

STANDARD OPERATING PROTOCOLS FOR DECOMMISSIONING

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ABSTRACT

Decommissioning projects at Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) sites are conducted under project-specific decision documents, which involve extensive preparation time, public comment periods, and regulatory approvals. Often, the decision documents must be initiated at least one year before commencing the decommissioning project, and they are expensive and time consuming to prepare. The Rocky Flats Environmental Technology Site (RFETS) is a former nuclear weapons production plant at which hazardous substances and wastes were released or disposed during operations. As a result of the releases, RFETS was placed on the National Priorities List in 1989, and is conducting cleanup activities under a federal facilities compliance agreement. Working closely with interested stakeholders and state and federal regulatory agencies, RFETS has developed and implemented an improved process for obtaining the approvals. The key to streamlining the approval process has been the development of sitewide decision documents called Rocky Flats Cleanup Agreement Standard Operating Protocols or "RSOPs." RSOPs have broad applicability, and could be used instead of project-specific documents.

Although no two decommissioning projects are exactly the same and they may vary widely in contamination and other hazards, the basic steps taken for cleanup are usually similar. Because of this, using RSOPs is more efficient than preparing a separate project-specific decision documents for each cleanup action. Over the Rocky Flats cleanup life cycle, using RSOPs has the potential to:

- 1) Save over 5 million dollars and 6 months on the site closure schedule;
- 2) Eliminate preparing one hundred and twenty project-specific decision documents; and
- 3) Eliminate writing seventy-five closure description documents for hazardous waste unit closure and corrective actions.

INTRODUCTION

In 1992, the mission at RFETS changed from production to environmental restoration and waste management with the goal of cleaning up and converting the site for new uses. The 4 billion dollar clean up will involve the decommissioning of over four hundred facilities and approximately one hundred soil and groundwater remedial actions to meet the planned closure of the site in 2006. In order to obtain regulatory approval under CERCLA and the Resource Conservation and Recovery Act (RCRA), it was anticipated that numerous decision documents would be needed. The RFETS management, stakeholders, and regulatory agencies agreed that sufficient information was needed in order to make cleanup decisions. On the other hand, they also realized that resources could be used more efficiently if the paperwork burden for making the decisions could be reduced.

All of the RSOPs were developed as the result of a cooperative effort between the Department of Energy (DOE), Kaiser-Hill, L.L.C., the regulators, and the stakeholders. Three decommissioning RSOPs and one environmental restoration RSOP have been prepared. Another environmental restoration RSOP has been drafted and is currently undergoing public comment. The RFETS staff anticipates that this suite of RSOPs will be sufficient for the completion of all remaining decommissioning projects and all soil (source) removal activities. Given the positive results to date and the anticipated positive impacts on costs and schedule, use of RSOP-like documents is being considered by several other DOE sites.

This paper provides 1) a brief history of RFETS, 2) a discussion of the types of cleanup decision documents used at RFETS, 3) the status of preparing and implementing the RSOPs, 4) a summary of the major stages of decommissioning projects, 5) a comparison of using RSOPs instead project specific decision documents, and 6) an analysis of the estimated cost and schedule savings expected from the use of RSOPs. The paper focuses on RSOP use for decommissioning activities; however, some information is provided on the planned use and potential savings for environmental restoration activities.

Background

The Rocky Flats Plant was built in 1951 to manufacture triggers for use in nuclear weapons and to purify plutonium recovered from weapons. The RFETS closure plan calls for the decontamination and demolition of all contaminated facilities and cleanup of contaminated groundwater and surface water and soil. The plant site was renamed the Rocky Flats Environmental Technology Site in recognition of the mission change from weapons production to cleanup. The RFETS is owned by the United States Department of Energy and was operated by private management and operating contractors. On July 1, 1995, Kaiser-Hill, L.L.C. (Kaiser-Hill), became the first Integrating Management Contractor for RFETS. The RFETS consists of 6,262 acres of federally owned land. The major plant structures are located within 384 acres called the industrial area surrounded by a buffer zone. The RFETS is located approximately 16 miles northwest of downtown Denver.

Materials defined as hazardous substances, pollutants, and contaminants by the CERCLA and materials defined as hazardous wastes and hazardous constituents by RCRA were produced and disposed or released at various onsite locations during the operating life of RFETS. Some of the released materials have been detected and remain in groundwater, sediments, surface water, and soils at the site. Many of the facilities contain significant quantities of special nuclear materials, radioactive and non-radioactive products and wastes (liquid and solid), and other materials that, if released to the environment, could further contaminate the site. Contamination exists within or adjacent to some of the former production, waste treatment/recycling, and laboratory facilities as the result of spills or fires in which the smoke transported the hazardous materials. The hazardous materials used at the site include weapons grade plutonium, beryllium, polychlorinated biphenyls (PCBs), highly enriched uranium, americium, heavy metals, and organic solvents.

RFETS has been listed on the National Priorities List (NPL) since 1989. At RFETS, all remediation work including building decommissioning is conducted as accelerated actions. Before beginning field work on accelerated actions, RFETS must obtain the approval of the Lead Regulatory Agency (LRA) which is either the U.S. Environmental Protection Agency, Region VIII (EPA) or the Colorado Department of Health and Environment (CDPHE). For sitewide cleanup activities, they

share the lead responsibility. In order to obtain regulatory approval to conduct each accelerated action, RFETS must draft and obtain public input on a decision document.

On July 19, 1996, the DOE, EPA, and CDPHE signed the Rocky Flats Cleanup Agreement (RFCA). The RFCA is a federal facility compliance agreement. The purpose of RFCA is to promote the effective and efficient cleanup of RFETS. It also establishes a procedural framework for developing, implementing, and monitoring appropriate response actions. The RFCA describes the relationship between the DOE, EPA and CDPHE during the cleanup and coordinates:

- DOE's CERCLA response obligations,
- Colorado Hazardous Waste Act (CHWA) closure obligations for hazardous waste management units,
- CHWA and RCRA corrective action obligations
- Remedial activities regulated under the Federal Facility Compliance Act (FFCA) to develop a plan for treatment of mixed wastes generated by RFCA-regulated activities.

RFCA STANDARD OPERATING PROTOCOLS

A stated goal of RFCA is to streamline the decision-making process. RFCA includes an option to prepare RSOPs for routine environmental remediation or decommissioning actions. Because the basic steps for accelerated actions are often routine activities, an RSOP or combination of RSOPs can be used for an accelerated action in lieu of preparing a project-specific decision document. This option allows RFETS to meet regulatory requirements and stakeholder commitments more efficiently by minimizing paperwork at the project level

Each RSOP provides the logically sequenced activities that RFETS will follow to complete an accelerated action. A description of each step in the sequence is also provided. As with each project-specific decision document, every RSOP requires public comment and approval by the regulatory agencies. However, the RSOPs have broad (sitewide) applicability and can be used on multiple projects in lieu of project-specific documents. DOE must notify the LRA before an RSOP will be used on a specific project.

The RCRA unit closure requirements are also addressed through the RSOPs, precluding the need for separate RCRA unit closure description documents. In addition to streamlining the document preparation requirements, it also places all of the activities under CERCLA and streamlines the regulatory process.

In accordance with the June 1994 DOE Secretarial Policy on the National Environmental Policy Act (NEPA), RFCA decision documents prepared by DOE are to incorporate NEPA values to the extent practicable. Incorporating NEPA values into the RSOPs precludes the need for preparing a separate document, such as a categorical exclusion or an environmental assessment, and conducting a separate public comment period for each accelerated action.

In combination, the decommissioning RSOPs address all physical decommissioning activities including hazard characterization, planning, decontamination and equipment removal, facility demolition, and reuse of uncontaminated concrete as backfill. Decontamination includes the physical or chemical removal of contaminants from the equipment and the structure. Equipment removal includes removing piping, gloveboxes, tanks, equipment, and size reducing equipment. It is anticipated that no additional decision documents will be required for decommissioning activities.

Relationship of RSOPs to Other RFCA Decision Documents

The *Decommissioning Program Plan* (DPP) is a high level decision document that addresses the requirement in RFCA for having a description of the overall administrative, technical, and regulatory facility decommissioning process. It was written before any of the RSOPs. The process described in the DPP was agreed to by the stakeholders and regulators for the characterization, decontamination (where necessary), and demolition of all facilities. It briefly summarizes all decommissioning activities and describes how RSOPs may be used. It also serves as the decision document for non-contaminated buildings.

Each RFETS facility has been screened and preliminarily categorized into one of three types: Type 1, 2, or 3. The typing is based on the level of contamination (radioactive and non-radioactive) known or believed to exist within the facility and the complexity of remediating the contamination. The purpose of the preliminary typing was to facilitate planning and initial budget estimating for the project. After the reconnaissance level characterization is completed for each facility, DOE makes the final facility typing determination and obtains the concurrence of the lead regulatory agency. The facility types are as follows:

- Type 1 - Free from contamination.
- Type 2 - Some radiological or hazardous substance contamination. The extent of the contamination is such that routine methods of decontamination should suffice, and a slight to moderate potential exists for environmental releases during decommissioning.
- Type 3 - Extensive radiological contamination, usually as a result of plutonium processing operations or accidents.

In accordance with RFCA, a decision document must be used to obtain regulatory approval for each proposed cleanup action. The five types of decision documents that have been established for decommissioning activities are listed in the following table.

Table I. Decision Documents

Decision Document	Project Specific	Facility Type	Pubic Comment Period (days)
Decommissioning Program Plan	No	Decision for Type 1; also describes the overall decommissioning process that all facilities will follow	60 (one time only)
Proposed Action Memorandum	Yes	Type 2 – activities that will be completed in less than 6 months of field work	30
Interim Measure/Interim Remedial Action (IM/IRA)	Yes	Type 2 – for activities that will be completed in more than 6 months of field work	45-60
Decommissioning Operations Plan	Yes	Type 3	45-60
RFCA Standard Operating Protocol (RSOP)	No	All (for routine, repetitive decommissioning activities)	45 (one time only)

A project-specific decision document may reference an approved RSOP when the planned activities are routine. This allows the project-specific document to be substantially reduced in size, and makes the review faster and easier because most stakeholders and all of the EPA and CDPHE oversight staff are already familiar with the contents of the RSOPs.

Administration of RSOPs and Project-Specific Decision Documents

The administrative process for using an RSOP requires a notification letter be sent to the LRA to implement an RSOP. Discussions with project managers and the notification letter are the primary methods the LRA uses to get project-specific information. On the other hand, project-specific decision documents are implemented (field work begins) after approval of the document is received.

Before the RSOP notification letter is sent, the scope of work must be determined and the scope must be compared against the RSOPs scope. The purpose of this is to see if the project has any non-routine activities and will need to conduct activities outside the scope of the RSOPs. Notification letters typically include:

- Project scope and a non-enforceable schedule,
- Unit-specific RCRA unit closure information,
- Characterization information summary or a reference to the Reconnaissance Level Characterization Report,
- Any deviations or exceptions to the RSOP,
- Reference to any additional decision documents that may be needed to complete the project,
- Project points of contact,
- The contents of the project-specific Administrative Record.

While this information is being gathered, initial briefings are held with the regulatory agencies and stakeholders.

RSOP Implementation Status

There are currently four approved RSOPs, and one environmental restoration RSOP is currently in public comment. The RSOPs cover a variety of work scope. For routine decommissioning and remediation activities they should be sufficient to cover all of the remaining known accelerated actions for decommissioning and soil removal. The following is a summary of the RSOPs.

- *RFCA Standard Operating Protocol for Recycling Concrete*, approval received 10/18/99. Addresses the recycling of concrete that meets the unrestricted release criteria and the use of the concrete as backfill onsite.
- *RFCA Standard Operating Protocol for Facility Disposition*, approval received 10/5/00. Provides the decision for the demolition of all facilities at RFETS, provides the demolition methods and controls for facilities that meet the unrestricted release criteria, and provides NEPA coverage for low level waste and low level mixed waste shipments.
- *RFCA Standard Operating Protocol for Facility Component Removal, Size Reduction, and Decontamination Activities*, approval received 1/22/01. Provides the methods and controls for facility component (for example, equipment, interior walls, and ductwork) removal, size reduction, and decontamination. It also includes the methods and controls for the removal of contaminated external walls and roofing.
- *RFCA Standard Operating Protocol for Asphalt and Soil Management*, approval received 8/28/01. Addresses soil management during maintenance and temporary activities site-wide.

This RSOP will be used for decommissioning, environmental restoration, and routine maintenance projects.

- *The Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation.* Addresses the remediation of the contamination in the soil below facilities and individual hazardous substance site (IHSS) remediation.

USING RSOPs INSTEAD OF PROJECT-SPECIFIC DECISION DOCUMENTS

The RFETS closure process consists of several major stages that apply no matter what type of decision document is used. The major stages include: 1) scoping characterization and planning, 2) reconnaissance level characterization and facility typing, 3) decision document selection and/or development and approval, 4) decontamination and equipment removal, 5) demolition, and 6) project closeout and transfer to environmental restoration for soil and groundwater remediation. Using RSOPs increases the efficiency of the third stage, decision document selection and/or development and approval.

Stage 1 – Scoping Characterization and Initial Planning

The project starts by developing the project scope and collecting preliminary hazard and contamination information. In this stage, historical records of building activities and existing survey reports are reviewed. The suspected locations of contamination and other hazards are mapped in preparation for the reconnaissance level characterization.

RFETS has developed a proactive public involvement process, so at this stage, RFETS attempts to identify the key stakeholders who will be interested in the particular project. The stakeholders are often given an initial notification at this stage that the project planning has been started, and they are encouraged to provide informal input to the project management as the planning progresses. The project manager discusses the scope of the planned decision document with the stakeholders and regulators. Feedback from these briefings is used to refine the strategy for developing the decision document and to determine if a project-specific document is needed or if RSOPs can be used. When the stakeholders and regulators are involved from the very early stages of a project and their concerns are addressed to the extent practicable, opposition to the project is often reduced.

Stage 2 – Reconnaissance Level Characterization and Facility Typing

At this stage, RFETS personnel use the information obtained from the scoping characterization to determine what, if any, additional surveys and sampling must be conducted to further characterize the contamination and hazards related to the project. After the surveys and sampling are completed and analyzed, they prepare a Reconnaissance Level Characterization Plan that is transmitted to DOE for approval and then to CDPHE for concurrence.

Stage 3 – Decision Document Selection and/or Development and Approval

After concurrence from CDPHE is received, a project-specific decision document or a notification letter invoking one or more RSOPs is drafted. Drafting a project-specific decision document, such as a Decommissioning Operations Plan, may take several months; researching and writing an RSOP notification letter takes a few days to a few weeks.

In general, the review and approval process takes longer than preparation of the draft decision document. Developing a review strategy and actively managing the conduct of the review are critical

to successfully completing it on time. Proactive communications and follow-up with commenters are important for reducing conflicts, disagreements, and delays during the review cycle. Because the RSOPs are broader in scope than project-specific decision documents, they normally take longer to research, draft, negotiate, and get approved. Project-specific documents take 9 to 12 months compared to 12 to 20 months for RSOPs. However, once the RSOPs are approved, they can be used many times, whereas, the project-specific decision documents can be used only once.

The decision document preparation process is started when the Kaiser-Hill staff drafts a decision document. Following an internal Kaiser-Hill review, the DOE review is conducted. Because decision documents are RFCA compliance documents, close coordination between Kaiser-Hill and DOE is imperative.

The Kaiser-Hill reviews can be extensive and take several months to complete. Concurrence must be obtained from the organizations that will be affected by the document, such as environmental, health and safety, radiological engineering, and criticality engineering. The input from these organizations is needed to support and assess the planning information provided in the draft by the decommissioning and ER operations organizations. The amount of time for the internal reviews varies from several weeks to several months depending on the project scope, complexity, and extent and location of contamination.

The standard review process normally works with each review being conducted in series. Each organization starts their review after the completion of the review of the previous organization. To gain efficiency, the standard review process is seldom used at RFETS. Instead, early drafts are given for concurrent review to the reviewing organizations to keep them "in the loop." This allows them to expedite their review of the final draft. Also, as the DOE review is being conducted, draft documents are often given to the regulatory agencies, and, in some cases, to the stakeholders for informal review. This enables the document preparation team to receive comments early and look for major areas of conflict and develop resolution ideas early in the process.

When the initial reviews are completed, the public comment period begins. This formal public comment also serves as the NEPA and RCRA public participation period. As shown on table 1, the review period for decision documents varies. For documents requiring 45-60 day comment periods, the length of the public comment period is negotiated with the regulators and stakeholders. Typically, involving the stakeholders and regulators early in the development process allows them to influence the preparation of the draft decision documents, and they have been willing to use the shorter 45-day period.

After the public comment period is completed and comments have been received, the final negotiations are conducted. Then the responsiveness summary (a section of the decision document that contains stakeholder comments with RFETS responses) is written. Resolving the comments is often a lengthy process. After revisions required by the responsiveness summary have been made to the decision document, it is sent to CDPHE and/or EPA for approval. For sitewide documents of broad application, such as RSOPs, both agencies must approve it.

The process for developing and getting approval of project-specific decision documents or RSOPs is very similar. The cost and schedule savings are realized when a project is allowed to use one or more RSOPs instead of a project-specific decision document. An analysis of the cost and schedule savings is included, below. When existing RSOPs are used, RFETS only needs to research and submit a notification letter to the LRA.

Stage 4 – Decontamination and Equipment Removal

Upon receiving regulatory approval of the project-specific decision document or (in the case of RSOPs) transmitting the notification letter, decommissioning work may begin. During this stage, detailed work planning and health and safety reviews are completed in accordance with the decision document and Integrated Safety Management requirements. Then the physical work of decommissioning is conducted. This includes 1) removing equipment, 2) decontaminating equipment, and 3) decontaminating the facility interior and exterior walls, floors, ceiling and roof. This work continues until the cleanup standards in the decision document are met, and the facility is ready for demolition.

Stage 5 – Demolition

After the decontamination and equipment removal stage is completed, RFETS conducts a pre-demolition survey to demonstrate the cleanup goals in the decision document have been achieved. In some cases, DOE may also conduct an independent validation and verification of the pre-demolition survey. The facility is demolished following regulatory approval of the pre-demolition survey.

Stage 6 – Project Close-out and Transfer to Environmental Restoration

Following demolition, the area is transferred to the environmental restoration organization which is responsible for addressing any contamination remaining in the soil and groundwater.

COST AND SCHEDULE SAVINGS

Considerable cost savings and schedule reductions are made possible by using the RSOPs instead of many individual decision documents. These savings will be manifested as a combination of 1) direct costs saved by not producing project-specific documents, 2) schedule reduction, and 3) indirect cost savings from the site management and infrastructure.

Direct Cost Savings

The direct cost savings from not producing project-specific decision documents can be calculated from the estimated number of documents avoided. Under the Environmental Restoration program, approximately 100 project-specific proposed action memorandums would have been needed. Each proposed action memorandum takes 6 to 7 months for development and approval. Development costs average about \$40,000 per document.

The Decommissioning Program had anticipated needing approximately 20 Interim Measure/Interim Remedial Action decision documents. Each takes 9 to 12 months to develop and get approved at a cost of about \$70,000 per document.

Additionally, using RSOPs has significantly reduced the number and length of Closure Description Documents (CDDs) that would have been needed to close RCRA hazardous waste units. Approximately 75 would have been developed, and each CDD costs approximately \$17,500.

The total estimated savings in direct costs are \$6.8 million. The funds saved by not writing the project-specific documents are being used more efficiently on decommissioning and environmental restoration projects.

Schedule Reduction

As stated above, there is a significant schedule impact resulting from reducing the number of project-specific decision documents. Although not all of the documents would create impact to the project's critical path, incidents have occurred where projects were delayed because they lacked an approved decision document. By eliminating the need for well over 100 decision documents, up to six months of the closure schedule could be reduced. However, conservatively assuming that just one week of the closure schedule critical path is reduced (using \$1.5 million per day of cost) would be saving \$7.5 million.

Indirect Cost Savings

Indirect savings expected from the use of RSOPs are more difficult to calculate than those for direct costs and schedule reduction. Indirect savings result from project and site management and infrastructure staff spending their time on planning or carrying out the removal actions rather than using it on preparing project-specific documents.

Reducing the number of decision documents decreases inefficiencies experienced in the past from renegotiating similar issues in project-specific decision documents. Although the issues and problems were similar, the negotiations sometimes resulted in different resolutions. Having different resolutions created confusion between the people tasked with implementing the decision documents and occasionally created mistakes and project delays.

The total impacts from the indirect cost savings are very difficult to determine, so no attempt has been made to estimate them.

CHALLENGES IN DEVELOPING THE RSOPs

Using an RSOP-like decision document to obtain approval for a large number of complex activities on several hundred facilities was a new concept, and there were as many conflicting expectations as there were individuals involved in drafting and negotiating the RSOPs. The effort was successful, because, although their expectations varied widely, the participants shared the common goal of making the approval process more efficient. Representatives from Kaiser-Hill, DOE, CDPHE, EPA, and stakeholder groups all had concerns and issues about the development, use, and enforcement of the RSOPs. The key issues included:

- Defining a "routine" activity;
- Identifying the appropriate level of detail for the RSOP text to describe the activities and processes; and
- Determining the regulator and stakeholder involvement in project initiation and progress once the RSOPs are implemented.

It was through the combined efforts of the individuals and their willingness to negotiate in good faith that the RSOPs were developed.

What is a Routine Activity?

The authors of RFCA envisioned that RSOPs would be for routine activities. The problem faced by the RSOP developers was in defining a "routine activity." Could an activity be "routine" if it is:

- Difficult or complex
- Hazardous

- Subject to authorization basis controls
- Done fewer than an established number of repetitions
- Not routinely done during operations at RFETS or elsewhere in the DOE weapons complex
- Not routine in private industry?

Significant time was spent in discussing technical and philosophical differences of opinion on these topics. A recurring discussion amongst the negotiators was how to handle situations where an activity required decisions to be made during the conduct of the work. One school of thought was that an activity could be generally described to allow significant flexibility by the trained, experienced workers and managers who were doing the physical work. Others disagreed with this and felt that the RSOPs should be written to fully cover the processes to ensure that flexibility would not be necessary or allowed without modifying the RSOP. Two examples of concerns were the decontamination and demolition methods.

The compromise adopted was to describe each major process in sufficient detail to permit understanding by the reader, and to establish criteria or flowcharts that would allow some flexibility. However, the flexibility to adopt different methods is constrained in the RSOPs to using methods that are similar. If new methods are needed that are not covered in the RSOPs, RFETS must assess the new method and determine that its outcome and environmental impacts would be similar to those already in the RSOP. Thus, the RSOPs allow for flexibility within prescribed boundaries. Where the outcome or impacts are not covered by the RSOPs, the consultative process must be used to determine if RFETS will be allowed to use the new method or if one or more decision documents must be modified or a new decision document must be written.

What is the Appropriate Level of Detail?

The regulators and most of the stakeholders expressed concern that the initial draft RSOPs did not contain adequate detail on some of the issues of most concern to them. These issues included: decontamination methods, cleanup standards (How clean is clean?), the physical and environmental condition of the area where the facility had been located, and methods for reducing the risk of accidental hazardous substance releases during decommissioning operations. The physical and environmental condition of the area was a concern for many reasons including: 1) ensure the transfer to the environmental restoration organization went smoothly, 2) minimize impacts to surface and ground water, 3) maintain utilities, and 4) identify and plug process and sanitary waste lines that had entered the facility.

As discussed above, RFETS staff wanted to have as much flexibility as possible in the conduct of the field work, so a compromise was sought to provide stakeholders and the regulator agencies with enough information in the RSOPs to satisfy their needs. Discussions resulted in the draft RSOPs being revised to: 1) include more information on the processes to be used for decontamination, size reduction, and demolition, 2) incorporate more decision trees and decision criteria, and 3) include a summary of scope and any particular issues in each notification letter.

Ongoing Regulator and Stakeholder Involvement

The regulators and stakeholders were concerned that they would not be kept apprised of project status and issues in the planning or implementation stages if RSOPs were used. They were also apprehensive that they would be left out of the decision making process, and thus, would not be in a position to influence the decisions and outcome of individual projects. For example, RFETS staff believes that using explosives is the safest and most economical method for demolishing several

facilities, including a 200-foot tall ventilation stack. Some of the stakeholders assume that unidentified, hidden contamination could remain in the facility and that using explosives for demolition would release the contaminants into the surrounding area. These concerns were addressed, in part, by agreement to the following.

- RSOP notification letters would be brief, but they would include a description of the scope and any particularly complex or hazardous work scope.
- For Type 1 facilities, the Reconnaissance Level Characterization would be conducted more rigorously than in the past. This would provide additional evidence that they were not contaminated.
- Whenever explosives are planned for use, an analysis will be conducted to determine that their use is the preferred method based on economic, health and safety, and environmental criteria outlined in the Facility Disposition RSOP. Briefings and the opportunity for discussion of the plan to use explosives will occur on a project-by-project basis before RFETS management make the final decision on whether to use explosives or not. The input received during the discussions will be one of the factors RFETS will use in making the final decision.
- For activities where flexibility may be needed during the planning or conduct of field work, decision trees and flowcharts are included in the RSOPs as discussed above in the "What is a Routine Activity" section.

Reaching agreement on the concerns facilitates the regulators' and stakeholders' ongoing involvement with each project, and it ensures that they will be kept apprised of project status.

CONCLUSION

Innovation, cooperation, and consultation between the stakeholders, CDPHE, EPA, Kaiser-Hill and DOE made possible the creation and implementation of the RSOPs. Using RSOPs is an efficient, cost effective method of meeting regulatory requirements for documenting and obtaining approval of the decisions made at CERCLA and RCRA cleanup sites. At RFETS, the cost savings and schedule reduction attributed to the use of RSOPs are significant even in a project with a budget of over four billion dollars. For other sites that have a compliance agreement flexible enough to allow the use of RSOPs, their use should be considered.