

CERCLA and RCRA Requirements Affecting Cleanup of a Hazardous Waste Management Unit at a Superfund Site: A Case Study

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INTRODUCTION

The Fernald Environmental Management Project (FEMP) involves the cleanup of a Department of Energy (DOE) Superfund site located near Cincinnati, Ohio (Figure 1). The site was developed in the early 1950's to manufacture uranium metals in support of DOE weapons complex activities. In 1989, uranium production at the FEMP ceased and cleanup efforts began.

Because past activities at the site involved the production of uranium metals, various chemicals were used in the production processes. As a result of over thirty years of production activity, radiological and chemical contamination exists at the site.

In 1966, a Fire Training Facility (FTF) was constructed at the site. From that time until 1990, the FTF operated as a training facility for the Fernald site fire department. The FTF was operated in a manner consistent with other fire training areas at the time. Various types of combustible substances were stored and burned at the FTF to practice fire fighting techniques. These substances included waste oils, kerosene, gasoline, wooden pallets, straw, vehicles, damaged office furniture, unusable household furniture, rubber tires, metallic sodium, magnesium, and waste solvents. Some of the substances burned at the FTF were contaminated by radionuclides.

The FTF is composed of the following structures and areas as shown on Figure 2 and listed below:

- Block building
- Skid tank/pond/sump
- Open top tank
- Horizontal pressure vessel
- Surface burn areas (south of the pressure vessel)

Due to the presence of radiological and chemical contamination at the FTF, both the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) regulations impact the present cleanup activities at the FTF.

This paper examines a case study of the FTF cleanup conducted as both a CERCLA removal action and a RCRA closure activity. Although both CERCLA and RCRA regulations address cleanup of the Hazardous Waste Management Unit (HWMU), the U. S. Environmental Protection Agency (EPA) approves the CERCLA removal action work plan (RAWP) while Ohio EPA approves the RCRA closure plan. An attempt to combine the RAWP with the closure plan has resulted in an number of issues which will be addressed in this paper.

Some of the issues include how debris from the FTF is handled under CERCLA and Ohio EPA hazardous waste rules. Also discussed is how contaminated environmental media from the HWMU is addressed by CERCLA and RCRA regulations. In addition, the paper examines the time frame on completion of the CERCLA removal action versus closure of the RCRA HWMU. Finally, the verification requirements under CERCLA versus the required RCRA certification requirements are compared.

Regulatory Requirements

The FTF was classified as a HWMU since the facility stored hazardous wastes for various periods of time during the 1980's. A HWMU is defined under RCRA regulations (40 CFR 260.10 and Ohio Administrative Code [OAC] 3745-50-10) as a contiguous area of land on or in which hazardous waste is placed, or the largest area in which there is significant likelihood of mixing hazardous waste constituents in the same area. The FTF was included in the list of HWMUs in the FEMP's RCRA Part A Permit Application submitted to Ohio EPA in 1991. Because the FTF is no longer used, closure of the HWMU is required under Ohio RCRA regulations. Normally, a RCRA closure plan detailing the removal of the waste and associated contaminated media from the FTF would have been submitted to Ohio EPA for review and approval (OAC 3745-66-12).

In 1989, the FEMP was placed on the National Priorities List (NPL) because of radiological and chemical contamination at the site. A Removal Site Evaluation (RSE) required by CERCLA regulations was performed for the FTF in July 1992. A RSE is performed under CERCLA to determine whether a removal action is necessary to prevent or stop a release or threat of a release of a hazardous substance to the environment (40 CFR 300.415). The RSE concluded that a removal action for radiological contamination at the FTF was justified under CERCLA.

In an effort to address both RCRA and CERCLA requirements, a combined RCRA closure plan information and data submittal and CERCLA RAWP detailing the appropriate methods of cleaning, removing, decontaminating, and disposing the structures, tanks, etc. for the FTF area was submitted to the U. S. EPA and Ohio EPA in June 1993. U. S. EPA approved the work plan in November 1993 under their authority designated in an Amended Consent Agreement (ACA) signed between USEPA and DOE in 1991.

During the period of November 1993 through the present time, numerous discussions with representatives of Ohio EPA addressed how to handle the cleanup activities at the FTF. Ohio EPA agreed to allow cleanup work under the U. S. EPA approved RAWP even though a closure plan for the FTF was not approved.

CERCLA Off-site Rule Notification

In August 1994, cleanup activities began at the FTF. Demolition of the concrete block building was completed in September 1994. Segregation, size-reduction, and radiological surveying of the building's debris took three days. Most of the debris is free of both radiological and chemical contamination.

However, since the debris was generated at a Superfund site, a facility acceptable to U. S. EPA must receive the debris due to the CERCLA Off-site rule (40 CFR 300.440). The intent of the Off-site rule was to avoid present or future environmental problems by ensuring that CERCLA wastes dispositioned at a facility would be handled in an environmentally sound manner. U. S. EPA determines if facilities are acceptable for receipt of CERCLA wastes only. Facilities receiving only solid wastes (non-hazardous Subtitle D) do not fall under the acceptability criteria of the Off-site rule. To date, an acceptable facility for the clean FTF debris has not been found. Presently, the clean debris is segregated on a pad area within the boundaries of the FTF.

Under RCRA (OAC 3745-66-14), the clean debris from the FTF would be classified as solid waste and could be dispositioned to a landfill. Before disposition occurs, the FEMP performs thorough evaluations of the potential disposal site to ensure the site complies with appropriate environmental regulations. However, no approval of the potential disposal site by U. S. EPA would be required.

Contaminated Environmental Media

During the course of cleanup activities at the FTF, water was removed from an open top tank. When the FTF was used, the tank was filled with waste oils or solvents and ignited to practice various fire fighting techniques. Since the tank was open to the atmosphere, precipitation would collect in the tank. The FEMP addressed the collected water in the tank as an environmental media. Analysis of the water showed the presence of 1,1,1-trichloroethane (TCA) and toluene at concentrations of 91 parts per million (ppm) and 10 ppm, respectively. Since the solvents burned in the exercises were classified as spent, RCRA listings of F002 and F005 were applied to the TCA and toluene, respectively.

The FEMP discussed the use of the EPA's RCRA contained-in policy with Ohio EPA to address the open top tank's water which contained RCRA hazardous waste constituents of TCA and toluene. The contained in-policy applies to environmental media which contains RCRA listed waste constituents. The policy states that the environmental media is not classified as waste but must be treated as such until the hazardous constituents in the media are removed.

The FEMP proposed the use of site's Granulated Activated Carbon (GAC) system to treat or remove the hazardous waste constituents from the water. Normally under RCRA regulations, a treatment permit would have been required for the use of the GAC system. However since the work at the FTF was being performed under a CERCLA removal action, a permit exemption was allowed. CERCLA allows administrative requirements to be waived for certain activities provided the substantive requirements of regulations are met. In this case, the RCRA treatment permit was an administrative requirement. However, the substantive requirements of RCRA and the Clean Water Act (CWA) still needed to be addressed. After treatment through the GAC, the FTF water was discharged to the site's wastewater treatment system. Both the TCA and toluene were removed (non-detectable via analytical methods) prior to entering the site's wastewater treatment system, thus satisfying the terms and conditions of the FEMP's National Pollutant Discharge Elimination System (NPDES) permit.

Under CERCLA removal actions, regulatory requirements are met to the extent practicable. Keeping in mind that CERCLA removal actions intend to remove or mitigate releases of hazardous substances, an administrative requirement like a permit may simply delay cleanup. CERCLA uses a process where other regulatory requirements affecting a cleanup are addressed as applicable or relevant and appropriate requirements (ARARs). Through the ARARs review process, a regulatory agency can see how regulations are addressed by the CERCLA removal action. The RAWP contained the ARARs information for the specified removal action. The FEMP provided a listing of ARARs for the FTF removal action to Ohio EPA to show how RCRA requirements for the FTF open top tank water were being addressed.

After treatment through the GAC system, analysis of the water showed the concentrations of TCA and toluene were below the method detection limit (MDL) for Method 8260 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846. Since the RCRA constituents were removed from the treated water, the water could then be processed through the remaining portions of the site's wastewater treatment system. The key point in calling the water environmental media allowed treatment without impacting the site's downstream surface impoundments via the RCRA derived-from rule. (The derived from rule states that wastestreams resulting from the treatment of RCRA listed hazardous wastes are still hazardous). The derived-from rule only applies to treated hazardous wastestreams containing listed constituents and not to environmental media. Environmental media is not considered a solid waste under RCRA regulations.

Completion of Removal Action and Closure Activities

Under CERCLA, removal actions can be completed in time frames ranging from days to years. However, RCRA closures are usually completed within 180 days after receiving regulatory agency approval on a closure plan. Occasionally, an extension greater than 180 days can be granted due to extenuating circumstances such as adverse weather conditions.

Another difference between the CERCLA removal action and RCRA closure activity involves the scope of cleanup. A CERCLA removal action doesn't necessarily remove all the contamination associated with an area. At the FEMP, the FTF is one relatively small area of the site undergoing a removal action. The site as a whole is progressing through the CERCLA cleanup process. Some contamination will remain at the FTF even though the removal action is completed. Remaining contamination at the FTF will be addressed under the CERCLA remediation process which will occur several years in the future.

RCRA closures usually require total removal of wastes from the HWMU and cleanup of contaminated media to background concentrations. In the case of the FTF, large-scale excavations of soil are not warranted at this time since the CERCLA remediation process will examine this area for cleanup in the future. The FEMP does not want to remove all the present FTF soils, backfill with clean soil and then have to re-excavate the area under a future CERCLA remediation activity. Ohio EPA has agreed to allow the CERCLA process at the FTF to guide the cleanup and eventual closure of the unit.

In the event that all the contamination of the soil at the FTF cannot be totally removed under CERCLA remediation activities, some options under Ohio RCRA guidance exists. Risk-based closures along with landfill closures are available to address some situations where all soil contamination in a HWMU area cannot be removed. Risk-based closures can be used to show that contaminants left in a HWMU soils will not adversely impact the environment or human health. Landfill closures require some engineering requirements like liners, vegetative caps, etc. to be placed over an area which contains contaminated soil. Usually some type of post-closure monitoring requirements exist for landfill closures. The FEMP will work with Ohio EPA and U. S. EPA to determine what future cleanup levels for the FTF will be.

Finally, verification of the cleanup activities at the FTF will be provided in several ways. The FEMP provides a final removal action report to U. S. EPA and Ohio EPA. The report will detail the actions performed at the FTF and the results of cleanup activities including sampling results. In addition, a final remediation action report for soils cleanup at the FEMP will be provided to U. S. EPA.

Under RCRA, closure of a HWMU requires a certification by a professional engineer that closure activities have been performed in accordance with an approved closure plan (40 CFR 265.115 and OAC 3745-66-15). Any deviations from the plan are detailed in the certification report. At the FEMP, discussions with Ohio EPA indicate that the CERCLA removal and remediation action reports serve a similar purpose as the RCRA certification report. A mechanism to integrate the CERCLA reports with the RCRA certification requirements is presently underway.

CONCLUSIONS

The FEMP attempted to address both RCRA and CERCLA requirements at the FTF by integrating a CERCLA RAWP with a RCRA closure plan. While the regulatory agencies involved with the cleanup of the FTF agreed the integrated document was a good idea, actual implementation of the document proved somewhat complicated. Complications arose regarding the disposition of clean debris from a Superfund site, treatment of contaminated media, duration of cleanup activities, and cleanup certification requirements.

While all of the complications detailed in the paper have not been resolved, solutions to all have been proposed to Ohio EPA and U. S. EPA. Both agencies have worked closely with FEMP personnel in trying to find the most effective solutions to satisfy RCRA and CERCLA requirements.

Hopefully, some of the resolutions of problems discussed in this paper may provide insight to possible solutions of RCRA/CERCLA conflicts at other Superfund sites. An integrated approach to RCRA/CERCLA cleanup activities at the FEMP is underway and has met with some success.

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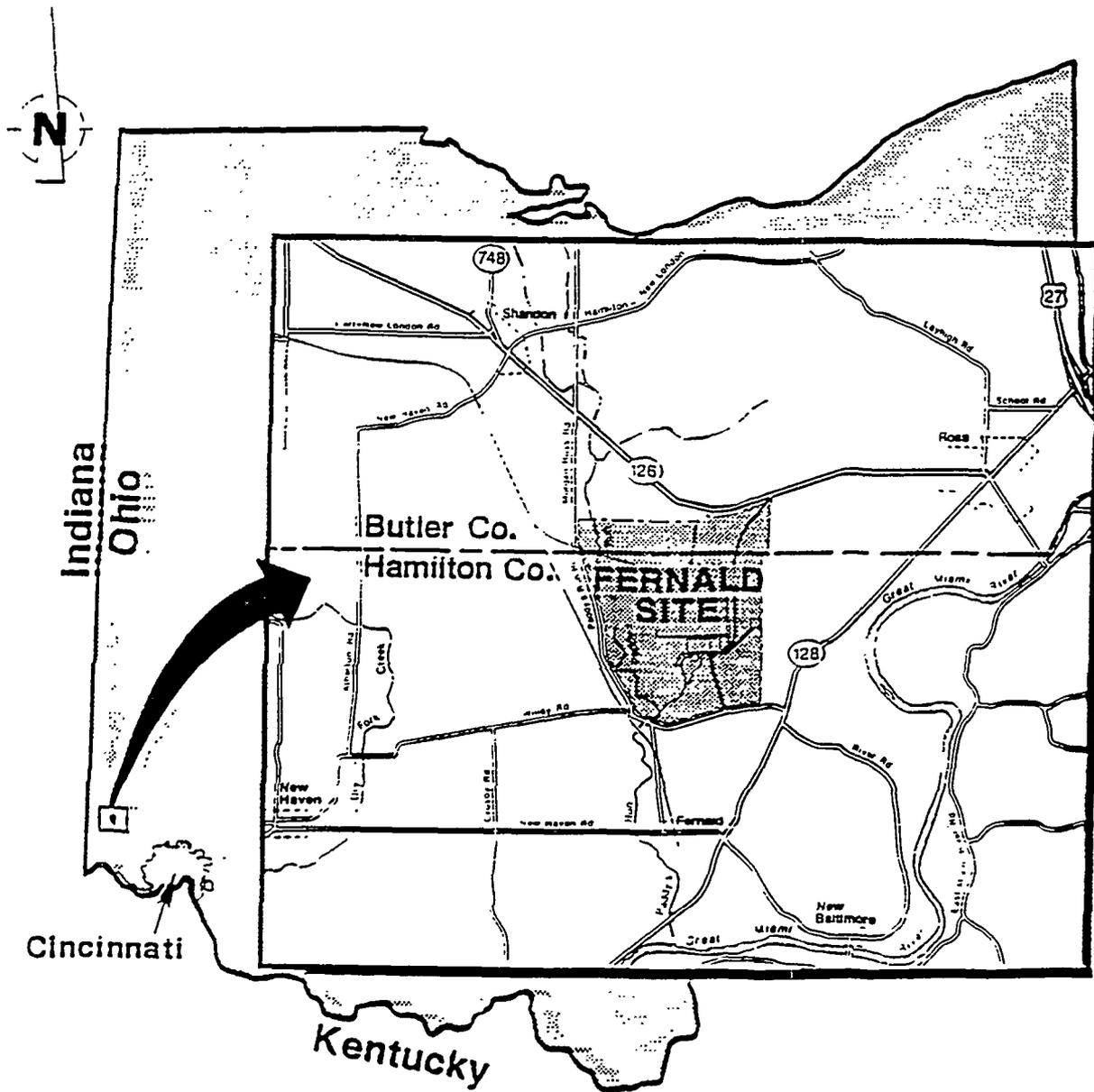
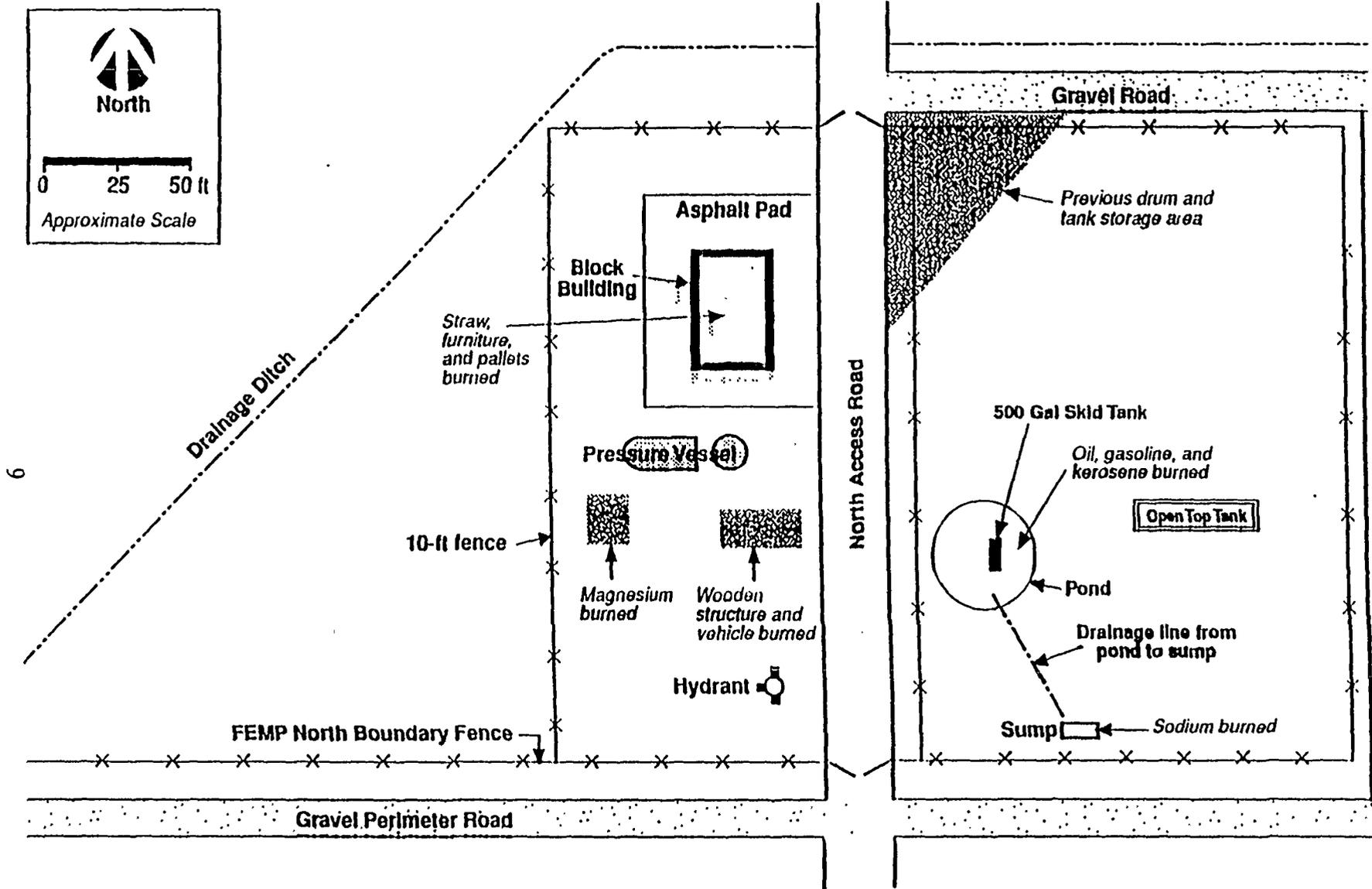


Figure 1. Fernald Site and Vicinity.



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Figure 2. Map of the Fire Training Facility.