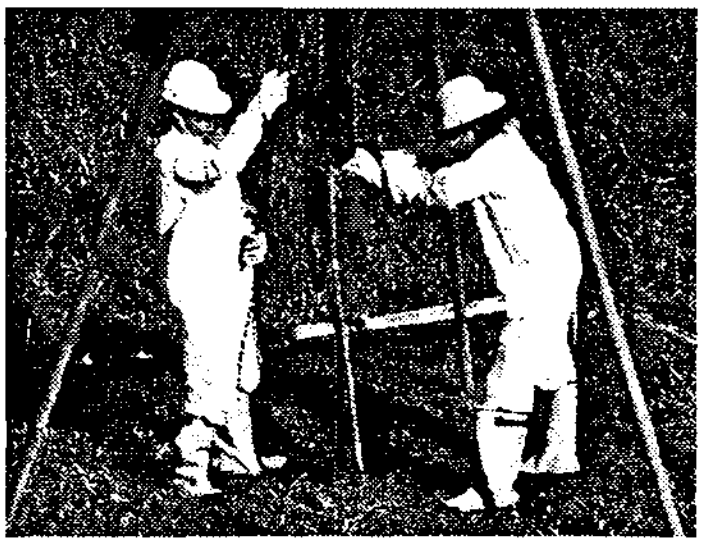
Objective

To test for chemicals and radionuclides in community soils.

Soil samples will be collected through the use of small hand-operated augers or scoops. Hand augers typically are used to sample to a depth of 2 feet or less. These augers commonly produce a hole between 1 and 2 inches in diameter. Surface soil samples may collected through the use of small scoops or trowels. Depths of these samples are typically limited to less than 6 inches.

Samples that are too difficult to collect using a hand auger or that are taken from greater depths may be collected by the use of a split-spoon sampler. A split-spoon is a steel tube, approximately 2 inches in diameter and 2 feet long, split lengthwise and held together at the top and bottom by threaded fittings. The split-spoon is driven into the ground using a weight suspended from a tripod. After removal from the hole, the split-spoon is opened and the soil sample is removed and placed in sample containers. The containers are placed into ice chests to preserve the samples and then shipped to the laboratory for analysis. At the completion of sampling activities, all holes will be backfilled to the surface.

There will be minimal disturbance of the ground at the sample locations and sampling points will generally be indistinguishable from the surrounding areas within a short period of time.



Strung from tripod support, split-spoon sampler is driven into soil.

Field screening of soil samples before they are sent to the lab.

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MOUND

Environmental Restoration Program

Groundwater Sampling

City Access Factsheet

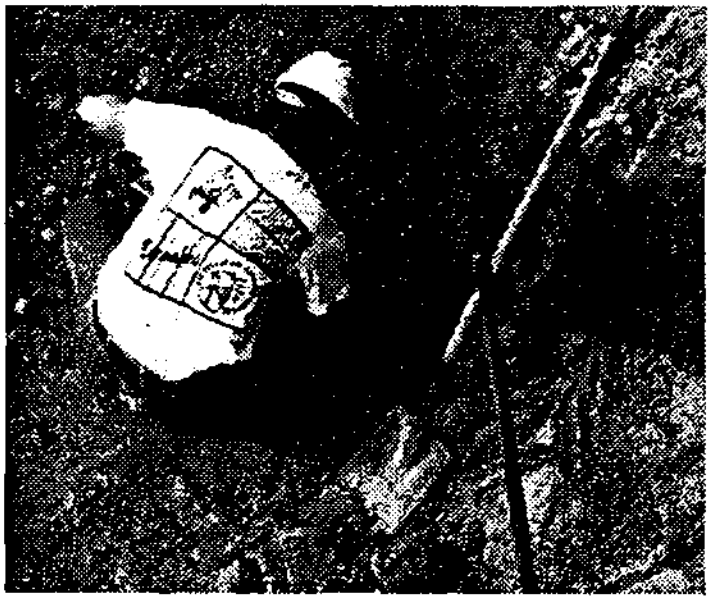
Sampling Location

Mound North Hillside

Objective

To determine levels and movement of chemicals and radionuclides in groundwater beneath Mound Plant.

Groundwater samples will be collected from seeps located on the north hillside of the Mound Plant. Seeps are locations where groundwater has moved through small cracks in the bedrock and into the soils or even the surface. Samples will be placed in shipping containers and shipped to the laboratories on a daily basis. Disturbance of the ground is not expected in these areas with the exception of those locations also used for soil sampling (in which case the disturbance is minimal and temporary).



Air monitoring before sample collection from a seep.

EG&G

Monitoring Well Installation

MOUND

Environmental Restoration Program

City Access Factsheet

Monitoring Location

Community Park

Objective

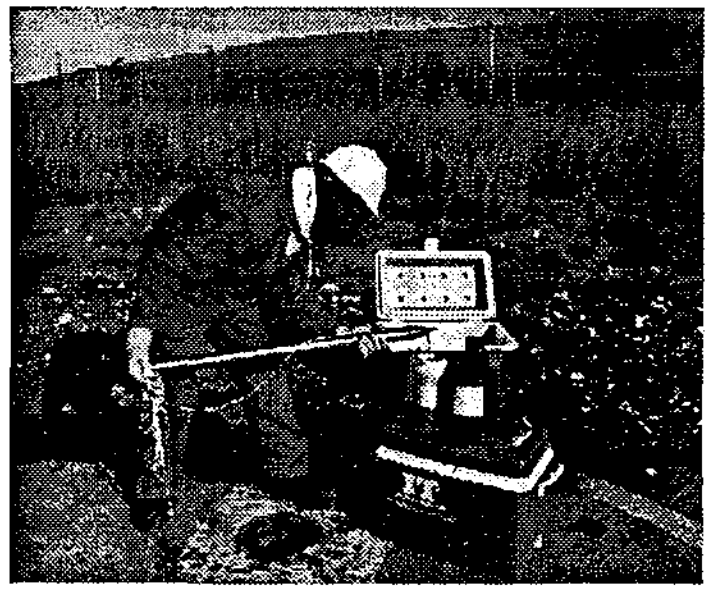
To increase monitoring of groundwater beneath Community Park and to investigate the bedrock make-up.

A monitoring well is to be installed near the south end of the parking lot cul-de-sac in Community Park. It is anticipated that this well will be drilled to a depth of 60-to-100 feet and a diameter of approximately 12 inches. The well will be used to determine the arrangement of the bedrock layers, test the quality of water seeping through the bedrock, investigate the lithology (composition) and fractures in the bedrock and determine the effects that changing river levels may have on water levels in the bedrock.

Potential drilling methods include Rotasonic and cable tool drilling. Cable tool drills use a heavy weight which is raised and dropped on a chisel-like tool that cuts into the rock. Rotasonic drilling uses a vibrating bit at the bottom of the drill stem to drill into the rock. Soil, rock and water samples will be collected during drilling to determine the type of materials being drilled. The completed well will have a locking cap and will be flush with the ground. The well drilling and installation process is expected to be completed within three weeks, depending upon the weather.

Groundwater samples will be collected from the well and placed in containers, preserved by chilling and/or adding chemical preservatives, and shipped daily to the laboratory.

Soil sampling (foreground) as monitoring well is being drilled (background).



Groundwater samples being taken from a monitoring well.

EG&G

Surface Water and Sediment Sampling

MOUND

Environmental Restoration Program

City Access Factsheet

Sampling Locations

Community Park, Overflow Creek, Sycamore Trails Park

Objective

To test for chemicals and radionuclides in community suface waters and waterway bottoms.

Surface water and sediment samples will be collected from the South Pond, Overflow Creek and Sycamore Creek. Surface water samples will be collected in special sampling containers and preserved by chilling and/or chemical preservatives.

Sediment samples will be collected from the same locations as the surface water samples. Sediments are often collected using tools similar to those used for soil samples. Small hand-held dredges may be used to collect sediment samples from deeper water where boats must be used. Like soil samples, sediment samples are contained and chilled, then sent to the lab.

Water level reading being taken before surface water sample.

Sediment sampling of creek bed using hand auger.

EG&G

MOUND

Environmental Restoration Program

Seismic Surveys

City Access Factsheet

Survey Locations

Community Park, Bell Civic Park

Objective

To map bedrock and other rock formations in the community, furthering information on groundwater migration.

Seismic (geophysical) surveys will be run in Community Park and Bell Civic Park. Seismic surveys are used to determine the depth to bedrock and to gain information on the types of rock present in an area. In a seismic survey, acoustical energy is sent into the ground either through the use of a large hammer or falling weight striking a metal plate resting on the ground. This is known as "thumping." For deeper surveys, small explosive charges, about the size of three shotgun shells, are set off approximately three feet below the surface of the ground. When the explosive is ignited there will be no dust, and the noise will not be heard more than several feet away.

The sound from the hammer or the charge travels through the ground. Because sound travels at different speeds in different materials, such as soil and rock, the sound waves are refracted or "bent" and return to the surface at different times. These sound waves are picked up by special microphones, called geophones, and the time and distance of travel from the source to the geophones is recorded and used to determine the depth to bedrock. There will be no hazard to people, and there will be minimal disturbance to the ground.

Sledge hammer producing seismic waves that are recorded when refracted to surface.

EG&G

MOUND

Environmental Restoration Program

Ecological Assessment

City Access Factsheet

Assessment Locations

Community Park, Overflow Creek, North Hillside

Objective

To delineate wetlands and determine populations and health of plant and animal species in the community, including rare and endangered species.

Visual surveys will be made of vegetation, birds, small and large mammals, reptiles and amphibians, fish and aquatic macroinvertebrates. This information will be used to:

- identify flora and fauna (plants and animals) in the vicinity
- identify sensitive environments such as wetlands, floodplains and breeding areas
- identify endangered species and their habitats
- gather information on accumulation of contaminants through the food chain in animals such as aquatic invertebrates and fish.

Collection of stunned fish from a creek for population survey.

Bird and mammal populations will be determined through the use of observation, live trapping and identification by calls (e.g. owls). Fish will be studied by running a small electric current through the water, stunning the fish, collecting them in a net and returning them to their habitat. Aquatic macroinvertebrates, such as crayfish, may be collected by dredging or otherwise removing a sample of the waterway bottom. There will be little or no disturbance of the ponds and streams.

EG&G

Sampling at City Access Areas

Parcel #1, Community Park

Ecological Assessment—aquatic animals and small mammals
1 Monitoring Well
3 Sediment Samples
4 Seismic Surveys
5 Soil Samples
3 Surface Water Samples

Parcel #2, Overflow Creek Area

Ecological Assessment—aquatic animals, small mammals
6 Sediment Samples
3 Surface Water Samples
6 Soil Samples

Parcel #3, North Hillside Seeps

Ecological Assessment—small reptiles and small mammals
4 Groundwater Samples
12 Soil Samples

Parcel #4, Mound Golf Course and Mound Memorial Park

13 Soil Samples

Parcel #5, Gebhart Tavern Museum

1 Soil Sample

Parcel #6, Bell Civic Park

1 Seismic Survey
1 Soil Sample

Parcel #7, Miamisburg Civic Center

1 Soil Sample

Parcel #8, Sycamore Trails Park

8 Sediment Samples
5 Surface Water Samples
1 Soil Sample

MOUND
Environmental Restoration Program

SUPERFUND Update

EG&G

October 1992

Mound environmental restoration review

The Mound Plant is a research, development and production site owned by the U.S. Department of Energy (DOE) and operated by EG&G Mound Applied Technologies under contract to DOE. Referred to as "Mound," the site is named for a large ancient Native American burial mound nearby.

As an outgrowth of the Manhattan Project, the Mound began work with nuclear bomb components in the late 1940s. Operated by Monsanto Research Corporation until 1988 and since then by EG&G Mound Applied Technologies, Mound has one of the best safety records for a DOE nuclear weapons site and enjoys significant support from the local community.

To address environmental concerns caused by the presence of radioactive and hazardous chemical waste on site, Mound was added to the **National Priority List (NPL)** in 1989. The NPL is the mechanism for establishing priorities for clean up of sites under the **Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA)** as amended by the **Superfund Amendments and Reauthorization Act of 1986 (SARA)**. CERCLA requires assessment and environmental restoration of areas potentially contaminated by hazardous chemicals or radioactive wastes.

Overseen by the U.S. Environmental Protection Agency (EPA), CERCLA incorporates related federal and state environmental laws and agencies. At Mound, DOE's **Environmental Restoration (ER)** program operates under the CERCLA umbrella. The ongoing implementation of CERCLA at the Mound Plant will be a topic of discussion at the November 12 Quarterly Meeting.

Quarterly CERCLA meeting November 12 at Miamisburg Civic Center, 7 p.m.

The next quarterly informational meeting on the Mound's Environmental Restoration Program will be held Thursday, November 12 at 7 p.m. in the Council Chambers of the Miamisburg Civic Center. The meeting is a service of the U.S. Department of Energy, the Mound's owner, and EG&G Mound Applied Technologies, the DOE operating contractor.

Topics to be discussed at the meeting are:

Public Participation in CERCLA

EG&G's environmental restoration/CERCLA manager, Chuck Friedman, will give a presentation and lead discussion on the formal public input process for Mound's CERCLA program, including how you may make comments on the program at your convenience.

ATSDR Role in CERCLA

Dr. William H. Taylor from the U.S. Agency for Toxic Substances and Disease Registry (ATSDR) will speak on the agency's role in Mound's Environmental Restoration. Also, he will discuss the setting of standards for health studies.

Dr. Taylor is an ATSDR health assessor and consultant. He has worked previously as an investigator for the U.S. Food and Drug Administration and as a technician for the U.S. Army Medical Research Institute of Infectious Diseases.

CERCLA Notebooks

The Mound Environmental Restoration program is instituting a special notebook for persons who wish to be part of the Public Participation Program. Previously published fact sheets and newsletters will be included, as well as other materials relevant to the Environmental Restoration. They will be updated periodically. If you wish to check out a notebook, please arrive a few minutes early for the meeting.

Your input is important

The public has an important role in a CERCLA program. The observations and opinions from anyone interested in the Mound ER program can help guide significant decisions, such as the ranking of areas selected for remediation, choice of proposed cleanup technologies and the program budget.

During many stages of the environmental restoration program, formal public comment will be sought on proposed actions. To keep abreast of formal comment periods, interested persons can be added to Mound's CERCLA mailing list and attend quarterly public meetings and special meetings. Dates, times and locations are announced in advance in the *Dayton Daily News* and the *Miamisburg News* through news releases and advertising.

In addition, the public is welcome to comment on any part of the environmental restoration or any issue related to it, whether announced by the CERCLA program or reported on in local media.

Persons with questions or comments on the program can write or call:

EG&G Mound Applied Technologies, c/o Public Affairs, P.O. Box 3000, Miamisburg, OH 45343-3000; 513-865-3001.

Profile: Chuck Friedman, Mound Environmental Restoration/ CERCLA Manager

Chuck Friedman has replaced Dick Neff, who retired, as Mound's manager for the ER/CERCLA Program as of July 1992. A Mound employee for 25 years, Mr. Friedman previously ran Mound's Environmental Monitoring and Waste Management programs.

A founding member of the Dayton Environmental Advisory Board, Mr. Friedman has served on the Water Resources Committee of the Dayton Chamber of Commerce and helped formulate Dayton's Wellfield Protection Ordinance. In addition, Mr. Friedman participated in emergency response during the Miamisburg train derailment fire in 1986 and coordinated the local effort to test for fallout after the Chernobyl reactor fire. He subsequently received a Federal Technology Exchange Consortium Award for using federal technologies during the 1986 train derailment.

He holds a B.S. in chemistry from John Carroll University and an M.S. in physical organic chemistry from Xavier University. Mr. Friedman has presented seminars at Wright State University's Aerospace Medicine Program on how to respond to chemical spill emergencies.

CERCLA documents available at Miamisburg public library

Mound has established a public repository at the Miamisburg Branch of the Dayton-Montgomery County Library, 35 S. 5th St., Miamisburg, Ohio. The library's phone number is 866-1071. Hours are noon to 8:30 p.m. Monday through Thursday, 9 a.m. to 5:30 p.m. Friday and Saturday.

Two copies of all CERCLA documents are available at the library. One set of documents is available for general circulation to library card holders. The second set of documents remains in the library repository for public inspection.

Non-CERCLA Mound and DOE documents are available for public inspection, but not for check-out from the library.

CERCLA mailing list

Mound maintains a mailing list for people interested in the Mound CERCLA program. People on the list receive notification of CERCLA-related meetings, Site Specific/Five Year Plan meetings and other DOE-related public affairs activities. If you wish to have your name added to this list, sign up at any of Mound's public meetings or send your mailing address to:

EG&G Mound Applied Technologies
c/o Public Affairs
P.O. Box 3000
Miamisburg, OH 45343-3000

Important phone numbers

EG&G Mound Applied Technologies Environmental Restoration/ CERCLA Community Relations:	513-865-4450 513-865-3001
U.S. Environmental Protection Agency (Region V Headquarters, Chicago):	312-353-6287
Ohio Environmental Protection Agency (Dayton office):	513-285-6357
Ohio Department of Health (Columbus):	1-800-523-4439
(Radiological Section)	614-644-2727

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MOUND
Environmental Restoration Program

EG&G Mound Applied Technologies
Public Relations/Environmental Restoration
P.O. Box 3000
Miamisburg, OH 45343-3000

SUPERFUND
UPDATE
EG&G
September 1992

The U.S. Department of Energy (DOE) Mound Plant is located in Miamisburg, Ohio. The Mound Plant was placed on the National Priorities List (NPL) in 1989. In 1990, the DOE signed a Federal Facility Agreement with the U.S. Environmental Protection Agency Region V (EPA) under Section 120 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, also known as Superfund). The Agreement outlines the investigations and cleanup activities to be performed at Mound. One of the investigations is called Operable Unit 9: Site-wide Remedial Investigation. The Ecological Assessment is one of several activities included in Operable Unit 9.

Operable Unit 9 Ecological Assessment

EG&G Mound Applied Technologies has hired the environmental engineering firm of Roy F. Weston, Inc. (WESTON) to conduct the first phase of an ecological assessment of the Mound Plant. The ecological assessment, which is part of the Operable Unit 9 Site-wide Remedial Investigation, endeavors to provide both quantitative and qualitative information regarding the actual or potential effects the Mound Plant has had on plant and animal communities.

The plant and animal communities at and around the Mound Plant contain a wide variety of organisms that are being studied. The dominant organisms may be arranged into five major groups: vegetation, small and large mammals, reptiles and amphibians, fish and macroinvertebrates, and birds.

Each of these will be thoroughly studied throughout the calendar years 1992 and 1993, or during periods of peak activity. The primary objectives of the work will be to identify the types and quantities of plants and animals present in and around the site (including state and federally listed threatened and endangered species), and to identify pollution sensitive environments such as wetlands, floodplains, and breeding areas.

Field methods used during the course of the assessment will consist of:

1. Vegetation: fixed area plots, transect surveys, and site-wide searches.
2. Small and large mammals: live trapping, and night-time surveys using spotlights.
3. Reptiles and amphibians: quadrant searches, drift fence and pitfall traps and vocal identifications.
4. Fish and macroinvertebrates: stream reach and pond inventories, artificial substrates, and bottom dredging.
5. Birds: transect surveys, and night-time owl vocalizations.

The results of this phase of the investigation will be used to guide follow-up research targeted at identifying possible bioaccumulation of pollutants within specific organisms. Such information will be critical for exposure and ecological effects assessments and characterization of risk to the environment as a whole.

Individual property owners are being contacted to request permission to conduct ecological study activities on their property.

For More Information... on these activities refer to the Field Sampling Plan and Work Plan documents for Operable Unit 9. These documents may be found at the information repository for the Mound Superfund Site at the Miamisburg Public Library.

For additional information Call: Mark Becker, EG&G Community Relations Manager at (513) 865-4450

or Submit a written request to:
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Operable Unit 9 Hydrogeologic Study

Roy F. Weston, Inc. (WESTON) is an environmental engineering company that has been hired by EG&G Mound Applied Technologies to do the hydrogeologic investigation for Operable Unit 9. This study will be conducted during the months of September 1992 through January 1993. The hydrogeologic investigation involves:

- ✓ Drilling 70 boreholes to depths ranging from 30 to 200 feet at locations on and off the Mound Plant property.
- ✓ Installing a monitoring well or piezometer in each of the 70 boreholes drilled so that water samples or a water level can be taken at later dates.
- ✓ Collecting samples of soil and rock from selected boreholes while drilling takes place.
- ✓ Geologic mapping of the rock that outcrops along the railroad tracks northwest of the Mound Plant.
- ✓ Placing stream gauges at three locations along the Great Miami River.

The boreholes will be made using both hollow-stem augers and roto-sonic drilling techniques through the top layers of soil. Upon reaching bedrock, rock core techniques using diamond cutting edges will be used.
Geologists will be present during all drilling operaions to direct the drilling and oversee collection and identification of soil and rock samples.

Upon completion of drilling operations, monitoring wells or piezometers *(a piezometer resembles a monitoring well but is somewhat smaller and is only used to measure water levels)* will be installed using PVC and stainless steel well construction materials. Each well location will be identified and protected to ensure the wells may be found and are secured against vandalism and accidents.

Individual property owners are being contacted to request permission to install piezometers or monitoring wells.

For More Information... on these activities refer to the Field Sampling Plan and Work Plan documents for Operable Unit 9. These documents may be found at the information repository for the Mound Superfund Site at the Miamisburg Public Library.

For additional Information Call: Mark Becker, EG&G Community Relations Manager at (513) 865-4450

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Operable Unit 9 Seismic Refraction Study

Roy F. Weston, Inc. (WESTON) is an environmental engineering company that has been hired by EG&G Mound Applied Technologies to perform the seismic refraction study for Operable Unit 9. A seismic refraction study involves:

- ✓ Placing electronic receivers, called geo-phones, on the ground;
- ✓ Making a sound underground; and
- ✓ Measuring how fast the sound travels through the soil and rock below.

When the speed of the sound is measured, a geologist can tell what kinds of rocks are in the ground and how deep they are. This work may be performed in the early morning or late evening hours.

Many common activities create sound and cause it to move through the rocks: for example, the operation of a pump in a well or a truck driving along a road. Many of these sounds could not be heard by a human ear, but can be heard by the geo-phone. For a seismic study it is important to make a sound that is short in duration and strong enough to be heard in the ground several hundred feet away.

For the seismic study at Mound, sounds will be made in two ways:

1. Hitting a metal plate lying on the ground with a sledge hammer.

2. Setting off a small explosive buried three feet underground that is not a hazard to people.

The small explosive is made from black powder, similar to gun powder, and is about the size of three shotgun shells. When the explosive is ignited there will be no dust, and the noise will probably not be heard more than a few feet away.

Individual property owners are being contacted to request permission to conduct seismic studies on their property. A map which illustrates the general locations for seismic activities is included on the back of this fact sheet. This study will be conducted during the fall of 1992.

For More Information... on these activities refer to the Field Sampling Plan and Work Plan documents for Operable Unit 9. These documents may be found at the information repository for the Mound Superfund Site at the Miamisburg Public Library.

For additional information Call: Mark Becker, EG&G Community Relations Manager at (513) 865-4450

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Operable Unit 9 Soil Study

EG&G Mound Applied Technologies has hired the environmental engineering firm of Roy F. Weston, Inc. (WESTON) to conduct the soil investigation for Operable Unit 9. The purpose of the soil investigation work is to evaluate the regional extent of soil contamination associated with Mound Plant activities, and to identify the background chemical characteristics of the soils found on and near the Mound Plant. The soil investigation work consists of collecting surface and subsurface soil samples at selected locations on and outside the Mound Plant. The work to be conducted off-site includes:

- ✓ **Regional Deposition:** Soil samples will be collected along 16 lines extending in a 20 mile radius from the Mound Plant.
- ✓ **Background:** Soil samples will be collected from 32 locations outside the Mound Plant. These locations will be selected based on soil types that are similar to those within the Mound Plant.

The surface soil samples will be collected from approximately the first six inches of the ground with a scoop or other small shovel. The subsurface samples will be collected from approximately 1.5 to 2 feet below the surface with a hand held auger and drive sampler - similar to a hollow pipe. Both of the sampling techniques being used require very little disturbance of property. No heavy equipment is required. All work can be done by one or two people. Soil that is removed for the purposes of sampling will be replaced with clean dirt to fill any holes.

All samples will be characterized to identify soil types, and analyzed for possible contaminants that may have originated from the Mound Plant.

Individual property owners are being contacted to request permission to take samples on their property. A map which illustrates the general sampling locations has been included on the back of this fact sheet for your information.

For More Information...

on these activities refer to the Field Sampling Plan and Work Plan documents for Operable Unit 9. These documents may be found at the information repository for the Mound Superfund Site at the Miamisburg Public Library.

For additional Information Call: Mark Becker, EG&G Community Relations Manager at (513) 865-4450

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Revision 1 September 11, 1992

SUPERFUND
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Operable Unit 9 Residential Well/Cistern Survey

EG&G Mound Applied Technologies has hired the environmental consulting firm of Terran Corporation (TERRAN) to perform the residential well/cistern survey for Operable Unit 9. This survey, which began in June 1992, is to determine possible impacts as a result of Mound Plant operations. The survey involves the following activities:

- ✓ Review of public records held at state, township and city offices, and review of information received in response to public notices in the Dayton Daily News and Miamisburg News, and at public meetings. This review process is to identify domestic, municipal, and industrial wells within a two mile radius of the Mound Plant. Public water distribution systems such as the City of Miamisburg's system will be identified and the extent of distribution determined.
- ✓ A door-to-door survey may be necessary in the late Fall of 1992 to identify additional wells and cisterns in areas where information from public records is limited.
- ✓ The data collected will be reviewed to determine a representative number of locations where ground water and cistern sediments will be sampled.
- ✓ The current owner of the residential wells that have been chosen to be sampled will be sent an Access Agreement Form. After the owner grants access permission, there will be an initial visit by an EG&G environmental consultant to inspect the well and determine the location for sample collection. A notice will also be sent to the residents at locations where the owner has granted permission, but is not the resident.

The ground water/cistern water and cistern sediment sampling will be conducted in 1993 by an EG&G environmental consultant. The sampling results will be available approximately one year after the date of sampling.

For More Information... on these activities refer to the Field Sampling Plan and Work Plan documents for Operable Unit 9. These documents may be found at the information repository for the Mound Superfund Site at the Miamisburg Public Library.

For additional information Call: Mark Becker, EG&G Community Relations Manager at (513) 865-4450

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Revision 1 September 11, 1992

SUPERFUND UPDATE

EG&G

September 1992

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Operable Unit 9 Surface Water and Sediment Studies

Roy F. Weston, Inc. (WESTON) is an environmental engineering company that has been hired by EG&G Mound Applied Technologies to do the surface water and sediment studies for Operable Unit 9. These studies are being performed to address: all surface water runoff areas originating within the Mound Plant site, the regional effects of redistribution of airborne deposits into ponds and streams, and effects of Mound Plant discharge on the Great Miami River.

The surface water and sediment studies involve:

- ✓ **Conducting a visit** to the proposed sampling site in order to identify the specific sampling points. Sampling locations may need to be adjusted at the actual time of sampling based on such factors as the presence or absence of water and sediment.
- ✓ **Collecting surface water and sediment samples** from rivers, streams, ponds, and other areas where water or sediment may be found. Collection of the samples may require use of a boat if sampling cannot be performed from land.

These studies will be conducted during two periods. The first sampling event will occur during October and November 1992. The second sampling will be performed in April 1993. The two periods of sampling are intended to roughly correspond to the dryer fall season and higher precipitation period common during the spring.

Sampling is being conducted both on Mound Plant property and in the local region surrounding the plant. Individual property owners are being contacted to request permission to conduct surface water and sediment studies on their property.

For More Information... on these activities refer to the Field Sampling Plan and Work Plan documents for Operable Unit 9. These documents may be found at the information repository for the Mound Superfund Site at the Miamisburg Public Library.

For additional information Call: Mark Becker, EG&G Community Relations Manager at (513) 865-4450

or Submit a written request to:
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Revision 1 September 11, 1992

SUPERFUND
UPDATE
EG&G
July 1992

Quarterly CERCLA Meeting July 23 at Miamisburg Civic Center, 7 p.m.

The next quarterly public meeting dealing with the CERCLA (Comprehensive Environmental Restoration, Compensation and Liability Act) program for environmental restoration at the Department of Energy's Mound Plant in Miamisburg will be held on Thursday, July 23, at 7 p.m. The meeting will be held in the Council Chambers of the Miamisburg Civic Center.

The July 23 meeting will cover a number of topics. The first part of the public meeting will be responses to questions from prior public meetings.

The second portion of the meeting will deal with demonstrations and examples of contaminants such as volatile organic compounds (VOCs) that we may run across on a daily basis plus a demonstration on radiation. The VOC portion will be presented by Dr. Daniel G. Carfagno of EG&G Mound Applied Technologies' Environmental Restoration program. The radioactive portion of the presentation will be made by representatives of the Ohio Department of Health's Radiological section.

This will be followed by a status on Field Work and documents for each of the Operable Units and future documents that will be available in the Public Repository at the Miamisburg Branch Library, 35 S. 5th Street, Miamisburg.

A wrap up session will conclude the evening's meeting and meeting attendees will be able to see first hand, various pieces of testing equipment used in the demonstrations.

Ecological assessment being conducted as part of Mound's CERCLA program

One phase of Mound's CERCLA program is to conduct an ecological assessment of the Superfund site, a requirement of the EPA.

An ecological assessment is a qualitative and/or quantitiative appraisal of the actual or potential effects of a hazardous waste site on plants and animals other than people or domesticated species.

Ecological assessment comprises four interralated activites:

- Problem Formulation
- Exposure Assessment
- Ecological Affects Assessment
- Risk Characterization

Through Weston, Inc., a team of biologists have been and will continue to be at the plant site and adjoining Superfund designated areas on a seasonal basis (spring, summer, fall, and winter) collecting information on the following categories of biota:

- Plants
- Small mammals (mice and shrews)
- Reptiles and amphibians (lizards, snakes, frogs, and turtles)
- Fish and aquatic insects
- Birds
- Medium and large animals

Work completed so far has included a bird survey, a nighttime deer spotlight survey, owl vocalazations survey and sampling of the following: plants, terrestrial insects, small mammals, fish aquatic insects, reptiles and amphibians. During these events, counts of the number and types of species are made.

Future sampling will include: 1) aquatic insects in late July; 2) plants in September; 3) all categories in October; 4) aquatic insects in December; 5) a bird survey, deer spotlight survey and nighttime owl vocalizations in January 1993; and 6) reptiles in March 1993

EG&G Mound Applied Technologies
Public Relations/Environmental Restoration
P.O. Box 3000
Miamisburg, OH 45343-3000

CERCLA documents available at public repository

Mound has established a public repository at the Miamisburg Branch of the Dayton-Montgomery County Library, 35 S. 5th Street, Miamisburg, Ohio. The phone number for the library is 866-1071. Hours are 12 noon to 8:30 p.m. Monday through Thursday, 9 a.m. to 5:30 p.m. on Friday and Saturday.

Two copies of all CERCLA documents are available at the library. One set of documents is available for general circulation (like a regular library book) from the library to individuals with library cards. The second set of documents remains in the library repository for reference and public inspection.

There are non-CERCLA Mound and DOE documents available as reference materials only and cannot be removed from the library repository.

New CERCLA documents in the public repository, as of July 7 include the following:

Operable Unit 9, Site-Wide Work Plan, Final, May 1992

Operable Unit 9, Site-Wide Field Sampling Plan 1992

Operable Unit 9, Site Scoping Report, Volume 2, Geologic and Well Information Report, Final, May 1992

Operable Unit 9, Site Scoping Report, Volume 10, Permits and Enforcement Actions, Final, May 1992

Also placed in the Public Repository are two volumes of Mound's Environmental Monitoring Reports (circulating copies not available):

Environmental Monitoring Reports for the Mound Plant, 1970-1979

Environmental Monitoring Reports for the Mound Plant, 1980-1989

CERCLA mailing list

Mound maintains a special mailing list for CERCLA-related activities for interested individuals. These individuals receive notification of CERCLA related meetings, Site Specific/Five Year Plan Public meetings, and other DOE related public affairs activities. If you are not on the current mailing list, either fill out the mailing list signup sheet at any of Mound's public meetings or send your mailing address to: EG&G Mound Applied Technologies, c/o Public Relations, P.O. Box 3000, Miamisburg, OH 45343-3000.

Important phone numbers

EG&G Mound Applied Technologies	
Environmental Restoration /CERCLA	**513-865-3651**
Public Relations	**513-865-3001**
U.S. Environmental Protection Agency	**312-353-6287**
Ohio Environmental Protection Agency	**513-285-6357**
Ohio Department of Health	**1-800-523-4439**
(Radiological)	**614-644-2727**

Your input is sought

Your input is needed in order to help us in putting on worthwhile and informative meetings. At each quarterly public meeting, meeting questionnaires are available. It is asked that you fill them out and return them after the meeting or mail to: EG&G Mound Applied Technologies, c/o Public Relations, P.O. Box 3000, Miamisburg, OH 45343-3000.

SUPERFUND
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EG&G
April 1992

Quarterly CERCLA Meeting April 30 at Miamisburg Civic Center, 7 p.m.

Poster session scheduled

On Thursday, April 30, the United States Department of Energy and its contractor for the Mound Plant in Miamisburg, EG&G Mound Applied Technologies, will hold a quarterly informational CERCLA public meeting. The meeting will be held in the Community Room of the Miamisburg Civic Center and will begin at 7 p.m.

This meeting will differ from previous meetings in its format. Instead of a presentation on a particular operable unit and a question and answer session, from 7 to 8:30 p.m. a poster session will be held that will address various activities in the CERCLA process.

Some of those topics will include Operable Unit 4 (Miami-Erie Canal), Operable Unit 9 (Site-Wide), Risk Assessment process, Site Specific/Five Year Plan and how it works in the CERCLA process, and Community Relations. Representatives of the United States Environmental Protection Agency and the Ohio Environmental Protection Agency will also be in attendance.

Interested individuals who attend will be able to spend time at each of the poster stations which will be staffed by a representative who deals specifically in those areas. In addition, other representatives from EG&G Mound Applied Technologies and the Department of Energy's Dayton Area Office will be available.

Following the poster session, a wrap up session will be held for those who attend and allows for the opportunity to ask additional questions.

Previous CERCLA public meetings have been held in the Council Chambers at the Miamisburg Civic Center. This meeting has been changed to the Community Room to allow for this informal type meeting. The Community Room is located at the north end of the Miamisburg Civic Center concourse, 10 N. 1st Street in Miamisburg, Ohio. If you have any questions, contact EG&G Mound's Public Relations office at 865-3001.

CERCLA mailing list

Mound maintains a special mailing list for CERCLA-related activities for interested individuals. These individuals receive notification of CERCLA related meetings, Site Specific/Five Year Plan Public meetings, and other DOE related public affairs activities. If you are not on the current mailing list, either fill out the mailing list signup sheet at any of Mound's public meetings or send your mailing address to: EG&G Mound Applied Technologies, c/o Public Relations, P.O. Box 3000, Miamisburg, OH 45343-3000.

Help available for citizen's groups

An important aspect of the Superfund program is citizen involvement at the local level in the decision-making process related to specific clean-up actions. This requires an understanding of the technical issues concerning a hazardous waste site.

Citizens can seek assistance in establishing technical awareness through a government Technical Assistance Grant (TAG). The TAG program provides up to $50,000 for the purpose of hiring technical advisors to help citizens understand and interpret technical information related to a specific hazardous waste site.

Congress and the EPA have established certain basic requirements for the use of TAG funds by a group that receives a grant. More detailed information on these grants can be obtained by contacting the EPA. The EPA office responsible for the states of Illinois, Indiana, Michigan, Minnesota, Wisconsin, and Ohio is:

EPA Region 5
77 West Jackson
Chicago, IL 60604
(312) 353-1325
Contact: Sue Pastor

CERCLA documents available at public repository

Mound has established a public repository at the Miamisburg Branch of the Dayton-Montgomery County Library, 35 S. 5th Street, Miamisburg, Ohio. The phone number for the library is 866-1071. Hours are 12 noon to 8:30 p.m. Monday through Thursday, 9 a.m. to 5:30 p.m. on Friday and Saturday.

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There are non-CERCLA Mound and DOE documents available as reference materials only and cannot be removed from the library repository.

The following CERCLA documents are located in the repository:

FEDERAL FACILITY AGREEMENT, U.S. Environmental Protection Agency (USEPA) & U.S. Department of Energy's (DOE) Mound (Ohio) Plant, Miamisburg, OH, 890 008 984

AREA B, OPERABLE UNIT 1 - DOE MOUND PLANT (DRAFT)
History of Area B, February 1991

LETTER REPORT; PRELIMINARY RESULTS OF RECONNAISSANCE MAGNETIC SURVEY
Mound Plant - Areas 2, 6, 7 and C (Working Draft), November 1990

TRANSCRIPT; U.S. EPA FEDERAL FACILITY AGREEMENT WITH U.S. DOE
Mound Plant Public Meeting
Miamisburg, Ohio - August 28, 1990

MAIN HILL SEEPS, OPERABLE UNIT 2, ON-SCENE COORDINATOR REPORT FOR CERCLA SECTION 104 REMOVAL ACTION, WEST POWERHOUSE PCB SITE, October 1991, Mound Plant, Miamisburg, Ohio, DOE, Albuquerque Operations Office, Environmental Restoration Program, Technical Support Office, Los Alamos National Laboratory

LITERATURE REVIEW UPDATE AND ARCHAEOLOGICAL SURVEY OF THE EG&G MOUND FACILITY AND ADJACENT AREAS, CITY OF MIAMISBURG, MIAMI TOWNSHIP, MONTGOMERY COUNTY, OH, by Herb Beamer, April 16, 1991

MISCELLANEOUS SITES, OPERABLE UNIT 3, QUALITY ASSURANCE PROJECT PLAN, OCTOBER 1991

MISCELLANEOUS SITES, OPERABLE UNIT 3, LIMITED FIELD INVESTIGATION WORK PLAN, JUNE 1991

OPERABLE UNIT 9, SITE SCOPING REPORT - VOLUME 1 - GROUNDWATER DATA: FEBRUARY 1987 - JULY 1990 AND ADDENDUM, Final, February 1992

OPERABLE UNIT 9, SITE SCOPING REPORT - VOLUME 4 - ENGINEERING MAP SERIES Final, February 1992

OPERABLE UNIT 9, SITE SCOPING REPORT - VOLUME 5 - TOPOGRAPHIC MAP SERIES Final, February 1992

OPERABLE UNIT 9, SITE SCOPING REPORT - VOLUME 6 - PHOTO HISTORY REPORT Final, February 1992

OPERABLE UNIT 9, SITE SCOPING REPORT - VOLUME 8 - ENVIRONMENTAL MONITORING DATA: 1976-1989, Final, February 1992

PROPOSAL FOR ADDITIONAL WORK SOIL GAS SURVEY AND GEOPHYSICAL INVESTIGATIONS, Mound Plant Main Hill and SM/PP Hill Areas, February 1992

OPERABLE UNIT 9, SITE SCOPING REPORT - VOLUME 11 - SPILLS AND RESPONSE ACTIONS, Final, March 1992

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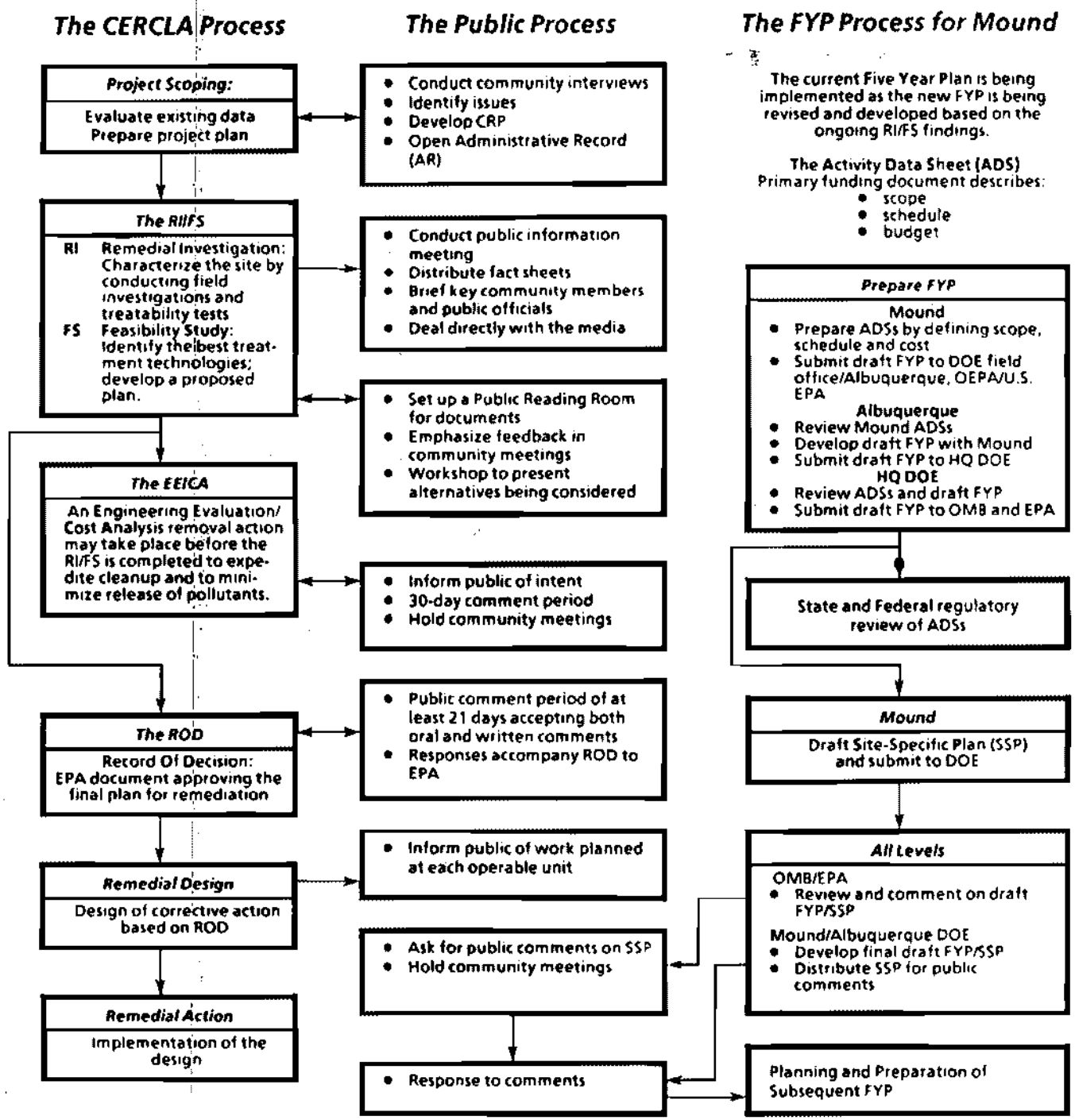
Public Relations/Environmental Restoration
P.O. Box 3000
Miamisburg, OH 45343-3000



EG&G

Public Participation in CERCLA and FYP

April 1992

CERCLA

The Law: CERCLA
Comprehensive Environmental Response, Compensation, and Liability Act - 1980

Intent: Provide
- liability
- compensation
- cleanup

Legislative Purpose:
- Protect human health and the environment through technically appropriate site remediation
- Provide mechanism to finance such clean-ups and allow initiation in a timely manner

Mechanism:

Superfund - Created in 1980 when CERCLA was enacted to provide funding to sites without clear ownership identified for inclusion on the National Priorities List (NPL). The Mound looked at the potential for being placed on the NPL as early as 1984. In November of 1989, Mound was placed on the NPL.

Remedial Investigation/Feasibility Study (RI/FS) - Under CERCLA, a RI/FS is conducted to determine the potential environmental problems represented by the site and identify a cost-effective remedy for the site. If appropriate, initial remedial actions may be performed during the RI. The Mound is presently conducting a RI/FS and has performed some initial remediation.

Final Remedy - Once the final remedy is recommended through the FS and agreed upon by the regulatory agencies, the remedy is implemented and the site clean-up is completed. Monitoring activities may continue after clean-up to ensure that the remedy was effective.

Public

The Public: CRP
Community Relations Plan

Intent: Give the public an opportunity to:
- comment
- provide input
- learn about planned and ongoing activities
- focus on and resolve alternative viewpoints

Why Public Involvement?
- The Mound recognizes that the surrounding community has a significant stake in the environmental conditions at the facility. Therefore, ensuring that the community is well-informed is vital.
- Mound is required by CERCLA to keep residents and local officials informed about the activities at the site and to provide opportunities for citizens to participate in the decision-making process.

Process at Mound
- Community interviews were conducted early in the CERCLA process and the Community Relations Plan was developed.
- Community meetings are held on a regular and an as needed basis.
- Public comment periods are held at certain key points in the process to allow citizens to provide their input and ask questions about the remedial action proposed for the site.
- The Mound will carefully consider citizen input when making decisions about the remedial action.
- Documents prepared during the CERCLA process are placed in the Miamisburg Public Library to ensure ready access to relevant information.
- In preparing the ADSs and other Five Year Plan information, programs are developed that ensure public involvement and community opinion is carefully considered in the planning process.

The Public: FYP

- A public meeting is held to explain the Mound Site Specific Plan part of the DOE Five Year Plan to the public.
- Public comments are c[illegible]idered in subsequent Five Year Plans.

Five Year Plan

The DOE/Mound: FYP
Five Year Plan

Intent:
- Establish specific priorities to meet CERCLA requirements
- Develop schedule milestones within budgets

Purpose:
- Establish a multi-year schedule and budget for environmental activities that is consistent with site needs and available funding.
- Helps determine funding needs for site environmental activities for the next five years for input into DOE budget request to Congress.

Process at Mound:
- Activity Data Sheets (ADSs) are developed which describe all activities to be performed.
- The Mound RI/FS has been divided into seven operable units, and the ADS for each is developed to establish specific priorities consistent with the legal requirements of the CERCLA for protecting human health and safety and the environment.
- Sets milestones for the RI/FS within budget and schedule.
- Planning effort results in an integrated plan and strategy for clean-up and restoration and the Site Specific Plan is developed.

SUPERFUND
UPDATE
EG&G
January 1992

Operable Unit 3

Quarterly Public Meetings

The primary subject of Mound's January 23, 1992 CERCLA quarterly public meeting is the work plan for Operable Unit 3. In addition, the status of other documents and field work will be updated.

First of all, the quarterly meetings will serve as a method to communicate facets of the Mound Environmental Restoration program to the community, which is one part of the Community Relations Program. Notice of the quarterly meetings will appear in two local newspapers, the *Dayton Daily News* and the *Miamisburg News*, approximately 10 to 14 days prior to the meeting. Individuals who have had their name placed on Mound's Superfund mailing list will also receive a notice of the meeting, either by postcard, letter or fact sheet.

Each of the quarterly meetings, or additional meetings if more are warranted, will deal with operable units that have been established. An operable unit is a discrete action that comprises an incremental step toward comprehensively addressing site problems. Operable units may address geographical portions of a site, specified site problems, or initial phases of action.

Operable Unit 3

The cleanup of a site can be divided into a number of operable units, depending on the complexity of the problems associated with the site. In Mound's case, nine operable units have been established, eight to specifically identify certain areas or problems, with a ninth being a site-wide operable unit.

Currently a work plan has been issued and work is progressing on Operable Unit 3. This work plan applies only to Miscellaneous Sites, Operable Unit 3, and includes potential release sites where the understanding of potential contamination is insufficient and collection of site-specific data is required for the scoping effort. In this particular Operable Unit, no radioactive contamination is expected.

This work plan presents information required to conduct a limited field investigation at 22 potential release sites at Mound (see map). While a complete description is available in the Public Repository, the following is a brief description of each of the potential release sites.

Potential Release Sites

Paint Shop Area - Paint shop wastes include excess paints and thinners, outdated paint, and cleaning solutions from paint operations. Wastes were containerized in 55-gallon drums. Historically, the paint shop wastes were placed at the Area B landfill, but in the 1970s this practice was changed to offsite disposal by a contractor. However, it is possible that leaks or spills could have contaminated the area around the paint shop.

Powerhouse Area, Fuel Tanks - Stained soils are present on the berm indicating that fuel spills (overflows) have occurred during tank filling operations.

WD Building Drum Staging Area - Drums staged on the open pad reportedly contained tritium contaminated wastewater from routine building maintenance. Stains have been observed extending from the concrete pad to the adjacent soil.

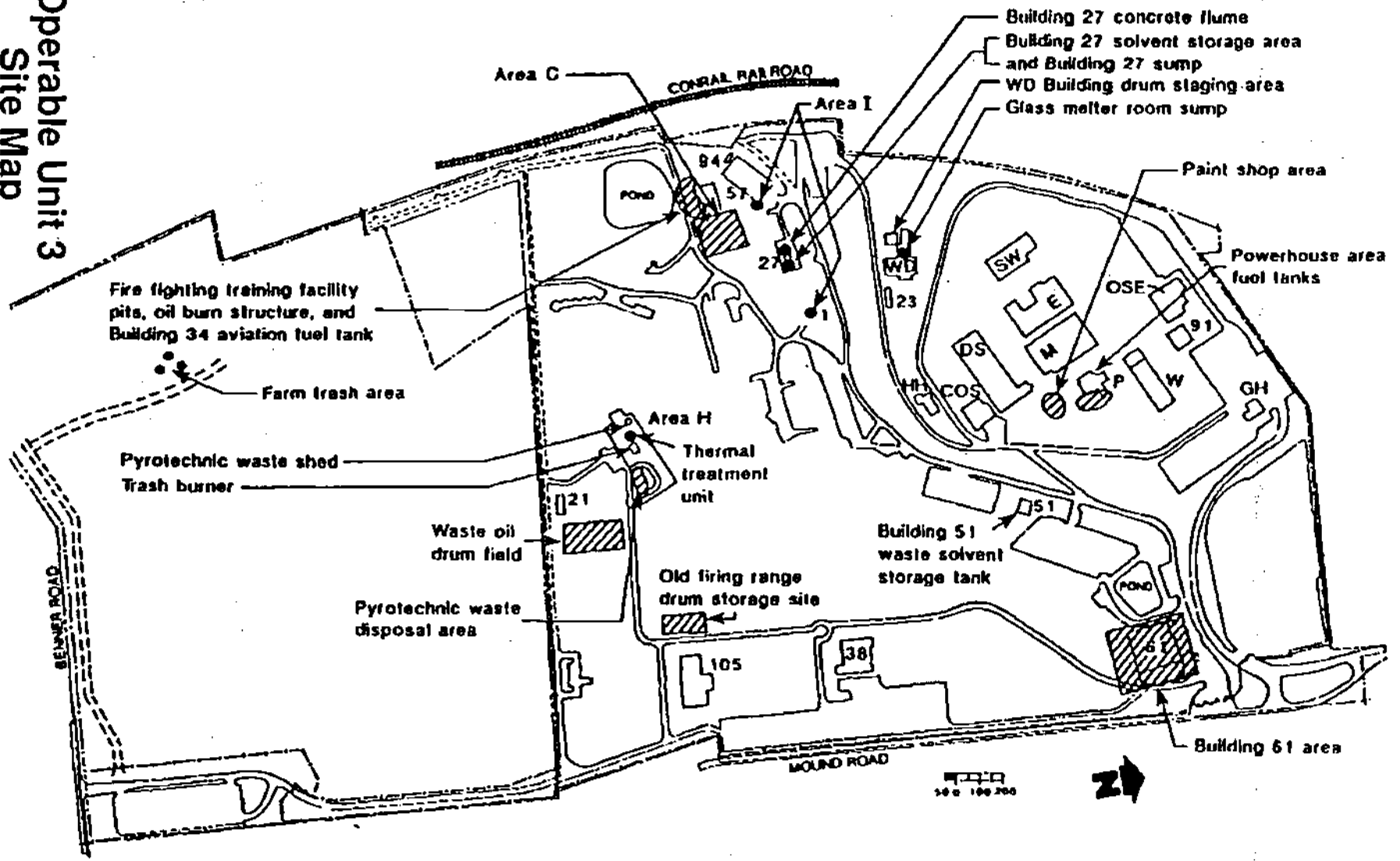
Glass Melter Room Sump Pump - Potential contamination of the sump will be associated with wastewater from the glass melter furnace and routine floor wash water. In addition, the sump may have received some materials from test burns conducted at the glass melter furnace in 1985 and 1987.

Building 51 Waste Solvent Tank - The Building 51 waste solvent tank was used for storage of waste solvents for approximately 10 years, and were collected mainly from fume hoods. The tank, which contained triclorethene, acetone, toulene and benzene, as well as additional solvents, was removed as part of Mound's Underground tank program in 1990.

Building 61 (former heavy equipment area) - The Building 61 area was previously used for the staging of heavy equipment with later construction of a building for an office and warehouse used as a receiving and shipping facility. With its former use, the area could have waste oil dumped that was associated with equip-

(continued on page 3)

Operable Unit 3 Site Map
(approximate locations)



[a] Sizes and locations are approximate
[b] Not shown: Underground sewer lines

Operable Unit 3 (from page 1)

ment maintenance. However, no spills or waste disposals have been documented.

Building 27 Sites: Solvent Storage Area, Concrete Flume, and Sump - The Building 27 sites receive a wastewater stream, which contains acetone, ethanol, and high explosives. The primary waste liquid is acetone. The concrete flume and the solvent storage area are still active and receive the wastewater. The sump is inactive but would receive wastewater if the concrete flume overflowed. No evidence of leaks or spills has been observed or reported at the sites.

Area I, Buildings 1 and 27 Leach Pits- Prior to 1985, Area I leachpits received wastewater streams, which contained trace quantities of acetone, ethanol, and high explosives. Acetone was the primary waste liquid in the wastewater. The leach pits are potential sources of contaminants to the environment because the wastewater had the potential to infiltrate the subsurface at these locations.

Building 34 Sites: Oil Burn Structure, Fire-Fighting Training Facility Pits, and Aviation Fuel Tank - Aviation fuel was stored at the Building 34 fuel tank and was used in test-burning operations at the oil burn structure. Diesel fuel was used in the fire-fighting training pits to create demonstration fires. Approximately 300 gallons of diesel fuel were used at the training pits in 1987 at a rate of three to five gallons per demonstration. The oil burn structure is an open-tapped, in-ground pit, formerly used to test shipping containers by subjecting them to a fuel fire for 15 minutes.

Area C, Waste Storage Area - Lithium containers placed in Area C during the 1950s potentially contain residual lithium carbonate. In addition, small quantities of other wastes could possibly have been placed in the area, but the nature (volumes and types) of any other waste is unrecorded. Reportedly, metal drums from another area of the plant were moved to Area C in 1950. Investigations at Area C will also include an area historically used for staging drums.

Area H - Area H encompasses four sites used for disposal processes for pyrotechnic and explosive wastes. The four sites include: the pyrotechnic waste disposal area, the trash burner, the thermal treatment unit, and the pyrotechnic waste shed. The pyrotechnic waste disposal area was used for disposal of pyrotechnic materials in solution onto land. The trash burner was used to burn up to 40 pounds of high explosives' trash per event. Explosive wastes are burned in the thermal treatment unit. Pyrotechnic wastes are packaged and enclosed in metal drums for temporary storage at the pyrotechnic waste shed.

Waste Oil Drum Field - Presently an inactive site, this area was used to temporarily store drums on pallets above the soil. Drums at the south end of the drum field contained waste oil; drums at the north end contained metal-plating shop waste, solvents, explosive/solvent waste, batteries, kitchen grease, herbicides, photographic solutions, epoxy resins, lab chemicals, ethylene glycol, scintillation vials, and other unknown chemical wastes. Drums stored at the waste oil drum field may have contained copper cyanide.

Old Firing Range Drum Storage Site - Drums containing chemical wastes such as spent solvents were stored on bare ground. According to plant personnel, no radiological waste was stored in this area. Past photographs indicate that from 100 to 500 drums were stored in this area. Because this area was operational in the 1960s and 1970s, the Resource Conservation and Recovery Act (RCRA) was not yet promulgated, and records of RCRA-listed wastes were not maintained. It is possible that these wastes could have been spent solvents or spent non-halogentated solvents

Farm Trash Area - The farm trash area, which may include three smaller areas, is estimated to cover less than an acre. It was used to receive trash, tires, and household debris when the farm was in use. Mound Plant has never used this area for waste or trash disposal, and no RCRA-regulated materials have been stored or handled at the area. It is characterized by a lack of vegetation and dark stains on soil near the assumed eastern edge of the area. The source of the stains is not known, but the stains are probably related to farm vehicle maintenance.

Underground Sewer Lines - Sanitary and industrial wastewater is carried to the sanitary wastewater treatment plant through the underground sewer lines. Sources of wastewater conveyed through the underground sewer lines including rest rooms, showers, laundry facilities, laboratory sinks, and rinses from a small metal-finishing operation. Some of the laboratory sinks have reportedly received small amounts of solvents, photographic solutions, acids, and bases.

Mound's Operable Units

The Mound Plant ER Program presently encompasses 109 identified sites. Because of this number and complexity of potential release sites at Mound Plant, the RI/FS has been divided into nine (9) operable units to facilitate program management. These nine operable units and current objectives are as follows:

• **Area B, Operable Unit 1,** includes a historical waste disposal area (landfill) with a known release of volatile organic chemicals to the Buried Valley Aquifer. Two stages of the remedial investigation have been performed for Area B, and a third is underway.

• **Seeps, Operable Unit 2,** addresses potential release sites on the Mound Plant Main Hill including some peripheral groundwater seeps. Its scope includes characterization of the indurated bedrock and unconsolidated overburden on the Main Hill and associated soils and groundwater.

• **Miscellaneous Sites, Operable Unit 3,** includes those potential release sites for which little or no data are currently available and for which the collection of site-specific data in a limited field investigation will enhance the scoping effort. At the conclusion of the field work and data validation a decision point is scheduled. At this decision point a recommendation will be made whether to proceed with a full RI/FS within Operable Unit 3, to reassign the sites to other operable units, or whether any of the sites require no further action. Since many of the sites undergoing limited field investigation are within the plant valley, it is conceivable that Operable Unit 3 may assume geographic responsibility of the plant valley for further characterization.

• **Miami-Erie Canal, Operable Unit 4,** addresses an abandoned segment of the Miami-Erie Canal west of Mound Plant that contains plutonium-contaminated sediments from a 1969 waste line break and tritium contaminated soils. Although a mile long, it is considered to be one potential release site.

• **Radioactively Contaminated Soils, Operable Unit 5,** includes soils with known or suspected radioactive contamination. The sites within Operable Unit 5 are not currently scheduled for Decommission and Decontamination (D&D) under the D&D Program at Mound. It is anticipated that as sites obtain funding under the D&D Program, they may be moved from Operable Unit 5 to Operable Unit 6, described below. Since many of the known radioactively contaminated sites are located on the SM/PP Hill, Operable Unit 5 has the geographic responsibility for the SM/PP Hill. As with the Main Hill, investigations of the potential source terms on the SM/PP Hill may require characterization of the bedrock and unconsolidated overburden.

• **Decontamination and Decommissioning (D&D) Program Sites, Operable Unit 6,** includes potential release sites with radioactively contaminated soils that are undergoing cleanup or are scheduled for cleanup in the near future. Because it is already known that the contaminated soil will be cleaned up, and because the D&D Program is an ongoing activity under the Atomic Energy Act that reduces potential impacts to human health and the environment, the scope of the RI/FS for these sites is verification of cleanup after the soil is removed. The cleanup levels are to be determined through the CERCLA risk assessment process.

• **Limited Action Sites, Operable Unit 7,** includes potential release sites that are believed to have no contamination based on a review of site histories and an August 1990 joint visual inspection by DOE, U.S. EPA and Ohio EPA. The site-wide Work Plan stipulates that no further action is required, and no further documentation will be produced.

• **Inactive Underground Storage Tanks, Operable Unit 8,** includes underground storage tanks primarily in the vicinity of the Waste Disposal (WD) Building. Its scope will also include an early review to determine the regulatory status of all underground tanks at the Mound Plant, and will result in a distribution of responsibility for the tanks between the ER Program and a Mound Plant underground tank compliance program under Resource Conservation and Recovery Act (RCRA) Subtitle 1, administered by the State of Ohio.

• **Site-wide RI/FS, Operable Unit 9,** includes off-plant migration of contaminants in groundwater, soils, surface water and sediments, airborne contamination, and ecological assessment. The site-wide RI/FS will additionally ensure that a comprehensive investigation is performed by compiling all data from individual operable unit investigations into a comprehensive report. Data reports from specific Site-Wide investigations conducted under this Work Plan will be initially reported in interim reports or technical memoranda to ensure that the off-plant and regional data are available early.

What is Risk Assessment?

During the course of CERCLA (referred commonly as Superfund) activities and public meetings for the Mound Plant, the term "risk assessment" will be used periodically. Risk assessment is an evaluation performed as part of the remedial investigation (RI) to assess conditions at a Superfund site and determine the risk posed to public health and/or the environment.

The risk assessment defines who is exposed to how much of a contaminant(s) for how long and the consequences of that exposure. The process includes hazard-identification, exposure assessment, toxicity assessment, and risk characterization. Usually, a baseline risk assessment is developed early during the feasibility study (FS). If necessary, the risk assessment is used to develop remedial action objectives.

The hazard identification pinpoints potential contaminants of concern (also called indicator chemicals) at the site for detailed assessment. The exposure assessment identifies how people and/or animals are exposed (e.g., ingestion, inhalation, skin contact), to what extent and for how long. Fate and transport modeling, which mathematically simulates contaminant behavior, assists in predicting contaminant concentration and movement.

Two scenarios may be developed: one for current exposure, the other for possible future exposure called a "reasonable maximum exposure scenario." To estimate the latter, the assessment assumes the highest beneficial use of the site possible in the future, such as a family living there for a lifetime and utilizing that site for all their food,water and air. Consequently, the assesment may include hypothetical exposure pathways that may seem unlikely given current site conditions.

The toxicity assessment reviews known or suspected health or environmental effects of hazardous substances found on-site. Sources include the Agency for Toxic Substances and Disease Registry's (ATSDR) toxilogical profiles, EPA's health effects assessments, published reference doses, and advisories issued under the Fish and Wildlife Coordination Act.

Finally, risk characterization characterizes and quantifies the potential risk posed by the site. This is done by combining the results of the exposure and toxicity assessments. Risks are characterized separately for each compound and each exposure pathway and are also combined to derive a total site risk. The calculation represents a conservative estimate of the reasonably maximum exposed individual, under both current and future land use conditions.

In Mound's case, the modeling that is done is conservative and would theoretically utilize an individual living on a particular piece of property throughout his/her lifetime, growing all food on the property, and use the different pathways for contaminants to human being by the air, water, and food they ingest.

For noncarcinogenic chemicals, the focus is upon concentration levels that exceed the reference dose, i.e., the doses that do not pose any appreciable risk of significant adverse effects to an individual over a lifetime. For carcinogens, acceptable risks are those that fall within a 1×10^{-4} to 1×10^{-6} range. of individual lifetime excess cancer risks A 1×10^{-6} means that people exposed to the contaminants at the site have a one in a one million chance of contracting a cancer.

Superfund remedies protect environmental organisms and ecosystems as well as people, although setting protective levels has so far been considerably less quantitatave. Sometimes, as in the cases where animal species or ecosystems are more sensitive than humans, or where human exposures are anticipated to be minimal, environmental goals may be more stringent than health-based goals.

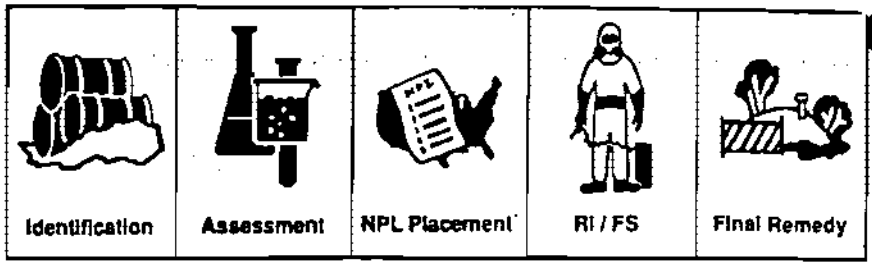
What is Meant by Dose?

When ionizing radiation penetrates and interacts with a material, it imparts energy to the material, which may cause damage to the material. For a given mass of the material this energy is called the absorbed dose; the unit that measures the absorbed dose is the rad (derived from radiation absorbed dose).

If a person is exposed to ionizing radiation, another quantity, the dose equivalent, must be used because the same dose of different types of radiation produces different effects in the body. The dose equivalent is obtained by multiplying the absorbed dose by a factor that varies with the type of radiation and takes into account these different effects.

It has been conventional to measure the dose equivalent by the unit rem (rad equivalent man). Rem and millirem (1/1000 rem) refer to the dose equivalent to an individual; man-rem indicates the dose equivalent to a population.

How the Superfund Process Works



The Superfund process is a lengthy one that follows a six step process that begins with site discovery and concludes with final action.

The Superfund program was created in 1980 when Congress enacted the Comprehnsive Environmental Response, Compensation and Liability Act (CERCLA). As amended in 1986, the Superfund law authorizes the United States Environmental Protection Agency (USEPA) to investigate and respond to releases or threatened releases of hazardous substances that may endanger public health and welfare or the environment.

What are the steps in the Superfund process?

Initially, after a site is discovered, the USEPA conducts a (1) *preliminary assessement and site inspection*. The USEPA then (2) *scores the site* using a point system that takes into account:

- Potential health risks to the human population;
- Potential or actual hazards created by sustances on the site (e.g., from direct contact, inhalation, ingestion, or fire);
- Potential or actual release of contaminants from the site to the air or drinking water supplies; and
- Possible release of substances from the site that may pollute or harm the environment.

If preliminary studies indicate that the site's problems pose an actual or potentially serious risk to human health or the environment, the site is then placed on the U.S. EPA's National Priorities List. Every site on the NPL qualifies for an investigation and cleanup.

Initially, Mound began looking at the potential of being placed under CERCLA as early as 1984, when the program was initiated through the Department of Energy's Albuquerque Operations Office. It was not until November of 1989 that Mound was finally placed on the National Priority List, making it a designated CERCLA or Superfund site.

The Mound Plant was scored in group 13 in the Hazardous Ranking System for having a score between 34.60 and 35.57. A score of 28.50 is needed to be placed on the NPL. Through a Federal Facility Agreement reached in 1990 between the Department of Energy and the USEPA, Mound became the lead agency in the CERCLA process, but is still monitored by the USEPA and the Ohio EPA.

The next step for the lead agency is developing a work plan and conducting a (3) *Remedial Investigation*. The Remedial Investigation identifies the types of contaminants present, assesses the degree of contamination, and characterizes the potential risks to the community. Following the Remedial Investigation, the lead agency performs a (4) *Feasibility Study* to identify and evaluate various remedies for addressing contamination problems identified during the Remedial Investigation.

Based on the Feasibility Study, the lead agency identifies the remedy it feels is most appropriate. When the Feasibility Study is complete a (5) *public comment period* is held to provide interested persons an opportunity for input in deciding the most appropriate remedy for the site. After receiving and considering public comments, the lead agency will (6) *select and design a specific-long term remedial action*. Once the design is finished, the actual cleanup can begin.

The time needed to complete each of these steps is different for every site. In general, the Remedial Investigation/Feasibility Study takes from 18 months to two years if a second phase of the Remedial Investigation is not needed. The long-term action typically takes six months to a year to design, and one to two years to put in place, although treatment of contaminated ground water, if needed, may take many years. It is possible, however, that Remedial Investigation/Feasibility Study will indicate that no further action should be taken at the site.

Monitoring of the Mound site during this process is conducted by the USEPA and the Ohio EPA. If contamination becomes an imminent threat to human health or the environment during the Remedial Investigation/Feasibility Study, the lead agency may conduct an emergency action, known as a removal.

Through the Superfund process, the lead agency attempts to keep residents and local officials informed about activities at the site and provides opportunities for citizens to participate in the decision making process. Public comment periods are held at certain key points in the process so that citizens can voice their concerns and ask questions about the remedial action proposed for the site. The lead agency will consider citizen input when making decisions about the remedial action.

Types of Radiation: Background and Man-Made

We have always been subjected to natural radiation. We are exposed to radiation from the sun and outer space; naturally occurring radioactive materials are present in the earth, the houses we live in and the buildings where we work, and the food and drink we consume. There are radioactive aerosols and gases in the air we breathe; and even our own bodies contain naturally occurring radioactive elements.

The level of this inescapable natural "background" radiation exposure varies greatly from place to place. These natural "background" radiations include terrestrial (which provides more than five-sixths of the annual effective dose equivalents received by people), and the remainder from cosmic rays.

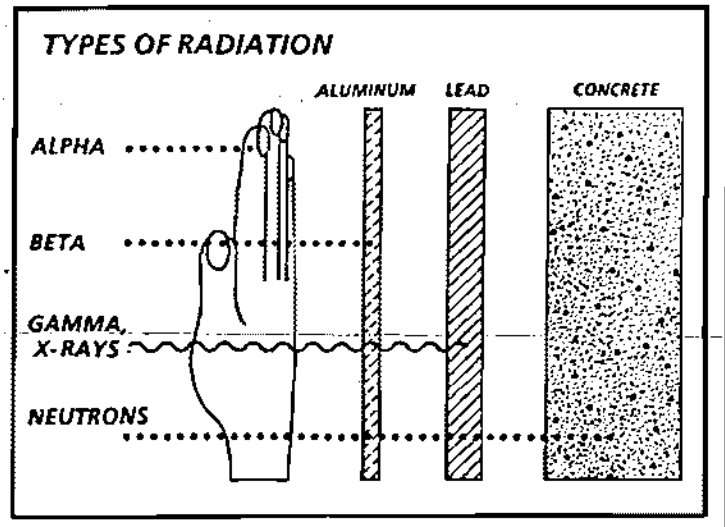
The "background" radiation you can be exposed to varies depending on where you may live for natural terrestrial radiation. Internal irradiation can come from radioactive substances in the air that is breathed, food that is eaten, and the water that is drunk - all naturally occurring from the decay of uranium-238 and thorium-232. Also potassium-40 is absorbed in the body along with non-radioactive potassium, an essential element. Another source of naturally occurring radioactive materials is radon gas, a colorless, tasteless, odorless, invisible gas, which is produced by the natural decay of uranium-238 and thorium-232. Most of the dose results from breathing in the radionuclides, particularly indoors.

We are also exposed to sources of radiation that we ourselves create. X-rays and other kinds of radiation used for medical purposes, fall-out from nuclear explosives testing and the quantities of radioactive materials which are allowed to escape to the environment in the course of normal operation of nuclear installations, are some examples.

The term "radiation" is very broad, and includes such things as light and radio waves. It is most often used however to mean "ionizing" radiation: that is, radiation which changes the physical state of atoms which it strikes, causing them to become electrically charged or "ionized." In some circumstances, the presence of such ions can disrupt normal biological processes. Ionizing radiation may therefore present a health hazard to man.

There are various types of ionizing radiation, each with different characteristics. Unstable, naturally-occurring and man-made atoms that emit these kinds of radiation are said to be radioactive.

Alpha radiation consists of heavy positively charged particles emitted by atoms of elements such as uranium and radium, and plutonium and americium. Alpha radiation can be stopped completely by a sheet of paper. However, if alpha-emitting materials are taken into the body by inhalation or along with food or water they can expose internal tissues directly, and may therefore



Penetrating Powers of the Various Types of Radiation

represent a hazard.

Beta radiation consists of electrons. These are more penetrating than alpha particles, and can pass through 1 to 2 centimeters of water. While it can pass through a piece of paper, a sheet of aluminum a few millimeters thick or plastic will stop beta radiation. One source of exposure to beta radiation is tritium, which is present in fall-out from nuclear explosive tests.

Gamma rays are a form of electromagnetic radiation, similar to X-rays, light and radiowaves, but in a different part of the spectrum. They are emitted, for example by atoms of cobalt-60 (used in apparatus for cancer therapy), and can be very penetrating. In general, gamma rays can pass right through the human body, but are almost completely absorbed by a foot of concrete.

X-rays are a more familiar form of electromagnetic radiation, with a limited penetrating power. Typically, for use in medical or dental examinations, a tungsten target is bombarded with high energy electrons to create x-rays which are then focused into a beam directed at the site to be investigated. Television - especially color sets, emit soft x-rays and are therefore shielded with a special glass to reduce the risk of radiation exposure.

Neutrons are uncharged heavy particles contained in the nucleus of every atom heavier than hydrogen. They induce ionization only indirectly in atoms which they stroke, but can thus damage body tissues. Neutrons, which are released for example during fission (splitting) of uranium atoms in the fuel of nuclear power plants, can also be very penetrating. In general, efficient shielding against neutrons can be provided by water.

(Information for this provided from the booklet "Radiation - a Fact of Life" which is published by the International Atomic Energy Agency.)

Information Repository

CURRENT DOCUMENTS ON FILE AT THE MIAMISBURG LIBRARY

Environmental Restoration

FEDERAL FACILITY AGREEMENT, U.S. Environmental Protection Agency (USEPA) & U.S. Department of Energy's (DOE) Mound (Ohio) Plant, Miamisburg, OH, 890 008 984

AREA B, OPERABLE UNIT 1 - DOE MOUND PLANT (DRAFT)
History of Area B, February 1991

LETTER REPORT; PRELIMINARY RESULTS OF RECONNAISSANCE MAGNETIC SURVEY
Mound Plant - Areas 2, 6, 7 and C (Working Draft), November 1990

TRANSCRIPT; U.S. EPA FEDERAL FACILITY AGREEMENT WITH U.S. DOE
Mound Plant Public Meeting
Miamisburg, Ohio - August 28, 1990

APPLICATION OF SAFEGUARDS TECHNOLOGY IN DOE'S ENVIRONMENTAL RESTORATION PROGRAM, Submitted to Nuclear Materials Management, Los Angeles, CA, 7/15-18/90; Los Alamos National Laboratory #LA-UR-90-2410 DE900014908

CONTROL OF AIR EMISSIONS FROM SUPERFUND AIR STRIPPERS AT SUPERFUND GROUNDWATER SITES, 6/15/89, USEPA, Washington, DC; U. S. Department of Commerce, National Technical Information Service #PB90-272667

DATA QUALITY OBJECTIVES FOR REMEDIAL RESPONSE ACTIVITIES - EXAMPLE SCENARIO: RI/FS ACTIVITIES AT A SITE WITH CONTAMINATED SOILS AND GROUNDWATER, March 1987, USEPA, Washington, DC; U.S. Department of Commerce, National Technical Information Service, #PB90-272634

MAIN HILL SEEPS, OPERABLE UNIT 2, ON-SCENE COORDINATOR REPORT FOR CERCLA SECTION 104 REMOVAL ACTION, WEST POWERHOUSE PCB SITE, October 1991, Mound Plant, Miamisburg, Ohio, DOE, Albuquerque Operations Office, Environmental Restoration Program, Technical Support Office, Los Alamos National Laboratory

LITERATURE REVIEW UPDATE AND ARCHAEOLOGICAL SURVEY OF THE EG&G MOUND FACILITY AND ADJACENT AREAS, CITY OF MIAMISBURG, MIAMI TOWNSHIP, MONTGOMERY COUNTY, OH, by Herb Beamer, April 16, 1991

MISCELLANEOUS SITES, OPERABLE UNIT 3, QUALITY ASSURANCE PROJECT PLAN, OCTOBER 1991

MISCELLANEOUS SITES, OPERABLE UNIT 3, LIMITED FIELD INVESTIGATION WORK PLAN, JUNE 1991

Superfund Mailing List

Do you wish to be notified of the quarterly public meetings or other special meetings related to Mound and its program under the Comprehensive Environmental Restoration, Liability and Compensation Act?

Actually it's very simple and can be done one of two ways. One way is to put your name and address on the sheets at any of the public meetings. Your name and address are put onto a master list that is used only for the mailing of items related to Mound and it's cleanup program.

The second method is to simply fill out the form below and return it to: **EG&G Mound Applied Technologies, c/o Public Relations, P.O. Box 3000, Miamisburg, OH 45343.**

I want to be placed on Mound's Superfund mailing list.

Name _____

Address _____

City _____ **State** _____ **Zip Code** _____

SUPERFUND UPDATE

PUBLISHED BY EG&G MOUND APPLIED TECHNOLOGIES

Volume I Number 2 September, 1990

SUPERFUND: lots of unfamiliar terms

Like any law-driven program dealing with technical problems, the Superfund effort at Mound has its own special set of terms and abbreviations. This issue of *Superfund UPDATE* is being published to help you better understand that language. Included are a glossary of terms and a list called "acronyms," but which do not strictly follow the definition of that word. But first, here's a quick look at how the Superfund works.

All of superfund is divided into three parts, and the entire process takes place in the public eye with public participation.

In all, there are eight situations at Mound that have been identified as "Operable Units" under Superfund. (See Superfund UPDATE, Volume I, Number 1, July, 1990.) Each has its own schedule, and each follows through three identical phases, but the outcomes may not be the same.

START HERE

PHASE I
INVESTIGATION

This phase verifies the kind and extent of potential or actual contamination, looks at its movement, and makes a determination of the risk to human health and the environment.

PHASE II
CORRECTIVE MEASURES?

The second phase includes extra data collection, if warranted, looking at and choosing appropriate clean-up actions, and evaluating those actions based upon a risk/benefit analysis to decide which actions are best. It is possible that no action will be taken.

PHASE III
CORRECTIVE ACTION

The clean-up activities decided upon in Phase II are carried to their conclusion, along with a verification that the proper work has been done and the proper results achieved.

THE PLAYERS

U. S. Department of Energy
U. S. & Ohio EPAs
EG&G
Interested Citizens & Governments

In all phases of the process, these players are an active part of the process.

During the various stages of the Superfund activities, there will be public notices in both the *Miamisburg News* and the *Dayton Daily News* that will apprise the public of such events as public meetings and other means to express opinions on Superfund actions. In all cases there will be a public commentary period during which you can submit your reactions or criticisms of those actions.

Unless otherwise advertised, all public meetings will be scheduled for 7:00PM in the Council Chambers of the Miamisburg Civic Center. The days on which those meetings are scheduled may vary because of the time line during which activities are carried out.

All documents for public review will be placed in the Miamisburg Branch of the Dayton & Montgomery County Public Library, 35 South 5th Street in Miamisburg. Those documents can be obtained by inquiring at the main desk of the Library and should not be removed from the repository. (See inside for a list of the current documents available for public review.)

SUPERFUND'S SCHEDULE FOR MOUND

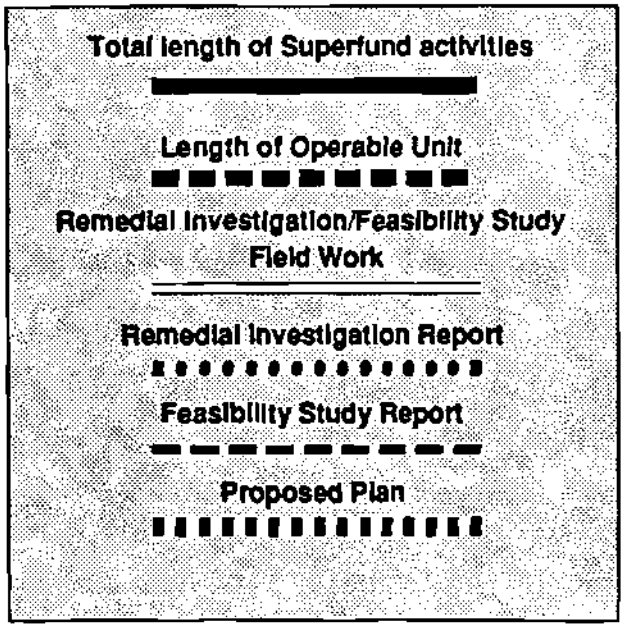
With the signing of the Federal Facility Agreement (FFA) between the U.S. EPA and the U.S. Department of Energy, the activities technically agreed upon by both parties kicked into action. As reported in the *Superfund UPDATE* of July, 1990, there is a specific schedule associated with each operable unit.

In the right column are those eight operable units identified for Mound. Opposite each of them on page 3 is the current schedule of each of the activities prescribed for them. The schedule has been simplified to include only major items. The detail of those schedules is included in the *Mound Environmental Restoration and Waste Mangement Five Year Plan* in the repository of the Miamisburg Branch of the Public Library.

The terms used in this schedule are more completely defined in the glossary of terms and acronyms on pages 4-7. They are not so important as is the basic understanding of the Superfund process which is outlined on page one of this issue of the newsletter.

As you can see on the chart on page three, the process is an extended one, covering 91.2 months. What are termed "Operable Units" in this newsletter, may be coded differently in other documents, but that should not pose a problem because the key is the Arabic numeral in the designation. "AL-MD-*1*" would be equivalent to "Operable Unit *1*" and so forth.

In the box below is a guide for reading the chart on page two. The items to which they refer are in column two on this page.



TOTAL SITE-WIDE RI/FS & ASSESSMENT

Operable Unit 1 addresses volatile organic chemical contamination of the Buried Valley Aquifer at the Mound Plant and includes three potential release sites.

Operable Unit 2 deals with the contaminated "seeps" of the hardened bedrock on the main hill at Mound which includes one potential release site.

Operable Unit 3 addresses possible hazardous contamination of soils at 16 potential release sites that are currently not operational, not covered by the Resource Conservation & Recovery Act (RCRA), and contain no known radioactive contamination.

Operable Unit 4 includes the Miami-Erie Canal and adjacent waterways, includes an area offsite that contains plutonium-238 contaminated sediments from a 1969 waste line break.

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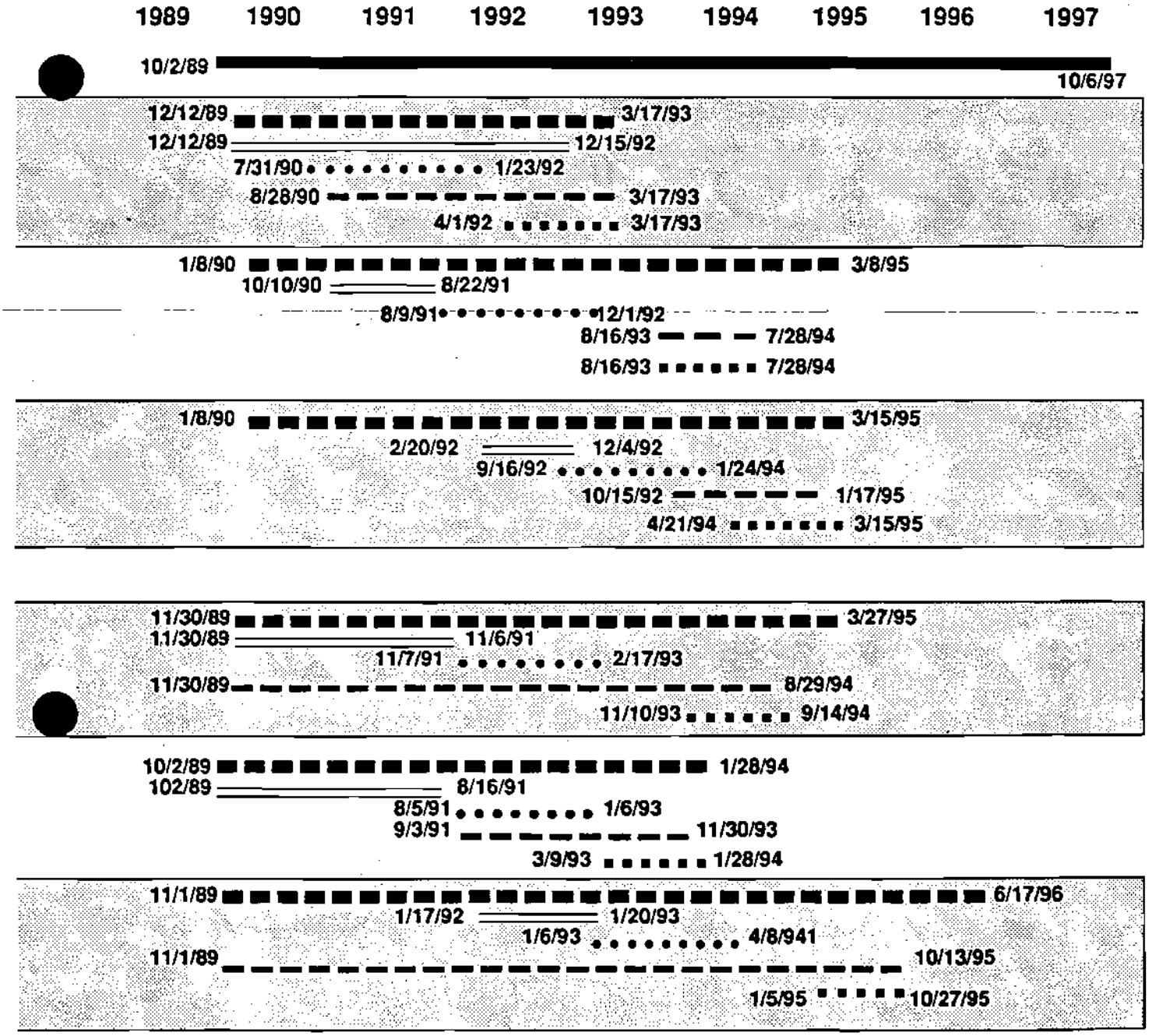
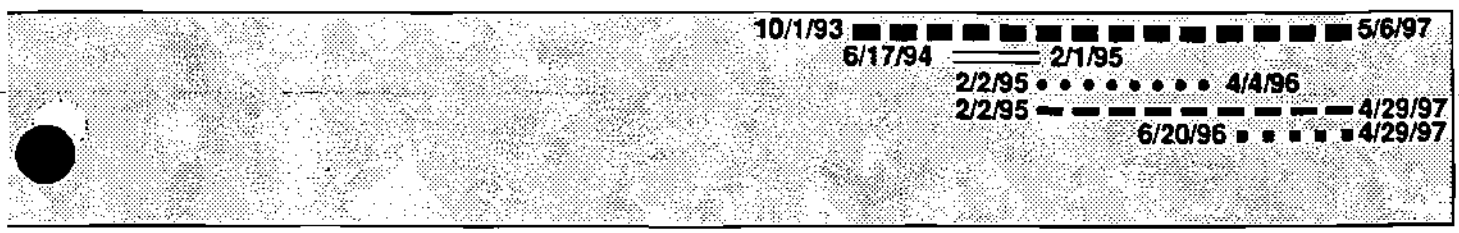
Operable Unit 6 covers and is funded by the Decontamination and Decommissioning (D&D) program and includes 10 potential release sites with radioactive contaminated soils. These are not included in Unit 3 because they are funded by D&D.

Operable Unit 7 is RCRA sites that address 50, non-radioactive solid waste management units which may require a different technical approach from Unit 3. In addition, media other than soil or sediments (*e.g.* sewage sludges or concrete) may be contaminated.

Operable Unit 8 deals with inactive underground storage tanks of which there are ten throughout the plant.



Because RCRA sites are involved in both Operable Units 2 and 7, the two are being investigated together, and their schedules coincide.



Glossary of Terms

This glossary defines terms often used by the U.S. Environmental Protection Agency (EPA) and the Ohio Environmental Protection Agency (OEPA) staffs when describing activities under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, commonly called Superfund), as amended in 1986. The definitions apply specifically to the Superfund program and may have other meanings when used in different circumstances. Underlined words included in various definitions are defined separately in the glossary.

Administrative Order on Consent (AOC): A legal agreement between EPA and potentially responsible parties (PRPs) whereby PRPs agree to perform or pay the cost of a site cleanup. The agreement describes actions to be taken at a site and may be subject to a public comment period. Unlike a consent decree, an administrative order on consent does not have to be approved by a judge.

Administrative Record: A file which is maintained and contains all information used by the lead agency to make its decision on the selection of a response action under CERCLA. This file is to be available for public review and a copy to be established at or near the site, usually at one of the information repositories. Also, a duplicate file is held in a central location, such as a Regional or State office.

Aquifer: An underground rock formation composed of materials such as sand, soil, or gravel that can store and supply ground water to wells and springs. Most aquifers used in the United States are within a thousand feet of the earth's surface.

Carcinogen: A substance that causes cancer.

Carbon Adsorption: A treatment system where contaminants are removed from ground water or surface water when the water is forced through tanks containing activated carbon, a specially treated material that attracts the contaminants.

Cleanup: Actions taken to deal with a release or threatened release of hazardous substances that could affect public health and and/or the environment. The term "cleanup" is often used broadly to describe various response actions or phases of remedial responses such as remedial investigation/feasibility study.

Comment Period: A time period during which the public can review and comment on various documents and EPA actions. For example, a comment period is provided when EPA proposes to add sites to the National Priorities List. Also, a minimum three-week comment period is held to allow community members to review and comment on a draft RI/FS and proposed plan.

Community Relations (CR): The program to inform and involve the public in the Superfund process and respond to community concerns.

Community Relations Plan (CRP): Formal Plan for the EPA community relations at a Superfund site.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): A federal law passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act. The Acts created a special tax that goes into a Trust Fund commonly known as Superfund to investigate and clean up abandoned or uncontrolled hazardous waste sites. Under the program, EPA can either:

- Pay for site cleanup when parties responsible for the contamination cannot be located or are unwilling or unable to perform the work; or
- Take legal action to force parties responsible for site contamination to clean up the site or pay back the federal government for the cost of the cleanup.

Consent Decree (CD): A legal document, approved and issued by a judge, that formalizes an agreement reached between EPA and potentially responsible parties (PRPs) where PRPs will perform all or part of a Superfund site cleanup. The consent decree describes actions that PRPs are required to perform and is subject to a public comment period.

Contract Lab Program: Laboratories under contract to EPA which analyze soil, water, and waste samples taken from areas at or near Superfund sites.

Cost Recovery: A legal process where potentially responsible parties can be required to pay back the Federal government for money it spends on any cleanup actions.

Emergency: Those releases or threats of releases requiring initiation of on-site recovery activity within hours of the lead agency's determination that a removal action is appropriate.

Enforcement: EPA's efforts, through legal action if necessary, to force potentially responsible parties to perform or pay for a Superfund site cleanup.

Engineering Evaluation/Cost Analysis (EE/CA): An analysis of removal alternatives for a site, similar to a remedial program feasibility study. The EE/CA must be made available for a 30 calendar day public comment period prior to signing off of the Action Memorandum.

Environmental Response Team (ERT): EPA hazardous waste experts who provide 24-hour technical assistance to EPA Regional Offices and States during all types of emergencies involving releases at hazardous waste sites and spills of hazardous substances.

Explanation of Differences: After adoption of final remedial action plan, if any remedial action is taken, or any enforcement action under Section 106 is taken, or if any settlement or consent decree under sections 106 or 122 is entered into, and if such action, settlement, or decree differs in any significant respects from the final plan, the lead agency is required to publish an explanation of the significant differences and the reasons the changes were made.

Feasibility Study (FS): See Remedial Investigation/Feasibility Study.

Ground Water: Water found beneath the earth's surface that fills pores between materials such as sand, soil, or gravel. In aquifers, ground water occurs in sufficient quantities that it can be used for drinking water, irrigation and other purposes.

Hazardous Ranking System (HRS): A scoring system used to evaluate potential relative risks to public health and the environment from releases or threatened releases of hazardous substances. EPA and States use the HRS to calculate a site score, from 0 to 100, based on the actual or potential release of hazardous substances from a site through air, surface water, or ground water to affect people. This score is the primary factor used to decide if a hazardous waste site should be placed on the National Priorities List.

Hazardous Substance: Any material that poses a threat to public health and/or the environment. Typical hazardous substances are materials that are toxic, corrosive, ignitable, explosive, or chemically reactive.

Hydrology: The science dealing with the properties, movement, and effects of water on the earth's surface, in the soil and rocks below, and in the atmosphere.

Incineration: Burning of certain types of soil, liquid, or gaseous materials under controlled conditions to destroy hazardous waste.

Information Repository: A file containing current information, technical reports, and reference documents regarding a Superfund site. The information repository is usually located in a public building that is convenient for local residents - - such as a public school, city hall, or library.

Monitoring Wells: Special wells drilled at specific locations on or off a hazardous waste site where ground water can be sampled at selected depths and studied to determine such things as the direction in which ground water flows and types and amounts of contaminants present.

National Oil and Hazardous Substances Pollution Contingency Plan (NCP): The Federal regulation that guides the Superfund program.

National Priorities List (NPL): EPA's list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial response. The list is based primarily on the score a site receives on the Hazard Ranking System (HRS). EPA is required to update the NPL at least once a year.

National Response Team (NRT): Representatives of 12 Federal agencies that coordinate Federal responses to nationally significant pollution incidents and provide advice and technical assistance to the responding agency(ies).

Non-Time-Critical Removals: Those releases or threats of releases not requiring initiation of on-site activity within six months after the lead agency's determination, based on the site evaluation, that a removal action is appropriate.

On-Scene Coordinator: The Federal Official who coordinates and directs Superfund removal actions.

Operable Unit: An action taken as one part of an overall site cleanup. For example, a carbon adsorption system could be installed to halt rapidly spreading ground water contaminants while a more comprehensive and long-term remedial investigation/feasibility study is underway. A number of operable units can be used in the course of a site cleanup.

Operation and Maintenance (O&M): Activities conducted at a site after a response action occurs, to ensure that cleanup or containment system is functioning properly.

Parts Per Billion (ppb) Parts per Million (ppm): Units commonly used to express low concentrations of containments. For example, one ounce of trichloroethylene (TCE) in one million ounces of water is one ppm; one ounce of TCE in one billion ounces of water is one ppb. If one drop of TCE is mixed in a competition-size swimming pool, the water will contain about one ppb of TCE.

Potentially Responsible Party (PRP): An individual(s) or company(ies) (such as owners, operators, transporters, or generators) potentially responsible for, or contributing to, the contamination problems at a Superfund site. Whenever possible, EPA requires PRPs, through administrative and legal actions, to clean up hazardous waste sites they have contaminated.

Preliminary Assessment: The process of collecting and reviewing available information about a known or suspected hazardous waste site or release. EPA or States may use this information to determine if the site requires further study. If further study is needed, a site inspection is undertaken.

Proposed Plan: A public participation requirement of SARA in which EPA summarizes for the public the preferred cleanup strategy, the rationale for the preference, reviews the alternatives presented in the detailed analysis of the remedial investigation/feasibility study, and presents any waivers to cleanup standards of §121(d) (4) which may be proposed. This may be prepared either as a fact sheet or as a separate document. In either case,

it must actively solicit public review and comment on all alternatives under Agency consideration.

Quality Assurance/Quality Control (QA/QC): A system of procedures, checks, audits, and corrective actions used to ensure that field work and laboratory analysis during the investigation and cleanup of Superfund sites meet established standards.

Record of Communication: A register of all verbal communications between EPA and citizens regarding site concerns.

Record of Decision (ROD): A public document that explains which cleanup alternatives will be used at National Priorities List sites. The record of decision is based on information and technical analysis generated during the remedial investigation/ feasibility study and consideration of public comments and community concerns.

Regional Response Team (RRT): Representatives of Federal, State, and local agencies who may assist in coordination of activities at the request of the On-Scene Coordinator or Remedial Project Manager before and during response actions.

Remedial Action (RA): The actual construction or implementation phase that follows remedial design of the selected cleanup alternatives at a site on the National Priorities List.

Remedial Design (RD): An engineering phase that follows the record of decision when technical drawings and specifications are developed for the subsequent remedial action at a site on the National Priorities List.

Remedial Investigation/Feasibility Study: Investigative and analytical studies usually performed at the same time in an interactive, iterative process, and together referred to as the "RI/ FS." They are intended to

•Gather the data necessary to determine the type and extent of contamination at a Superfund site:

• Establish criteria for cleaning up the site;

•Identify and screen cleanup alternatives for remedial action; and

•Analyze in detail the technology and costs of alternatives.

Remedial Project Manager (RPM): The EPA or State official responsible for overseeing remedial response activities.

Remedial Response: A long-term action that stops or substantially reduces a release of threatened release of hazardous substances that is serious, but does not pose an immediate threat to public health and/or the environment.

Removal Action: An immediate action taken over the short-term to address a release or threatened release of hazardous substances.

Resource Conservation and Recovery Act (RCRA): A Federal law that established a regulatory system to track hazardous substances from the time of generation to disposal. The law requires safe and secure procedures to be used in treating, transporting, storing, and disposing of hazardous substances. RCRA is designed to prevent new, uncontrolled hazardous waste sites.

Response Action: A CERCLA-authorized action at Superfund site involving either a short-term removal action or a long-term remedial response that may include, but is not limited to, the following activities:

•Removing hazardous materials from a site to an EPA-approved, licensed hazardous waste facility for treatment, containment, or destruction.

•Containing the waste safely on-site to eliminate further problems.

•Destroying or treating the waste on-site using incineration or other technologies.

•Identifying and removing the source of ground water contamination and halting further movement of the contaminants.

Responsiveness Summary: A summary of oral and/or written public comments received by EPA during a comment period on key EPA documents, and EPA's responses to those comments. The responsiveness summary is a key part of the ROD, highlighting community concerns for EPA decision-makers.

Site Inspection (SI): A technical phase that follows a preliminary assessment designed to collect more extensive information on a hazardous waste site. The information is used to score the site with the Hazard Ranking System to determine whether response action is needed.

Superfund: The common named used for the Comprehensive Environmental Response, Compensation, and Liability Act, also referred to as the Trust Fund.

Superfund Amendments and Reauthorization Act (SARA): Modifications to CERCLA enacted on October 17, 1986.

Surface Water: Bodies of water that are above ground, such as rivers, lakes, and streams.

Time Critical Removals: Including emergencies lasting longer than 30 calendar days, those releases requiring initiation of on-site activity within six months of the lead agency's determination, based on the site evaluation that a removal action is appropriate.

Treatment, Storage, and Disposal Facility (TSD Facility): Any building, structure, or installation where a hazardous substance has been treated, stored, or dispersed. TSD facilities are regulated by EPA and States under the Resource Conservation

and Recovery Act.

Trust Fund: A Fund set up under the Comprehensive Environmental Response, Compensation, and Liability Act to help pay for the cleanup of hazardous waste sites and to take legal action to force those responsible for the sites to clean them up.

Volatile Organic Compound: An organic (carbon-containing) compound that evaporates (volatizes) readily at room temperature.

Water Purveyor: A public utility, mutual water company, county water district, or municipality that delivers drinking water to customers.

Superfund Acronyms

AOC	—	Administrative Order on Consent
ARARs	—	Applicable or Relevant and Appropriate Requirements
ATSDR	—	Agency for Toxic Substances Disease Registry
CD	—	Consent Decree
CERCLA	—	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
COE	—	U. S. Army Corps of Engineers
CR	—	Community Relations
CRP	—	Community Relations Plan
DOC	—	Department of Commerce
DOD	—	Department of Defense
DOE	—	Department of Energy
DOI	—	Department of Interior
ERA	—	Expedited Removal Actions
ERT	—	Environmental Response Team
FEMA	—	Federal Emergency Management Agency
FFA	—	Federal Facility Agreement
FS	—	Feasibility Study
HHS	—	Department of Health and Human Services
HRS	—	Hazard Ranking System
IAGs	—	Interagency Agreements
NCP	—	National Oil and Hazardous Substances Contingency Plan
NOAA	—	National Oceanic and Atmospheric Administration
NPL	—	National Priorities List
NRC	—	National Response Center
NRT	—	National Response Team
OSC	—	On-Scene Coordinator
O&M	—	Operation and Maintenance
ppm/ppb	—	parts per million/parts per billion
PRP	—	Potentially Responsible Party
PA	—	Preliminary Assessment
QA/QC	—	Quality Assurance/Quality Control
ROD	—	Record of Decision
RRT	—	Regional Response Team
RA	—	Remedial Action
RD	—	Remedial Design
RI	—	Remedial Investigation
RPM	—	Remedial Project Manager
RCRA	—	Resource Conservation and Recovery Act
SI	—	Site Inspection
SARA	—	SuperFund Amendments and Reauthorization Act of 1986
SMOAs	—	State Memorandum of Agreements
TSD	—	Treatment, Storage, and Disposal Facility
USCG	—	United States Coast Guard
VOC	—	Volatile Organic Compound

DOCUMENTS IN THE LIBRARY

By law, Mound is required to have all primary documents related to its Superfund activities in a public reading room. As mentioned on the first page of this newsletter, that repository is the Miamisburg Public Library. Ask for them at the main desk

However, knowing that the public may want additional information of Mound and its operations, EG&G has placed other pertinent documents in the repository for public reading. Available now are

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Draft Report of the Tiger Team Investigation, November, 1989;

Tiger Team Assessment of the Mound Plant, December, 1989;

Report of the Type A Investigation Board on the Tritium Release Incident at the Mound Plant (U), November 8, 1989, U.S. Department of Energy, January, 1990;

Headquarters (HQ) Environmental Restoration and Waste Management Five-Year Plan, FY 1992-1996, June,1990-Executive Summary

HQ Environmental Restoration and Waste Management Five-Year Plan, FY1992-1996, June, 1990;

Albuquerque Summary, Site Specific Plan, June, 1990;

Federal Facility Agreement Under CERCLA Section 120, U.S. EPA and U.S. Department of Energy, OH6 890 008 984;

Mound Plant Environmental Restoration & Waste Management Site Specific Plan, February 12, 1990;

Mound Plant Environmental Restoration & Waste Management Five-Year Plan.

PUBLIC COMMENTS BECOME A PART OF THE PUBLIC RECORD

Public meetings are a part of the Superfund process. They are forums in which interested parties can ask questions, participate in discussions about Superfund activities, and register either agreement or disagreement about a course of action.

Comments are not limited to public meetings, however. Individuals or groups can make their comments in writing during the course of a comment period, normally 30 days, which will be advertised in the *Miamisburg News* and the *Dayton Daily News*.

All public comments become a part of the public record, and all are considered in the evaluation of the Superfund activities--including the way that DOE and EG&G communicate during Superfund's lengthy progress. All comments will be reviewed in concert with the Federal and Ohio EPAs and will either be accepted or rejected based upon a review of them.

All comments will become a part of the public record, including the part of the process that considers public comments. Those records will be placed regularly in the Miamisburg Branch of the Dayton & Montgomery County Public Library, along with all other documents (see the list above) related to Superfund.

Because of the size of the documents and the time and expense required to reproduce them, Mound cannot provide special copies of them to individuals.

Although public meetings are a currently planned activity for Superfund. Their timing will vary. Current plans call for meetings that coincide with important milestones in the program (see schedule above), but there is some possiblity that schedules may slip and, therefore, meetings as well.

There will be other avenues of communication, however, and the plan for them is extensive. It is also flexible in order to keep citizens well informed.

That does not mean that you cannot communicate with Mound when you have questions. Although it is incumbent upon Mound to communicate with you, you can write to Public Relations at the return address on this newsletter at any time. Writing is preferred to a phone call because the staff may have to compile information to reply to you adequately.

In the case of an emergency need for information, you can call (513) 865-3001 at any time.

PLEASE INCLUDE ME ON YOUR SUPERFUND MAILING LIST (PLEASE PRINT OR TYPE)

NAME_____

ADDRESS_____

CITY_____ **STATE**_____ **ZIP**_____

CLIP AND MAIL TO THE ADDRESS BELOW

PUBLIC RELATIONS
EG&G MOUND APPLIED TECHNOLOGIES
P.O. Box 3000
Miamisburg, OH 45343
(513) 865-3001

Published quarterly or as appropriate for Superfund communication.

SUPERFUND UPDATE

PUBLISHED BY EG&G MOUND APPLIED TECHNOLOGIES

Volume I Number 1 July, 1990

SUPERFUND: You Are Involved

Under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, EG&G Mound is required to involve local citizens and other interested parties, giving them an opportunity to comment on and provide input to technical decisions related to the assessment and remediation of environmental problems.

EG&G is also required to seek public comment regarding the manner in which the public wants communication from the company during that process. Pursuant to that goal, Mound has completed a "Community Relations Plan," a copy of which will be included in the "Site Wide Work Plan" in the Miamisburg Branch of the Dayton & Montgomery County Public Library, 35 S. Fifth Street, in Miamisburg. It will be available for review in September.

The "Community Relations Plan" was developed from over 80 interviews of elected and appointed government officials, educators, business people, religious leaders, realtors, special interest groups, the news media, and local residents. In the process another 22 people either declined to be interviewed or did not respond to Mound inquiries.

The results of our analysis of what the public wanted in terms of communication has resulted in these media being identified as the prime modes of communication:

Public Meetings for Citizens, Appearances before Miamisburg City Council, Meetings with City and Miami Township Miami Valley Regional Planning Management, Communication with the Commission, Briefings for the News Media, a Newsletter for Interested Parties, Public Advertising of Activities Related to CERCLA, Periodic Tours of Mound, Speakers for Civic Organizations, Mailings of Mound's Annual Environmental Monitoring Report & Summary, and Placement of Related Documents in the Public Library.

The initial plan is subject to public comment, and it will be altered if public commentary elicits additional needs.

HOW DO YOU COMMUNICATE WITH MOUND????

There are two ways that you can get in touch with us regarding CERCLA or the communications related to what is commonly called Superfund.

The best way is to write:

CERCLA
c/o Public Relations
EG&G Mound Applied
Technologies
P.O. Box 3000
Miamisburg, OH 45343-3000

Write to us, if you are not on the mailing list and want to be included, using the form on the back page of this publication,
or,
if the matter is urgent, please call
(513) 865-3001.

SUPERFUND SITES: A MATTER OF PUBLIC INVOLVEMENT THAT WILL BE MEASURED IN YEARS

Understanding the Superfund process is important because it is based upon a series of steps intended not only to evaluate the severity of an environmental situation, but to determine its true impact.

The law requires that a business, in this case Mound, make an evaluation of its impact on the environment. This is done in a number of ways including such things as actual sample collection and analysis, searching of records, and interviews with long-time and retired employees. Through investigation, a picture can be drawn of the places that Mound must look to see if there are any real threats to the environment from past or current operations.

Once identified, the sites and situations are assigned "points" according to an evaluation system established by the EPA. Accumulating a certain number of points above a set number might mean, as in Mound's case, that a site is named to the "National Priority List" or NPL. Being named to the NPL is a signal that situations need to be further investigated. Being on the NPL does not mean, however, that there is imminent danger to the public or the environment.

Once on the NPL, a very formal arrangement is worked out for the investigation of waste sites. That arrangement requires EPA approval and oversight and has a set schedule and plans that govern such things as sampling and quality assurance. All of this documentation--the plans, the works--is also put in a repository so that the public can examine it and make comments on it.

Each stage of the program, by the way, will be held in the open air of public scrutiny. Advertisements in the local newspaper will announce such things as documents being available for public reading and open meetings at which the public is free to offer suggestions.

Once the remedial investigation is complete on each site to be evaluated, a risk/benefit analysis is done to determine whether or not the site needs to be "cleaned-up." That analysis entails the evaluation of true risk to the public, the cost of remediation, and the benefits derived from the clean-up.

There may be cases where partial cleanup is required . . . perhaps restoration . . . perhaps no clean-up. In any case, public comment will be a continuing part of the process

How long will of this take? **Years** is the answer. The exact details of those beginning years will be in the Mound documents in the Miamisburg branch of the Public Library.

DOCUMENTS AT THE LIBRARY

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Tiger Team Assessment of the Mound Plant, December, 1989

Report of the Type A Investigation Board on the Tritium Release Incident at the Mound Plant (U), November 8, 1989, U.S. Department of Energy, January, 1990.

Copies of these documents can be obtained for reading in the Library at the main desk.

EIGHT OPERABLE UNITS IDENTIFIED AT MOUND

The U.S. Department of Energy has identified eight operable units to be addressed under the "Assessment" phase Superfund action plan. The DOE has technical agreemment with both the U.S. EPA and Ohio EPA and legal agreement with the U.S. EPA. Legal agreement with the State is still being negotiated. Still, it is expected that these will be the areas of investigation under Superfund. Although currently anticipated time frames for all actions are listed below, they may change dependent upon funding and the adjustment of work schedules.

The public is notified as soon as legal agreements on the plan of action have been finalized. When that happens, copies of all the primary documents related to the plan will be placed in the Miamisburg Public Library for public review and comment.

It is also important to note that each of the operable units includes one or more potential release sites that are being addressed as a group. The scheduled assessment times are preliminary.

Operable Unit 1 addresses volatile organic chemical contamination of the Buried Valley Aquifer at the Mound Plant and includes three potential release sites. Assessment from December 12, 1989, to March 16, 1993.

Operable Unit 2 deals with the contaminated "seeps" of the hardened bedrock on the main hill at Mound which includes one potential release site. Assessment from January 8, 1990, to November 16, 1993.

Operable Unit 3 addresses possible hazardous contamination of soils at 16 potential release sites that are currently not operational, not covered by the Resource Conservation & Recovery Act (RCRA), and contain no known radioactive contamination. Assessment from December 1, 1989, to June 20, 1994.

Operable Unit 4 includes the Miami-Erie Canal and adjacent waterways, includes an area offsite that contains plutonium-238 contaminated sediments from a 1969 waste line break. Assessment from November 30, 1989, to September 21, 1993.

Operable Unit 5 covers 19 areas that have soils with known or suspected radioactive contamination. Assessment from November 27, 1989, to September 20, 1993.

Operable Unit 6 covers and is funded by the Decontamination and Decommissioning (D&D) program and includes 10 potential release sites with radioactive contaminated soils. These are not included in Unit 3 because they are funded by D&D. Assessment from October 2, 1989, to November 21, 1990.

Operable Unit 7 is RCRA sites that address 50, non-radioactive solid waste management units which may require a different technical approach from Unit 3. In addition, media other than soil or sediments (e.g. sewage sludges or concrete) may be contaminated. Assessment from January 8, 1990, to September 17, 1991.

Operable Unit 8 deals with inactive underground storage tanks of which there are ten throughout the plant. Assessment from September 3, 1991, to June 23, 1995.

HELP FOR CITIZENS GROUPS

An important aspect of the Superfund program is citizen involvement at the local level in the decision-making process related to specific clean-up actions. This requires an understanding of the technical issues concerning a hazardous waste site.

Citizens can seek assistance in establishing technical awareness through a government Technical Assistance Grant (TAG). The TAG program provides up to $50,000 for the purpose of hiring technical advisors to help citizens understand and interpret technical information related to a specific hazardous waste site.

Congress and the EPA have established certain basic requirements for the use of TAG funds by a group that receives a grant. More detailed information on these grants can be obtained by contacting the EPA. The EPA office responsible for the states of Illinois, Indiana, Michigan, Minnesota, Wisconsin, and Ohio is:

EPA Region 5
230 South Dearborn Street
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Published quarterly or as appropriate for Superfund communication

F. CERCLA/DOE PROGRAM FACT SHEETS

SUPERFUND AND YOU

WHAT IT IS - HOW IT WORKS

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) commonly known as Superfund, was enacted in 1980. This law provided broad federal authority and resources to respond directly to releases (or threatened releases) of hazardous substances that could endanger human health or the environment. Costs for the first five years of the Superfund program were covered by a $1.6 billion Hazardous Substance Response Trust Fund established to pay for cleanup of abandoned or uncontrolled hazardous waste sites. The law also authorized enforcement action and cost recovery from those responsible for a release.

The hazardous waste problem, brought to public attention in the late 1970s by Love Canal in Niagara Falls, New York, is now recognized as larger and more complex than originally expected - generating a need for new and stronger legislation.

On October 17, 1986, the Superfund Amendments and Reauthorization Act of 1986 (SARA) was enacted. The new Superfund:

- reauthorizes the program for five years;
- increases the size of the Fund to $8.5 billion;
- strengthens and expands the cleanup program;
- focuses on the need for emergency preparedness and community right-to-know; and
- changes the tax structure for financing the Fund.

• Remedial Action (RA), also known as the construction or implementation phase, follows the completion and approval of the remedial design and includes actual site cleanup measures. The new Superfund requires EPA to begin 175 new remedial actions by October 1989 and another 200 by October 1991.

In 1986, Congress added new response authorities to the Resource Conservation and Recovery Act (RCRA) to regulate underground storage tanks and respond to leaks that seriously threaten the nation's ground water. Under these authorities, EPA is issuing regulations for underground storage tanks. EPA (and states that have entered into cooperative agreements with EPA) have also been given the authority to take corrective action or order a tank owner or operator to take corrective action to protect human health and the environment.

The Superfund program is a coordinated effort of federal, state, and local governments, private industry, and citizens. The problems are widespread and will take time to solve. But the Superfund program is a significant part of our national response to one of the major environmental challenges of the decade.

For further information about Superfund, please contact EPA Headquarters or a Regional Office or call the national information number listed on the back page of this brochure. The toll-free number of the National Response Center is also provided for citizens to report releases of oil and hazardous substances.

How Superfund Works

The U.S. Environmental Protection Agency (EPA) has the primary responsibility for managing the cleanup and enforcement activities under Superfund and is generally the lead agency. A comprehensive regulation known as the National Contingency Plan (NCP) describes the guidelines and procedures for implementing this law.

An Executive Order (9.0 12580) designates Federal agencies as the lead agencies for implenting the NCP and CERCLA at their respective facilities.

Every Superfund site is unique, and cleanups must be tailored to the specific needs of each site or release of hazardous substances. From the beginning of the process, a concerted effort is made to encourage those responsible to pay for cleanup. However, if an immediate problem threatens human health, welfare, or the environment, action will be taken.

If efforts to ensure responsible party response do not lead to prompt action and EPA or lead agency determines that action is necessary, EPA or lead agency can initiate:

• ***removal actions*** - short-term actions which stabilize or clean up a hazardous site that poses a threat to human health or the environment. Typical removal actions include removing tanks or drums of hazardous substances on the surface, installing fencing or other security measures, and providing a temporary alternate source of drinking water to local residents.

or

• ***remedial actions*** - the study, design and construction of term and usually more expensive actions aimed at permanent remedy. EPA or lead agency can respond in this way only at sites on the National Priorities List (NPL) - the list of the nation's most serious hazardous waste sites. Typical remedial responses include removing buried wastes from the site; installing a clay "cap" over the site; constructing underground walls to control movement of ground water; on-site incineration or solidification of wastes; or providing a permanent alternate source of drinking water.

Removal Actions

Removals can take place at any site, including those on the NPL. Removals may be appropriate, for example, to clean up spills of hazardous materials when a truck or train overturns, to keep the public from being exposed to hazardous substances, or to protect a drinking water supply from contamination.

Under the 1980 law, each removal was limited to six months and a total cost of $1 million. An exemption to these limits can be granted if:

• continued federal response was needed to prevent, limit, or control an emergency;

• there was an immediate risk to human health or welfare or the environment; and

• such assistance was not otherwise available on a timely basis.

Superfund raises the limits on removal actions to 24 months and $2 million and provides an additional exemption. The removal can continue if it is consistent with long-term action to be taken at the site.

State Involvement

States have always been encouraged to participate in the Superfund process. (Under the new Superfund, Indian Tribes are generally treated as states.) Now, states are more formally involved in the selection, initiation, and development of remedial responses. The NCPcontains state participation regulations that will provide for a number of opportunities to participate, including review and comment on planning documents, involvement in long-term planning activities, and participation in negotiations.

Either EPA, the state, or lead agency may take the lead role in managing cleanup activities. Private contractors actually complete the work at a site under federal or state government supervision.

Research, Development, and Training

Superfund establishes a research and development program, including demonstration programs for technologies that offer alternatives to conventional methods of handling site cleanups, and favoring methods that lead to the destruction or recycling of wastes rather than land disposal.

It also calls for the establishment of training programs for hazardous substance response and research.

Enforcement Authorities

Based on the principle that "the polluter should pay," Superfund contains authorities which ensure that those responsible for hazardous waste problems pay for their cleanup.

- ***Cleanup Action*** - In case of imminent hazard to human health or the environment, Superfund authorizes EPA to order the responsible party to undertake necessary actions to control the threat. In the case of a Federal facility, the owning federal agency is obligated to undertake necessary action. To accomplish this, the Agency can either issue an administrative order or bring a civil action against the responsible party. The new Superfund provides specific procedures for negotiating settlements with responsible parties to conduct response actions. These are designed to encourage voluntary cleanup.

- ***Criminal Authorities*** - Criminal penalties for failure to notify proper authorities of a release have been increased and submitting false information is now a criminal offense.

• ***Citizen Suits*** - Superfund authorizes a citizen to sue any person, the United States, or an individual state for any violation of standards and requirements of the law.

• ***Access to Sites*** - Superfund strengthens the ability to obtain access to sites in order to investigate and clean up.

Community Involvement

Because the people in a community with a Superfund site personally face the hazardous waste problems associated with that site, community residents are encouraged to participate in the process of determining the best way to clean it up. To ensure effective and substantive two-way communications from the outset at each remedial response site, a community relations program is tailored to local circumstances. Often, residents, local officials, and civic leaders are interviewed to learn all they can about the site and about the community's concerns.

These interviews are conducted before and during field work on the Remedial Investigation. Superfund formalizes EPA community relations policy and public participation requirements outlined in the National Contingency Plan. It also requires:

• publish a notice and brief analysis of the proposed remedial action plan;
• provide an opportunity for the public to comment on that plan;
• provide an opportunity for a public meeting to allow for two-way communication on the remedial action plan;
• make a copy of the transcript of the public meeting available to the public: and
• prepare a response to each significant comment made on the proposed remedial action plan.

Community relations activities are somewhat different during a removal action, where human health and the environment must be protected from an immediate threat. During the initial phase of these response actions, the Agency's primary responsibility is to inform the community about actions being taken and the possible effect on the community.

Superfund also requires EPA to develop a grant program to make funding for technical assistance available to those who may be affected by a release. The purpose of these grants is to help concerned citizens understand and interpret technical information on the nature of the hazard and recommended alternatives for cleanup. Grants are limited by law to one grant of no more than $50,000 per NPL site. In addition, the grant recipient must contribute at least 20 percent of the total cost of the grant.

The Superfund confirms that Superfund applies to federal agencies and states that they must comply with its requirements. It also defines the

process federal agencies must follow in undertaking remedial responses. If the federal agency and EPA disagree, EPA is responsible for selecting the remedy. State and local officials must be given the opportunity to participate in the planning and selection of any remedy at a federal facility, including reviewing all data. States are given a formal opportunity to review remedies to ensure that they incorporate state standards. The new Superfund also provides a schedule for response actions at federal facilities, including a schedule for preliminary assessments, listing on the National Priorities List, remedial investigations/feasibility studies, and remedial actions.

Who to Contact

EPA Region 5
Emergency and Remedial Response Branch
230 S. Dearborn Street
Chicago, IL 60604
(312) 353-9773
Illinois, Indiana, Michigan,
Minnesota, Ohio, Wisconsin.

Ohio EPA
Southwest District Office
40 S. Main Street
Dayton, OH 45305
(513) 285-6357

Superfund/RCRA Hotline
1-800- 424-9346 or 382-3000
in the Washington, DC, metropolitan area
(for information on programs)

National Response Center
1-800-424-8802
(to report releases of oil and hazardous substances)

DOE/EM-0038P

Comprehensive Environmental Response, Compensation, and Liability Act or "Superfund"

- *Protect human health and the environment*
- *Regulate government and industry response to waste spills*

Introduction

The Department of Energy's (DOE) hazardous waste cleanup activity responsibilities are derived from the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); the Resource Conservation and Recovery Act; state and local requirements; and internal DOE Orders, standards, and guidance documents.

CERCLA (or Superfund, as it is more commonly known) was passed in December 1980 in response to the discovery in the late 1970's of a large number of abandoned, leaking hazardous waste dumps that posed a serious threat to both human health and the environment. CERCLA was designed to impose cleanup and reporting requirements on the private sector by:

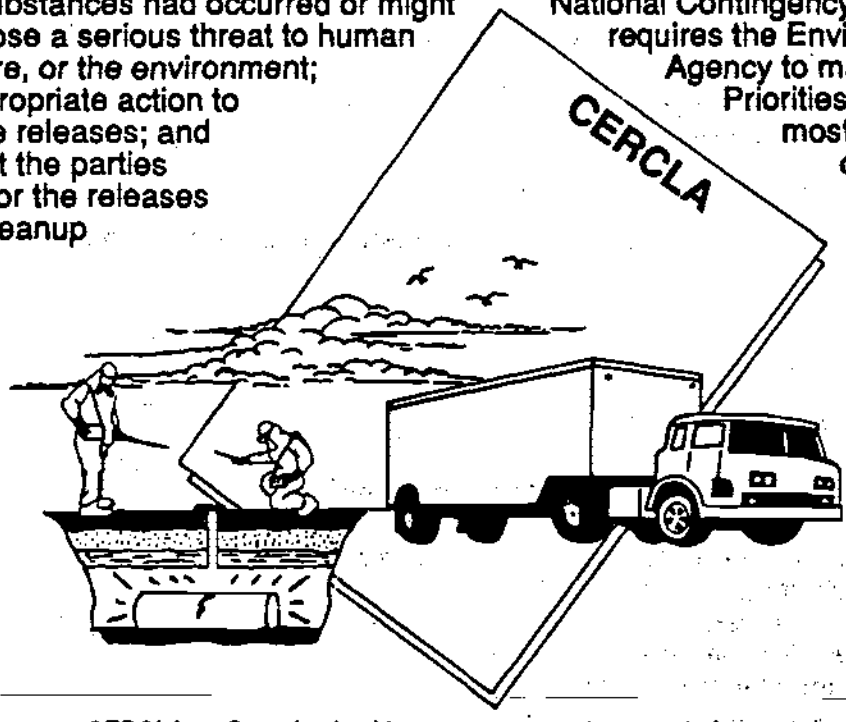
- identifying those sites where releases of hazardous substances had occurred or might occur, and pose a serious threat to human health, welfare, or the environment;
- taking appropriate action to remedy those releases; and
- seeing that the parties responsible for the releases pay for the cleanup activities.

If DOE facilities are guilty of such violations, they too are subject to CERCLA's jurisdiction. It is important to note that, unlike other environmental laws, CERCLA is a response and reporting Act as opposed to an extensive regulatory Act. However, CERCLA responsibilities do overlap with the Resource Conservation and Recovery Act (RCRA), the Clean Water Act, and the Safe Drinking Water Act.

Structure

CERCLA has two elements: response actions and the Superfund Amendments and Reauthorization Act (SARA), which includes the National Contingency Plan and the Community Right-to-Know Act. The original National Contingency Plan (1985) detailed the specific steps involved in cleanup activities, but after the passage of SARA, it also set applicable or relevant and appropriate requirements for remedial actions. The National Contingency Plan revision also requires the Environmental Protection Agency to maintain the National Priorities List, a list of the nation's most environmentally contaminated sites.

CERCLA and RCRA share authority with respect to underground storage tanks containing petroleum products and hazardous substances. Guidelines for these tanks are contained in Subtitle I of the 1984 Hazardous and Solid Waste Amendments to RCRA, but the



CERCLA, or Superfund, addresses responses to unwanted releases of hazardous materials.

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types of waste regulated are outlined by CERCLA.

Response Actions and Authority

CERCLA authorizes cleanup responses when there is a release or threat of a release of a hazardous substance into the environment. Two types of response actions are authorized: removal and remedial actions. In the event of an emergency situation, e.g., to avert an explosion or to clean up a hazardous waste spill, removal actions are undertaken to address the problem at the surface of the site. Such events concern not only listed hazardous substances but also any pollutants or contaminants with the exception of oil and gas. Remedial actions provide a more permanent solution to hazardous substance threats but can only be initiated at hazardous waste sites on the National Priorities List.

In many cases, the Environmental Protection Agency (EPA) attempts to identify the party(s) responsible for the contamination before taking any response actions itself. Responsible parties can be any of the following: past and present site owners; generators of hazardous substances found at the site; or transporters of hazardous substances to the site. If these parties are able and willing to undertake the response task, the EPA either negotiates a legal agreement with them or unilaterally orders them to do so. Should they be unable, due to bankruptcy, or refuse to comply with the order altogether, the EPA can undertake the response actions itself.

Superfund Amendments and Reauthorization Act (SARA)

The Superfund Amendments and Reauthorization Act (SARA), passed in 1986, was the first major revision of CERCLA since its inception. One year prior, the National Contingency Plan had been created to establish a blueprint for cleanup activities in response to releases to the water, land, or air. The SARA expanded the 1985 National Contingency Plan to include the provision that remedial actions must at least attain applicable or relevant and appropriate requirements (ARARs).

ARARs determine the technical standards for cleanup activities but apply only to on-site CERCLA actions. The applicable requirements are federal or state environmental or public health laws and regulations on cleanup standards specific to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site. If a requirement is not directly applicable, it may still be relevant and appropriate. A situation sufficiently similar to an applicable CERCLA site may be deemed relevant to the cleanup. A relevant requirement, however, may or may not be considered appropriate.

Another important element contained in SARA gave the states a greater role than they enjoyed under the previous version. The states' roles are now to join the EPA in all stages of identifying National Priority List sites and the appropriate cleanup remedy.

Community Right-to-Know

Contained in the 1986 SARA was the Emergency Planning and Community Right-to-Know Act. The Right-to-Know Act creates emergency planning, reporting, and notification requirements intended to protect the public in the event of a release of a hazardous substance. Facilities are required to report the presence of hazardous chemical substances in addition to those listed as extremely hazardous.

Emergency release notice is only required by the act if the release is of an EPA-listed substance extending beyond the facility's boundaries. The Right-to-Know Act also includes a system of administrative, civil, and criminal penalties to enforce notification requirements. Both EPA and private individuals may order DOE and commercial facilities into compliance or bring civil action against them and impose monetary and prison penalties for violations.

Related Fact Sheets

- Resource Conservation and Recovery Act
- Hazardous Waste

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DOE/EM-0039P

Additional Environmental Regulations Affecting DOE

- AEA
- CAA
- TSCA
- NEPA
- CWA
- SDWA

Atomic Energy Act (AEA)

The AEA, enacted in 1954, outlines roles and responsibilities for the control of nuclear energy. The AEA's primary objective is to assure proper management of nuclear materials. The Department of Energy (DOE) has authority to manage and regulate all the materials generated at its facilities. The Nuclear Regulatory Commission (NRC) regulates these materials when generated or managed by private or commercial organizations.

Clean Air Act (CAA)

The CAA was enacted in 1964 and was recently reauthorized. It is the major federal legislation regulating air emissions. The objective of the CAA is to protect and enhance the quality of the nation's air resource and protect public health and welfare, while fostering a beneficial productive capacity. Under the CAA, standards are set for air pollutants. Facilities which generate and release these pollutants to the air are required to comply with these standards. This may require process modification or some form of pretreatment before an emission is released to the environment.

Toxic Substances Control Act (TSCA)

The TSCA was enacted in 1976. Its purpose is to protect human health and the environment by requiring that specific chemicals be tested and regulations restricting their processing and use be implemented. The objectives of the TSCA include the development of adequate data to determine the health and environmental effects of chemicals and control of chemicals that present an unreasonable risk of injury.

The TSCA regulates the control of polychlorinated biphenyls (PCB's) and many other chemicals.

National Environmental Policy Act (NEPA)

Enacted in 1970, the NEPA established a national policy for federal review of environmental impacts before undertaking any action that might significantly affect the quality of the environment. Congress recognized the potential impact of human activity on all components of the natural environment. Through the NEPA, Congress requires all federal agencies to use a systematic approach to ensure that environmental information is available to both federal officials and citizens before decisions are made to take major federal actions. Federal agencies are also required to study, develop, and describe appropriate alternatives to recommended courses of action.

Clean Water Act (CWA)

The CWA was enacted in 1977 and established a federal/state scheme for controlling the introduction of pollutants into the nation's water. The objectives of the CWA include prohibition of toxic discharges, zero discharge by 1985 (i.e., elimination of pollutant discharge to navigable waters), protection of fish and wildlife, and availability of federal funds for public waste treatment works. All facilities that discharge wastewaters to either a surface water body (i.e., not groundwater) or a publicly-owned treatment system must ensure compliance with the CWA. Facilities that directly discharge wastewaters must obtain a National Pollutant Discharge Elimination System (NPDES) permit. This permit specifies the discharge standards and monitoring requirements that the facility must achieve.

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Safe Drinking Water Act (SDWA)

The SDWA was enacted in 1975. It's primary purpose is to protect drinking water resources. Primary drinking water standards set by the SDWA apply to drinking water "at the tap" as delivered by public water systems. Of equal significance is that drinking water standards are used to determine groundwater protection regulations under a number of other statutes. The SDWA states that each federal agency having jurisdiction over a federally-owned or operated public water system must comply with all federal, state and local requirements for the provision of safe drinking water.

Environmental Protection Agency

- Clean Air Act, 1964 (1968, 1978, 1990)
- National Environmental Policy Act, 1970
- Federal Water Pollution Control Act, 1972 (amended as the Clean Water Act, 1977 [1987])
- Noise Control Act, 1973
- Safe Drinking Water Act, 1974 (1981, 1986)
- Resource Conservation and Recovery Act, 1976 (1980, 1984)
- Toxic Substances Control Act, 1976
- Comprehensive Environmental Response, Compensation, and Liability Act, 1981 (1986)

National Institute of Occupational Safety & Health

- Occupational Safety and Health Act, 1968

Nuclear Regulatory Commission

- Atomic Energy Act, 1954 (in conjunction with DOE)
- Nuclear Waste Policy Act, 1983 (1987)
- Low-Level Radioactive Waste Policy Act, 1980 (1986)

Department of Transportation

- Hazardous Materials Transportation Act, 1975

Department of Energy

- Uranium Mill Tailings Radiation Control Act, 1978

Department of the Interior

- National Historic Preservation Act, 1966
- Endangered Species Act, 1974
- Archaeological Resource Protection Act, 1979

Note: Dates in parentheses are reauthorizations of the original Act.

Related Fact Sheets

- Resource Conservation and Recovery Act
- Comprehensive Environmental Response, Compensation, and Liability Act or "Superfund"
- DOE Orders Regulating Waste Management

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DOE/EM-0041P

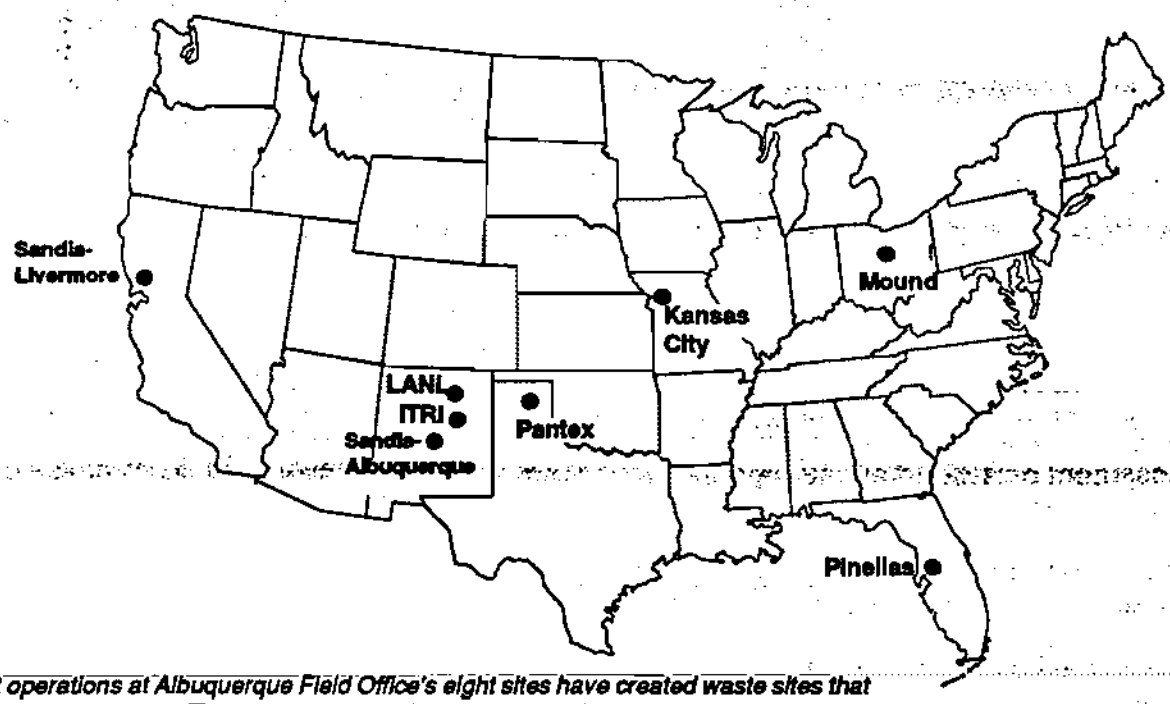
Environmental Restoration Activities at Albuquerque Field Office

- *2,500 Remedial Action sites in 6 states*
- *20+ Decontamination and Decommissioning sites*

Past operations in support of Defense Programs nuclear weapons production missions at Albuquerque Field Office facilities have left a legacy of radioactive and hazardous waste problems that must be corrected. As shown on the map below, the Albuquerque Field Office oversees environmental restoration activities at eight sites: Los Alamos National Laboratory (LANL), Sandia National Laboratories - Albuquerque, Sandia National Laboratories - Livermore, Mound Plant, Pantex Plant, Pinellas Plant, Kansas City Plant, and the Lovelace Inhalation Toxicology Research Institute (ITRI).

These sites are contaminated with some or all of the following waste: transuranic and low-level radioactive waste, hazardous waste, and mixed waste (radioactive and hazardous combined). These byproducts of the defense mission are regulated by increasingly stringent and numerous federal, state, and local regulations. Most contamination problems are the result of past waste management practices that, although considered acceptable at the time, no longer meet today's tougher standards for protection of human health and the environment.

Environmental Restoration consists of two sets of activities: Remedial Actions and Decontamination and Decommissioning (D&D). Remedial Actions tasks encompass: (1) site discovery, preliminary assessment, and site inspection; (2) site characterization, analysis of cleanup alternatives, and selection of remedy; (3) cleanup and site closure; and (4) site compliance monitoring. D&D is concerned with the safe caretaking of surplus nuclear facilities and either their decontamination or their complete dismantling and removal. The D&D tasks encompass: (1) surveillance and



Past operations at Albuquerque Field Office's eight sites have created waste sites that must be cleaned up. There is no high-level waste at these locations. Cleanup actions will address transuranic waste, low-level waste, hazardous waste, and mixed waste.

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maintenance, (2) assessment and characterization, (3) environmental review, (4) engineering design, (5) D&D operations, (6) waste disposal, and (7) closeout.

More than 2,500 potential remedial action sites across the Albuquerque Field Office complex have been identified as needing further assessment and/or clean up. In addition, more than twenty surplus facilities are included in the decontamination and decommissioning program for surveillance and maintenance or final decommissioning.

The types and extent of contamination vary from one site to another. In general, the types of waste found include radionuclides, solvents, gasoline, organics, metals, high-explosive residues, and uranium mill tailings. This waste is primarily present in soil, groundwater, surface water, buildings, structures, and equipment. In many cases, hazardous and radioactive contaminants are found together as mixed waste. The environmental restoration of all these sites will carefully comply with all applicable federal, state, and local environmental laws. The Waste Isolation Pilot Plant is a waste management facility for the potential disposal of transuranic waste. There are no environmental restoration activities there yet.

Specific environmental restoration activities include:

Los Alamos National Laboratory
- Ongoing investigation of approximately 2,100 potential remedial action sites.
- Continue D&D on reactors, while two already completed.

Sandia National Laboratory - Albuquerque
- Site characterization and contamination assessment on 132 potential remedial action sites.
- Install of groundwater detection monitoring at shallow land burial sites.

Sandia National Laboratory - Livermore
- Conduct studies to determine cleanup standards.
- Evaluate of in-situ bioremediation for Fuel Oil Spill site.

Mound Plant
- Ongoing study of remedial action sites; identified over 125 potential remedial action sites and grouped them into eight operable units.
- Continue D&D of formerly utilized plutonium processing buildings and associated plutonium contaminated soils.

Pantex Plant
- Perform assessments on 99 potential release sites.

Pinellas Plant
- Perform assessments of 14 Solid Waste Management Units.
- Start interim remedial action on 4.5 acre site.

Kansas City Plant
- Perform assessments on 35 potential release sites.
- Complete assessments on Abandoned Indian Creek Outfall South Lagoon and Northeast Area.

Lovelace Inhalation Toxicology Research Institute
- Complete hot pond cleanup and remove all radioactive sediment.
- Complete assessments for sanitary lagoons, nitrates in groundwater, and diesel oil release.

Related Fact Sheets

- Radioactive Waste
- Hazardous Waste
- Mixed Waste
- Waste Isolation Pilot Plant
- Decontamination and Decommissioning Program

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DOE/EM-0051P

Decontamination and Decommissioning Program

- *500 D&D facilities*
- *35 sites in 17 states*
- *Surplus facilities cleanup*

Mission and Background

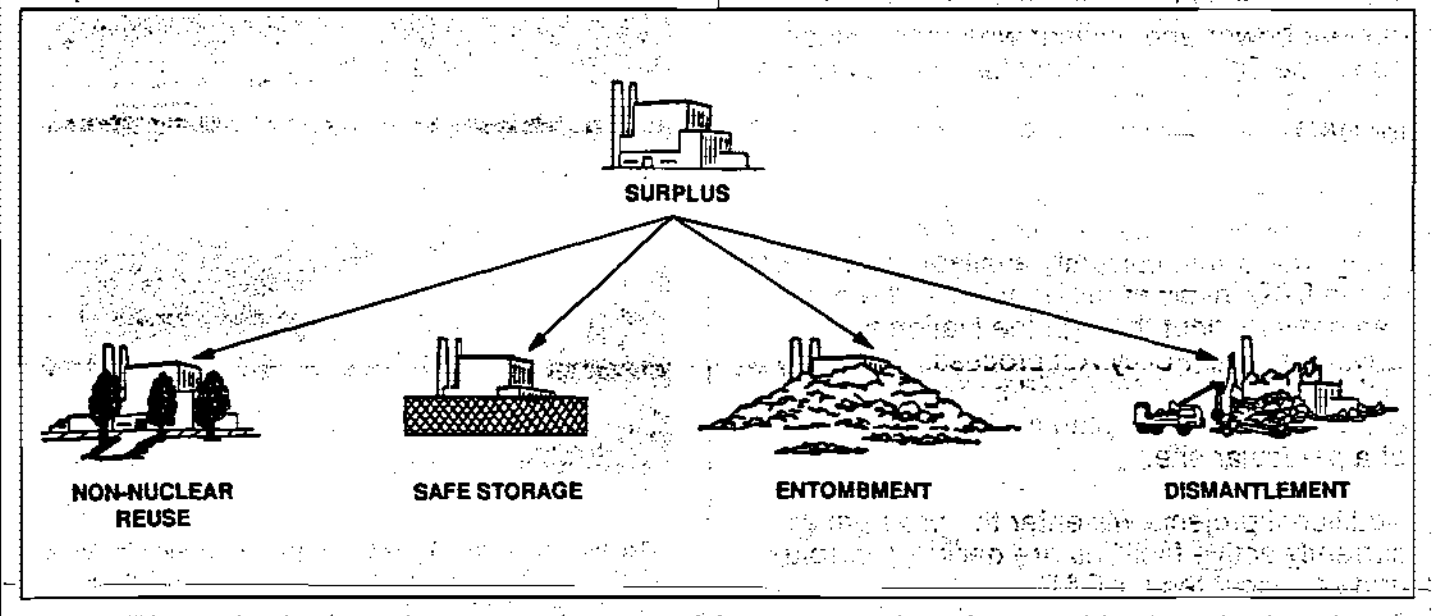
Many government-owned facilities that supported the early nuclear energy research and defense programs have no current use and have been retired. Some of these Department of Energy (DOE) facilities have residual radioactive or chemical contamination levels which require cleanup.

The Decontamination and Decommissioning (D&D) program is responsible for managing these surplus facilities to protect the public health and environment from radioactive contamination or hazardous materials that may be present. Surplus facilities are facilities or sites (including equipment) that have no identified programmatic use and may or may not have radioactive contamination levels that require controlled access. D&D is concerned with the safe caretaking of surplus nuclear facilities until their decontamination, entombment, dismantling and removal, or conversion to another non-nuclear reuse. D&D tasks encompass: (1) surveillance and maintenance, (2) assessment and characterization, (3) environmental review, (4) engineering design, (5) D&D operations, (6) waste disposal, and (7) closeout.

The inventory of surplus facilities includes reactors, laboratory facilities, tanks, pipelines, waste treatment systems, and storage areas with uranium and thorium residues. The target completion date for the current inventory of surplus facilities is 2019.

The D&D program cost-effectively maintains surplus facilities awaiting decommissioning in a safe and secure state and ultimately completes decommissioning activities of the facilities. In some cases facilities may be used for other non-nuclear purposes following their decontamination.

The D&D modes usually considered for a facility include safe storage followed by dismantlement, entombment, or immediate



Some facilities used to develop nuclear power and to support defense programs are no longer useful and must be cleaned up and demolished or restored for future non-nuclear reuse.

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dismantlement. The waste generated by the D&D activities is stored or disposed of at DOE-owned sites. D&D activities may also include soil and ground water contamination.

Additional D&D program activities include D&D-specific research and development of techniques, maintaining a technical information center, disseminating technical information to government and commercial industry, and participating in international exchanges.

The recently completed Shippingport Atomic Power Station Decommissioning Project involved the dismantlement and removal of the radioactive portions of the first nuclear power plant used by a public utility. The successful completion of this project demonstrates to the nuclear industry the practical and affordable decommissioning of a nuclear power plant. D&D activities ranged from demolishing all structures to planting grass. The reactor vessel package and all radioactive components were removed and safely transported to a permanent DOE disposal site.

Regulatory Concerns

The Surplus Facilities Management Program (SFMP), the precursor to today's D&D program, was established in 1978 to provide safe caretaking (surveillance and maintenance) and disposition (decommissioning) of retired, DOE-owned or DOE-sponsored nuclear facilities that were used to support the development of nuclear power and nuclear weapons. Since 1989, the Office of Environmental Restoration and Waste Management has had responsibility for D&D.

D&D activities are conducted in accordance with all applicable standards, regulations, codes, and DOE orders with currently available technology. When D&D involves major actions, the public can provide input through the National Environmental Policy Act process. This may include public hearings and/or providing written comments to DOE's plan for D&D and cleanup of a particular site.

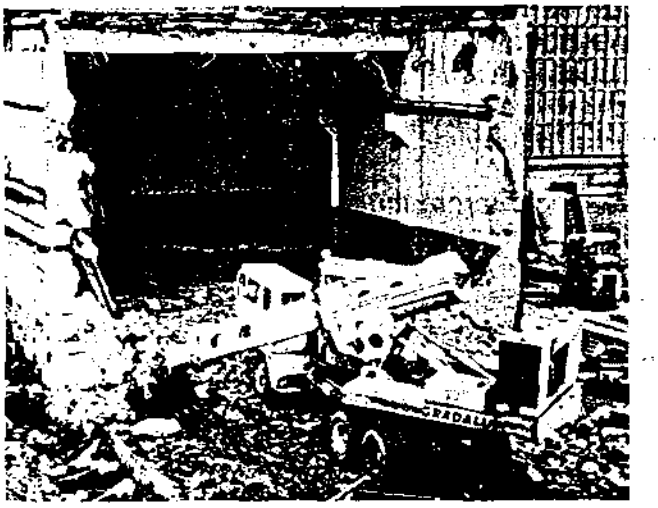
Additional projects will enter the program as currently active facilities are declared surplus and are accepted for D&D.

Status

There are more than 500 facilities in the current D&D inventory at 35 sites in 17 states.

Surveillance and maintenance is being performed for more than 60 projects that are awaiting D&D or have been completed.

D&D is in progress for 36 projects.



Decommissioning the inactive Shippingport Atomic Power Station involved activities ranging from demolishing all structures to planting grass.

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DOE/EM-0025P

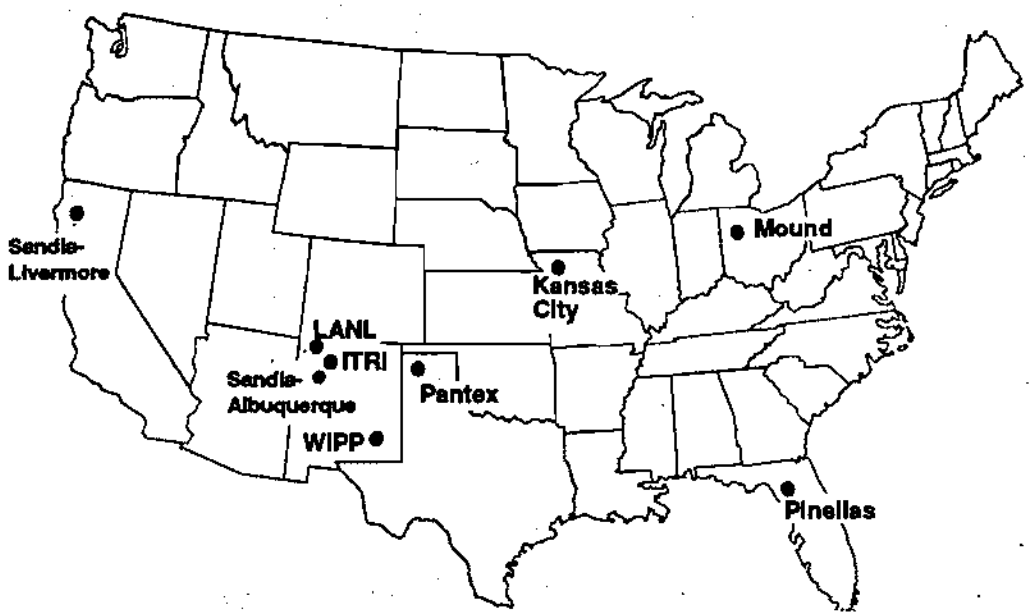
Waste Management Activities at Albuquerque Field Office

- *Waste Isolation Pilot Plant*
- *9 sites in 6 states*

Past operations in support of defense programs nuclear materials production at Albuquerque Field Office sites have generated transuranic waste and low-level waste, hazardous waste, and mixed waste (radioactive and hazardous combined).

The Albuquerque Field Office oversees waste management activities at nine sites: Los Alamos National Laboratory (LANL), Sandia National Laboratories - Albuquerque, Sandia National Laboratories - Livermore, Waste Isolation Pilot Plant (WIPP), Mound Plant, Pantex Plant, Pinellas Plant, Kansas City Plant, and Lovelace Inhalation Toxicology Research Institute (ITRI). Waste generated at these sites is managed to comply with federal, state, and local environmental laws and regulations.

The Los Alamos National Laboratory and Mound Plant are the only transuranic waste generators under the Albuquerque Field Office oversight. Plans are to dispose of transuranic waste in WIPP if the five-year test phase demonstrates safe disposal. Transuranic waste must be certified to meet specific criteria before it can be sent to WIPP. The Mound Plant certifies all of its transuranic waste and ships it to Idaho National Engineering Laboratory in Idaho for storage. The Los Alamos National Laboratory certifies and stores its newly-generated transuranic waste on-site and is retrieving and processing previously stored waste for certification. Combustible transuranic waste is burned in Los Alamos National Laboratory's controlled air incinerator.



Albuquerque Field Office oversees waste management at nine sites across the nation. There is no high-level radioactive waste at any of these locations.

Large items, such as gloveboxes, are reduced in size to fit standard containers in the Size Reduction Facility. The Los Alamos National Laboratory will operate the Corrugated Metal Pipe Saw facility for size reducing transuranic waste that was solidified in concrete and

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stored in metal pipes. If the Waste Isolation Pilot Plant successfully demonstrates that it is a safe disposal facility, both Mound Plant and Los Alamos National Laboratory will ship their certified transuranic waste there for disposal.

Although all of Albuquerque Field Office sites generate low-level waste, Los Alamos National Laboratory and Sandia National Laboratories - Albuquerque are the only two sites that currently dispose of low-level waste in on-site burial facilities. Both sites are engaged in active waste minimization programs. The remaining sites treat, package, and ship their low-level waste to other DOE disposal facilities.

Most hazardous waste generated at Albuquerque Field Office sites is shipped to commercial facilities for treatment and disposal. The Los Alamos National Laboratory stores hazardous waste on-site, and design has begun on a hazardous waste treatment facility. Mixed waste is stored on-site at all the sites pending the identification of appropriate waste management options. Waste management facilities and equipment are being continually designed, constructed, or enhanced. An example of this is the new Mixed Waste Facility at Sandia National Laboratories-Albuquerque for stabilizing mixed waste for storage and eventual disposal.

Specific waste management activities include:

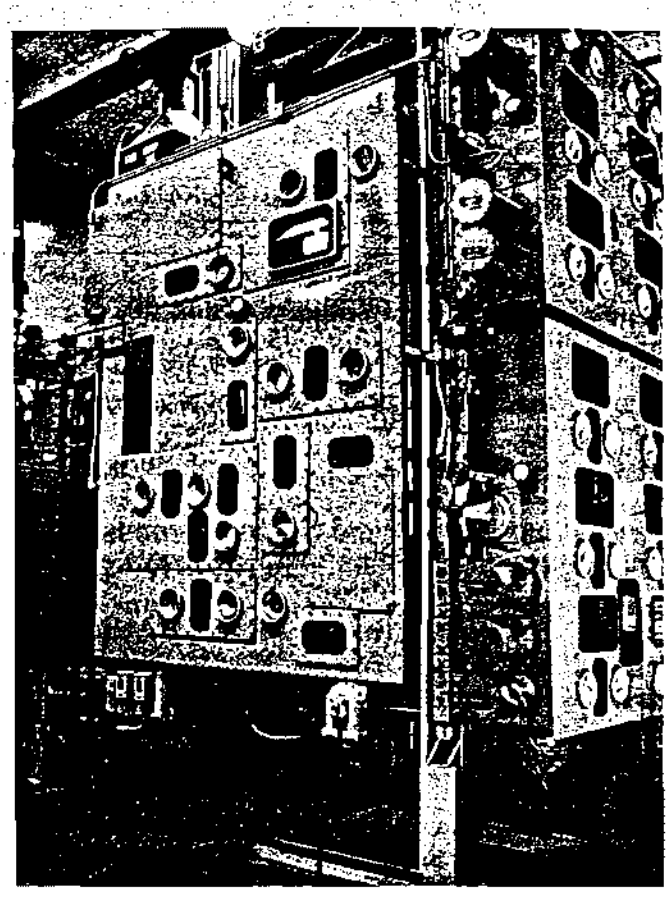
Inhalation Toxicology Research Institute
- Construction of waste treatment and storage facility upgrade.

Kansas City Plant
- Construction of hazardous waste tank farm.

Pantex Plant
- Construction of mixed waste storage facilities.

Pinellas Plant
- Construction of Neutralization Facility upgrade.

Los Alamos National Laboratory
- Upgrade and restart Controlled Air Incinerator.



This radioactive and mixed waste controlled air incinerator at Los Alamos National Laboratory will be used for volume reduction of transuranic waste and destruction of hazardous components of mixed waste. It has been demonstrated to safely process waste without release of any radioactivity to the environment.

Mound Plant
- Construction of Radioactive Waste Storage Building.

Related Fact Sheets

- Radioactive Waste
- Hazardous Waste
- Mixed Waste
- Waste Minimization
- Waste Isolation Pilot Plant

U.S. Department of Energy
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June 1991

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DOE/EM-0019P

Radioactive Waste

- *High-level waste*
- *Transuranic waste*
- *Low-level waste*
- *Uranium mill tailings*

Definition

For more than 40 years, the United States has produced materials for nuclear weapons. These production activities generated both radioactive and hazardous waste and often contaminated the facility or site. The Department of Energy (DOE) is faced with the challenge of managing this waste and cleaning up the contaminated sites at its facilities across the nation. In some cases, radioactive and hazardous waste are combined. This is called mixed waste.

DOE manages four categories of radioactive waste:

High-Level Waste (HLW) is radioactive waste resulting from the reprocessing of spent nuclear fuel used to make nuclear weapons or energy. It includes spent nuclear fuel, liquid waste produced directly in reprocessing, and highly radioactive solid waste derived from the liquid. High-level waste contains some elements that decay slowly and remain radioactive for thousands of years. Most high-level waste must be handled by remote-control from behind protective shielding.

Transuranic (TRU) Waste is radioactive waste contaminated with alpha-particle-emitting isotopes which have decay rates and concentrations exceeding certain specified levels. It is produced during reactor fuel assembly, weapons fabrication, and reprocessing operations. It contains man-made elements heavier than uranium, thus the name trans (or beyond) uranium. Transuranic waste decays very slowly and requires isolation for many thousands of years. Protective clothing, equipment, and tools may be contaminated with transuranic radionuclides.

Low-Level Waste (LLW) is any radioactive waste not classified as high-level waste, transuranic waste, or uranium mill tailings. Low-level waste is typically small amounts of radioactivity dispersed in large amounts of material. Low-level waste consists of rags, papers, filters, tools, equipment and discarded protective clothing contaminated with radionuclides. It is generated by uranium enrichment processes, reactor operations, isotope production, medical diagnostic procedures, medical tracer production and use, and research and development projects. Some low-level waste material requires shielding during handling and transportation activities.

Uranium Mill Tailings, which have low levels of radiation, are byproducts of uranium mining and milling operations. They are naturally radioactive rock and soil. Tailings contain small amounts of radium that decay and emit radon, a radioactive gas. Released into the atmosphere, radon gas disperses harmlessly, but the gas is harmful if a person is exposed to high concentrations for long periods of time.

Waste Management

DOE's high-level waste program goal is to convert all currently stored or newly-generated high-level waste into a waste form suitable for future disposal in a deep geologic repository. The sites generating high-level waste treat the raw waste to stabilize it enough for interim storage. Interim storage of treated high-level waste--sludges, precipitated salts, and concentrated salt solutions--is primarily in double-wall tanks at the Savannah River Site in South Carolina, Hanford Site in Washington, and West Valley in New York. The latter is a commercial site owned by New York State where DOE is conducting a waste demonstration project. At Idaho National Engineering Laboratory, liquid high-level waste is stored in stainless steel tanks until it is converted to a granular solid and then stored in shielded stainless steel bins.

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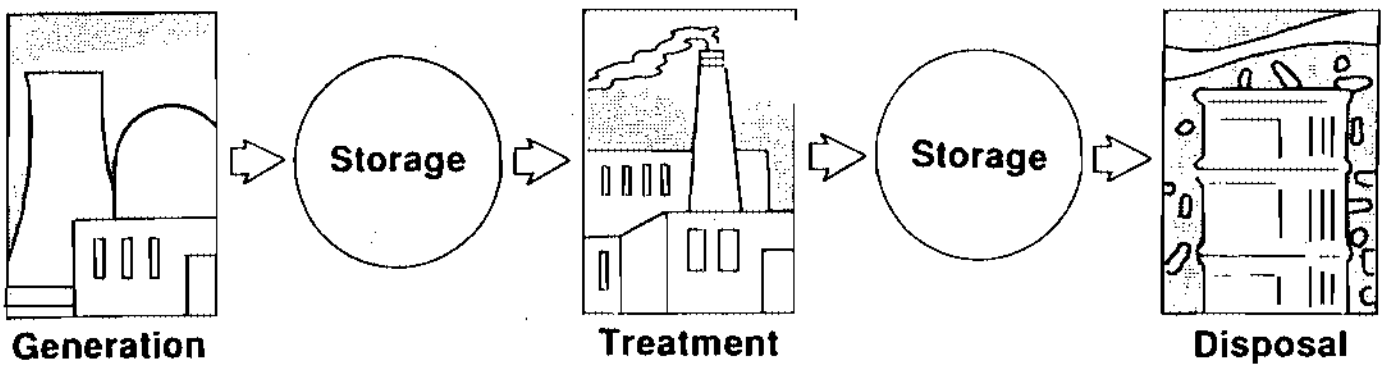
For nearly 20 years DOE's principal strategy for managing transuranic waste has been based on the development of a geologic repository. For more than 10 years the focus of this effort has been the Waste Isolation Pilot Plant (WIPP) in New Mexico. WIPP is designed to store transuranic waste in vast salt deposits 2,150 feet beneath the desert surface. These deep salt deposits are found primarily in stable geologic areas with an absence of fresh water. A five-year test period is planned to determine whether or not transuranic waste can be safely disposed at WIPP. DOE is required to obtain all applicable environmental permits and an appropriate land withdrawal before the test phase begins.

The majority of DOE low-level waste will continue to be disposed of using proven techniques at qualified DOE locations. Engineered techniques include shallow trench burial in dry areas and disposal on concrete pads in more humid areas. Some low-level waste, such as liquids or large machinery, must be treated by solidification or size reduction before disposal. Site monitoring systems ensure protection of the environment during treatment, storage, and disposal.

The Uranium Mill Tailings Remedial Action (UMTRA) Project addresses the cleanup of sites and vicinity properties contaminated with tailings--naturally radioactive rock and soil--left over from uranium mining activities. The UMTRA Project is responsible for remedial action at 24 former uranium ore processing sites and an additional 5,000 vicinity properties across the nation. Congress passed the Uranium Mill Tailings Radiation Control Act in 1978 and directed DOE to restore sites contaminated with uranium mill tailings from prior mining activities. This cleanup is regulated by the Environmental Protection Agency and the Nuclear Regulatory Commission.

Regulatory Concerns

All DOE radioactive waste management activities must comply with federal, state, and local laws and regulations. The greatest radioactive waste management concern is with mixed waste. Dual regulatory requirements for both the radioactive and hazardous waste components are applicable to all mixed waste.



Radioactive waste is generated during all phases of nuclear materials production and must be responsibly managed. DOE's long-term waste management goal is to end storage and begin permanent disposal.

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June 1991

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DOE/EM-0020P

Hazardous Waste

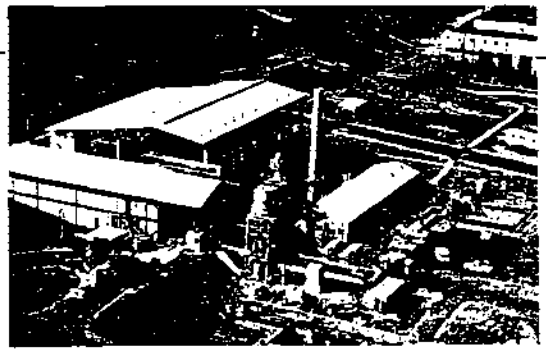
• Toxic • Corrosive • Reactive • Ignitable

Definition

For more than 40 years, the United States has produced materials for nuclear weapons. These production activities generated both radioactive and hazardous waste and often contaminated the facility or site. The Department of Energy (DOE) is faced with the challenge of managing this waste and cleaning up the contaminated sites at its facilities across the nation. In some cases, radioactive and hazardous waste are combined. This is called mixed waste.

Hazardous waste are defined and regulated by the Resource Conservation and Recovery Act and other federal laws such as the Toxic Substances Control Act and the Clean Water Act. Hazardous waste are toxic, corrosive, reactive, or ignitable materials that can negatively affect human health or damage the environment. They can be liquid, solid, or sludge and include polychlorinated biphenyls (PCBs), heavy metals (such as mercury), organic solvents, reactive compounds, and corrosive materials.

Some hazardous waste is stored in buildings on DOE sites before it is disposed of in permitted facilities.



This incinerator in Oak Ridge, Tennessee processes hazardous and mixed waste. It is designed to comply with the Toxic Substances Control Act.

Waste Management

The DOE hazardous waste program is committed to complying with regulatory requirements, reducing risk to human health and the environment, and minimizing waste generation.

Technologies for managing hazardous waste include: incineration, biodegradation, solidification, encapsulation, and land disposal. The success of these technologies depends, in part, on the specific hazardous waste being handled, the volume and composition of the waste being handled, and citizen understanding and acceptance of treatment and disposal technologies. Many research efforts are underway to develop treatment technologies, including vitrification (immobilization), biodegradation, and solidification.

Much DOE waste is either mixed or perceived to be mixed waste by commercial disposal sites. Thus DOE must build and operate

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treatment facilities, like the hazardous and mixed waste incinerator in Oak Ridge, Tennessee, shown on the previous page, to process the waste to an acceptable disposal form.

DOE has a five-point strategy for managing hazardous waste:

1. Avoid hazardous waste generation. The best approach is to minimize and/or eliminate hazardous waste generation. DOE currently has programs in place to minimize or eliminate the use of chlorinated solvents at its facilities. These include: eliminating the use of carbon tetrachloride in nonplutonium operations at Rocky Flats Plant in Colorado; eliminating chlorinated solvents from Y-12 Plant at Oak Ridge National Laboratory in Tennessee; recycling mercury waste at Savannah River Site in South Carolina; and recycling antifreeze at Hanford Site in Washington State.

2. Treat hazardous waste. DOE's near-term objective is to treat hazardous waste as it is generated and thus avoid storage. Two examples are the hazardous and mixed waste incinerator at Oak Ridge National Laboratory in Tennessee, and the planned incineration facility at Savannah River Site in South Carolina. Wet oxidation technology is also being investigated for specific hazardous waste treatment.

3. Dispose of hazardous waste. DOE disposes of hazardous waste in permitted DOE facilities and commercial facilities after minimization and treatment. When DOE uses licensed commercial facilities for the disposal of its hazardous waste, priority in selecting a vendor is given to recycling first, treatment second, and finally, containment and storage.

4. Use applicable commercial technology. DOE uses the best available technology for hazardous waste treatment, including commercial technology and upgrades as new methods are developed.

5. Control liability. DOE will consider controlling liability by using the Resource Conservation and Recovery Act (RCRA)-permitted DOE treatment, storage, or disposal facilities instead of commercial hazardous waste disposal sites.

Regulatory Concerns

DOE's hazardous waste management program ensures waste is managed in accordance with RCRA and its amendments. The Environmental Protection Agency has been given the authority to implement and enforce RCRA. It is also possible for states and territories to be delegated this authority if they pass regulations at least as stringent as RCRA. Forty-six states have done so.

The recently passed Clean Air Act amendment will significantly impact waste operations at DOE. For example, "fugitive," or secondary emissions standards will require significantly more testing at potential release locations such as pumps, flanges, and valves.

The Environmental Protection Agency and the states are steadily increasing the number of hazardous waste types banned from land disposal without previous treatment. Disposal facilities must meet increasingly stringent criteria.

The Land Disposal Restriction (LDR) regulations under RCRA require either: (1) reduction of the hazardous constituents in waste to specific concentration levels, or (2) the use of specific treatment technologies before land disposal. Some progress has been made in developing and implementing methods to reduce or eliminate the hazardous components in waste. However, in many cases, neither DOE nor industry can meet current and proposed LDR regulations. As a result, available storage will have to increase temporarily until effective methods for reducing the toxicity of the hazardous waste to below these established limits are developed and proven. LDR regulations also prohibit storage of banned waste except to accumulate sufficient quantities to facilitate proper recovery, treatment, or disposal.

Related Fact Sheets

- Radioactive Waste
- Mixed Waste
- Waste Minimization
- Resource Conservation and Recovery Act
- Additional Environmental Regulations Affecting DOE

U.S. Department of Energy
Office of Environmental Restoration and Waste Management
June 1991

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EPA
United States
Environmental Protection Agency
(PM-221)
401 M Street SW
Washington DC 20460

Official Business
Penalty For Private Use $300

EPA

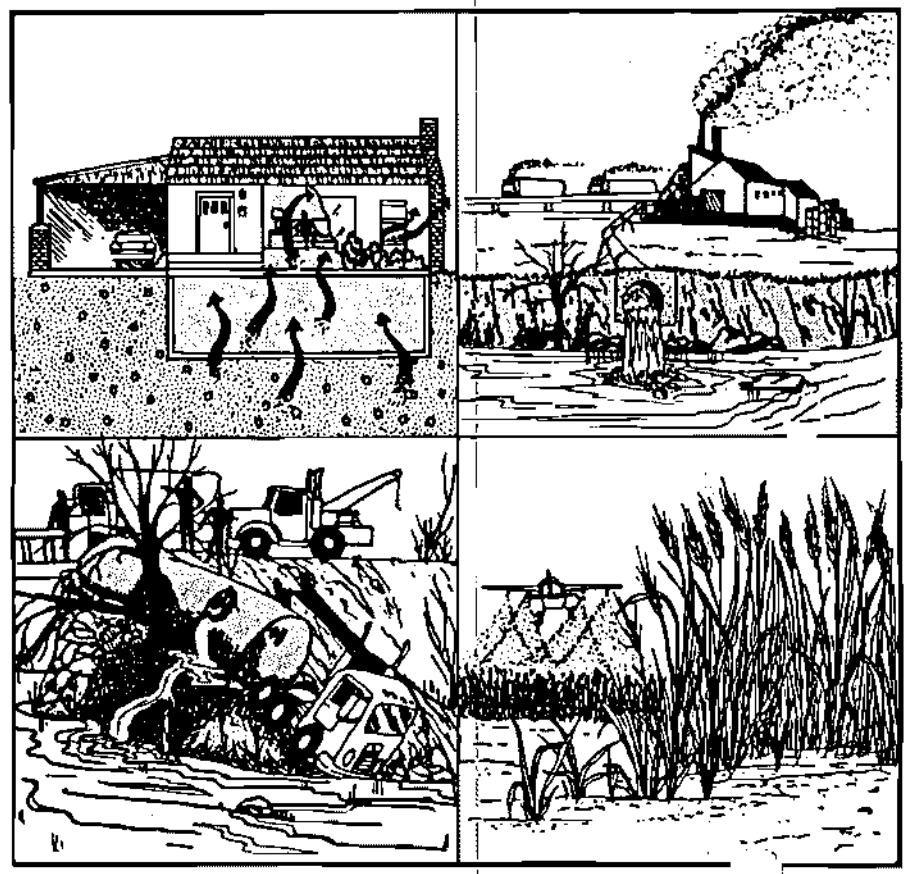
Environmental Protection Agency

September 1990

Policy, Planning, And Evaluation (PM-221)

Understanding Environmental Health Risks And Reducing Exposure

Highlights Of A Citizen's Guide



Risk Communication Series

How Can You Find Out Whether Your Environment Is Harmful?

Every day the news media tell us about the harmful effects of hazardous substances in our environment. For the concerned citizen, these media statements often create more questions than they answer. You may ask these questions:

- How many people are likely to be exposed to hazardous substances, and will these exposures make them sick?
- What is the government doing to reduce my exposure?
- What actions can I take on my own to reduce my exposure?

Scientists have developed ways to assess how many people may be exposed to hazardous substances and their risks from those exposures. The next two pages describe these methods.

Federal and state governments use information about risks to develop regulations for reducing your exposure. Page 4 describes the U.S. Environmental Protection Agency's (EPA's) role in developing and enforcing these environmental regulations.

At the community level, both government and nongovernmental programs have been developed to reduce your exposure to hazardous substances. And, on a personal level, you can change habits to reduce your exposure even more. Pages 6 and 7 describe community and personal actions to reduce your exposure to hazardous substances.

This flyer should begin to answer your questions about hazardous substances in your environment, but you may want to know more. EPA has prepared a 125-page guidebook to help people understand environmental risks so they can make informed decisions about their exposure to hazardous substances. The guidebook also contains a list of government and nongovernmental sources of additional information on hazardous substances. To order the guidebook fill out and return the request form at the bottom of page 7.

What Can You Do to Reduce Your Exposure to Hazardous Substances?

You can take various actions on your own to reduce your exposure to hazardous substances. Indoor exposures to radon, asbestos, indoor tobacco smoke, lead in paint, lead in drinking water, and others may pose dangers to you and your family. Get information about these exposures and how to reduce them.

Many consumer products such as household cleaners, paints, and pesticides contain hazardous substances. Select and use these products carefully — or use less hazardous alternatives. **Read labels** and follow instructions for proper use.

If you have an accident with a pesticide or other hazardous substance, **consult the label** for first aid information. Then **call your local poison control center** (get the number from the inside cover of your telephone book) for further instructions.

You also can **change habits** such as living or working around environmental tobacco smoke, spending time outdoors when air quality is poor, or swimming in or eating fish from contaminated water bodies.

Diet is important for two reasons. First, removing surface residues from vegetables and trimming the fat from meat and poultry products can reduce your risk of exposure to pesticides. Second, people who eat healthy diets are less susceptible to harm from hazardous substances.

Summary

Regulatory and other actions by federal, state, and local governments reduce your exposure to hazardous substances in the environment. Through individual and community actions you can do even more to prevent the harmful effects of such exposures. Following the suggestions outlined here is a first step — if you are interested in getting EPA's 125-page guidebook that provides more information, please fill out and return the order form below.

Request Form

Please send me a copy of *Hazardous Substances in Our Environment: A Citizen's Guide to Understanding Health Risks and Reducing Exposure*, EPA-230-09-90-081.

Name: _____

Address: _____

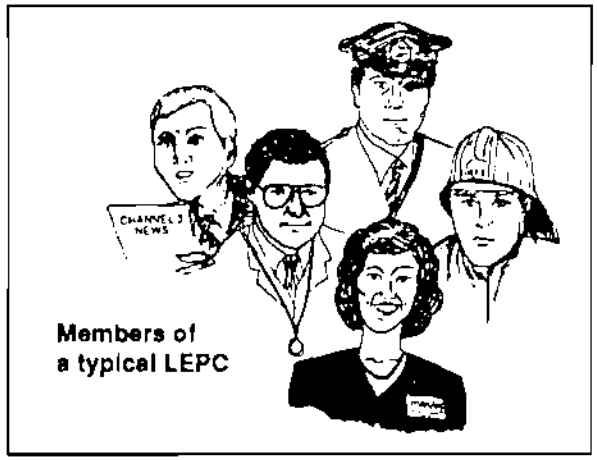
City: _____

State: _____ Zip: _____

Mail request to:
Public Information Center PM-211B
U.S. Environmental Protection Agency
401 M Street, SW
Washington, DC 20460

Or call (202) 382-2080 or (202) 475-7751

What Is Your Community Doing to Reduce Your Exposure to Hazardous Substances?



Members of a typical LEPC

One example of what communities are doing is through the Local Emergency Planning Committee (LEPC). This local group is charged with developing a plan for evacuation or emergency response to an accident involving hazardous substances. LEPCs were established under federal law in 1986, and there are now about 4,000 LEPCs nationwide. LEPCs include representatives from all parts of the community, including volunteer citizen representatives. You can volunteer to serve on your community's LEPC. The chemical industry is actively involved with LEPCs and often provides technical assistance, information, and equipment.

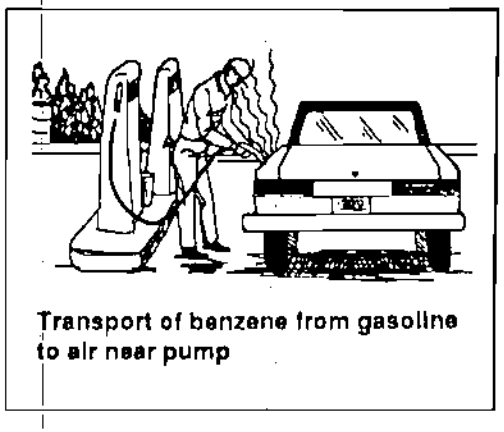
In addition to developing an emergency plan for the community, LEPCs can provide public access to information about

- hazardous substances that are used and stored by facilities in the community,
- accidental releases that have occurred in the community, and
- routine releases that are occurring in the community,

The LEPC's ability to focus community attention on the releases and inventories of chemicals at facilities in the community has forced some facilities to rethink their chemical housekeeping practices.

In addition to your LEPC, other organizations or agencies in your community, such as local environmental and public health agencies, provide helpful services and information. You and your neighbors can use these resources to organize other activities to reduce hazardous substances in your community. You might want to organize a household hazardous waste collection program or information programs aimed at problems in your community.

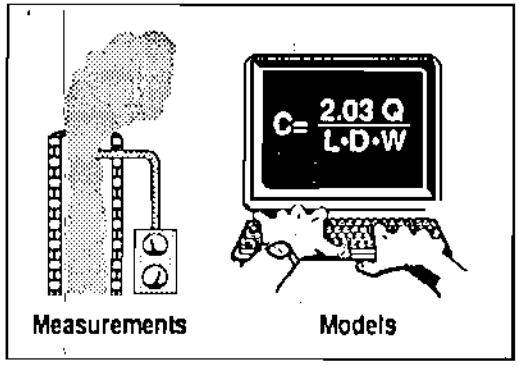
How Does EPA Estimate Your Exposures to Hazardous Substances?


Transport of benzene from gasoline to air near pump

Hazardous substances come from **man-made sources** such as commercial facilities that make, treat, store, use, or dispose of hazardous substances; sewage and water treatment plants; and consumer products such as gasoline, household cleaners, pesticides, and paint solvents. Hazardous substances also can come from **natural sources** such as naturally occurring minerals or gases and from naturally occurring pesticides in plants used for food.

Hazardous substances can be released **routinely**, for example, during normal operations of a factory, water-treatment plant, or other government or commercial enterprise and during normal use of a car or a pesticide. Hazardous substances also can be released **accidentally**, for example, during fires, explosions, and transportation accidents.

Hazardous substances are transported by many different **pathways** through the air, water, soil, or food to get to you.



EPA needs to know the identity of a hazardous substance, the type of release, and the pathway to your environment before estimating the concentration of a hazardous substance in your environment. EPA either measures the concentration directly or uses mathematical models to estimate it. Because so many substances could be hazardous, however, EPA has done this for only some substances in your environment.

Your **exposure** depends on how much of a hazardous substance you take into your body when breathing, eating, or drinking. EPA estimates your exposure by multiplying the concentration of the hazardous substance in your environment by conversion factors for each type of exposure — such as the amount of water drunk per day.

How Does EPA Estimate Your Risk of Illness?

You already have some risk, or chance, of getting any illness during your lifetime. Your increased **risk of illness** is the likelihood that exposure to a hazardous substance will increase your chance of getting that illness.

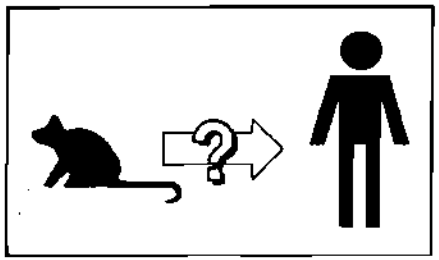
Some hazardous substances cause harmful effects at smaller exposures than others. EPA uses **dose-response relationships** to estimate how much increased exposure to a hazardous substance increases the risks of various illnesses.

Of course, scientists cannot perform experiments on humans. Some human information is available (for example, for workers exposed to benzene on the job), but scientists usually rely on animal experiments to give information for dose-response relationships.

EPA computes increased risk of illness in terms of the number of **extra cases of an illness expected in a population**. Multiplying the number of extra cases expected for each unit of exposure (estimated using the dose-response relationship) by people's actual exposure (see discussion on page 3) gives the number of cases predicted for that population.

Extra Cases of Illness = Cases for Each Unit of Exposure x Exposure

EPA's risk-of-illness estimates are only rough estimates of the human health effects. This is because scientists lack complete information about human exposures to hazardous substances and about how these substances actually harm human cells.



EPA scientists make adjustments to the risk-of-illness calculations to be sure they do not underestimate the number of illnesses that would occur from an exposure. That way, regulations that EPA develops based on these estimates provide an extra level of protection of human health.

One way to judge the seriousness of a risk is by the size of your exposure and the associated health risks. But people also consider other **characteristics** of the risk such as whether it is voluntary or involuntary. For example, two risks may be the same size, but you may be more willing to tolerate one because it is associated with an activity you can control (such as your job) versus the other, which is associated with an activity you cannot control (such as a pesticide residue in food).

What Is the Government Doing to Reduce Your Exposure to Hazardous Substances?

In the past two decades, the U.S. Congress has passed many laws to protect the environment and people from exposure to hazardous substances. EPA administers most laws concerning pollution in the outdoor environment and provides information on pollutants in indoor air. EPA's responsibilities include

- setting and enforcing standards under environmental laws,
- developing and testing new methods to reduce the sources of environmental risks,
- requiring the cleanup of sites where damage from hazardous substances already has occurred,
- administering programs to provide information to the public and businesses about regulatory requirements, environmental programs, procedures to reduce exposures to hazardous substances, and the health effects of hazardous substances,
- assisting state and local governments in planning for emergencies, and
- coordinating the efforts of local government groups.

To set and enforce standards under environmental laws, EPA uses the information from exposure and risk of illness estimates (described on pages 3 and 4 of this flyer). Protecting people and the environment from damage caused by pollution to the air, soil, surface water, and ground water is the major focus of these environmental laws. They cover sources such as factories, power plants, cars, hazardous waste facilities.

Government actions both provide benefits and impose costs. For example, people and the environment benefit because the risk of harmful effects is reduced, but regulations can cause increased prices of some goods and services and reduced employment in some industries.

EPA considers these and other benefits and costs when setting standards — focusing on the environmental problems that pose the most significant and serious risks. But broader social concerns — often driven by public perceptions of the seriousness of risks — also play a role in EPA's decisionmaking process.

G. ATSDR INFORMATION

October 1993

ATSDR

Agency for Toxic Substances and Disease Registry

ATSDR's Health Consultation on the Miami-Erie Canals and Miamisburg Community Park

The Agency for Toxic Substances and Disease Registry -- part of the U.S. Public Health Service -- developed this fact sheet for people in Miamisburg to let them know about its Health Consultation. You may have questions the fact sheet doesn't answer or need more information about ATSDR and its public health activities at the Mound Plant. People to call are listed on the back.

Why Did ATSDR Do a Health Consultation?

In May 1992, the U.S. Department of Energy asked ATSDR to look at the possible threat to people's health from contamination in surface water and soil in the Miami-Erie Canals and the Miamisburg Community Park.

An ATSDR Health Consultation is not the same thing as a medical exam, a community health study, or a Public Health Assessment. It can sometimes lead to those things, as well as other public health activities. A Health Consultation provides advice on a specific public health issue related to people's real or possible exposure to toxic material. A Health Consultation is a way for ATSDR to respond quickly to a need for health information on toxic substances and make recommendations for actions to protect people's health.

What Does the Health Consultation Say?

In 1969, a pipe carrying waste material -- including plutonium-238 -- broke at the plant and spilled waste on the ground. Heavy rain washed some contaminated dirt off the plant property into surface water and areas next to the plant. Other spills over the years from the Mound Plant, from the highway, from the railroad, or from other activities such as the coal-burning power plant may have contaminated the surface waters and soil in and around the Canals and Community Park.

Continued on back

Based on the environmental data available, the health consultation reports that:

- **Levels of plutonium-238 are not a public health hazard.** The total radiation dose someone might get from all possible sources off site is likely less than 100 millirem a year.

- **Environmental data do not indicate the Canals or Community Park pose a health hazard. However, there have not been enough samples tested for radioactive substances, other than plutonium-238, to know whether there could be a problem. There have also not been enough samples tested for non-radioactive wastes,** such as heavy metals, pesticides and other materials, that people could come in contact with. People could be exposed to these materials by breathing them, getting them on their skin, or by accidently swallowing them if they get dirt or dust on their hands and put their hands in their mouths.

- To find out more about exactly where the waste is, and what kind of contamination it is, **ATSDR recommends more tests on surface soil** (the first three inches). This soil should be tested for plutonium-238 and -239, tritium, uranium, americium, and for non-radioactive wastes, such as volatile and semi-volatile organic compounds, metals, and pesticides. ATSDR also recommends **more air testing** at the Canals and the Park to find out if people could breathe in contaminants.

- **There isn't enough information about whether fish in the South Pond might be contaminated.** People could be exposed to contamination if they eat the fish. ATSDR recommends that **fishing should be stopped until the fish are tested.**

- When additional test results are available, ATSDR will review them to see whether people's health could be at risk.

Need More Info? Call --

Bill Taylor in Atlanta (404) 639-6068
Louise Fabinski in Chicago (312) 886-0840

TO ALL INTERESTED PARTIES:

The Agency for Toxic Substances and Disease Registry (ATSDR), an agency of the U.S. Public Health Service, announces the availability of a Health Consultation, "DOE MOUND PLANT Miami-Erie Canals and Community Park." This document addresses contamination in the soils and surface waters in the Miami-Erie Canals and Community Park in Miamisburg, Ohio.

ATSDR also announces the availability of a "Work Plan for Environmental Studies in the Vicinity of the Mound Plant." This document describes the environmental sampling and analysis ATSDR will conduct in the environs of the Mound Plant. This environmental sampling and analysis will be performed by the U.S. Environmental Protection Agency's National Air and Radiation Environmental Laboratory under an interagency agreement with ATSDR.

Both the Health Consultation and the Work Plan are being made available in the Mound Plant public repository at the Miamisburg Branch Library of the Dayton & Montgomery County Public Library. Copies of the Health Consultation may be requested from:

Ms. Dontanette L. Cohill
Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
1600 Clifton Road, N.E.
Mail Stop E-56
Atlanta, Georgia 30333

Comments may be made in writing to:

Chief, Records and Information Management Branch
Agency for Toxic Substances and Disease Registry
Attention: Federal Programs
1600 Clifton Rd., NE
Mail Stop E-56
Atlanta, GA 30333

If you have any questions, you may contact William H. Taylor, Ph.D. at (404) 639-6068 between 7:00 a.m. and 3:30 p.m. (Eastern Time).

PLAN TO ATTEND

PUBLIC AVAILABILITY SESSIONS

FOR

MOUND PLANT

WHEN: Tues., November 9, 10am - 2pm and 4:30pm - 8:00pm
Wed., November 10, 10am - 2pm

WHERE: The Carnegie Center
5th & Central Avenue
Miamisburg, Ohio

WHY: The Agency for Toxic Substances and Disease Registry (ATSDR), part of the U.S. Public Health Service, is developing a public health assessment for the Mound Plant. ATSDR is also gathering community and personal health concerns from people who live or work near the Plant and who are concerned about its possible contamination. ATSDR will evaluate these concerns, along with information about the Plant chemicals, possible routes of exposure to those chemicals, and other health data, to reach an independent assessment of whether or not present or future exposures might cause adverse health effects.

ATSDR has scheduled informal "Public Availability Sessions," to learn about the community's personal health concerns that may be related to the Plant. These sessions are not intended to be large-scale public meetings to disseminate information, but to meet with the public one-on-one while the assessment is being drafted to ensure individual health concerns have been identified. ATSDR staff will meet individually with those who attend. *Individual conversations will be confidential.* Please plan to attend one of the scheduled sessions listed above.

FOR MORE INFORMATION CALL:

ATSDR Regional Representative, Louise Fabinski (312) 886-0840 or the health assessors William Taylor or Burt Cooper at (404) 639-6068.

ANNOUNCING

DOCUMENTS AVAILABLE FOR PUBLIC REVIEW
ON

MOUND PLANT

The Agency for Toxic Substances and Disease Registry (ATSDR), an agency of the U.S. Public Health Service, is announcing the release of two documents which they have produced concerning the property immediately surrounding the Mound Plant in Miamisburg, Ohio.

ATSDR is releasing its health consultation on the soils and surface waters in the Miami-Erie Canals and Community Park in Miamisburg. Also, ATSDR is planning on collecting samples of surface soil, water, air, and some plants in the vicinity of the Mound Plant, to help in its mission to conduct a public health assessment of the Mound Plant. Both the health consultation and the sampling plan will be discussed as part of the Department of Energy (DOE) Mound Plant Quarterly Public CERCLA Meeting, to be held in the Carnegie Center in Miamisburg on the evening of October 20, 1993. Prior to that meeting the documents will be made available in the DOE repository in the Miamisburg Branch Library of the Dayton & Montgomery County Public Library System.

Written comments on either document may be submitted to:

ATSDR/Records & Information Branch
ATTN: Dontanette Cohill
1600 Clifton Rd. NE (E56)
Atlanta, Georgia 30333

Copies of the health consultation may be obtained through a written request or by calling Ms. Cohill at (404) 639-6070.

ATSDR Documents at Miamisburg Public Library March, 1993

MOUND

Environmental Restoration Program

ATSDR Public Health Assessment Guidance Manual. March 1992. Agency for Toxic Substances and Disease Registry, Atlanta, GA. NTIS #PB92-147164.

ATSDR Public Health Statements. 1992. Agency for Toxic Substances and Disease Registry, Atlanta, GA.

Public Health Assessment for Cornhusker Army Ammunitions Plant. September 30, 1992. Agency for Toxic Substances and Disease Registry, Atlanta, GA.

Preventing Lead Poisoning in Young Children. October 1991. U.S. Centers for Disease Control, Atlanta, GA.

Environmental Issues in Primary Care. 1991. Minnesota Department of Health.

Hazardous Substances & Public Health (Quarterly Newsletter). Fall 1992. Agency for Toxic Substances and Disease Registry, Atlanta, GA.

EG&G

AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY
TOXICOLOGICAL PROFILE INFORMATION SHEET

Fall 1992

The Agency for Toxic Substances and Disease Registry (ATSDR) has been mandated by Congress to produce "toxicological profiles" for hazardous substances found at National Priorities List (NPL) sites. These hazardous substances have been ranked based upon frequency of occurrence at NPL sites, toxicity, and potential for human exposure.

Two hundred and seventy-five substances have been identified in the *Federal Register* on April 17, 1987 (100), October 20, 1988 (100), October 26, 1989 (25), October 17, 1990 (25), and on October 17,1991 (revised list of 275). The current priority list of 275 hazardous substances was published in the *Federal Register* on October 28, 1992. The development of the *Toxicological Profile* occurs in two stages:

(1) Initially, the Toxicological Profiles are produced in draft form, and an announcement of the release of these draft profiles for a 90-day public comment period appears in the *Federal Register*. Each draft *Toxicological Profile* is available from ATSDR.

(2) After the 90-day comment period expires, all comments are considered for incorporation into the documents, and the profiles are finalized and distributed by the National Technical Information Service (NTIS).

ATSDR has also been mandated to provide toxicological profiles to state health and environmental agencies, and make them available to other interested parties. ATSDR has determined the principal audiences for the profiles are health professionals at the federal, state, and local levels; academia; and members of the public involved with Superfund sites. The Division of Toxicology (DT) maintains a mailing list, which is updated and verified yearly, of these persons and distributes to them free copies of both draft and final profiles. The Agency publishes notices in the *Federal Register* announcing the availability of profiles as draft or final versions. For persons not on the mailing list, requests for final profiles must be submitted to NTIS, which distributes the final profiles for a fee. Please refer to the end of this information sheet for more information concerning ATSDR's mailing list policy.

Update Toxicological Profiles Available as Draft for Public Comment in October 1991:

Aldrin/Dieldrin	Arsenic
Benzene	Beryllium
Cadmium	Chloroform
Chromium	Cyanide
1,4-Dichlorobenzene	Di(2-ethylhexyl)phthalate
Heptachlor/Heptachlor epoxide	Lead
Methylene chloride	Nickel
N-nitrosodiphenylamine	Polychlorinated biphenyls
Tetrachloroethylene	Trichloroethylene
Vinyl chloride	

ATSDR's Congressional mandate requires that the Toxicological Profiles be updated every three years. The draft Toxicological Profiles listed above are updated versions of chemicals profiled in 1988. These more recent versions of previously finalized profiles are available as draft for public comment versions at no charge. The public comment period ended February 18, 1992. However, draft profiles are still available until the supply is exhausted. Requests must be submitted in writing to --

Division of Toxicology
Agency for Toxic Substances and Disease Registry
1600 Clifton Road NE, Mail Stop E-29
Atlanta, Georgia 30333

revised November 9, 1992

Finalized Toxicological Profiles: Chemical (NTIS Order Number):

Acrolein (PB/91/180307/AS)
Acrylonitrile (PB/91/180489/AS)
*Aldrin/Dieldrin (PB/89/214514/AS)
Ammonia (PB/91/180315/AS)
*Arsenic (PB/89/185706/AS)
Asbestos (PB/91/180497/AS)
*Benzene (PB/89/209464/AS)
Benzidine (PB/90/168204/AS)
Benzo(a)anthracene (PB/90/247669/AS)
Benzo(a)pyrene (PB/90/258245/AS)
Benzo(b)fluoranthene (PB/90/247651/AS)
*Beryllium (PB/89/148233/AS)
Bis(2-chloroethyl)ether (PB/90/168683/AS)
Bis(chloromethyl)ether (PB/90/168691/AS)
Bromodichloromethane (PB/90/167461/AS)
Bromoform (PB/91/180323/AS)
*Cadmium (PB/89/194476/AS)
Carbon tetrachloride (PB/90/168196/AS)
Chlordane (PB/90/168709/AS)
Chlorobenzene (PB/91/180505/AS)
Chlorodibromomethane (PB/91/180323/AS)
Chloroethane (PB/90/181264/AS)
*Chloroform (PB/89/160360/AS)
Chloromethane (PB91/180331/AS)
*Chromium (PB/89/236665/AS)
Chrysene (PB/90/247644/AS)
Copper (PB/91/180513/AS)
Creosote (PB91/180349/AS)
*Cyanide (PB/90/162058/AS)
p,p'-DDT, DDE, DDD (PB/90/182171/AS)
3,3'-Dichlorobenzidine (PB/90/171455/AS)
Di-n-butylphthalate (PB/91/180521/AS)
2,4- & 2,6-Dinitrotoluene (PB/90/171430/AS)
*Di(2-ethylhexyl)phthalate (PB/89/194484/AS)
Dibenzo(a,h)anthracene (PB/90/247636/AS)
*1,4-Dichlorobenzene (PB/89/160352/AS)
1,1-Dichloroethane (PB/91/180539/AS)
1,2-Dichloroethane (PB/90/171422/AS)
1,1-Dichloroethene (PB/90/182114/AS)
cis-, trans- 1,2-Dichloroethene (PB/91/180364/AS)
1,2-Dichloropropane (PB/90/182122/AS)
1,2-Diphenylhydrazine (PB/91/180356/AS)
Endrin/Endrin aldehyde (PB/91/180547/AS)
Ethylbenzene (PB/91/180372/AS)
Ethylene oxide (PB/91/180554/AS)
*Heptachlor/Heptachlor epoxide (PB/89/184492/AS)
Hexachlorobenzene (PB/91/180380/AS)
Hexachlorocyclohexane (PB/90/171406/AS)
Isophorone (PB/90/180225/AS)
*Lead (PB/90/267378/AS)
Mercury (PB/90/181256/AS)
*Methylene chloride (PB/89/194468/AS)
2-Methylnaphthalene (PB/91/180562/AS)
N-Nitrosodimethylamine (PB/90/182130/AS)
N-Nitrosodi-n-propylamine (PB/90/180258/AS)
*N-Nitrosodiphenylamine (PB/89/154090/AS)
Naphthalene (PB/91/180562/AS)
*Nickel (PB/89/160378/AS)
Nitrobenzene (PB/91/180398/AS)
Pentachlorophenol (PB/90/182163/AS)
Phenol (PB/90/181249/AS)
Plutonium (PB/91/180406/AS)
*Polychlorinated biphenyls: (PB/89/225403/AS)
Aroclor-1260, -1254, -1248, -1242, -1232, -1221, and -1016
Polycyclic aromatic hydrocarbons: (PB/91/181537/AS)
Acenaphthene, Acenaphthylene, Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, Chrysene, Dibenzo(a,h)anthracene Fluoranthene, Fluorene, Indeno(1,2,3-cd)pyrene, Phenanthrene, Pyrene
Radium (PB/91/180414/AS)
Radon (PB/91/180422/AS)
Selenium (PB/90/182155/AS)
Silver (PB/91/180430/AS)
2,3,7,8-Tetrachlorodibenzo-p-dioxin (PB/89/214522/AS)
1,1,2,2-Tetrachloroethane (PB/90/182148/AS)
*Tetrachloroethylene (PB/90/247628/AS)
Thorium (PB/91/180448/AS)
Toluene (PB/90/188904/AS)
Toxaphene (PB/91/180455/AS)
1,1,1-Trichloroethane (PB/91/180463/AS)
1,1,2-Trichloroethane (PB/90/196411/AS)
*Trichloroethylene (PB/90/127523/AS)
2,4,6-Trichlorophenol (PB/91/181545/AS)
Uranium (PB/91/180471/AS)
*Vinyl chloride (PB/90/103870/AS)
Total Xylenes (PB/91/181552/AS)
Zinc (PB/90/171414/AS)

*** Denotes an updated profile (containing more recent information) available in October 1991 as draft for public comment.**

NTIS is responsible for the distribution of finalized Toxicological Profiles. There is a charge, determined by the NTIS, for these profiles. Further ordering information on a *Toxicological Profile* listed above may be obtained by writing or calling --

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161
(800) 553-6847 or (703) 487-4650

Draft Toxicological Profiles Finalized in Summer 1992 (call for more information):

Aluminum	Cresols	Methyl parathion
Antimony	Dibromochloropropane	Mustard gas
Barium	1,2-Dibromoethane	Nitrophenol
2,3-Benzofuran	2,4-Dichlorophenol	Pyridine
Boron	1,3-Dichloropropene	Styrene
Bromomethane	Endosulfan	Thallium
1,3-Butadiene	Fluorides	Tin
2-Butanone	2-Hexanone	1,2,3-Trichloropropane
Carbon disulfide	Manganese	Vanadium
Cobalt	Methyl mercaptan	Vinyl acetate

The availability of each draft *Toxicological Profile* listed directly above was announced in the October 16, 1990 *Federal Register*. The public comment period expired February 15, 1991.

ATSDR TOXICOLOGICAL PROFILES CURRENTLY UNDER DEVELOPMENT

CERCLA Toxicological Profiles: ***Available as "Draft for Public Comment" in Fall 1992***

Acetone	1,2-Dichloroethane (UPDATE)	Mercury (UPDATE)
Carbon Tetrachloride (UPDATE)	1,1-Dichloroethene (UPDATE)	Methoxychlor
Chlordane (UPDATE)	Hexachlorobutadiene	Pentachlorophenol (UPDATE)
Chlorodibenzofurans	Hexachlorocyclohexanes (UPDATE)	Toluene (UPDATE)
4,4'-DDD,DDE,DDT (UPDATE)	MBOCA	Zinc (UPDATE)

US Department of Defense Toxicological Profiles: ***Available as "Draft for Public Comment" in February 1993***

Diethyl phthalate	Jet Fuels — JP-4 & JP-7	Tetryl
Ethylene and propylene glycols	Otto fuel II	Trinitrobenzene/1,3-Dinitrobenzene
Fuel Oils	RDX	Trinitrotoluene
Gasoline	Stoddard solvent	

The US Department of Defense (DOD) has asked ATSDR to develop Toxicological Profiles on the above substances found at DOD sites. It is anticipated that future DOD substances will be profiled by ATSDR as well.

*** ATSDR's Toxicological Profile Mailing List Policy ***

Because of resource limitations, all persons interested in being considered for the DT mailing list for final profiles must fall into one of the following categories: Health professionals at the federal, state, and local levels; academia; or nonprofit/environmental groups. Parties with special needs for the profiles will be considered on a case-by-case basis.

When requesting to be placed on the mailing list for Toxicological Profiles, please submit a written justification for inclusion on the mailing list and note why such inclusion is in the best interest of the general public. ATSDR will consider all requests; those persons added to the mailing list will be notified. All others will be referred to the National Technical Information Service or other distribution networks.

These procedures as established will apply to all persons requesting to be included on the Agency mailing list.

Department of Health and Human Services
U.S. Public Health Service
Agency for Toxic Substances and Disease Registry
Division of Toxicology
1600 Clifton Road N.E., Mail Stop E-29
Atlanta, Georgia 30333
(404) 639-6300 FAX: (404) 639-6315

ATSDR *TOX-INFO* LINE 24 HOURS-A-DAY
(404) 639-6000

ATSDR

The Agency for Toxic Substances and Disease Registry (ATSDR) is a federal public health agency located in Atlanta, Georgia. It is part of the Public Health Service within the U.S. Department of Health and Human Services. Created by Superfund legislation in 1980, ATSDR has a mission to prevent or mitigate adverse human health effects and diminished quality of life resulting from exposure to hazardous substances in the environment. To carry out this mission and serve the needs of the American public, ATSDR conducts activities in the following areas:

- ✓ **PUBLIC HEALTH ASSESSMENTS** - evaluate data and information on the release of hazardous substances into the environment to 1) assess any current or future impact on public health, 2) develop health advisories or other health recommendations, and 3) identify studies or actions needed to evaluate and mitigate or prevent human health effects. ATSDR conducts health assessments for all waste sites on the National Priorities List and in response to petitions from concerned individuals or organizations.

- ✓ **HEALTH INVESTIGATIONS** - increase our understanding of the relationship between exposure to hazardous substances and adverse human health effects, through epidemiologic, surveillance, and other studies of toxic substances and their effects.

- ✓ **EXPOSURE AND DISEASE REGISTRIES** - establish and maintain a registry of persons exposed to hazardous substances and a registry of serious diseases and illnesses in persons exposed to hazardous substances in the environment.

- ✓ **EMERGENCY RESPONSE** - provide health-related support to states, local agencies, and health care providers in public health emergencies that involve exposure to hazardous substances, including health consultations on request and training for first responders.

- ✓ **TOXICOLOGICAL PROFILES** - summarize and make available to the public data on the health effects of hazardous substances, identify significant gaps in knowledge, and initiate research in toxicology and health effects where needed.

- ✓ **HEALTH EDUCATION** - develop and disseminate, to physicians and other health care providers, materials on the health effects of toxic substances; establish and maintain a publicly accessible inventory of hazardous substances; and maintain a list of sites closed or restricted to the public because of contamination by hazardous substances.

- ✓ **APPLIED RESEARCH** - conduct or sponsor research to increase scientific knowledge about the effects on human health of hazardous substances released from waste sites or of other releases into the environment.

For more information, contact:

ATSDR
1600 Clifton Road, N.E. (E-28)
Atlanta, Georgia 30333.

March 1990

ATSDR Health Consultations

This fact sheet was developed to provide the public with information about ATSDR Health Consultations. ATSDR hopes it is useful to you in understanding what a Health Consultation is and how it can help you. You may have questions the fact sheet doesn't answer or need more information about ATSDR and its activities. A contact person is listed at the end of the fact sheet.

What is ATSDR?

ATSDR is the **Agency for Toxic Substances and Disease Registry**, a federal public health agency. ATSDR is part of the Public Health Service in the U.S. Department of Health and Human Services. ATSDR is not a regulatory agency like the U.S. Environmental Protection Agency. Created by Superfund legislation in 1980, ATSDR's mission is to **prevent or mitigate adverse human health effects and diminished quality of life resulting from exposure to hazardous substances in the environment**. Through its programs -- including surveillance, registries, health studies, environmental health education, and applied substance-specific research -- and by working with other federal, state, and local government agencies, ATSDR acts to protect public health.

What is a Health Consultation?

An ATSDR Health Consultation is not the same thing as a medical exam, a community health study, or a Public Health Assessment. It can sometimes lead to those things, as well as other public health activities.

A Health Consultation provides advice on a specific public health issue related to real or possible human exposure to toxic material. Anyone can request a Health Consultation. ATSDR receives the most requests from EPA and state and local health and environmental departments, and provides about 1,000 Health Consultations per year.

A Health Consultation is a way for ATSDR to respond quickly to a need for health information on toxic substances and make recommendations for actions to protect the public's health. ATSDR staff evaluate information available about toxic material at the site, determine whether people might be exposed to it, and report what harm exposure might cause. Health Consultations may consider —

- what the levels (or "concentrations") of hazardous substances are
- whether people might be exposed to contamination and how (through "exposure pathways" such as breathing air, drinking or contacting water, contacting or eating soil, or eating food)
- what harm the substances might cause to people (or the contaminants' "toxicity")
- whether working or living nearby might affect people's health
- other dangers to people, such as unsafe buildings, abandoned mine shafts, or other physical hazards

What Happens After the Health Consultation?

Every Health Consultation includes ATSDR's conclusions about public health hazards and recommendations for actions to protect the public's health. ATSDR's recommendations can cover many activities by EPA and state environmental and health agencies, as well as by ATSDR. For example, ATSDR recommendations can contribute to —

- site cleanup
- keeping people away from contamination and physical dangers — for example, by fencing the site
- giving residents acceptable drinking water
- relocating exposed people
- community environmental health education for residents and health care providers to inform them about site contaminants, harmful health effects, and ways to reduce or prevent health effects
- an ATSDR or state health study

In addition, a Health Consultation can lead to other ATSDR activities -- specifically, a **Public Health Assessment** or **Public Health Advisory.**

ATSDR Public Health Assessments report on sites but in more detail. They rely on three main types of information —

- ***environmental data,*** such as information available on contaminants and how people could come in contact with them
- ***health data,*** including available information on community-wide rates of illness, disease, and death compared with national and state rates
- ***community concerns,*** such as reports from the public about how the site affects their health or quality of life

Public Health Advisories are notices from ATSDR's administrator to EPA's administrator. They are used when sites pose an immediate and significant threat to people.

Fact sheets are available on Public Health Assessments, Public Health Advisories, and other ATSDR activities. If you want to know more about ATSDR, or if you have health concerns about a site or information to share about ways people might have been or might now be exposed to hazardous substances, please contact the person listed below.

For more information, call or write:

Lydia Ogden Askew
Community Involvement Liaison
ATSDR-Division of Health Assessment and Consultation
1600 Clifton Road, NE (E32)
Atlanta, Georgia 30333
404/330-9543 (24 hours)

Recycled Paper

April 1992

ATSDR Public Health Assessments

ATSDR developed this fact sheet to provide the public with information about its Public Health Assessments -- a term that can be confusing. A Public Health Assessment is not the same thing as a medical exam or a community health study. It can sometimes lead to those things, as well as other public health activities. ATSDR hopes this fact sheet is helpful to you in understanding what a Public Health Assessment is. You may have questions the fact sheet doesn't answer or need more information about the agency and its activities. A contact person is listed at the end of the fact sheet.

What is ATSDR?

ATSDR is the **Agency for Toxic Substances and Disease Registry**, a federal public health agency. ATSDR is part of the Public Health Service within the U.S. Department of Health and Human Services. ATSDR is not a regulatory agency like the U.S. Environmental Protection Agency. Created by Superfund legislation in 1980, ATSDR's mission is to **prevent or mitigate adverse human health effects and diminished** quality of life resulting from exposure to hazardous substances in the **environment**. Through its programs -- including surveillance, registries, health studies, environmental health education, and applied substance-specific research -- and by working with other federal, state, and local government agencies, ATSDR acts to protect public health.

What is a Public Health Assessment?

An ATSDR Public Health Assessment gathers available information about hazardous substances at a site and evaluates whether exposure to those substances might cause any harm to people. ATSDR conducts a Public Health Assessment for every site on or proposed for the National Priorities List (the NPL, also known as the Superfund list).

Public Health Assessments consider --

- what the levels (or "concentrations") of hazardous substances are
- whether people might be exposed to contamination and how (through "exposure pathways" such as breathing air, drinking or contacting water, contacting or eating soil, or eating food)
- what harm the substances might cause to people (or the contaminants' "toxicity")
- whether working or living nearby might affect people's health

To make those determinations, ATSDR looks at three primary sources of information --

- environmental data, such as information available on the contaminants and how people could come in contact with them
- health data, including available information on community-wide rates of illness, disease, and death compared with national and state rates
- community concerns, such as reports from the public about how the site affects their health or quality of life

How Are Public Health Assessments Used?

ATSDR's Public Health Assessments are used to identify health studies or other public health actions -- such as environmental health education for the community and its health care providers -- that might be needed. They advise federal, state, and local agencies on actions to prevent or reduce people's exposure to hazardous substances. They are also used to develop Public Health Advisories and other recommendations to protect the public's health.

How Is the Community Involved in a Public Health Assessment?

The community has a key role to play in a Public Health Assessment and any activity that may follow. Throughout the Public Health Assessment, ATSDR talks with people living or working near the site -- community groups, local leaders, and health professionals, among other community members -- about what they know about the site and their site-related health concerns. Community health concerns are addressed in every Public Health Assessment for every site.

Two-way communication between the public and ATSDR is vital to a successful **Public Health Assessment**. For that reason, ATSDR has several mechanisms to keep the public informed and to solicit information from the community, such as --

- Public Availability Sessions where community members can meet individually with ATSDR staff.
- Public Meetings so community members can express ideas in a larger forum.
- Community Assistance Panels, or CAPs, which work to inform ATSDR about community concerns and health information and, in turn, to inform the community about ATSDR activities and the status of the Public Health Assessment.
- Other communication channels, such as contact with local community groups, political leaders, and health professionals, as well as articles in local newspapers and stories on television and radio stations.
- Before the Public Health Assessment is finished, it is available in the community during the Public Comment Period. The Public Comment Period gives the community the opportunity to tell ATSDR how well the Public Health Assessment addresses health concerns. To provide information back to the community, ATSDR responds to public comments in the final Public Health Assessment.

Fact sheets are available on Public Health Advisories, Health Consultations, and other ATSDR activities. If you want to know more about ATSDR, or if you have health concerns or information to share about ways people might have been or might now be exposed to hazardous substances, please contact the person listed below.

For more information, call or write:

Lydia Ogden Askew
Community Involvement Liaison
ATSDR-Division of Health Assessment and Consultation
1600 Clifton Road, NE (E32)
Atlanta, Georgia 30333
404/330-9543 (24 hours)

H. DOCUMENTS IN MOUND PLANT CERCLA PUBLIC READING ROOM

Reading Room Additions

New Documents in the Mound Plant CERCLA Public Reading Room

MOUND
Environmental Restoration Program

March 1994

As the Mound Plant cleanup progresses, new documents are generated and added to the CERCLA Public Reading Room. The most recent additions since January 1994 are:

Administrative Record section:

- Operable Unit 5 South Property Remedial Investigation/Feasibility Study Work Plan
- Operable Unit 5 South Property Remedial Investigation/Feasibility Study Sampling and Analysis Plan, Quality Assurance Plan, Field Sampling Plan
- Operable Unit 5 South Property Remedial Investigation/Feasibility Study Health and Safety Plan
- Operable Unit 5 Action Memorandum/Removal Site Evaluation Fire Fighting Training Area Site

CERCLA Document section:

- Operable Unit 2 B Building Solvent Shed Removal Action Memorandum

Operable Unit 5 (South Property) Work Plan

The Operable Unit 5 Work Plan describes the known physical characteristics of the site and outlines Remedial Investigation fieldwork activities that will be conducted to determine if contamination exists, if the site poses potential risks to human health and the environment, and if remediation is necessary.

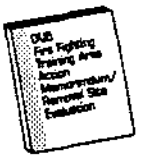
Operable Unit 5 Sampling and Analysis Plan

The Operable Unit 5 Sampling and Analysis Plan is a companion document to the Work Plan. It describes quality assurance and quality control procedures that will be followed during Remedial Investigation sampling in the South Property. It also dictates all field sampling locations and methods, sample handling and shipment methods, required laboratory analysis methods and detection limits, and data validation efforts necessary to meet Remedial Investigation objectives.

Operable Unit 5 Health and Safety Plan

The Operable Unit 5 Health and Safety Plan is a companion document to the Work Plan. It describes procedures for protecting on-site workers and the public from hazardous substances during the Operable Unit 5 Remedial Investigation. It also details such topics as worker training, personal protection equipment, spill containment, and decontamination procedures. The plan complies with Occupational Safety and Health Administration (OSHA) requirements and must be read by all field personnel. A copy of the plan must be kept on-site at or near all Remedial Investigation fieldwork sites.

EG&G



Operable Unit 5 Fire Fighting Training Area Site Action Memorandum/Removal Site Evaluation

The Fire Fighting Training Area Site Action Memorandum/Removal Site Evaluation describes the physical location and characteristics of the site and the nature and extent of contamination—primarily petroleum products in on-site soils. It also evaluates potential remedies for cleaning up the site and selects a proposed remedy—ex-situ biological remediation. The potential remedies were evaluated in terms of cost, effectiveness in cleaning up the contamination, and protection of human health and the environment.

The proposed technology—ex-situ biological remediation—involves three main steps:

- Installing a groundwater extraction well with an oil/water separator to pump out petroleum floating on the water table
- Removing the concrete fire training pits and digging up the contaminated soils
- Placing the contaminated soils in two piles and introducing microorganisms that will "eat" the petroleum, converting it over time to carbon dioxide and water

Operable Unit 2 (Main Hill) B Building Solvent Storage Shed Removal Action Memorandum

The B Building Removal Action Memorandum describes the physical location and characteristics of the site and the nature and extent of contamination—primarily volatile organic compounds in underlying soils. It also evaluates potential remedies for cleaning up the site and selects a proposed remedy—soil vapor extraction. The potential remedies were evaluated in terms of cost, effectiveness in cleaning up the contamination, and protection of human health and the environment.

The proposed remedy—soil vapor extraction—involves:

- Installing extraction wells into contaminated soils
- Pumping out evaporated organic compounds in the spaces between soil particles
- Separating out any residual groundwater for treatment
- Filtering or destroying organic vapors

These documents are available to the public in the Mound Plant CERCLA Public Reading Room, located in the Miamisburg Senior Adult Center, 305 E. Central Ave., Miamisburg, Ohio.

Reading Room Additions *will be published quarterly by EG&G Mound CERCLA Community Relations. Copies will be distributed at CERCLA Quarterly Public Meetings and in the Public Reading Room.*

Reading Room Additions

New Documents in the Mound Plant CERCLA Public Reading Room

MOUND

Environmental Restoration Program

March 1994

As the Mound Plant cleanup progresses, new documents are generated and added to the CERCLA Public Reading Room. The most recent additions since January 1994 are:

Administrative Record section:

- Operable Unit 5 South Property Remedial Investigation/Feasibility Study Work Plan
- Operable Unit 5 South Property Remedial Investigation/Feasibility Study Sampling and Analysis Plan, Quality Assurance Plan, Field Sampling Plan
- Operable Unit 5 South Property Remedial Investigation/Feasibility Study Health and Safety Plan
- Operable Unit 5 Action Memorandum/Removal Site Evaluation Fire Fighting Training Area Site

CERCLA Document section:

- Operable Unit 2 B Building Solvent Shed Removal Action Memorandum

Operable Unit 5 (South Property) Work Plan

The Operable Unit 5 Work Plan describes the known physical characteristics of the site and outlines Remedial Investigation fieldwork activities that will be conducted to determine if contamination exists, if the site poses potential risks to human health and the environment, and if remediation is necessary.

Operable Unit 5 Sampling and Analysis Plan

The Operable Unit 5 Sampling and Analysis Plan is a companion document to the Work Plan. It describes quality assurance and quality control procedures that will be followed during Remedial Investigation sampling in the South Property. It also dictates all field sampling locations and methods, sample handling and shipment methods, required laboratory analysis methods and detection limits, and data validation efforts necessary to meet Remedial Investigation objectives.

Operable Unit 5 Health and Safety Plan

The Operable Unit 5 Health and Safety Plan is a companion document to the Work Plan. It describes procedures for protecting on-site workers and the public from hazardous substances during the Operable Unit 5 Remedial Investigation. It also details such topics as worker training, personal protection equipment, spill containment, and decontamination procedures. The plan complies with Occupational Safety and Health Administration (OSHA) requirements and must be read by all field personnel. A copy of the plan must be kept on-site at or near all Remedial Investigation fieldwork sites.

EG&G

Operable Unit 5 Fire Fighting Training Area Site Action Memorandum/Removal Site Evaluation

The Fire Fighting Training Area Site Action Memorandum/Removal Site Evaluation describes the physical location and characteristics of the site and the nature and extent of contamination—primarily petroleum products in on-site soils. It also evaluates potential remedies for cleaning up the site and selects a proposed remedy—ex-situ biological remediation. The potential remedies were evaluated in terms of cost, effectiveness in cleaning up the contamination, and protection of human health and the environment.

The proposed technology—ex-situ biological remediation—involves three main steps:

- Installing a groundwater extraction well with an oil/water separator to pump out petroleum floating on the water table
- Removing the concrete fire training pits and digging up the contaminated soils
- Placing the contaminated soils in two piles and introducing microorganisms that will "eat" the petroleum, converting it over time to carbon dioxide and water

Operable Unit 2 (Main Hill) B Building Solvent Storage Shed Removal Action Memorandum

The B Building Removal Action Memorandum describes the physical location and characteristics of the site and the nature and extent of contamination—primarily volatile organic compounds in underlying soils. It also evaluates potential remedies for cleaning up the site and selects a proposed remedy—soil vapor extraction. The potential remedies were evaluated in terms of cost, effectiveness in cleaning up the contamination, and protection of human health and the environment.

The proposed remedy—soil vapor extraction—involves:

- Installing extraction wells into contaminated soils
- Pumping out evaporated organic compounds in the spaces between soil particles
- Separating out any residual groundwater for treatment
- Filtering or destroying organic vapors

These documents are available to the public in the Mound Plant CERCLA Public Reading Room, located in the Miamisburg Senior Adult Center, 305 E. Central Ave., Miamisburg, Ohio.

Reading Room Additions *will be published quarterly by EG&G Mound CERCLA Community Relations. Copies will be distributed at CERCLA Quarterly Public Meetings and in the Public Reading Room.*

CERCLA PUBLIC READING ROOM
MOUND PLANT
INFORMATION REPOSITORY INDEX
As of March 31, 1994

CERCLA DOCUMENTS

* FFA; U.S. EPA, Region V and The State of Ohio; Federal Facility Agreement Under CERCLA Section 120; of the U.S. DOE's Mound Plant; Miamisburg, OH. July 15, 1993. OH6 890 008 984. (AR #SP.4-3-2193)

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* CERCLA Notebook. November 12, 1992. EG&G Mound Applied Technologies, Miamisburg, Ohio. (AR #PP.3-1-62893)

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* *Denotes Administrative Record Documents*

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* OU2; Mound Plant; Main Hill Seeps; Operable Unit 2; On-Scene Coordinator Report for CERCLA Section 104 Removal Action; West Powerhouse PCB Site; Final. October 1991. U.S. Department of Energy, Albuquerque Field Office, Albuquerque, NM. (AR #0U2-3.6-1-2193)

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* OU2; B Building Solvent Shed Removal Action Memorandum; Mound Plant, Miamisburg, Ohio. Final. February 25, 1994. U. S. Department of Energy, Albuquerque Field Office, Albuquerque, NM. (AR #OU2.7.0-1-31794)

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* *Denotes Administrative Record Documents*

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* OU9; Remedial Investigation/Feasibility Study; Operable Unit 9; Site-Wide Work Plan; Field Sampling Plan; Volume I; Final. May 1992. U.S. Department of Energy, Albuquerque Field Office, Albuquerque, NM. (AR #OU9.1.2-1-2193)

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* *Denotes Administrative Record Documents*

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Individual Submitted Postcards

I. PROGRESS REPORTS

Progress Report

New Mound Plant CERCLA Public Reading Room

March 1994

MOUND
Environmental Restoration Program

The new Mound Plant CERCLA Public Reading Room was established for you as a Mound stakeholder. It contains Mound's Administrative Record and Information Repository, as well as non-CERCLA U.S. Department of Energy (DOE) and Mound documents. CERCLA* requires the establishment of an Administrative Record and Information Repository at every Superfund site because citizens have a right to know when contamination is present in their community, what kind of contamination is there, and how it will be cleaned up. During a Superfund cleanup, the public may comment, criticize or offer new information on proposed cleanup remedies during formal public comment periods. The documents that "form the basis" for selecting a proposed remedy, as well as other background and reference materials, are made available to the public in the Public Reading Room as soon as they are generated or received by Mound.

What: Mound Plant CERCLA Public Reading Room

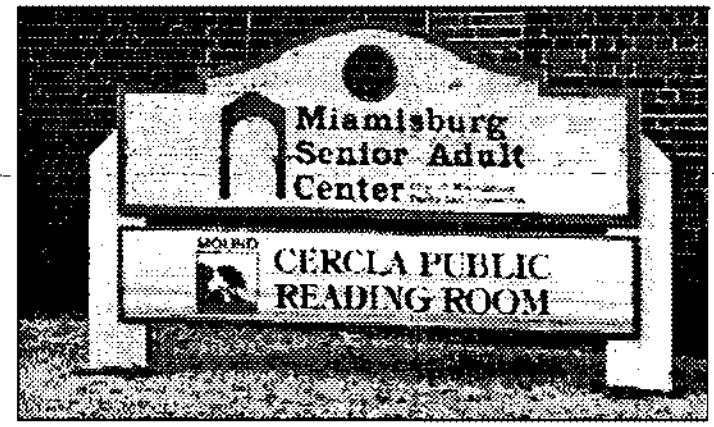
Where: Main floor of Miamisburg Senior Adult Center, 305 E. Central Ave., Miamisburg, Ohio

When: Staffed 35 hours a week by a City of Miamisburg employee and volunteers who will answer questions, help locate documents, and assist in making photocopies

Monday	12 pm – 8 pm
Tuesday	8:30 am – 1 pm; 4 pm – 8 pm
Wednesday	12 pm – 8 pm
Thursday	8:30 am – 1 pm
Friday	10:30 am – 4:30 pm

Closed Saturdays and Sundays

How: Documents can be removed from the shelves for reading and photocopying during open hours, but they cannot be checked out overnight.



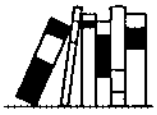
The Mound Plant CERCLA Public Reading Room moved to its new home at the Miamisburg Senior Adult Center in January 1994. It relocated from the Miamisburg Public Library due to space limitations.

What is an Administrative Record?

The Administrative Record is a compilation of major reports, documents, agreements, transcripts, records and comments submitted by the public that either relate to selection of a final cleanup remedy or document the decision-making process itself. The record serves two main purposes:

- to keep the public informed and involved in the site restoration
- to serve as the legal and historical record of why and how decisions were made—from investigation of a site to selection of a final remedy.

All Superfund sites maintain at least two identical Administrative Records: one copy is for the public and the other is kept on site for legal purposes. At federal facilities (i.e. Mound), a third copy also is provided to the regulators.



What is an Information Repository?

The Information Repository is where general CERCLA information, secondary sources or background materials are compiled. These documents are relevant to the site cleanup, but are not specifically used to help select a cleanup method. They often lead up to or are incorporated into Administrative Record documents.

EG&G

The following information can be found in the Mound Plant CERCLA Public Reading Room: (the documents are divided into six different sections and organized either by Operable Unit number or subject matter.)

Administrative Record documents

- CERCLA Notebook (contains information on Mound Plant history, Mound Plant Operable Units, the CERCLA program, the U.S. Agency for Toxic Substances and Disease Registry (ATSDR), a glossary and acronyms list, all Superfund Update newsletters to date and all Mound Plant Fact Sheets and Progress Reports to date)
- All area newspaper articles on the Mound Plant since January 1991
- Community Relations Plan for the Mound Plant
- Federal Facility Agreement between the Mound Plant, USEPA and Ohio EPA
- All major decision documents generated to date, organized by Operable Unit (i.e. Operable Unit 9 Remedial Investigation Work Plan)

CERCLA Documents (Mound Information Repository)

- Special Reports (i.e. Special Canal Sampling Report, Miami-Erie Canal)
- Site Scoping Reports (i.e. Site Scoping Report, Volume 3, Radiological Site Survey)
- Technical memoranda, reference books and related materials

ATSDR Documents (Mound Information Repository)

- ATSDR documents (i.e. Health Consultation on the Miami-Erie Canal) and guidance manuals

Non-CERCLA Documents

- Non-CERCLA documents related to Mound environmental programs (i.e. Environmental Monitoring at Mound annual reports; Mound Laboratory Environmental Plutonium Study 1974, D. R. Rogers)

ER/WM Five Year Planning Documents

- Non-CERCLA documents related to Mound Environmental Restoration and Waste Management plans (i.e. Mound Plant Environmental Restoration and Waste Management Site-Specific Plan)

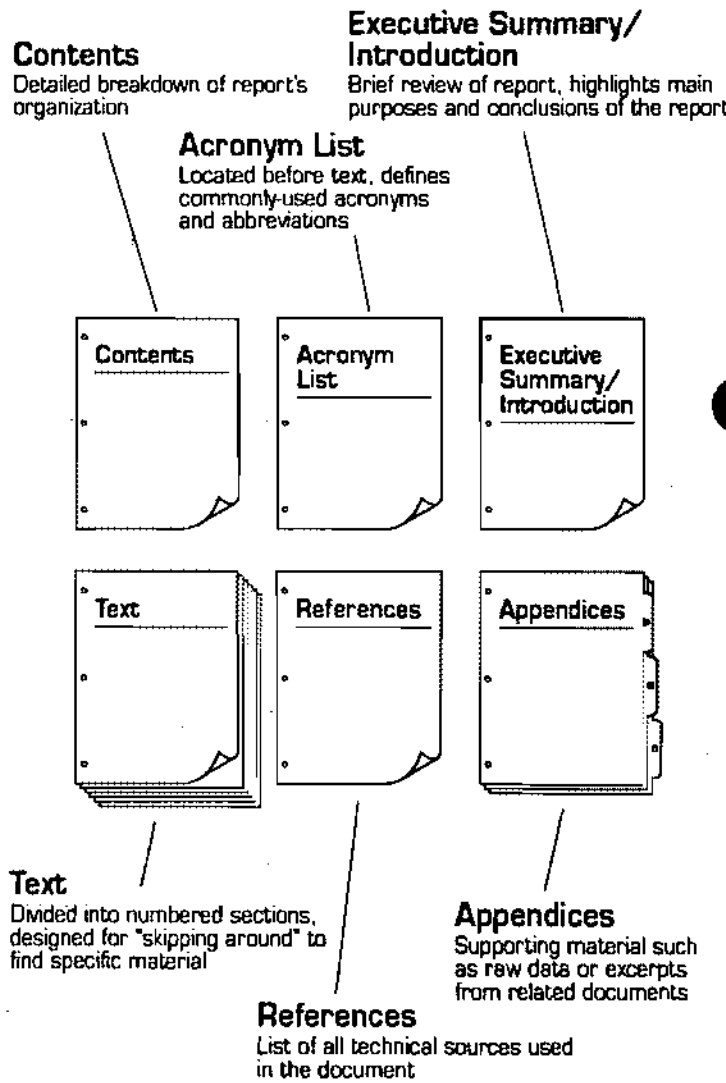
Nonnuclear Consolidation/ Reconfiguration Study documents

- Non-CERCLA documents related to DOE activities (i.e. Public Comment, DOE Weapons Complex Reconfiguration Programmatic Environmental Impact Statement)

How to Read a CERCLA Document

The majority of documents in the Administrative Record and Information Repository are "CERCLA" documents. These documents plan or report the results of Operable Unit fieldwork and laboratory analysis, previous studies and community interviews. They are recognizable by their blue covers and DOE seal on three-ring binders or spiral notebooks. All CERCLA documents follow the same basic structure for quick access to specific information (see graphic).

Here's the basic structure of a CERCLA document:



**CERCLA stands for the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, which governs all Superfund cleanups.*

Progress Report

Regroup, Eliminate OU3 Sites

June 1993

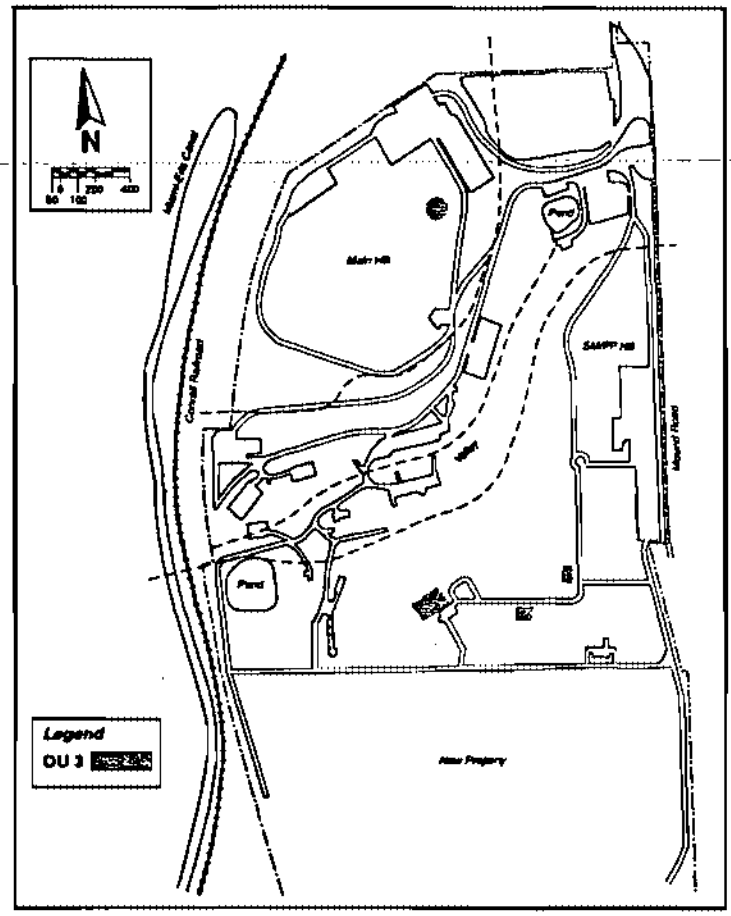
MOUND
Environmental Restoration Program

The report on the Limited Field Investigation of Mound's OU3 recommends the regrouping or elimination from further investigation or action several previously uninvestigated areas of possible contamination. OU3 addressed 32 potential release sites throughout Mound Plant on which little or no prior data had existed.

A Limited Field Investigation is undertaken to gain enough information on uninvestigated sites to "scope" them properly. In the language of CERCLA, "scope" is a preliminary understanding of the extent of possible contamination and its potential exposure "pathways" to people and the environment.

After testing for a variety of hazardous chemicals and radioactive waste during 1991 and 1992, the OU3 Limited Field Investigation found no need for further CERCLA investigation at 23 of 32 potential release sites.

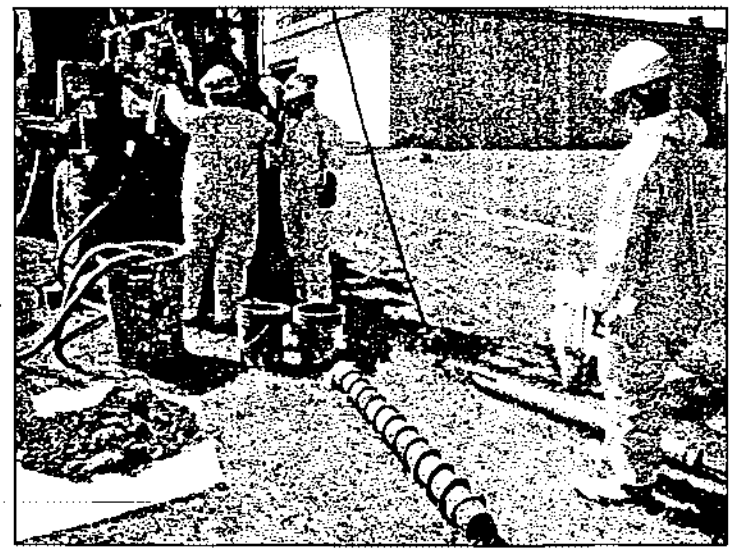
The OU3 Limited Field Investigation Report recommends further investigation into nine of the 32 poten-



OU3 Documents in the Information Repository

The following documents on OU3 are now available for public inspection in the Mound Information Repository at the Miamisburg Public Library, 35 S. Fifth St., Miamisburg:

- *Letter Report: Preliminary Results of Reconnaissance Magnetic Survey; Mound Plant–Areas 2, 6, 7 and C (November 1990).*
- *Operable Unit 3; Miscellaneous Sites; Quality Assurance Project Plan (November 1991).*
- *Operable Unit 3; Miscellaneous Sites; Limited Field Investigation Work Plan; Health and Safety Plan (November 1991).*
- *Closure Report; Building 34; Aviation Fuel Storage Tank (August 1992).*
- *Closure Report; Building 51; Waste Storage Tank (August 1992).*



Soil sampling using hollow-stem auger drilling rig.

EG&G

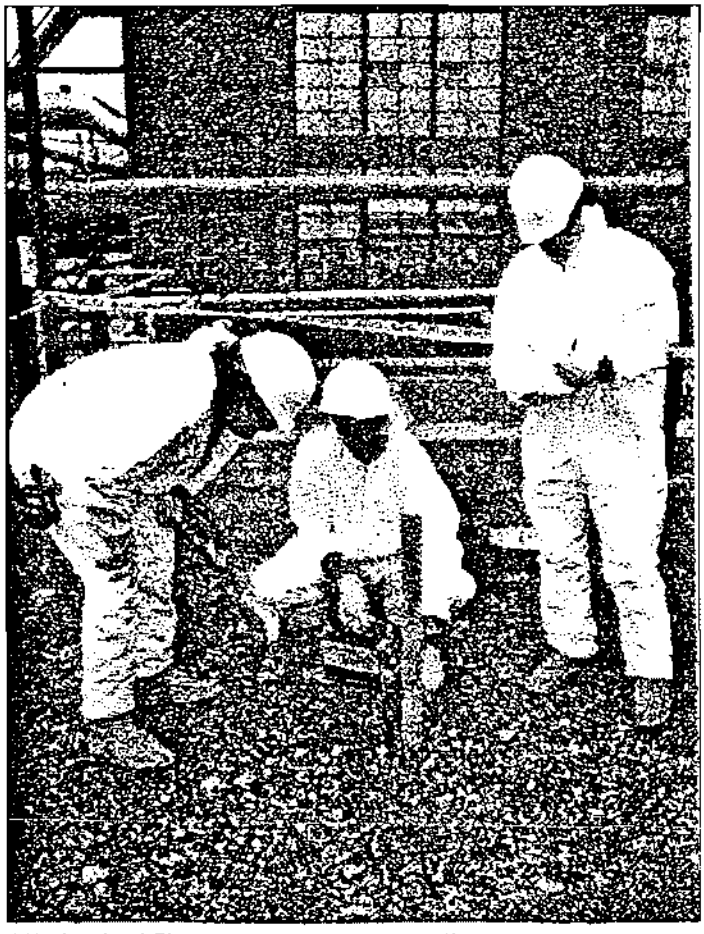
tial release sites. These 9 sites will be divided between OU2, Main Hill, and OU5, South Property. One site, the Waste Disposal Glass Melter Sump, will be reassigned to OU6, Decontamination and Decontamination (D&D) Program Sites.

The Limited Field Investigation Report is undergoing final review by USEPA and OEPA. Once approved, it will be released to the public. Final decisions on the regrouping and elimination of OU3 sites will be made at a later date.

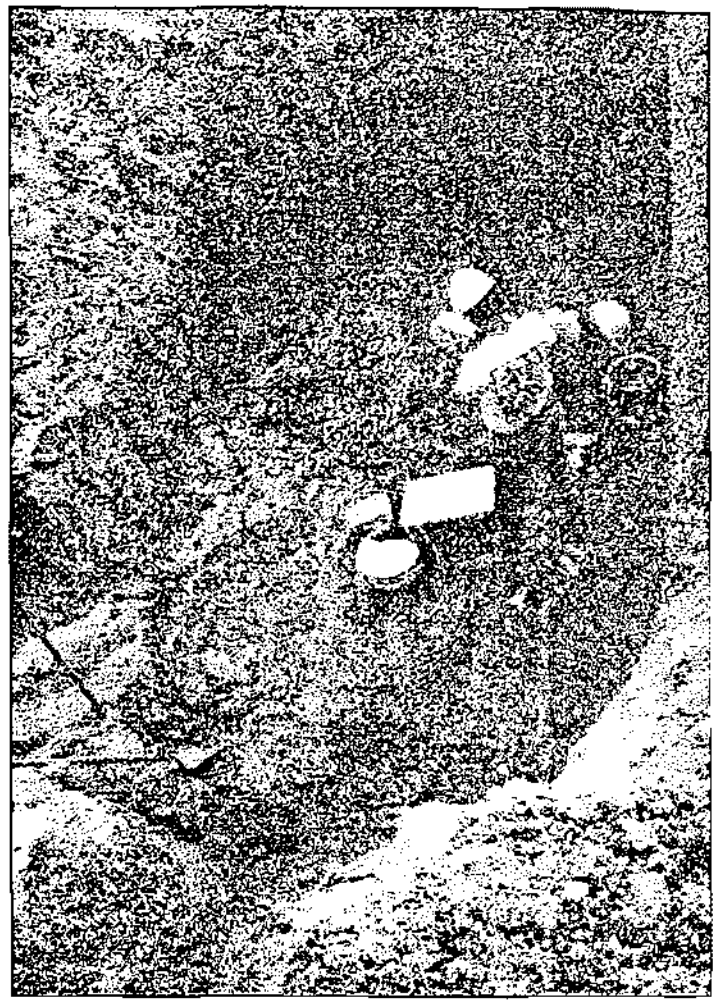
Previously Eliminated Operable Units

Upon the elimination of OU3, six of Mound's original nine OUs will remain. OUs 7 and 8 were eliminated previously. OU7 had addressed suspected release sites at which previous inspections found no evidence of a release. OU7 was eliminated in 1990 after current information was evaluated under CERCLA and it was determined the sites do not warrant further investigation.

OU8 had addressed underground storage tanks on-site. Some tanks were added to their geographically appropriate Operable Unit and the remaining tanks were placed in other regulated Mound programs. OU8 was eliminated in January, 1993.



OU3 Limited Field Investigation: Sampling at Powerhouse



OU3 Limited Field Investigation: Building 34 Tank Site

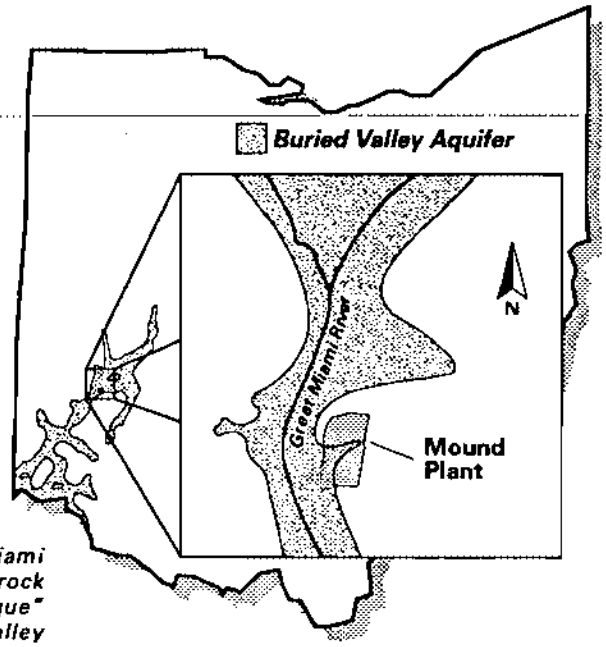
Progress Report

Hydrogeological Investigation

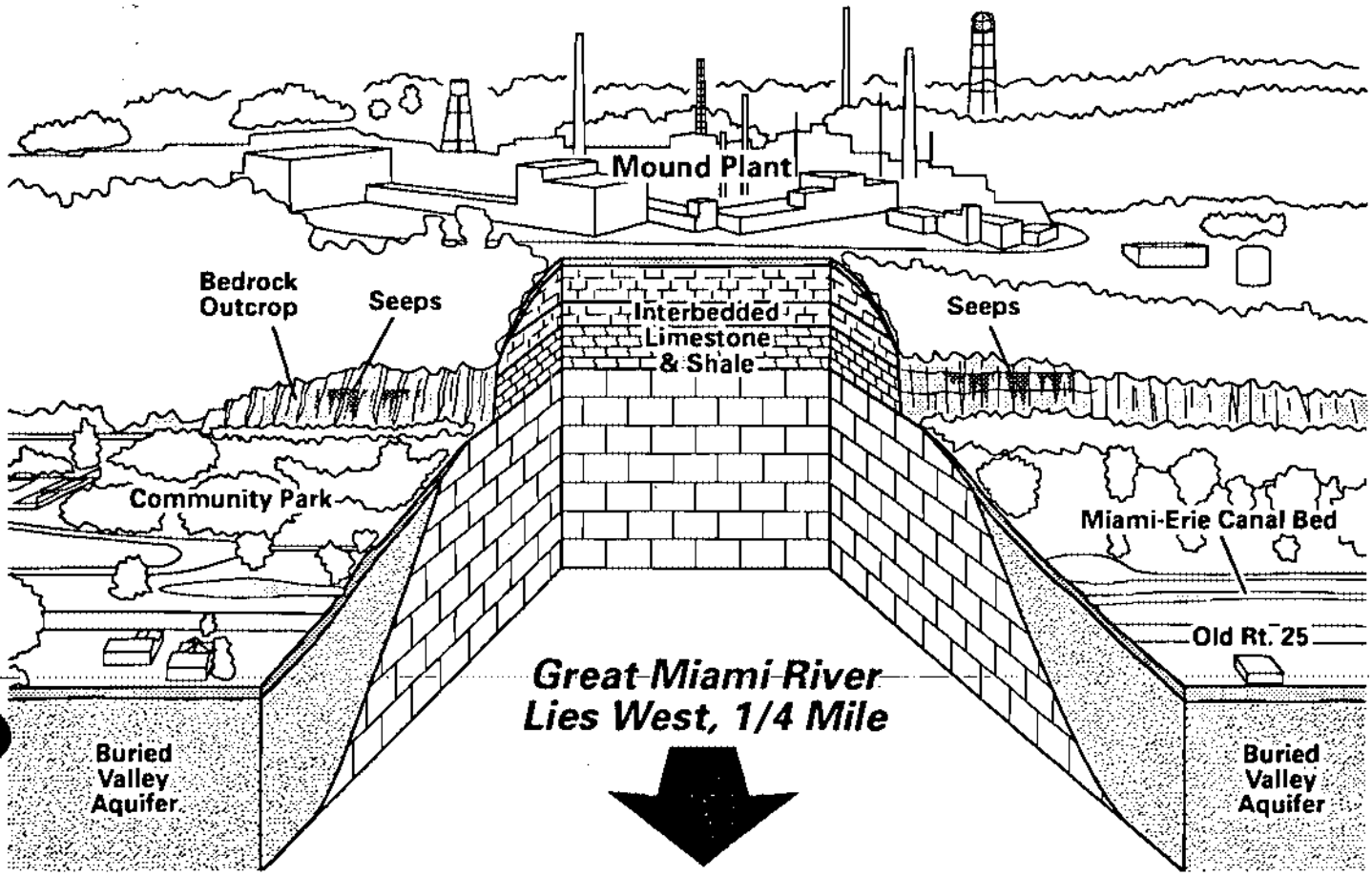
October 1993

MOUND
Environmental Restoration Program

The recently completed fieldwork for the Mound Hydrogeologic Investigation was an important part of the Mound's CERCLA Program as a whole. ***Hydrogeologic*** *describes studying the interaction of groundwater with underground soil and rock. The Mound Hydrogeologic Investigation concentrates on finding and assessing any contaminated groundwater possibly migrating through the earth into the Buried Valley Aquifer (BVA), which supplies drinking water to regional communities, including Miamisburg.*



Formed by glaciers during the Ice Age, the Buried Valley Aquifer is the Miami Valley's sole source of drinking water. Mound Plant is located on a rock ridge near the Great Miami River and partially atop the aquifer. A "tongue" of the aquifer underlies an old disposal area and enters the narrow valley between the two hills on which all site operations are located.

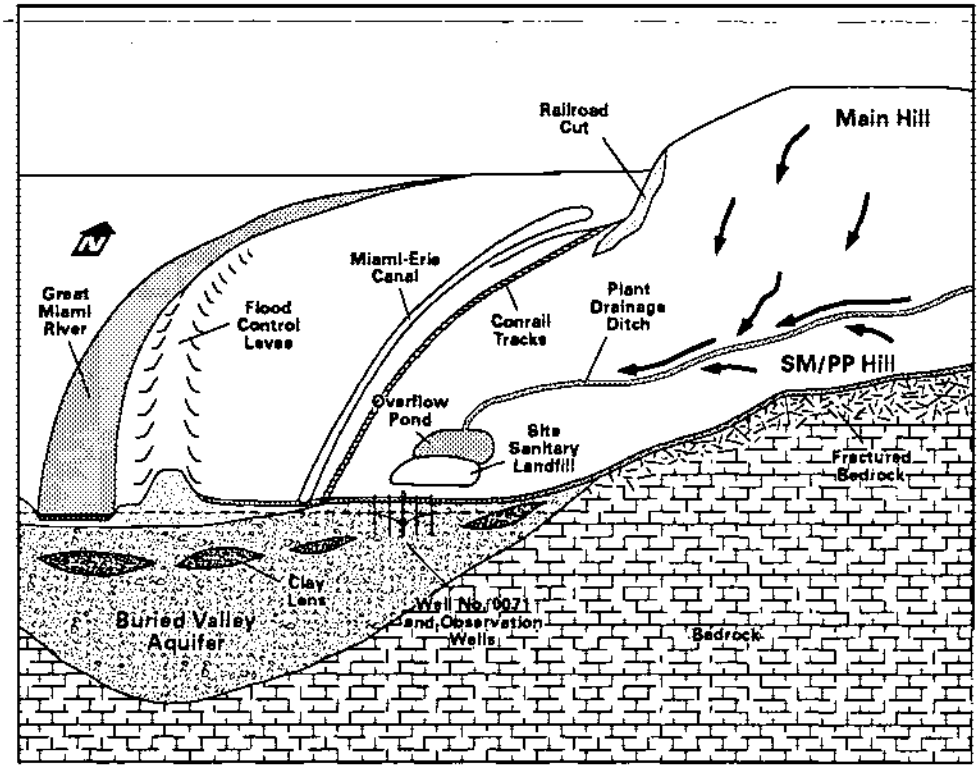


Purpose

- Enable cleanup planners to locate, assess and treat any groundwater contamination possibly migrating from Mound Plant

Work Scope

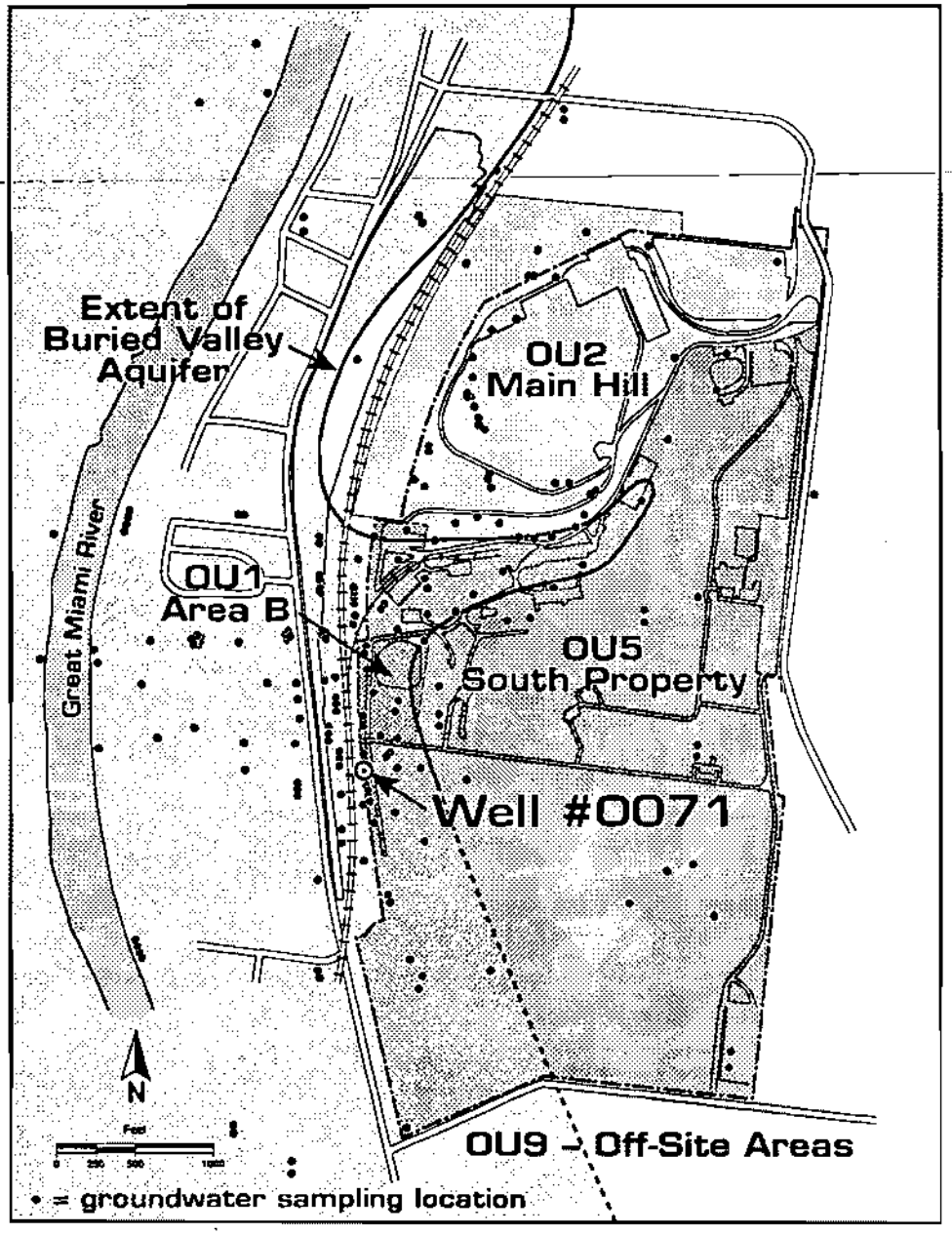
- Determine the direction and rate of groundwater flow underneath Mound and the BVA
  - Installing a network of 99 new groundwater monitoring wells to expand Mound's existing network
  - Conducting a special Aquifer Test in which water is pumped in high volume from the aquifer and the effects are measured by other wells



Groundwater flows southwest through the BVA "tongue" in the valley between Mound Plant's two hills and then flows generally southward towards well #0071.

- Determine the composition and layering of bedrock underlying and surrounding the BVA
  - Studying bedrock core samples taken during well drilling

- Assess the quality of groundwater flowing from Mound Plant into the aquifer
  - Regular sampling of the network of monitoring wells, current and long-term
  - "Background" sampling to determine quality of groundwater unaffected by Mound

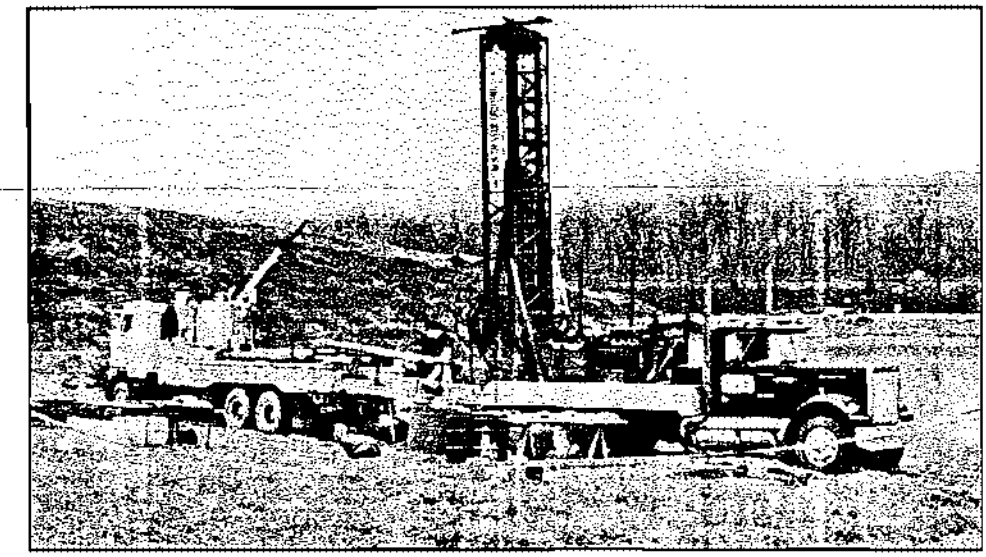


The Hydrogeologic Investigation explored the local extent of the BVA through a network of groundwater wells. Data gathered will be used in continuing investigations of OUs 1, 2, 5 and 9.

- Revise conceptual model of the Mound-BVA relationship
  - To be used in other investigations, Site-Wide Risk Assessment and development of any necessary treatment methods

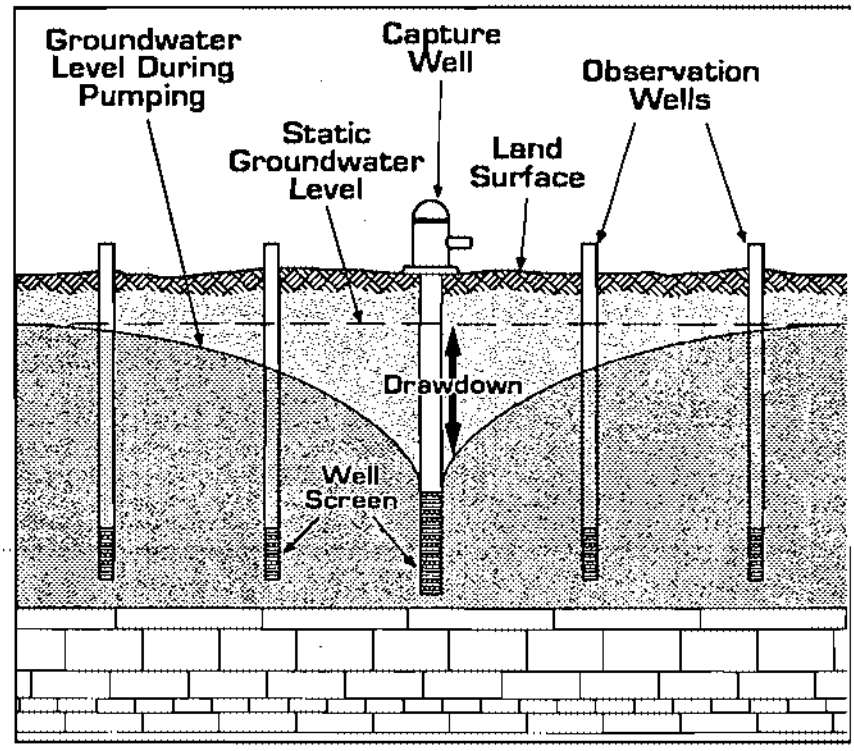
Progress to Date

- **Data, sample analysis** underway
- **Well installation**—October 1992-April 1993
  - 99 monitoring wells and piezometers installed—63 in OU9, 26 in OU1
  - Access agreements signed for off-site locations



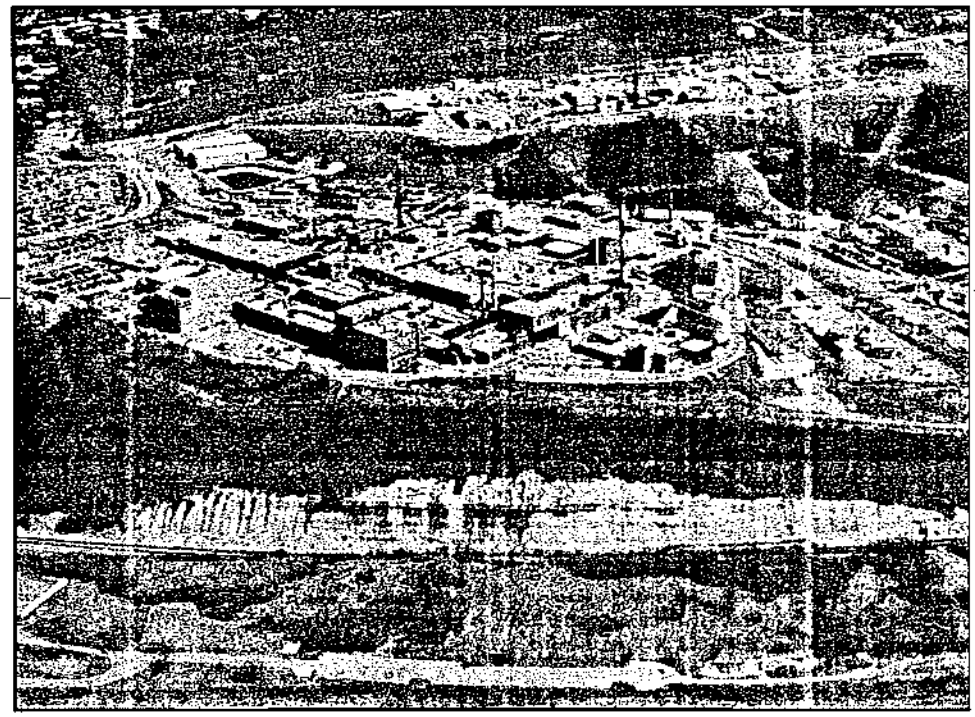
OU1 well drilling for Hydrogeological Investigation.

- **OU1 Aquifer Test**—May-June 1993
  - Characterize groundwater flow in immediate vicinity of Area B
  - Assess possible groundwater contamination originating from historic disposal area—VOCs
  - 35-day continuous pumping of nearby on-site well (#0071), up to 600 gallons per minute (See Page 3)
  - Effects on groundwater measured by 52 observation wells
  - Completion of Aquifer Test marks end of fieldwork for Operable Unit 1 Remedial Investigation



During the OU1 Aquifer Test, groundwater near Area B was pumped from one well, and the effects on the water table were measured by a network of 52 observation wells.

- **Railroad cut characterization**—June 1993
  - Determine composition, layering, fracturing of Main Hill bedrock
  - Model of groundwater seeps



Groundwater seeping through exposed bedrock on the Main Hill's railroad cut. These seeps emit only slight amounts of groundwater.

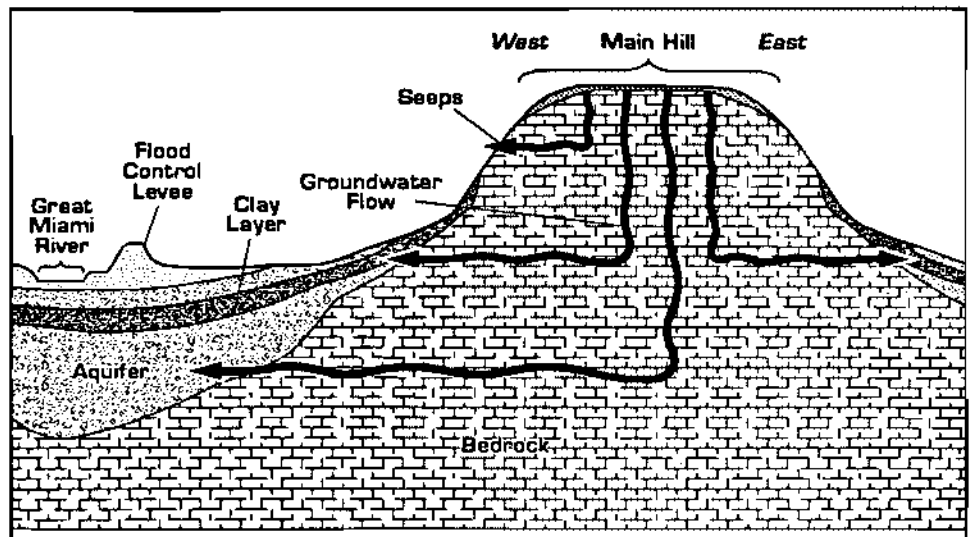
Geologists rappel down the railroad cut to characterize Main Hill bedrock.

Schedule for FY94

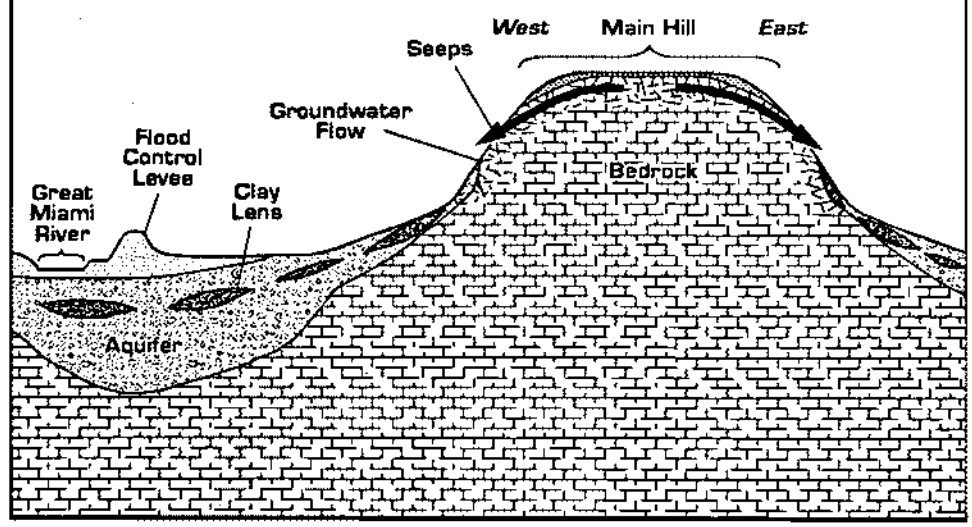
- Hydrogeologic Investigation Report—1994
- Fall/spring "sweep" sampling of all groundwater wells to continue
  - Fall 1993-Spring 1994
  - Determine groundwater trends

Early Results–Revised BVA Conceptual Model

- Important changes for the tracing and treatment of potential groundwater contamination
- Bedrock cores taken during well drilling for the Hydrogeologic Investigation have revised the hydrogeological relationship between Mound Plant and the BVA
- Revised conceptual model of Mound/BVA interaction
  - Fractures in bedrock confined to exposed elevations; do not occur significantly at depths below elevation of Main Hill Seeps
  - Clay layer in BVA is broken into lenses; not an impermeable, unbroken layer



***Previous** BVA conceptual model, in which groundwater entered aquifer directly through fractured bedrock. Aquifer divided in two by impermeable clay layer.*



***Current model** — shallower fracturing means that groundwater from the Main Hill does not enter aquifer directly through bedrock. Aquifer is not split into two discrete sections by clay layer.*

- Interpretation of revised model
  - Significant amounts of groundwater do not move downward through Main Hill and enter BVA directly through bedrock, as previously thought
  - Any groundwater reaching BVA from Mound probably originates from runoff and surface seeps
  - BVA not divided into unconnected upper and lower portions; groundwater can circulate between shallower and deeper points in the aquifer

J. (FUTURE INFORMATION)

Mound's CERCLA Public Participation Program at a Glance

These are some of the highlights of Mound's Public Participation Program:

- *Mailing list*—Those on the CERCLA mailing list receive a newsletter plus other information on the CERCLA program. You may request addition to the list by calling EG&G Mound CERCLA Community Relations.
- *Newsletter*—Twice-quarterly "Superfund Update" announces meeting times, gives CERCLA news and related features.
- *Public Reading Room*—Documents relating to the Mound Plant are available for public inspection at the Miamisburg Senior Adult Center, 305 E. Central Ave., Miamisburg, OH, during weekdays.
- *Administrative Record*—Contains all CERCLA documents relating to selection of cleanup remedies. A copy of Administrative Record documents is kept in the Public Reading Room.
- *News Releases and Fact Sheets*—Fact sheets are summaries of major documents or CERCLA activities. Like news releases, they are produced regularly when pertinent information needs to be given or clarified.
- *CERCLA Notebooks*—These contain fact sheets, newsletters and other information published since the beginning of Mound's CERCLA program and are updated quarterly. CERCLA Notebooks are available at quarterly public meetings and also through Mound CERCLA Community Relations.
- *Community Interviews*—Mound's Public Participation Program is based on interviews with area residents who represent a wide variety of community interests. Most recent interviews were conducted in June 1992.
- *Public Meetings and Hearings*—Public meetings on Mound's CERCLA program are held quarterly in Miamisburg. Special hearings are held to get community input before major CERCLA decisions are made.
- *Meetings with Government*—Mound regularly meets with Miamisburg officials, Montgomery County officials, the Miami Valley Regional Planning Commission, the U.S. Environmental Protection Agency and Ohio EPA.
- *Presentations and Briefings*—Mound experts are available to give presentations on the CERCLA program to schools and community groups. Also, Mound holds briefings for news media when needed.

Call Mound CERCLA Community Relations at (513) 865-4140 for more information on any aspect of Mound's Public Participation Program.

EG&G

Public Participation in CERCLA*

MOUND
Environmental Restoration Program

Who? Anyone interested in Mound's Environmental Restoration Program is encouraged to become involved. You really can make a difference by participating in the CERCLA program. Citizens of the Miamisburg area are particularly encouraged to take part as they have the greatest stake in the outcome of this project.

***What?** The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) empowers the federal government to investigate and, if necessary, restore sites where contamination may be hazardous to health or the environment. Also called "Superfund," CERCLA is one of very few laws that involve the public directly in important project decisions.

When? There are many opportunities for the public to become involved in CERCLA. These include CERCLA Quarterly Public Meetings, workshops and presentations before local government and community groups. At any time, the public may review and comment on CERCLA documents, which are kept in a Public Reading Room open during weekdays. In addition, there will be special opportunities for formal comment on major CERCLA decisions. Meeting dates and comment periods are announced in advance through newspaper ads.

Where? Quarterly public meetings on Mound's CERCLA program are held at accessible locations in Miamisburg. Meetings and other activities are announced through large advertisements in the *Miamisburg News*, the *Dayton Daily News* and in "Superfund Update," a newsletter sent to those on the CERCLA mailing list. The Miamisburg Senior Adult Center, 305 E. Central Ave., Miamisburg, OH, houses the Mound Plant CERCLA Public Reading Room, which contains CERCLA documents for public review.

Why? Environmental concerns can affect both the immediate health and the overall standard of living in a community. CERCLA recognizes your stake in the community, and the law is designed to make your input felt. Further, Mound continues its effort to be a good neighbor in the Miamisburg community by surpassing the law's requirements for public participation. The program in place was designed around concerns expressed by area residents, and it will be revised when necessary to respond to changing concerns.

For more information on Mound's CERCLA program, including how you can participate, call Mound CERCLA Community Relations at (513) 865-4140.

March 1994

Your Roadmap to Community Involvement in the Mound CERCLA Program

Inclusion in CERCLA Program 1989

Remedial Investigation/ Feasibility Study

- **Assess Contamination**
- **Determine Possible Treatments**
- **Choose Best Treatments**

- Join CERCLA mailing list
- Read *Superfund Update* newsletter
- Review documents and background information in the Mound Plant CERCLA Public Reading Room
- Comment on documents
- Attend CERCLA Quarterly Public Meetings
- Track cleanup progress in news media
- Request presentations (schools and groups)
- Ask for a CERCLA Notebook
- Call Mound CERCLA Community Relations with questions
- Attend workshops/roundtables when offered
- Request information from U.S. EPA on Technical Assistance Grants (TAGs)

RI/FS Proposed Plan (upon completion of RI/FS)

- **U.S.EPA, Ohio EPA Comment**
- **Public Comment**

All previous activities, plus:

- Read RI/FS Proposed Plan and comment on it during formal Public Comment Period
- Attend public hearing on Proposed Plan for further information and comment

Record of Decision

- **Legal Document Spelling Out Final Cleanup Plan**
- **Response to Public Comments**
- **Explanation of Significant Changes from Proposed Plan**

Cleanup

- **Remedial Design**
- **Remedial Action**

- Continue to attend meetings, review and comment on documents, receive mailings from Mound, ask questions, etc.