

June 1993

NUCLEAR REGULATION

Cleanup Delays Continue at Two Radioactive Waste Sites in Ohio



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United States
General Accounting Office
Washington, D.C. 20548

Resources, Community, and
Economic Development Division

B-251640

June 28, 1993

The Honorable John Glenn
Chairman, Committee on
Governmental Affairs
United States Senate

The Honorable Howard M. Metzenbaum
United States Senate

Two sites in Newburgh Heights, Ohio, are contaminated with low-level radioactive material used during the Chemetron Corporation's chemical manufacturing operations. Although Chemetron ceased these operations in 1972, it has yet to clean up the sites and still holds a Nuclear Regulatory Commission (NRC) materials license to possess radioactive materials. NRC will not terminate Chemetron's license until the company properly disposes of the radioactive material and has led recent efforts to clean up the sites. Chemetron's cleanup efforts must also comply with the Ohio Environmental Protection Agency's (Ohio EPA) requirements for disposing of the solid waste mixed with the radioactive material, and any hazardous wastes that may be located at the sites.

This report responds to your request that we review Chemetron's cleanup of the two sites located at Bert and Harvard avenues in Newburgh Heights. The report discusses factors that led to the failure of past cleanup attempts and problems Chemetron is facing with its current cleanup proposal.

Results in Brief

Little progress has been made toward the cleanup of the Bert Avenue and Harvard Avenue sites in the 21 years since Chemetron ceased operations using radioactive materials. Two cleanup attempts made in the 1980s failed because of NRC's inattention to the radioactive material licensee's cleanups, inadequate efforts to characterize (identify) waste at the site, a prolonged dispute between Chemetron and the current owner of the sites over who should assume financial responsibility for site cleanup, and Chemetron's financial problems and subsequent bankruptcy.

Chemetron's current cleanup attempt began in 1990 after new owners acquired the assets of the company. However, to date, Chemetron has not been able to satisfy state concerns about hazardous and solid waste for its preferred disposal option—onsite burial of the wastes—which would

minimize its cleanup costs. (Chemetron estimated in 1992 that onsite burial would cost about \$7 million, while offsite disposal would cost about \$50 million.) Furthermore, NRC and the cognizant state agencies have been unable to develop a coordinated enforcement strategy that would move cleanup efforts beyond the planning phase.

In 1991, Chemetron, seeking to minimize its costs, proposed to bury the contaminated waste at the Bert Avenue site in accordance with NRC guidance. At that time, however, Ohio EPA raised concerns that Chemetron may not be able to meet the state's solid waste landfill permit requirements for onsite burial. State officials also told Chemetron in 1991 that the company had not yet adequately determined if any hazardous wastes exist at the Bert Avenue site. Most of the regulatory concerns to date have been directed at the Bert Avenue site. However, Chemetron proposes to clean up both sites at the same time in order to limit some contractor costs.

In 1992, other factors also threatened to complicate the cleanup. For example, local citizens indicated that they may challenge any cleanup plan that would allow low-level radioactive waste or any solid waste to remain at the Bert Avenue site. In addition, it is not clear what effect a 1992 state law concerning the treatment, recycling, storing, or disposing of low-level radioactive waste will have on the cleanup.

In January 1993, NRC encouraged Chemetron to resolve the state's regulatory concerns and directed Chemetron to submit a remediation (cleanup) plan by March 15, 1993. However, Chemetron did not resolve the state regulatory concerns by then and is now considering a number of disposal options, including offsite burial. To allow Chemetron time to evaluate disposal alternatives, NRC agreed to extend the deadline for submitting the remediation plan to October 1993. NRC officials expect that Chemetron's October 1993 plan will include measures needed to satisfy state regulatory concerns. Depending on the option selected, final cleanup could take more than a year.

Background

In 1965, the Atomic Energy Commission—the predecessor to NRC—issued a source material¹ license to Chemetron to use depleted uranium² in the

¹Source material includes uranium or thorium, or any combination thereof, in any physical or chemical form.

²Depleted uranium is uranium with a lower concentration of the uranium-235 isotope that results from the processing of naturally occurring uranium.

manufacture of a chemical catalyst at the Harvard Avenue plant site. After these operations ceased in 1972, Chemetron dismantled the equipment in the Harvard Avenue facility and shipped its remaining depleted uranium offsite for disposal. In January 1975, Chemetron improperly dumped contaminated building rubble from the Harvard Avenue building into the Bert Avenue dump site owned by the company. In September 1975, McGean Chemical Company, Inc., purchased the Bert Avenue and Harvard Avenue properties. However, Chemetron retained responsibility for the license and for cleaning up the low-level radioactive waste on the properties. In 1980, NRC investigated Chemetron's disposal of the material at the Bert Avenue site and found that it was not in compliance with NRC requirements. NRC informed Chemetron that corrective action required decontamination of the site.

During the 1980s, Chemetron initiated two unsuccessful cleanup attempts, and in 1990, under a bankruptcy reorganization plan, Sunbeam-Oster Company, Inc., became the successor to Allegheny International, Inc., Chemetron's parent company. Chemetron began its current cleanup effort under this new management. After this cleanup is complete, Chemetron will be dissolved. (See app. I for a detailed chronology of events.)

The Bert Avenue site occupies about 7 acres and is bordered by industrial property and private residences. In addition to depleted uranium, the site contains solid waste in the form of concrete and other debris dumped at the site since the late 1940s or early 1950s. The nearby Harvard Avenue site occupies about 3 acres. The site is located in the McGean-Rohco, Inc., industrial complex and is bordered by another company and a railroad line. (See app. II for photographs of the sites.)

NRC issues licenses to use radioactive materials, including depleted uranium, and is responsible for protecting public health and safety related to the use of these materials under the Atomic Energy Act of 1954, as amended. Once licensed activities cease, licensees must decontaminate sites by removing radioactive materials and decommission sites by reducing residual radioactivity to levels that allow the property to be released for unrestricted use. (See app. III for a discussion of the decommissioning process.)

NRC uses its 1981 "Disposal or Onsite Storage of Thorium or Uranium Wastes from Past Operations" guidance to determine acceptable levels of those materials that can remain in soil. Using this guidance, NRC provides two options for cleaning up depleted uranium that can remain in soil and

releasing the site for unrestricted use. Under option 1, NRC can release a site for unrestricted use if all soil containing more than 35 picocuries³ of depleted uranium per gram of soil is removed. Option 2 allows onsite burial of waste if the concentration is below 100 and 300 picocuries for soluble and insoluble depleted uranium, respectively. As with option 1, surface soil must contain 35 picocuries per gram or less. NRC's 1981 guidance is not a regulation and, therefore, has not been reviewed extensively outside of NRC. However, NRC officials believe that this guidance is conservative and provides for adequate protection of the public.

NRC and state officials agree that current radiation levels at the two Chemetron sites pose no health and safety risk; however, they do not meet NRC's standards for terminating a license. Furthermore, existing research on long-term, low-level radioactive waste exposure is inconclusive. Local residents who live near the sites are very concerned about the effects of the radiation and want unsightly waste piles accumulated during earlier cleanup efforts removed.

NRC's Inattention, Inadequate Site Characterization, and Lack of Regulations Contributed to Early Chemetron Cleanup Failures

Until recently, NRC paid little attention to problems among a growing number of material licensees—businesses authorized to handle radioactive materials for industrial, research, or medical purposes. Indeed, NRC did not have a management strategy to address cleanup problems at material licensee sites until 1990 when it issued its Site Decommissioning Management Plan (SDMP). Inadequate site characterization efforts and the lack of enforceable cleanup standards also contributed to cleanup delays.

NRC Was Slow to Address Site Cleanup Problems

Over the years, NRC paid little attention to material licensees that were decontaminating and decommissioning their facilities and sites in anticipation of terminating their licenses. An August 1989 hearing before the Energy, Environment, and Natural Resources Subcommittee, House Committee on Government Operations, highlighted that NRC's decommissioning activities needed increased attention. As a result, NRC issued its SDMP in 1990.

SDMP was developed to provide a comprehensive strategy for cleaning up contaminated material licensees' sites in a timely manner. The plan gives

³A curie is a measure of the rate of radioactive decay. A picocurie is one-trillionth of a curie.

responsibility for removing the sites from the SDMP list to NRC's Division of Low-Level Waste Management and Decommissioning within the Office of Nuclear Material Safety and Safeguards. The 1992 update of SDMP lists 46 problem sites, including the two Chemetron sites.

To accelerate the cleanup of SDMP sites, NRC issued an SDMP action plan in April 1992 that targeted six problem sites, including the two Chemetron sites. The plan summarizes existing NRC guidance and criteria for the cleanup of sites, establishes time frames for major decommissioning milestones, identifies currently available guidance on site characterization, and describes the process that NRC will use to establish and enforce schedules for timely cleanup. The plan also provides that an NRC decision to terminate a license will relieve the licensee from any further obligation to NRC to conduct additional cleanup, as long as the licensee decommissions the site in full accordance with an NRC-approved decommissioning plan. According to NRC, without this release, licensees may be reluctant to pursue decommissioning activities.

SDMP and its follow-up action plan also recognized that inadequate site characterization has delayed timely site-specific decommissioning actions and that the lack of enforceable cleanup standards has inhibited NRC's ability to direct cleanup activities. To remedy these problems, NRC issued a draft site characterization manual in June 1992. NRC also recently initiated a formal federal rulemaking process to establish enforceable standards, but development of these regulations is expected to take several years. According to an NRC official, inadequate site characterization and the lack of enforceable cleanup standards contributed to Chemetron's two cleanup failures in the 1980s.

**Inadequate Site
Characterization
Contributed to Failure of
Early Cleanup Effort**

In 1984, Chemetron initiated decontamination activities that included shipping contaminated materials offsite and demolishing the Harvard Avenue building. By September 1985, Chemetron reported that both sites met NRC's cleanup criteria. However, confirmatory surveys performed by NRC's contractor, Oak Ridge Associated Universities, showed that waste remaining at the sites did not meet NRC's standards. An Oak Ridge official said that in one instance, Oak Ridge found that radioactivity levels in some areas were three times as high as Chemetron reported. He also said that the major reason for the differences between the survey results was Chemetron's use of inadequate and inaccurate analytical processes. An NRC official said that NRC guidance on proper site characterization procedures might have eliminated some of the problems with the

analytical processes. However, other NRC officials believe that Chemetron's contractor should have been knowledgeable about the proper processes.

Lack of Enforceable Cleanup Standards Contributed to Failure of Another Cleanup Effort

In 1989, Chemetron initiated another cleanup attempt with a new contractor who used a "guided excavation" technique to decontaminate the sites. According to contractor officials, this technique involved excavating and measuring contaminated soil and separating the soil into piles containing material registering more than 100 picocuries per gram for later offsite disposal and less than 100 picocuries per gram for material expected to remain on the surface.

Informal discussions between the contractor and NRC led the contractor to believe that a draft NRC policy that would have allowed surface contamination higher than the 35-picocuries-per-gram level allowed by NRC's 1981 guidance would be adopted. However, according to an NRC official, NRC informed Chemetron that if the company wanted to operate under the draft policy, it would be doing so under its own risk. The contractor chose to follow the draft policy and separated waste material using a 100-picocurie-per-gram criterion. However, in June 1991, NRC decided not to implement the policy change after it faced strong public opposition. When Chemetron subsequently dismissed this contractor after larger-than-anticipated amounts of radioactive material were discovered at the sites, several large piles of waste material were left on the sites.

Other Factors Also Contributed to Early Chemetron Cleanup Failures

While a lack of enforceable NRC cleanup standards and site characterization guidance may have played a role in the previous cleanup attempts at the Chemetron sites, other factors also significantly contributed to the delays. These include Chemetron's dispute with the owner of the Bert Avenue property over who was responsible for the cleanup and the bankruptcy of Chemetron's parent company, Allegheny International, Inc., in 1988.

In 1980, NRC determined that Chemetron improperly dumped low-level radioactive material at the Bert Avenue site in January 1975 and notified Chemetron that the company must decontaminate the site. However, Chemetron believed that McGean Chemical Company, Inc., was ultimately responsible for the cleanup since McGean purchased the Bert Avenue property in September 1975. Chemetron filed suit against McGean Chemical Company, Inc., in January 1981, seeking to fix financial

responsibility for the cleanup on McGean Chemical Company, Inc. The dispute was not resolved until 1984 when the two companies signed a consent decree in which Chemetron agreed to clean up the sites.

Allegheny International's bankruptcy in 1988 also delayed the cleanup. At that time, Chemetron informed NRC that all company assets were frozen and that no progress would be made on the decommissioning unless the bankruptcy court released funds. Cleanup activities did not progress until funds were released in March 1989. After Sunbeam-Oster Company, Inc., became the successor to Allegheny International, Inc., in 1990, the new management hired a different environmental contractor and initiated a broad site characterization survey effort.

State Requirements and Citizen Concerns Complicate Current Cleanup

In July 1990, under a new decommissioning team, Chemetron decided to re-characterize the sites in order to isolate significant contamination, minimize radioactive disposal quantities, and contain costs. In June 1991, Chemetron submitted what it called a preliminary site characterization report to NRC. NRC found that the report did not fully characterize the sites' radioactive contamination. Ohio EPA also reviewed the report and considered the characterization inadequate, particularly with respect to potential chemical contamination. Ohio EPA said that additional work was needed to determine if the waste contained hazardous substances.

Although its site characterization report was deemed incomplete, Chemetron submitted a remediation plan in August 1991 as required by its license, as amended. This plan proposed consolidating the contaminated material from both sites in a disposal cell at the bottom of the Bert Avenue ravine, using option 2 of NRC's 1981 onsite disposal guidance. However, NRC and Ohio EPA were concerned that the plan was based on incomplete information in the June site characterization report. Both agencies said that the plan should be revised to incorporate information from additional site characterization work. At this time, Ohio EPA also informed Chemetron that it would need a permit to install a solid waste disposal facility if it decided to bury the waste onsite.

In June 1992, Chemetron submitted what it called a final site characterization report. NRC did not formally respond to the report until January 1993. An NRC official said that the comments were delayed by NRC's efforts to reflect Ohio EPA's concerns without necessarily endorsing them. In its comments, NRC found the characterization report adequate for the purposes of developing a final remediation plan for both sites.

According to NRC officials, depending on the disposal option Chemetron chooses, further site characterization may be needed. NRC asked Chemetron to formally submit its remediation plan by March 15, 1993.

Chemetron's initial remediation plan and recent discussions indicate that, for financial reasons, Chemetron favors onsite disposal at the Bert Avenue site. For the Harvard Avenue site, a company representative told us that it would identify and ship the most radioactive material to an appropriate licensed disposal facility. In total, Chemetron estimates that it will need to dispose of about 50,000 cubic yards of waste from the two sites. In 1992, Chemetron estimated that onsite disposal would cost about \$7 million compared with about \$50 million for offsite disposal. Recent revised prices we obtained now indicate that offsite disposal may cost considerably less—\$20 million to \$22 million. However, Chemetron officials have not yet received a specific cost estimate for offsite disposal. Furthermore, they said that \$20 million is still about three times more than they planned to spend on the cleanup.

While onsite disposal at Bert Avenue may be allowed by NRC guidance, NRC has not officially approved this approach for the site. Furthermore, Ohio EPA's concerns must be resolved before Chemetron can remediate the site using onsite burial. These concerns relate to the state's solid waste permitting requirements and the possibility of hazardous wastes at the site. Alternatives to onsite disposal exist, but each presents its own unique challenges and does not necessarily guarantee a timely cleanup. (See app. IV for more information on cleanup alternatives.)

Chemetron Must Meet Ohio's Solid Waste Permitting Requirements

The Bert Avenue site contains solid waste from earlier dumping activities. Because Chemetron would excavate this solid waste for placement into its disposal cell, Ohio EPA told Chemetron in 1991 that it considers the cell a new solid waste landfill that would require a state permit. However, the permitting process could take 2 years to complete, and several of Ohio's landfill siting criteria probably could not be met. For example, Ohio requires solid waste facilities to be at least 300 feet inside of the site's property line, 1,000 feet away from a residence, and 15 feet above the groundwater level.

Exemptions from these siting criteria can be granted by the Director of Ohio EPA if the public's health and the environment are protected. According to state officials, a waiver from the property line and residence criteria may not be that difficult for Chemetron to obtain since the criteria

were designed to apply to active solid waste disposal sites, and Chemetron would not be operating such a facility. However, Ohio EPA is most concerned with the possibility of groundwater contamination. According to Ohio EPA officials, the ravine at the Bert Avenue site is a poor location for the cell because ravines are natural water courses, and water seeps from the walls. This water could allow contaminants to leach into the groundwater. State officials told us that an exemption from the requirement for a 15-foot separation between existing groundwater and the bottom of the landfill will be difficult to obtain.

State officials cannot tell Chemetron with certainty that waivers will be granted until after Chemetron applies for the permit. However, Chemetron officials said that they will not submit an application if it could take 2 years to process and then be rejected for failure to meet certain criteria. Furthermore, Chemetron officials do not believe that their onsite disposal option should be considered an installation of a new solid waste landfill. Rather, the officials believe that onsite disposal should be allowed under other state regulations pertaining to the remediation of old solid waste landfills. Ohio EPA officials told us that they have looked to NRC for leadership in the Chemetron cleanup and that they see their role as providing guidance to NRC on the state's solid and hazardous waste laws.

Chemetron Needs to Assess the Sites for Hazardous Wastes

Under its state program authorized by the Resource Conservation and Recovery Act of 1976, as amended, Ohio EPA also has jurisdiction over the state's hazardous waste disposal standards. It found that Chemetron's final site characterization report still inadequately assesses the extent of hazardous wastes at both sites. Accordingly, Ohio EPA believes that Chemetron must properly characterize the sites to determine if hazardous wastes are present before any remediation action can proceed. Sampling by the U.S. EPA, Ohio EPA, and Chemetron have shown no evidence of significant hazardous wastes. Ohio EPA officials believe that the Harvard Avenue site contains no hazardous wastes.

Chemetron officials have agreed to perform additional testing for hazardous wastes at the time the sites are remediated and are confident that such testing will rule out the presence of hazardous wastes. If hazardous wastes are discovered, however, they must be properly managed and disposed of at a separate, appropriately licensed disposal facility.

Citizens Could Also Challenge Cleanup

Citizens have filed suits against McGean-Rohco, Inc., and Chemetron in both federal and state courts⁴ related to the presence of hazardous and radioactive materials at the sites. In July 1992, Ohio EPA received a letter on behalf of about 200 citizens stating that they intend to contest any cleanup plan that would allow low-level radioactive waste, or any other solid or hazardous wastes, to remain at the Bert Avenue site. In March 1993, citizens notified McGean-Rohco, Inc., of their intent to begin a civil action against the company under Ohio solid and hazardous waste law. This notice was later amended to include Sunbeam-Oster Company, Inc., and Chemetron.

Recent Efforts to Resolve State Regulatory Concerns

On February 15, 1993, Chemetron informed NRC that it needed to explore other remediation options given Ohio EPA's position on onsite disposal and that meeting NRC's March 15, 1993, deadline for submitting a remediation plan would not be possible. Chemetron noted that all of its efforts to date have been directed towards complying with NRC's onsite disposal requirements. To explore other disposal options, such as offsite disposal, Chemetron said that additional characterization and remediation planning is necessary. Until such work is performed, a remediation plan for the Bert Avenue site cannot be submitted.

Subsequently, Chemetron and Ohio EPA officials met in late March 1993 to discuss possible alternatives to Chemetron's onsite disposal plan. At this meeting, Ohio EPA presented both offsite and onsite disposal options, including a variation of Chemetron's current cleanup plan that would eliminate the need for a permit. Under this alternative, Chemetron would have to agree to expand the scope of the cleanup to include the entire Bert Avenue site and dispose of all wastes, including any nonradiological solid or hazardous wastes. Such a cleanup would be carried out under an administrative order negotiated between Chemetron and Ohio EPA; a formal permit to install a solid waste landfill would not be required, although the permit's siting criteria would still be considered. While Ohio EPA presented this option to allow Chemetron more flexibility, an Ohio EPA official said that the agency is also proposing this alternative because the site would be completely cleaned up and removed from Ohio's Master Sites List. If Chemetron cleans up only the radiological waste as required by its NRC license, the site would still need to be remediated for solid and hazardous wastes in the future under the direction of Ohio EPA. In this

⁴Kalnasy et al. v. McGean-Rohco, Inc., and Chemetron Corporation, No. 1:91 CV 1078 (ND Ohio filed June 1991) and Jaskey Jones et al. v. McGean-Rohco, Inc., McGean Chemical Company, Inc., and Chemetron Corporation, Cuyahoga County Common Pleas No. 227973, (filed Mar. 1992).

case, the current or previous owners of the dump may also be held responsible.

Ohio EPA officials told us that even if Chemetron chooses to clean up the entire site, this alternative is still subject to review and approval by its Division of Solid and Infectious Waste Management and legal staff. In addition, Ohio EPA said that implementation of this alternative is dependent on the Ohio Department of Health's interpretation of Ohio Revised Code section 3701.914(B). In part, this 1992 statute prohibits any person from treating, recycling, storing, or disposing of any low-level radioactive waste except at a facility licensed for such purposes by NRC. Chemetron's current license does not authorize onsite disposal; however, NRC officials said that NRC could amend Chemetron's license to authorize onsite disposal. The Ohio Attorney General's office said that, assuming NRC has the authority to license such a disposal by amending the license, the requirements of the Ohio statute would be satisfied.

In May 1993, NRC officials told us that Chemetron's license will be amended to require Chemetron to submit a remediation plan by October 1, 1993, establishing a binding requirement. NRC officials also expect this plan to address Ohio's concerns, but they conceded that NRC could not compel Chemetron to do so.

To ensure that state interests are considered in other SDMP cleanups, NRC has informed licensees that they need to meet state and other regulatory requirements when they clean up sites in order to terminate NRC licenses. For example, the SDMP action plan instructs NRC to inform the U.S. EPA and state and local agencies with jurisdiction over site remediation of NRC actions taken on SDMP sites. In addition, NRC held a workshop in November 1992 to identify ways that licensees and federal and state regulators can work together more effectively to accomplish their cleanup goals. Also, in December 1992, NRC asked the governors of states with SDMP sites to provide information on anticipated state requirements that may affect the selection and implementation of cleanup actions at the sites.

Conclusions

After more than a decade, little progress has been made towards cleaning up the two Chemetron sites. NRC's inattention to the material licensee's cleanups, Chemetron's financial problems and failure to provide an adequate site characterization, and the lack of a coordinated federal and state cleanup strategy have all contributed to the delays. Unless the principal regulatory agencies involved agree on a disposal strategy and

Chemetron develops a remediation plan that is acceptable to all parties concerned, administrative appeals, public hearings, and litigation could prevent cleanup actions for years.

Chemetron's dispute with McGean Chemical Company, Inc., over who had financial responsibility for the cleanup and a subsequent bankruptcy resulted in long delays in the 1980s. More recent delays relate to Chemetron's desire to minimize disposal costs by burying the waste materials onsite. Chemetron has only recently begun to explore offsite disposal options, which apparently would satisfy all concerned parties.

Neither NRC nor Ohio state regulators have the authority to force actions that may affect the other's jurisdiction. In addition, the regulators have been unable to develop a coordinated enforceable cleanup strategy within the framework of their respective jurisdictions for radioactive wastes and solid and hazardous wastes at the sites. NRC has recognized that coordination with state agencies is needed in SDMP site cleanups and has taken steps to ensure that state requirements are considered by NRC and its licensees.

Agency Comments

We discussed the contents of this report with NRC officials in the offices of Nuclear Material Safety and Safeguards and General Counsel; Ohio officials representing the Ohio Attorney General, the Ohio Department of Health, and Ohio EPA; and Chemetron representatives. These officials generally agreed with the report and provided us with detailed comments that have been incorporated into the report where appropriate. However, as requested, we did not obtain written comments on a draft of this report.

We conducted our work between August 1992 and April 1993 in accordance with generally accepted government auditing standards. (App. V contains our scope and methodology.) We plan to continue our work in this area by reviewing NRC's nationwide SDMP program to determine if (1) similar circumstances have resulted in long delays at other sites and (2) legislative action is warranted.

Unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days after the date of this letter. At that time, we will send copies to appropriate congressional committees; NRC Commissioners; and the Director, Office of Management and Budget. We will also make copies available to others upon request.

If you or your staff have any questions, please contact me at
(202) 512-3841. Major contributors to this report are listed in app. VI.

A handwritten signature in black ink, appearing to read "Victor S. Rezendes". The signature is written in a cursive style with a large, prominent initial "V".

Victor S. Rezendes
Director, Energy and Science Issues

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Abbreviations

EPA	Environmental Protection Agency
GAO	General Accounting Office
NRC	Nuclear Regulatory Commission
SDMP	Site Decommissioning Management Plan

Chronology of Events

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- 1965-72 In 1965, the Atomic Energy Commission (predecessor to the Nuclear Regulatory Commission (NRC)) issued a source material license to Chemetron to use depleted uranium in the manufacture of a chemical catalyst at its Harvard Avenue facility. Catalyst production ceased in 1972, and the license was amended to allow storage only of the depleted uranium. Chemetron owned the Bert Avenue and Harvard Avenue properties at this time.
- 1974 Chemetron dismantled its catalyst production equipment. This equipment was shipped to Chemetron's Kentucky facility.
- 1975 In January, Chemetron disposed of radioactive material from the Harvard Avenue facility at its Bert Avenue dump. In September, McGean Chemical Company, Inc. (now McGean-Rohco, Inc.), purchased the Bert Avenue and Harvard Avenue properties. Chemetron retained responsibility for the nuclear material license.
- 1977 In October, Allegheny Ludlum Industries purchased Chemetron.
- 1978 Chemetron informed NRC that the Harvard Avenue site will be decommissioned and returned to unrestricted use.
- 1980 NRC received an allegation that the 1975 disposal of radioactive waste at the Bert Avenue site was improper. NRC substantiated this allegation and informed Chemetron that decontamination of the site is required.
- 1981 In January, Chemetron filed suit against McGean Chemical Company, Inc., seeking to fix financial responsibility on McGean Chemical Company, Inc., for the cleanup of the Bert Avenue site. Because McGean Chemical Company, Inc., was the owner of the property, Chemetron believed that McGean Chemical Company, Inc., was responsible for the cleanup. NRC's investigation showed that McGean Chemical Company, Inc., was not involved in Chemetron's license violation.
- 1984 Chemetron's 1981 lawsuit against McGean Chemical Company, Inc., was settled when the companies signed a consent decree in which Chemetron agreed to clean up the sites.
- Chemetron's contractor began decontamination activities at the Bert Avenue and Harvard Avenue sites, including removal of contaminated material and demolition of the Harvard Avenue facility.

-
- Ohio EPA prepared a preliminary assessment of the dump site as a potential hazardous waste site. Samples obtained in 1980 by Ohio EPA and U.S. EPA indicated elevated levels of metals and other chemicals.
- 1985 Chemetron submitted final radiological surveys for both sites indicating that the sites met NRC's release criteria. NRC's contractor, Oak Ridge Associated Universities, performed a confirmatory survey of both sites and concluded that neither site met NRC's release criteria. The U.S. EPA prepared a site inspection report for the dump site. This report describes the presence of heavy metals and other waste.
- 1988 In February, Allegheny International, Inc., filed bankruptcy. Chemetron said that court approval would be required to spend additional money on decontamination.
- 1989 The bankruptcy court approved the release of funds in March, and Chemetron hired a new contractor to perform cleanup activities.
- 1990 Chemetron excavated material from the Bert Avenue and Harvard Avenue sites. In July, Chemetron stopped work after the discovery of a much larger volume of contaminated material than anticipated. Chemetron subsequently dismissed the contractor.
- In September, Sunbeam-Oster Company, Inc., became the successor to Chemetron's parent company after which Chemetron installed a new decommissioning team consisting of the president of Chemetron, a consultant to oversee the cleanup, and two contractors, one to perform site security and monitoring and one to perform site characterization.
- 1991 In January, the first quarterly regulators meeting was held with NRC, Ohio EPA, and Ohio Department of Health officials to discuss the status of cleanup activities at the Bert Avenue site. A public meeting was also held and included representatives of the city, NRC, and Ohio Department of Health. While the Department of Health made a presentation at the meeting, Ohio EPA did not participate in the meeting. An Ohio EPA official said that the agency was not notified in time to prepare for the meeting, even though an NRC official said that both state agencies were notified of the meeting at the same time. In addition, Ohio EPA at this time considered the site to be NRC's responsibility.
- In April, Ohio EPA informed NRC that previous testing at the Bert Avenue site indicated possible chemical contamination. However, Ohio EPA said

that it took no further action on this issue since NRC has primary regulatory authority over the site. Furthermore, Ohio EPA believed that NRC has the burden of incorporating Ohio EPA concerns into the remediation process, including any enforcement issues. NRC responded by saying that enforcement of Ohio EPA regulations regarding municipal and industrial waste is beyond the scope of NRC authority.

In June, Chemetron submitted its initial site characterization report to NRC. Ohio EPA and the Ohio Department of Health also reviewed this report. NRC found the report inadequate in its characterization of radioactive contamination and said that substantial effort was still required to adequately characterize onsite soil contamination and the potential for groundwater contamination. Ohio EPA considered the report inadequate in its characterization of onsite chemical contamination with respect to state requirements. The Ohio Department of Health was concerned with Chemetron's assessment of the potential spread of contamination offsite.

Also in June, a class action suit was filed against Chemetron and McGean-Rohco, Inc., in federal court.

In August, Chemetron submitted its remediation plan in accordance with dates specified in its license, as amended. This remediation plan proposed onsite burial at the Bert Avenue site. Again, this plan was reviewed by NRC, Ohio EPA, and the Ohio Department of Health. The agencies were concerned that this plan was based on information provided in Chemetron's June site characterization report which contained considerable deficiencies and said that the plan should be revised to incorporate information obtained from additional site characterization studies. At this time, Ohio EPA also noted the need for Chemetron to properly characterize the site for chemical contamination and that a permit to install a new solid waste landfill would be needed for the agency to determine if onsite disposal is feasible.

1992

In January, Chemetron submitted a site characterization plan for completing characterization activities at the sites.

In March, citizens filed a suit against McGean-Rohco, Inc., McGean Chemical Company, Inc., and Chemetron in state court.

In April, Chemetron informed NRC that a final site characterization report would be submitted by June 15, 1992. However, at this time, NRC issued an order to compel Chemetron to submit the report by June 15. NRC believed

such enforcement was necessary because of Chemetron's repeated failures to meet deadlines and provide complete information.

In May, Chemetron and NRC agreed to a consent order that required Chemetron to submit its final site characterization report by June 15, and Chemetron submitted this report on that date.

Also in May, Ohio EPA determined that the agency shared joint jurisdiction with NRC in the decontamination of the dump site.

In July, attorneys for approximately 200 persons who live adjacent to the Bert Avenue site informed Ohio EPA that the residents intend to contest any application for a permit to install that Chemetron submits and will challenge any closure plan that will allow low-level radioactive waste, solid, or hazardous wastes to remain onsite.

In August, a quarterly regulators meeting was held in Newburgh Heights. In November, parties agreed to delay future regulator meetings until the Ohio EPA permitting issues are resolved.

1993

In January, NRC released its comments on Chemetron's final site characterization report. NRC determined that the report was adequate for developing a final remediation plan. NRC asked Chemetron to submit this plan by March 15, 1993. NRC also strongly encouraged Chemetron to resolve the regulatory issues raised by the state over the Bert Avenue site.

On February 1, Ohio EPA hosted a meeting of Chemetron, NRC, and Ohio Department of Health officials to resolve these issues. However, the issues were not resolved. In a February 15 letter to NRC, Chemetron stated that it would need to consider other cleanup options, given Ohio EPA's position on onsite disposal, and that meeting the March 15, 1993, deadline for submitting the remediation plan would be impossible. Chemetron stated that all of its efforts to date had been directed to onsite burial and that additional characterization and planning would be necessary to explore other options.

In March, citizens notified McGean-Rohco, Inc., of their intent to begin a civil action suit against the company under Ohio solid and hazardous waste law. This notice was later amended to include Sunbeam-Oster Company, Inc., and Chemetron.

Chemetron and Ohio EPA also met in March to discuss possible alternatives to Chemetron's onsite disposal plan. Ohio EPA presented both offsite and onsite disposal options, including a variation of Chemetron's current cleanup plan. This alternative eliminates the need for a permit to install but requires Chemetron to expand the scope of the cleanup to include the entire Bert Avenue site. Chemetron would be required to dispose of all wastes, including any nonradiological solid or hazardous wastes. This cleanup would be carried out under an administrative order negotiated between Chemetron and Ohio EPA.

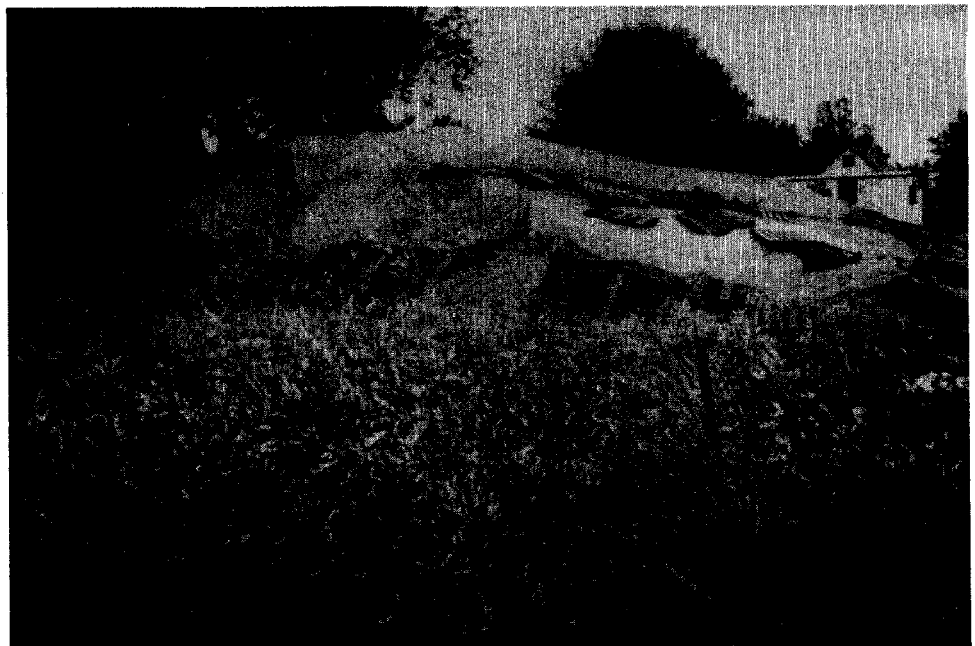
Chemetron and NRC met in early April and discussed the remediation plan submission. To allow Chemetron to evaluate both offsite and onsite disposal alternatives, NRC agreed to extend the remediation plan deadline to October 1993. According to NRC officials, Chemetron's license will be amended to establish a binding requirement to submit this plan by October 1, 1993.

Photographs of the Bert Avenue and Harvard Avenue Sites

Figure II.1: Overhead Area View of the Bert Avenue and Harvard Avenue Sites



Figure II.2: Waste Pile at the Bert Avenue Site



Source: NRC's Division of Low-Level Waste Management and Decommissioning, Office of Nuclear Material Safety and Safeguards

Description of Decommissioning Process

When a licensee seeks to terminate its license, NRC requires it to submit a decommissioning plan; generally that plan is submitted in sequential steps. Usually, the licensee first submits a site characterization plan that includes procedures, techniques, and equipment to be used in characterizing the site for radiological contamination. Upon NRC approval of the plan, the licensee performs the characterization and submits a site characterization report. After NRC approves the report, the licensee submits a site remediation plan for NRC approval. The remediation plan includes the methods the licensee intends to use to dispose of the contamination and ensure protection of workers and the environment against radiation hazards during the remediation. After completing the remediation activities, the licensee performs a final radiation survey to show that the site meets NRC's release criteria. NRC then performs a confirmatory survey to verify the results of the licensee's final survey. If the results are confirmed, then the license can be terminated.

Alternative Cleanup Options

Listing the Chemetron sites with U.S. EPA's Superfund program, offsite disposal, and disposing of materials at the Midwest Compact site are other options to Chemetron's preferred onsite disposal option. However, each of these alternatives has drawbacks, and a timely cleanup is not guaranteed.

NRC could request the U.S. EPA to place the sites under the Superfund program. However, NRC's policy is to use Superfund only as a last resort. The U.S. EPA also has a policy not to place an NRC-licensed site on the Superfund list. To date, one site with an NRC license has been placed on the Superfund list. NRC officials said that they would consider petitioning U.S. EPA to add the sites to the Superfund list only if (1) there were no remediation funds available from parties under NRC's jurisdiction and (2) listing the sites on the Superfund National Priorities List would make funds for remediation available. The advantage to putting the sites on the Superfund list is that the government may pursue responsible parties other than the licensee to pay for cleanup. For instance, in Chemetron's case, previous owners of the Bert Avenue dump could be held responsible. However, Ohio EPA officials indicated that the Chemetron sites would have a very low priority when compared with other sites on the list with far worse pollution problems, and it is not clear that it would even qualify.

Another option—shipping the wastes to a licensed disposal facility—could respond to state regulatory agencies' and citizens' concerns. For instance, offsite disposal would eliminate the need for a permit to install a new landfill, and according to a Chemetron representative, be accomplished in about 1 year.

However, offsite disposal is expensive. Chemetron estimates that about 50,000 cubic yards of waste from the two sites may need to be moved at a cost of about \$50 million, compared with Chemetron's estimate of about \$7 million for onsite disposal. Chemetron developed its estimate for offsite disposal using 1991 figures provided by Envirocare, a low-level radioactive waste disposal facility near Salt Lake City, Utah. In February 1993, Envirocare officials told us that cleanup may now cost between \$20 million and \$22 million, including costs for excavation and transportation. Chemetron officials told us that they have not yet received a specific price quote from Envirocare, but that \$20 million is still about three times more than they planned to spend on the cleanup.

The Low-Level Radioactive Waste Policy Amendments Act of 1985 encouraged states to develop multi-state agreements in which one state hosts a disposal facility for all partners to the agreement. A partnership

among states is called a compact. Ohio is the host state for the Midwest Industrial Low-Level Radioactive Waste Management Compact and is currently in the early stages of planning and providing for a disposal facility in Ohio for the compact. At this early stage, it is unknown when such a facility would be available and whether it would be able to accommodate all or some of the materials from the Chemetron sites.

Scope and Methodology

Because contamination at the Bert Avenue site was not discovered until 1980, we limited our scope to cleanup activities performed between 1980 and the present. This period included cleanup activities for both the Bert Avenue and Harvard Avenue sites.

To obtain information on Chemetron's unsuccessful attempts to clean up its two sites contaminated with radioactive waste, we spoke with officials from NRC's Office of Nuclear Material Safety and Safeguards in Rockville, Maryland, and Region III Division of Radiation Safety and Safeguards in Glen Ellyn, Illinois; Chemetron and its consultants, B. Koh & Associates, Inc., and Dames and Moore; previous Chemetron contractor Remcor, Inc.; McGean-Rohco, Inc.; Newburgh Heights; and Earth Day Coalition. Where an official was not directly involved with some early cleanup efforts, we relied on available documentation. We spoke with Oak Ridge Associated University officials to determine the activities they perform for NRC, the results of their confirmatory surveys performed on the sites, and their views regarding NRC's site characterization guidance.

We reviewed NRC inspection reports; NRC, Ohio EPA, and Newburgh Heights records of meetings concerning the Chemetron sites; and Chemetron licenses and amendments that specified the conditions under which Chemetron could use and store the depleted uranium and provided information concerning specific cleanup requirements. We also reviewed Chemetron's site characterization reports and remediation plans, including NRC and state regulatory agency comments.

To determine what problems Chemetron has with its current cleanup proposal, we interviewed officials from NRC; Ohio EPA; Ohio Department of Health, Division of Environmental and Radiological Health; Cuyahoga County Board of Health; and Chemetron. We also reviewed Chemetron's February 15, 1993, letter to NRC and Ohio EPA concerning Chemetron's desire to bring the cleanup to closure.

To determine whether Superfund or any other possible cleanup options are available and the advantages and disadvantages of these options, we interviewed U.S. EPA, NRC, and state officials. We also reviewed Chemetron's onsite versus offsite disposal cost estimates. We corroborated the offsite disposal estimates with Envirocare officials because Envirocare is the only facility that currently accepts mixed wastes.

To obtain an understanding of NRC's license termination procedures, we interviewed NRC officials and reviewed Code of Federal Regulations Title 10 and attended NRC's November 1992 Site Decommissioning Management Plan Workshop in Rockville, Maryland. To determine Ohio's low-level radioactive, solid, and hazardous waste disposal requirements, we interviewed Ohio EPA and Attorney General officials. We also obtained and reviewed Ohio solid and hazardous waste statutes. We discussed federal and state regulatory jurisdictional issues with NRC's and U.S. EPA's General Counsels and the Ohio Attorney General.

Finally, we visited the Bert Avenue and Harvard Avenue sites to observe the operations conducted and radioactive waste disposal methods used.

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