

# PROGRESS AND PROBLEMS IN THE FORMERLY UTILIZED SITES REMEDIAL ACTION PROGRAM AND SURPLUS FACILITIES MANAGEMENT PROGRAM

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## ABSTRACT

The Formerly Utilized Sites Remedial Action Program (FUSRAP) was established in 1974 to identify, evaluate, and as appropriate, conduct remedial actions at sites used in the early years of nuclear energy development by the Manhattan Engineer District and the Atomic Energy Commission (AEC). This program currently has 29 sites and is evaluating 350 other sites for possible inclusion in the program. Another remedial action program in the Department of Energy's (DOE) Division of Facility and Site Decommissioning Projects is the Surplus Facilities Management Program (SFMP). The SFMP involves the safe management, decontamination and disposal of surplus DOE contaminated facilities which were not related to defense activities. There are currently 33 projects at 15 different sites in the program.

These two programs have made steady progress over the last 10 or so years in cleaning up sites so that they can be reused or released for unrestricted use. Work has been completed at 8 of the FUSRAP sites and three of the SFMP sites. In addition, significant efforts continued at the Shippingport Station Decommissioning Project, which is scheduled to be completed by 1990. The Department has also initiated work on a major project at the Weldon Spring Site in Missouri, which was first used by the Army as an ordnance works and later by a DOE predecessor agency as a uranium feed material plant.

However, these programs, like other remedial action programs, face many challenges and issues which could significantly delay their completion or increase their costs. Some of these issues include how to deal with mixed waste (waste which has both hazardous and radioactive components), how to integrate the National Environmental Policy Act (NEPA) requirements with those of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and how to best interact with the Environmental Protection Agency (EPA) and State agencies. The siting and development of permanent disposal facilities is a very difficult challenge which must be met successfully to complete these programs.

Many of these issues are particularly difficult because they involve technical, regulatory, and institutional factors. The Department is taking specific steps to address each of these issues or challenges to permit the FUSRAP and SFMP programs to move forward.

## INTRODUCTION

Someone unfamiliar with remedial actions might wonder how large a role waste management has in remedial activities. To give you some perspective, currently the estimated volume of radioactive waste resulting from the FUSRAP and SFMP is 1,189,600 cubic meters (1) and 2,324,500 cubic meters (2) respectively. The combined volume is greater than the total volume of low-level waste disposed of at commercial (1,205,600 cubic meters (2)) and at DOE/Defense sites through 1986 (2,282,800 cubic meters (2)). As another comparison, the total estimated volume of FUSRAP and SFMP waste is greater than the projected commercial low-level waste inventory from the year 1987 to 2020 (2,885,400 cubic meters (2)).

## FORMERLY UTILIZED SITES REMEDIAL ACTION PROGRAM

During the 1940's and 1950's the Manhattan Engineer District and its immediate successor, the Atomic Energy

Commission, conducted several programs involving research and development, and the processing of uranium and thorium and the storage of their residues. A majority of this work was done through private contractors and/or institutions. Following completion of these contracts, the facilities were decontaminated and the radioactive wastes resulting from the projects were removed to meet the health and safety guidelines then in use. Since that time guidelines for control of radioactive waste and contamination have become more restrictive. In 1974 the Department established the Formerly Utilized Sites Remedial Action Program to assure that these previously used sites would be identified, evaluated and if necessary, decontaminated, to meet today's applicable standards. Other radiologically contaminated sites have been added to FUSRAP by Congress for the purpose of conducting decontamination research and development projects.

The current scope of the program includes 29 remedial action sites (Fig. 1) with associated vicinity properties and

one radiological surveillance site. Of the 29 sites, remedial action has been completed at eight as shown in Fig. 1.

The form of the remedial action varies significantly from one site to another. The following are two examples. The Acid/Pueblo Canyon site in New Mexico was a waste discharge and treatment facility for liquid waste resulting from research and processing at the Los Alamos Scientific Laboratory. Approximately 298 cubic meters of radiologically contaminated demolition debris, soil and rocks, were removed from the site before it was released for un-

and cracks in the floor, a small volume of contaminated soil under a concrete floor and 16 drums of mixed waste in the sumps in the motor pool area.

It is difficult to show FUSRAP progress in photographs because a goal is to remove the contamination and return the property to its original appearance. In which case it is hard to distinguish visually between before and after photos except for the fact that the general appearance of the completed site is usually improved through general



Fig. 1. Locations for Formerly Utilized Sites Remedial Action Program Sites.

restricted use. Portions of the Illinois National Guard Armory were used for uranium processing and storage of radioactive materials. The Armory was believed to be decontaminated sometime in 1949 to 1951 prior to being released; however, documentation of the final survey could not be found. Under FUSRAP the site was surveyed in 1977 and remedial actions were conducted in 1987 prior to renovation activities. The remedial actions involved the removal of spotty surface contamination in walls, ceilings,

housekeeping, painting and landscaping.

### SURPLUS FACILITIES MANAGEMENT PROGRAM

Many government owned or operated nuclear facilities that were used throughout the early development of nuclear energy have no current use and have been retired. However these facilities have residual radioactive contamination which require surveillance, maintenance and at some point will require decontamination and decommissioning. Under

the authority of the Atomic Energy Act as amended, a survey of surplus facilities was taken and the SFMP was initiated in 1977 to decontaminate and decommission these facilities. The portion of the Program which includes defense related facilities is managed by the DOE Office of Defense Waste and Transportation Management and the remaining facilities are managed by the DOE Office of Remedial Action and Waste Technology. SFMP includes 33 facilities at 15 sites as shown on Fig. 2. The objectives of the SFMP are to decontaminate these facilities and to eliminate any potential hazard to the public health and the environment. SFMP facilities include power and research reactors, fuel reprocessing plants, laboratories, storage tanks, waste treatment systems, solid waste disposal facilities, ponds, ditches, and areas contaminated by uranium and thorium from mill tailings.

The most noteworthy SFMP progress to date is the Shippingport Station Decommissioning Project, scheduled to be completed in 1990. Following defueling of the reactor in 1984, physical dismantling of the plant began in September 1985. Preparation for the removal of the reactor pres-

sure vessel began in 1987 and the vessel will be barged to the DOE Hanford Reservation for disposal in 1989.

**PROGRESS AND PROBLEMS**

Over the past 10 years FUSRAP and SFMP have made steady progress in decontaminating sites and facilities so that they can be reused or released for unrestricted use. As with most engineering and construction activities this has not happened without problems but in spite of problems. Some, such as those involving decontamination techniques have been solved, but the problems associated with waste management have grown.

**Waste Management**

Waste management is a significant issue for FUSRAP. It will be necessary for the DOE to develop new disposal sites for the following reasons: 1) None of the FUSRAP sites are located on or near DOE reservations which have DOE disposal capacity. 2) The cost and impacts associated with transporting waste are significant. 3) Further, there is resistance among communities in the vicinity of DOE disposal sites to accept "outside" waste especially out-of-state waste. Consequently, at FUSRAP sites where there is a significant



Fig. 2. Locations of Surplus Facilities Management Program Sites.

quantity of waste, DOE will need to develop disposal sites within the state. In addition, long-term control of the waste is required because of the very long half-life of the waste.

Waste disposal has associated with it the potential risk of delaying FUSRAP. If DOE is unsuccessful at establishing disposal sites, necessary remedial actions will be delayed. In addition to this schedule impact, waste management can and does impact the total FUSRAP budget. As shown in Fig. 3, waste disposal represents 31 percent of the total FUSRAP budget of \$960 million. This waste disposal estimate does not include the cost associated with long-term surveillance and maintenance of the disposal sites.

The total volume of waste associated with the current 29 FUSRAP sites is 1,189,600 cubic meters (2). The current baseline plan calls for the development of four disposal sites (one each in the states of New York, New Jersey, Missouri, and Maryland). In 1987, DOE completed comprehensive plans to initiate disposal site development for New York and St. Louis, Missouri, and initiated an agreement with New Jersey whereby DOE and the State would jointly conduct the siting process.

SFMP and FUSRAP disposal site development requires an extensive (i.e., 2-4 year) environmental review and evaluation process. This process was initiated in 1984 for the SFMP Weldon Spring Site Remedial Action Project and is expected to continue for three to four more years because significant new data was found after the draft Environmental Impact Statement (EIS) was prepared.

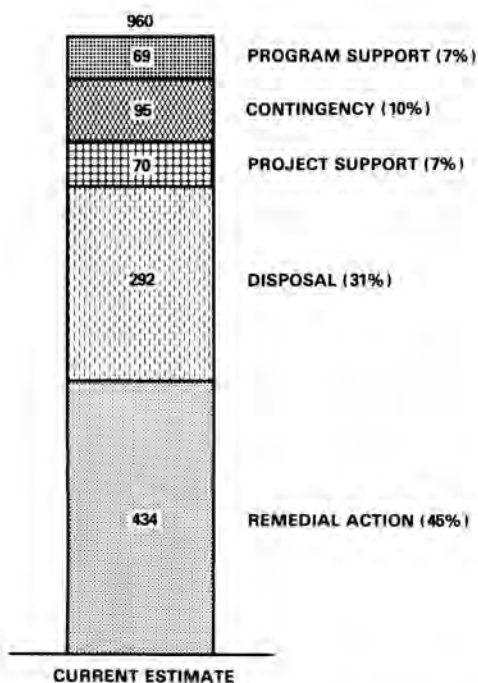


Fig. 3. Breakdown of Total FUSRAP Cost Estimate

A majority of the SFMP sites are located on DOE reservations and the waste from the remedial actions will be disposed at the waste facilities at the respective reservations. Therefore waste management for those sites does not represent a potential risk to the SFMP schedule nor will the waste volume be a significant addition to ongoing DOE disposal operations. Cost is another matter, since disposal costs at DOE sites, as at commercial sites, are rising. An example of this is the disposal cost at the DOE Hanford site in Richland, Washington. The approximate disposal costs have gone from \$140 per m<sup>3</sup> cubic meters in 1985 to \$410 per m<sup>3</sup> cubic meters in 1987.

Three of the SFMP sites--Niagara Falls Storage Site (NFSS), Monticello, and Weldon Spring--which are not located on or near DOE reservations, represent 97 percent of the total estimated volume of waste from SFMP. The policy for disposal of these wastes is the same as for the FUSRAP sites which have large quantities of waste. In 1986, DOE issued a record of decision (ROD) to provide for long-term in-place management of the radioactive waste at NFSS. A decision on management of the more concentrated radioactive residues, which represent about 6 percent of the radioactive waste at the site, will be issued later subject to future Environmental Protection Agency (EPA) guidance. While environmental reviews have not been completed for Monticello and Weldon Spring and decisions have not been made, DOE's preference at this time is for local disposal sites for these wastes.

**Mixed Waste**

The generally accepted meaning of the term "mixed waste" is waste which has radioactive and hazardous components. Just as there are several categories of radioactive waste, there are also several categories of mixed waste. The majority of waste associated with FUSRAP and SFMP is byproduct material as defined in the Atomic Energy Act, as amended, Section 11e(2), (i.e., the tailings or waste produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content). This 11e(2) byproduct material is excluded from the Resource Conservation and Recovery Act (RCRA) by definition (see 40 CFR 261.4(a)(4)). The majority of the mixed waste associated with the FUSRAP and SFMP can be classified as mixed "11e(2) byproduct" waste. Two modifiers--11e(2) and byproduct--are both necessary because 11e(1) byproduct material is not excluded from RCRA. Mixed "11e(2) byproduct" waste is defined as a mixture of 11e(2) byproduct material and hazardous waste that either is listed as a hazardous waste in Subpart D of 40 CFR 261 or exhibits any of the hazardous waste characteristics identified in Subpart C of 40 CFR Part 261.

There are regulations for the disposal of each of the two components of the mixed "11e(2) byproduct" waste.

"Standards for Remedial Actions at Inactive Uranium Processing Sites" (40 CFR Part 192) are relevant regulations for the disposal of the long lived, naturally occurring 11e(2) byproduct material. "Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities" (40 CFR Part 264) establishes the requirements for hazardous waste disposal. However, there are no standards written for mixed "11e(2) byproduct" waste for which 40 CFR Parts 192 and 264 are relevant regulations.

The issue of mixed "11e(2) byproduct" waste first received significant attention in SFMP when DOE and EPA Region VII were preparing the Weldon Spring Site Remedial Action Project Federal Facilities Agreement in 1985. One area of the Weldon Spring Site is a nine-acre limestone quarry which was used by the Department of Army for the disposal of rubble and soils contaminated with trinitrotoluene (TNT) and dinitrotoluene (DNT), and later by the AEC for the disposal of building rubble and soils contaminated with thorium, uranium and associated decay products. The quarry which is currently listed on the National Priorities List (NPL) contains approximately 99,400 cubic meters of waste and quarry materials contaminated by the disposal operations. In light of the potential for mixed waste and the lack of applicable standards, the following provision was included in the Weldon Spring Agreement:

"Those substances that are both chemically and radiologically contaminated, as determined by the waste characterization data and information for the Site, will be managed and disposed of in accordance with the best technical approach available considering RCRA and UMTRCA 40 CFR Part 192 to assure maximum protection of public health, welfare and the environment."

Mixed wastes have been characterized at other sites such as the National Guard Armory, Chicago, Illinois. Also, there is a potential for mixed waste at FUSRAP sites in New York and Massachusetts. It became clear in 1987, based on ongoing discussions with the affected EPA regions concerning mixed waste, that there was a need to work with EPA to develop the "best technical approach" for disposal of these wastes.

In late 1987, DOE, EPA, and the Nuclear Regulatory Commission (NRC) formed a working group to prepare guidance for the disposal of mixed "11e(2) byproduct" waste. Although the guidance developed by EPA and NRC for mixed "low-level" waste is not relevant for mixed "11e(2) byproduct" waste, the interagency process for preparing joint guidance has been adopted. The working group will evaluate and compare the requirements and disposal cell designs of each of the standards. The group is fortunate in having representatives from the NRC-EPA group which prepared the guidance for mixed "low-level" waste. Only preliminary meetings have been held and it is too early to predict the outcome of the group's effort. However, we are

very encouraged by the willingness of EPA and NRC to work with DOE to attempt to develop guidance for concurrently meeting both of these regulations.

The DOE Office of Remedial Action and Waste Technology has also organized a Hazardous and Mixed Waste Working Group involving the four remedial action programs--FUSRAP, SFMP, the Uranium Mill Tailings Remedial Action Program, and the Grand Junction Remedial Action Program--and the West Valley Demonstration Project. The purpose of the group is to increase the transfer of experiences and issues concerning hazardous and mixed waste among the various programs.

#### Integration of the CERCLA and NEPA Processes

In October 1986 the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) was amended by the Superfund Amendments and Reauthorization Act (SARA). CERCLA provided broad Federal authority to respond directly to releases or threatened releases of hazardous substances that could endanger public health, welfare or the environment. CERCLA as amended by SARA strengthened EPA's authority to conduct response and enforcement actions, and confirmed CERCLA's applicability to Federal agencies.

Three of the FUSRAP sites--Wayne, Maywood and Shpack--and two of the SFMP sites--Monticello and Weldon Spring--are on the CERCLA National Priorities List. Additional FUSRAP and SFMP sites will likely be added to this list when it is updated.

CERCLA as amended includes mandatory schedules for the preparation of Remedial Investigations/Feasibility Studies (RI/FS) for NPL sites. The RI/FS includes data necessary to determine the type and extent of contamination, establishes cleanup criteria and identifies, screens and analyzes remedial action alternatives. The same type of information is provided in the remedial action NEPA documents. It is expected that a majority of the FUSRAP and SFMP sites, both NPL and non-NPL, may be required to follow both the CERCLA and NEPA processes. In light of the similarities in the processes, we plan to meet the requirements of both laws by combining the NEPA and CERCLA processes into a single, comprehensive environmental process. This will eliminate the need for and confusion caused by duplicative public reviews. The approach is now being implemented for the Weldon Spring Site Remedial Action Project, and will be initiated for the FUSRAP sites in New York, and possibly Missouri, in 1988.

#### Interactions with the State, EPA and Public under CERCLA as amended

SARA added a new section to CERCLA dealing with hazardous substance releases at Federal facilities. Section 120 clearly defines the process Federal agencies must follow in undertaking CERCLA remedial actions, including a

requirement that EPA make the final selection of the remedy at NPL sites if there is a disagreement between the Federal agency and EPA. It also requires that Federal agencies enter into agreements with EPA at the time of the remedial action record of decision. In practice EPA is requesting agreements during the RI/FS phase to assure that they will be satisfied that the information in the ROD is complete. Currently, DOE is working with EPA at the Headquarters level to develop guidelines on specific provisions to be included in DOE/EPA agreements. Clearly with the passage of SARA our interaction with EPA during the remedial action alternative selection process has increased. One of our main concerns is to minimize any schedule and cost impacts that EPA oversight could have on the projects. Close EPA oversight has increased the need to have very detailed schedules to allow EPA to plan their resources for conducting their reviews in a timely manner. Also, the detailed plans facilitate the identification of alternate tasks when EPA review is delayed or there is need for additional time for DOE/EPA discussions.

SARA also expanded the State participation process. While DOE remedial action activities have always been coordinated closely with the State, under the new law States are more formally involved in the process. States and local officials must be given an opportunity to participate in the planning and selection of any remedial action, including the review of all relevant data. States review the selected remedies to ensure that State standards are met. (These standards can be waived under certain limited conditions.) EPA will be developing formal State participation requirements in the revisions to the National Contingency Plan. This extensive State role has raised the question of having the State a party to the DOE/EPA agreements. At this time there is no general policy and it is being discussed with the States on a case-by-case basis.

SARA strengthened existing procedures for public participation by establishing public participation requirements and authorizing technical assistance grants. Some of the citizens groups at our remedial action sites expressed an interest in obtaining the grants as soon as they heard about

their availability. However, as of January 1988, EPA has not issued final regulations for implementation of this provision.

In the past, FUSRAP and SFMP have provided for significant public participation through the NEPA process. This public participation will now be a part of the integrated environmental process which DOE will conduct to meet the requirements of both NEPA and CERCLA. Public understanding/involvement in the remedial action planning and implementation can effect the progress of the project. It is very much to DOE's advantage to have the public well informed about health and environmental impacts of the remedial actions and the alternatives which are available. When people realize that a "not in my backyard" solution may not be a viable alternative, we can focus on assuring that the remedial action is properly conducted and the waste is safely controlled.

### CONCLUSION

As you can see, the DOE remedial action programs are doing more than moving dirt and decontaminating laboratories. We are working with the public, States, and EPA to develop disposal sites to provide for the safe, long-term control of significant quantities of radioactive waste. Also, our engineers and scientists are working with EPA and the States to develop the best technical approach for the management of mixed "11 e(2) byproducts" waste. Finally, we are developing procedures to integrate the requirements for CERCLA and NEPA; thus, allowing a reasoned approach and more meaningful and efficient public interactions and environmental analyses.

### REFERENCES

1. U.S. Department of Energy, "Energy Systems Acquisition Project Plan, Formerly Utilized MED/AEC Sites Remedial Action Program (FUSRAP)," prepared by Oak Ridge Operations Office, Oak Ridge, Tennessee (1988).
2. DOE/RW-006, Rev. 3, "Integrated Data Base for 1987; Spent Fuel and Radioactive Waste Inventories, Projections, and Characteristics," prepared by Oak Ridge National Laboratory, Oak Ridge, Tennessee (1988).