

**Rocky Flats Environmental Technology Site**

**Integrated Monitoring Plan  
Background Document**

---

**Introduction**

---

**October 1998**

## Table of Contents

	<b>Page</b>
1.0 INTRODUCTION.....	1-1
1.1 Background .....	1-4
1.2 References .....	1-6

## 1.0 INTRODUCTION

The *Integrated Monitoring Plan* (IMP) revision for fiscal years 1998 and 1999 (FY98/FY99) includes some minor improvements to each media-specific area. Some changes were brought about as a result of an independent review by a subcontractor hired by the Rocky Flats Citizens Advisory Board (CAB). Other changes came about as a result of ongoing discussions by the individual working groups to improve their monitoring programs. Still other changes came from scope modifications directed by the Rocky Flats Environmental Technology Site (RFETS or the Site) management.

In the Ecology area, new monitoring was added for aquatics in streams and ponds. This addition came from a recommendation by the CAB to identify species that could be used as indicators of a release. Aquatic species are such sensitive species as to be indicative of a problem in the drainage systems on Site.

Air Quality Management (AQM) devised and implemented a method for monitoring the radiological impact of environmental restoration (ER) or building decontamination and decommissioning (D&D) or demolition activities that occur through the air pathway. The method involves exchanging filters at key existing ambient samplers on a weekly basis during project activities; performing quick turnaround alpha/beta screens, and, when necessary, expedited isotopic analyses; and tracking project emissions against predefined notification levels.

For Groundwater, the decision was made to include plume degradation evaluation into the IMP. Additionally, the inventory of wells, in Appendix E, that details the wells sampled has been updated to reflect new sampling requirements.

The Surface Water IMP has been updated to include changes in the surface water monitoring programs resulting from the first year's implementation of *Rocky Flats Cleanup Agreement* (RFCA)(DOE et al., 1996) monitoring. The most significant changes involved reorganizing monitoring programs previously categorized as either Industrial Area monitoring or monitoring for industrial area discharges to ponds. Performance monitoring is updated to include new monitoring stations installed for the Walnut Creek source evaluation and administrative transfer of OU2 closure monitoring. Monitoring changes related to the National Pollutant Discharge Elimination System (NPDES) permit renewal options are also addressed. New sections were added for new monitoring of the sanitary collection system (i.e., influent flow and radiological monitoring).

Additionally, the IMP working group decided to add a new subgroup, the Special Projects working group. This group helps to identify and integrate the monitoring that would be required to satisfy the needs of individual projects. This subgroup also took on the issue of soil monitoring and how to include that in the IMP. Soil monitoring is conducted as it relates to specific ER or D&D activities. Furthermore, each media-specific section has developed a Special Project

Template. This template is to be used as a guide to develop monitoring data quality objectives (DQOs) for individual projects, which would be consistent with the DQOs for routine monitoring.

Integration of Site-wide and project-specific monitoring will occur during the planning of all major new activities, such as ER and D&D projects. Kaiser-Hill Company, L.L.C. (Kaiser-Hill) will review all major project plans and evaluate the need for specific environmental monitoring, based on potential release characteristics (e.g., constituents and concentrations), potential impacts [e.g., adherence to regulatory standards, RFCA, and as low as reasonably achievable (ALARA) principles], and existing Site-wide, multi-media monitoring. Consideration will be given to data needs before, during, and after a proposed activity. Monitoring before a project would assist in defining baseline conditions, characterizing relationships between media, assessing potential impacts to multiple media, and developing designs and controls to eliminate or mitigate impacts. Monitoring during and after a project would assist in determining the effectiveness and performance of designs and controls to eliminate or mitigate impacts. If additional monitoring is deemed necessary, Kaiser-Hill would work with project personnel to develop appropriate, media-specific DQOs and monitoring specifications. Project-specific DQOs will address protection of project personnel, collocated workers, off-Site populations, and the environment, and will complement Site-wide monitoring DQOs. Project-specific monitoring plans will be included in separate field sampling plans and/or health and safety plans, and, therefore, will be available for review by the regulatory agencies and other stakeholders. Integration of Site-wide and project-specific monitoring could also be the subject of future meetings of the integrated monitoring working group.

A key component of the DQO process and the RFETS IMP is data evaluation. To be successful, both Site-wide and project-specific monitoring data will need to be continuously evaluated to support the DQO decision rules. Decision rules could address baseline definition, relationships between various media, performance and compliance demonstration, and identification of unplanned conditions and trends. Actions based on data evaluation are specified by the decision rules. Actions also may involve modification of DQOs and monitoring specifications. For example, additional data may be required to adequately characterize observed conditions and potential impacts (e.g., exceedance of RFCA Tier I and Tier II groundwater action levels), and in some cases, to properly scope a proposed activity (e.g., ER and D&D projects, or changes to existing water management schemes). Data evaluation is discussed in the media-specific sections that follow and in RFETS environmental program plans.

Data reporting and data exchange were considered during the development of the IMP. The data exchange mechanism, which was formalized as a RFCA requirement (Section 207), will provide Site-wide and project-specific monitoring data to all appropriate monitoring entities and regulatory agencies and will allow these groups to evaluate data needs associated with proposed activities (e.g., baseline characterization, design, and performance monitoring). Work is progressing on defining the data management tools needed for data exchange and interpretation. All entities are involved to ensure that the proper information is conveyed in a timely manner.

The plan presented herein should be considered dynamic. The monitoring programs will evolve as further progress is made on Site remediation and closure, as new remediation and closure efforts are planned and initiated that require performance monitoring, as the regulatory setting changes, and as new data become available to improve the statistical design. Such changes will be made by the multi-party working group and documented in updates to this plan. Routine meetings of the working group will be held, and resulting changes will be presented to other stakeholders, including the CAB. Additional work that should be performed is presented below.

- Evaluate detection limits, quality control (QC) specifications, and other aspects not fully specified at this time;
- Finalize process to develop and evaluate monitoring DQOs and plans for new activities, such as ER and D&D projects, including integration of Site-wide and project-specific monitoring;
- Continue to identify integration opportunities between media (see Table 7-1 in Section 7);
- Finalize DQOs for Buffer Zone flow monitoring;
- Develop monitoring DQOs for controlled detention mode of pond operations;
- Continue to evaluate groundwater data regarding Tier I and II exceedances, and modify sampling and analysis accordingly (data review, additional sampling and analysis, and modeling as appropriate), for example:
  - Nitrate plume at Solar Ponds,
  - Walnut Creek wells,
  - Wells north of B771/B779 Complex, and
  - Volatile organic compound plume at Property Utilization and Disposal (PU&D) yard;
- Negotiate changes in “National Emission Standards for Emissions of Radionuclides Other Than Radon from DOE Facilities” (Rad NESHAP) monitoring in light of facility D&D [i.e., use of ambient monitoring to demonstrate compliance with National Emission Standards for Hazardous Air Pollutants (NESHAP) standards];
- Solicit broader stakeholder input (e.g., present plan and modifications to interested stakeholder groups);

- Convene integrated monitoring working group routinely (e.g., semiannually); and
- Complete development of mechanism to exchange data among monitoring entities and with other stakeholders.

## 1.1 **Background**

Soon after Kaiser-Hill became the Integrating Management Contractor at the RFETS, Kaiser-Hill undertook a structured, comprehensive, reevaluation of all environmental monitoring programs. The objective of this effort was to develop specifications for monitoring utilizing the U.S. Environmental Protection Agency's (EPA's) established DQO process. The process involved the Department of Energy (DOE), EPA and Colorado Department of Public Health and Environment (CDPHE) (state) regulators, the cities of Broomfield and Westminster, and the Kaiser-Hill team. The effort was intended to identify any unnecessary monitoring and existing weaknesses in the monitoring programs, and to ensure protective and compliant programs. Using the consensus specifications (DQOs), an optimal data collection design was determined. This approach demonstrates compliance with the myriad of federal and state regulations and DOE Orders, and supports the decisions that must be made to protect human health and the environment with an acceptable degree of certainty. The monitoring programs of the regulators and cities were included and also modified to develop an integrated, multi-party Site monitoring program. The development and maintenance of this integrated program became a requirement of the RFCA issued on July 19, 1996<sup>1</sup>. The *Integrated Monitoring Plan* is a result of the process described above.

The DQO process is a structured decision-making process that requires the identification of and agreement on decisions for which data are required, and results in the full set of specifications needed to develop a protective and compliant monitoring program (i.e., qualitative and quantitative statements that specify the type, quality, and quantity of the data required to support decision making). The formal DQO process is documented in two EPA documents (EPA, 1993a; EPA, 1993b). In September 1994, DOE institutionalized the DQO process for environmental data collection activities. This was implemented to balance DOE's environmental sampling and

---

<sup>1</sup> RFCA Part 21 Sections 267 and 268 state: "In consultation with CDPHE and EPA, DOE shall establish an IMP that effectively collects and reports the data required to ensure the protection of human health and the environment consistent with the Preamble, compliance with this Agreement, laws and regulation, and the effective management of RFETS's resources. The IMP will be jointly evaluated for adequacy on an annual basis, based on previous monitoring results, changed conditions, planned activities and public input. Changes to the IMP will be made with the approval of EPA and CDPHE. Disagreements regarding any modifications to the IMP will be subject to the dispute resolution process described in Subpart 15B or E, as appropriate."

"All Parties shall make available to each other and the public results of sampling, tests, or other data with respect to the implementation of this Agreement as specified in the IMP or appropriate sampling and analysis plan. If quality assurance is not completed within the time frames specified in the IMP or appropriate sampling and analysis plan, raw data or results shall be submitted upon the request of EPA or CDPHE. In addition, quality assured data or results shall be submitted as soon as they become available."

analysis costs with the need for sound environmental data that address regulatory requirements and stakeholder's concerns. Specific steps in the DQO process include:

- Identify and define problem(s) to be solved;
- Identify decision(s) to be made relative to the problem;
- Identify inputs to the decision (data needed to make decision);
- Define study boundaries/scope of problem and decision;
- Develop decision rule(s) [IF/THEN action statement(s)];
- Specify limits on decision errors (acceptable types and degrees of uncertainty); and
- Develop and optimize design for obtaining data.

The goal of using this approach was to reevaluate the basis and focus of existing programs, increase the defensibility of Site monitoring, and incorporate regulatory changes (e.g., water quality standards and cleanup levels) associated with RFCA. The RFCA requirements have been incorporated into the DQOs.

Implementation of the DQO process forces data suppliers and data users to consider the following questions:

- What decision has to be made?
- What type and quality of data are required to support the decision?
- Why are new data needed for the decision?
- How will new data be used to make the decision?

DOE and Kaiser-Hill recognized that the Site could no longer have separate, non-integrated sampling and analysis activities performed by various entities at the Site (e.g., Environmental Restoration and Environmental Protection), or between the Site, the cities, CDPHE, and EPA Region VIII. DOE and Kaiser-Hill also realized that they should not work alone; therefore, an integrated monitoring working group was formed with representatives from EPA, CDPHE, and the cities of Broomfield, Northglenn, Arvada, and Westminster to develop consensus on what data were needed and how data would be used, and to develop sampling and analysis plans based on these specifications. The responsibility for data generation was then spread across these entities in a logical way. In developing the requirements for an integrated monitoring plan, the decisions and multimedia data requirements associated with the Resource Conservation and

Recovery Act (RCRA); the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); the Clean Air Act (CAA); the Clean Water Act (CWA); the Colorado Water Quality Control Commission (CWQCC) standards; natural resource management regulations, Site-specific cleanup agreements (e.g., the *Industrial Area Interim Measures/Interim Remedial Action Decision Document*), and several DOE Orders were considered. After data requirements to support each of the desired decisions were identified, data collection was streamlined by looking for opportunities to use measurements for more than one decision.

To accomplish the work associated with developing an integrated monitoring plan, four medium-specific DQO working groups (i.e., surface water, groundwater, air, and ecological resources) were established. Each group met regularly to work through the DQO process for each decision that required monitoring data. In addition, all four groups met together to discuss data needs across media, share progress, ensure consistency, and identify problems. DQO facilitators and statisticians, sponsored in part by DOE Headquarters, assisted the integrated monitoring working group in developing the DQOs, evaluating the adequacy of existing designs, and developing new sampling and analysis plans. The results of these efforts represent a multi-party consensus agreement and are documented in this document by environmental media. Integration was achieved between monitoring entities, regulatory programs, and environmental media. Interactions between media are discussed in Section 7.0 of this *IMP Background Document*.

This document covers all the environmental monitoring conducted by DOE and the Kaiser-Hill team, as well as monitoring conducted by CDPHE and the cities where interface and integration opportunities exist. Other monitoring conducted by CDPHE and the cities is related to the Site, but does not present integration opportunities (e.g., monitoring of area reservoirs conducted by the cities and spot checks conducted by CDPHE).

## 1.2 References

- U.S. Department of Energy, Colorado Department of Health and Environment, and U.S. Environmental Protection Agency, 1996. *Final Rocky Flats Cleanup Agreement*, July.
- U.S. Environmental Protection Agency, 1993a. *Guidance for Planning for Data Collection in Support of Environmental Decision Making Using the Data Quality Objective Process*, EPA QA/G4.
- U.S. Environmental Protection Agency, 1993b. *Data Quality Objectives Process for Superfund*, EPA/540/G-93/071.