

## 1.0 Introduction

The U.S. Department of Energy (DOE) Office of Legacy Management (LM) is responsible for implementing the final response action selected in the final *Corrective Action Decision/Record of Decision for Rocky Flats Plant (USDOE) Peripheral Operable Unit and Central Operable Unit (CAD/ROD)* (DOE 2006a) issued September 29, 2006, for the Rocky Flats, Colorado, Site (Site). Prior to the CAD/ROD, cleanup and closure activities were completed in accordance with the requirements of the *Final Rocky Flats Cleanup Agreement (RFCA)* (CDPHE et al. 1996). Under the CAD/ROD, two Operable Units (OUs) were established within the boundaries of the Rocky Flats property: the Peripheral Operable Unit (POU) and the Central Operable Unit (COU). The COU consolidates all areas of the Site that require additional remedial or corrective actions while also considering practicalities of future land management. The POU includes the remaining, generally unimpacted portions of the Site and surrounds the COU. The response action in the final CAD/ROD is no action for the POU and institutional and physical controls with continued monitoring for the COU. The Offsite Areas at Rocky Flats, known as OU 3, were addressed under a separate no-action CAD/ROD dated June 3, 1997.

The CAD/RODs for OU 3 and the POU determined that conditions in those OUs were suitable for unrestricted use. As a result, the U.S. Environmental Protection Agency (EPA) published a Notice of Intent for Partial Deletion (NOIPD) of the Rocky Flats Site (also known as the Rocky Flats Plant) from the National Priorities List (NPL) on March 13, 2007 (Volume 72 *Federal Register* page 11313 [72 FR 11313]), which was a proposal to delete the POU and OU 3 from the NPL. The NOIPD was based on the results of the remedial investigations leading to the CAD/ROD no-action remedies being selected for these OUs. The NOIPD stated that, because no hazardous substances occur in the OUs above levels that allow for unlimited use and unrestricted exposure, a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Five-Year Review was no longer required for these OUs. EPA subsequently published a Notice of Partial Deletion from the NPL for the POU and OU 3 on May 25, 2007 (72 FR 29276).

On July 12, 2007, most of the property outside the COU was transferred to the U.S. Department of the Interior for establishment of a national wildlife refuge managed by the U.S. Fish and Wildlife Service (USFWS). EPA certified that cleanup and closure of Rocky Flats was complete and that the COU remedy was operating properly and successfully, in accordance with requirements for DOE to transfer land to USFWS for establishing the refuge. DOE retained the COU and is responsible for implementing the CAD/ROD final response action and for ensuring that it remains protective of human health and the environment. The monitoring, surveillance, and maintenance activities—for which quarterly, annual, and Five-Year Review reports are issued—are included in the *Rocky Flats Legacy Management Agreement (RFLMA)* (CDPHE et al. 2012).

RFLMA, signed March 14, 2007, superseded the RFCA. RFLMA is a Federal Facility Agreement and Consent Order under CERCLA, the Resource Conservation and Recovery Act (RCRA), and the Colorado Hazardous Waste Act, between DOE, EPA Region 8, and the Colorado Department of Public Health and Environment (CDPHE). The purpose of RFLMA is to establish the regulatory framework for RFLMA Attachment 2, “Legacy Management Requirements.”

RFLMA Attachment 2, Section 7.0, requires DOE to provide reports pertaining to the surveillance and maintenance of the remedy prescribed in the CAD/ROD on a calendar quarter and annual basis. The fourth-quarter report information is to be included in the annual report.

RFLMA Attachment 2, Section 7.2, specifies that the annual reports may include a summary for the previous quarter and shall include the following:

- A discussion of surface-water monitoring data
- A discussion of groundwater monitoring data
- A discussion of groundwater treatment system monitoring data
- A discussion of ecological sampling data
- A description of any adverse biological conditions
- A summary of actions taken in response to reportable conditions
- A summary of maintenance and repairs
- Inspection reports
- Verification of the *Environmental Covenant* (CDPHE 2011a) and evaluation of the effectiveness of institutional controls (ICs)
- Monitoring and maintenance required by the Original Landfill (OLF) Monitoring Report (see Table 3 and Section 6.1 of the final *U.S. Department of Energy Rocky Flats Site, Original Landfill Monitoring and Maintenance Plan* [OLF M&M Plan] [DOE 2009a])
- Monitoring and maintenance required by the Present Landfill (PLF) Monitoring Report (see Table 3 and Section 6.1 of the *Present Landfill Monitoring and Maintenance Plan and Post-Closure Plan, U.S. Department of Energy Rocky Flats Site* (PLF M&M Plan) [DOE 2008a])
- Assessments of analytical data, including laboratory audits
- Other conditions or actions taken that are pertinent to the continued effectiveness of the remedy

This calendar year (CY) 2013 Annual Report contains the summary for the fourth quarter of CY 2013.

LM prepared and continually updates the *Rocky Flats, Colorado, Site, Site Operations Guide* (DOE 2013e), also called the RFSOG, as a framework to guide work at the Site. The RFSOG provides details on the surveillance and maintenance needed to satisfy the requirements of the CAD/ROD as well as best management practices (BMPs) at the Site. The RFSOG explains how DOE will fulfill its long-term surveillance and maintenance obligations at the Site.

While the specific BMPs are not subject to regulation under RFLMA, this annual report includes a discussion of activities related to implementing BMPs to document the information for future reference and to provide a perspective of the work conducted over the year.

## 1.1 Purpose and Scope

The purpose of this report is to inform the regulatory agencies and stakeholders of the surveillance, monitoring, and maintenance activities being conducted at the Site. LM provides

periodic communications such as this report and communicates through other means such as Web-based tools and public meetings.

Topics covered in this annual report include Site operations and maintenance (Section 2.0) and environmental monitoring, including water and ecological monitoring (Section 3.0). Data management, data validation, and an assessment of data quality are also included in Section 3.0. References cited in this report are included in Section 4.0.

Supporting information is provided in a series of appendixes. Appendix A provides the hydrologic data and Appendix B provides the water-quality data. The fourth quarter of CY 2013 landfill inspection forms for the PLF and OLF are included in Appendix C. RFLMA and RFSOG data evaluation flowcharts are provided in Appendix D. Appendix E contains the *Technical Memorandum Regarding Instrumentation and Monitoring at the Rocky Flats OLF*. The *Technical Memorandum on OLF Berm Height Evaluation Using Site-Specific Data* is included as Appendix F. Appendix G consists of the Lawrence Berkeley National Laboratory reports received for selected site samples, and Appendix H contains the RFLMA contact records issued during CY 2013.

## 1.2 Background

Surveillance, maintenance, and monitoring activities are conducted according to RFLMA. RFLMA incorporates the following plans:

- The OLF O&M Plan (DOE 2009a)
- The PLF M&M Plan (DOE 2008a)

RFLMA Attachment 2 stipulates that DOE employ administrative procedures to control activities in accordance with the ICs and to meet quality assurance and quality control program requirements. Other Site procedures are established to guide work and implement BMPs. These procedures are referenced in the RFSOG and include the *Erosion Control Plan for the Rocky Flats Property Central Operable Unit* (DOE 2007a).

## 1.3 RFLMA Contact Records

This section provides a summary of the status of activities addressed by RFLMA contact records issued during 2013. RFLMA references the use of contact records to document CDPHE oral approvals of field modifications to implement approved response actions (see RFLMA paragraph 34). Excavation or soil disturbance activities that are subject to ICs must have prior regulatory review and approval pursuant to the Soil Disturbance Review Plan in RFLMA Attachment 2, Section 4.1, and results of consultation will be documented in contact records or written correspondence. RFLMA Attachment 2 also references the use of contact records to document the outcome of consultation related to addressing any reportable conditions (see RFLMA Attachment 2, Section 6.0). Finally, the *Rocky Flats Site Legacy Management Public Involvement Plan* (PIP), in RFLMA Appendix 2, also provides that a contact record of consultative process discussions between the RFLMA Parties will be made available to the Rocky Flats Stewardship Council and other interested stakeholders as early in the process as is practicable following signature approval by the parties. The PIP process to make contact records

available is implemented by posting contact records on the Rocky Flats public website and by promptly notifying stakeholders (by e-mail) that the contact record is posted.

The RFLMA Parties agreed, as documented in RFLMA Contact Record 2007-08, that DOE will document the status of actions or activities in RFLMA contact records from time to time and will include the documentation in RFLMA quarterly and/or annual surveillance and maintenance reports for tracking purposes. The RFLMA Parties also agreed that to facilitate the status reporting, contact records should include a short discussion of the anticipated actions or activities to close out the RFLMA contact record. Thus, RFLMA Contact Record 2007-08 and subsequent contact records will include the closeout discussion.

Under certain situations, activities previously approved in a contact record that has been closed out will need to be performed. A simple notification and approval process has been developed for these situations, which is documented in RFLMA Contact Record 2009-05. CDPHE may receive notification of and approve the activities over the phone or in person, with e-mail follow-ups. The notification and approval of such work shall be reported in the next RFLMA annual report, in relation to the contact record that originally covered the work. This protocol is consistent with RFLMA paragraph 34.

Table 1 lists the RFLMA contact records issued in 2013 and their status at the end of 2013. The table also lists contact records that were issued from 2007 to the end of 2012, were discussed in the 2012 Annual Report, and were not closed by the end of 2013, and shows their status at the end of 2013. The table also lists e-mail approval of activities previously covered by closed-out contact records. Appendix H contains copies of the 2013 contact records.

## **1.4 RFLMA Modifications**

Minor modifications to RFLMA Attachment 1, “Site Map,” and Attachment 2, “Legacy Management Requirements,” were proposed in Contact Record 2012-03. The contact record, which was approved on December 7, 2012, and subsequently posted on the Rocky Flats website, constitutes the public notice required in RFLMA paragraph 66. These minor modifications to RFLMA attachments were approved by CDPHE and EPA on February 21, 2013, and have been incorporated into RFLMA Attachment 1, “Site Map” and Attachment 2, “Legacy Management Requirements,” posted on the Rocky Flats public website. The minor modifications are summarized below.

### **1.4.1 Attachment 1 “Site Map”**

Completion of breaching the Present Landfill Pond and Pond A-3 dams resulted in a change to several map figures to show the new surface water configuration as wetlands. The “Site Map” now reflects the Present Landfill former pond area and A-3 dam former pond area by changing the footprint and the map features to indicate areas as “wetland/marsh.” Also, “McCaslin Road” and “Indiana St.” labels have replaced “County Highway 5” labels to be consistent with road signs.

## **1.4.2 Attachment 2 “Legacy Management Requirements”**

### **1.4.2.1 Monitoring Requirements**

Completion of the installation of the new flumes for surface water monitoring locations WOMPOC and WALPOC and the required notification to CDPHE and EPA completed the requirements for these locations to become new Points of Compliance (POCs). The RFLMA Attachment 2 change is:

#### Section 5.1, “Monitoring Surface Water”

Points of Compliance (POCs): Located in Woman and Walnut Creeks. These locations are used to demonstrate compliance with the surface-water standards in Table 1. WALPOC, which replaced former POCs GS08 and GS11 on September 28, 2011, and WOMPOC, which replaced former POC GS31 on September 9, 2011, will also replace GS03 and GS01 respectively upon DOE notification to EPA and CDPHE certifying that WALPOC and WOMPOC have been functioning as POCs for at least 2 years. EPA or CDPHE may extend the 2-year period by requiring DOE to submit a modification to this attachment in accordance with RFLMA paragraph 65 if either determines that such modification is necessary to ensure protection of human health and the environment.

Table 2, “Water Monitoring Locations and Sampling Criteria,” was modified to reflect changes to Section 5.1. The rows for locations GS08, GS11, and GS31 were deleted. Also, in Figure 1, “Water Monitoring at Rocky Flats: RFLMA,” locations GS08, GS11, and GS31 were deleted.

The additional ecological sampling required under RFLMA Attachment 2, Table 5 was completed in CY 2007, and the evaluation of results is included in the *Quarterly Report of Site Surveillance and Maintenance Activities, First Quarter Calendar Year 2008* (DOE 2009c). CDPHE agreed that no further ecological sampling is required, as documented in Contact Record 2008-01. Therefore Section 5.3.7, “Ecological Sampling” has been deleted and Table 5 “Ecological Sampling” was also deleted.

### **1.4.2.2 Reporting Requirements**

Completion of the third Five-Year Review necessitated clarifying the schedule for subsequent reviews. Therefore Section 7.3, “CERLCA 5-Year Review,” was modified by deleting specific dates for the Five-Year Review report and inserting that a “mutually agreeable schedule determined by the RFLMA Project Coordinators in accordance with consultative process in RFLMA paragraph 11, so as to allow for EPA concurrence within five years of the preceding 5-year review report.”

### 1.4.2.3 Table 1 “Surface Water Standards”

There have been recent changes to Regulation #31, “Basic Standards and Methodologies for Surface Water” (5 CCR 1002-31) (Reg. #31), which required updates to RFLMA Attachment 2, Table 1, “Surface Water Standards.” Table 1 was modified to delete the current standards and replace them with the new Regulation #31 standards, as follows:

Analyte	Current RFLMA Standard (mg/L)	New RFLMA Standard (mg/L)
Acrylamide	7.80E-6	2.20E-5
Carbon tetrachloride	2.30E-4	4.30E-4
1,2-dichloroethene ( <i>cis</i> )	7.00E-2	1.40E-2 to 7.00E-2
1,4-dioxane	3.20E-3	3.50E-4
Hexachloroethane	4.00E-4	5.00E-4
Nitrobenzene	3.50E-3	1.40E-2
Pentachlorophenol	2.70E-4	8.00E-5
Tetrachloroethene	6.90E-4	5.00E-3

**Abbreviations:**

mg/L = milligrams per liter

Table 1 footnotes were modified as follows:

[c] Reserved.

[e] Applies to Segment 4a.

[h] Reserved.

[i] The listed nitrite value is the chronic aquatic life standard based on chloride levels in excess of 22 mg/L in Segment 4. Nitrate and nitrite standards are as nitrogen.

[m] Reserved

[n] The second number in the range for arsenic and 1,2-Dichloroethene (*cis*) is applied as the corresponding or applicable Table 1 standard in the flowcharts in Figures 7 through 11.

### 1.4.2.4 Table 3, “Present and Original Landfill Inspection and Maintenance Requirements”

The landfill vegetation meets success criteria, and it will be monitored and managed under the sitewide vegetation and revegetation plans as recommended in the third Five-Year Review report. Therefore Table 3, “Present and Original Landfill Inspection and Maintenance Requirements,” has been modified to remove the vegetation and inspection requirements.

Table 1. Status of RFLMA Contact Records

Contact Record No.	Purpose	Approval Date	Status as of December 31, 2012
2013-01	GS10 Flume Replacement Project and Soil Disturbance Review Plan	5/2/2013	Actions completed. Closed.
2013-02	Reportable Condition at Original Landfill	10/21/2013	Contact record will be closed when the construction is completed, post-construction reseeding has been performed, and post-construction erosion controls are in place.
2013-03	Soil Disturbance Review Plan for Regrading the East Perimeter Channel and Associated Diversion Berms at the Original Landfill	11/22/2013	Contact record will be closed when the work is completed, post-construction reseeding has been performed, and post-construction erosion controls are in place. Related to Contact Record 2013-02.
2012-02	Improving Treatment at the East Trenches Plume Treatment System by Adding an Air Stripper Component	10/25/2012	Actions completed. Closed.
2012-03	Minor Modification of <i>Rocky Flats Legacy Management Agreement</i> (RFLMA) Attachment 1, "Site Map," and of RFLMA Attachment 2, "Legacy Management Requirements"	12/7/2012	Actions completed. Closed.
2011-04	Reportable Condition for Uranium at Point of Evaluation GS10	7/8/2011	Contact record serves as the plan and schedule for the evaluation of the reportable condition and will be closed when the evaluation is completed.
2011-05	Update for Reportable Condition for Uranium at Point of Evaluation GS10	10/4/2011	Contact record serves as the plan and schedule for the evaluation of the reportable condition and will be closed when the evaluation is completed. Related to Contact Record 2011-05.
2011-08	Reportable Condition for Americium-241 at Rocky Flats Legacy Management Agreement Point of Evaluation GS10	12/23/2011	Contact record serves as the plan and schedule for the evaluation of the reportable condition and will be closed when the evaluation is completed.
2010-03	Non-Rocky Flats Legacy Management Agreement Surface Water Monitoring Project for North and South Walnut Creeks	3/15/2010	Actions completed. Closed.
2009-01	Phase II and III Upgrades to Solar Ponds Plume Treatment System	2/17/2009	Construction and post-construction revegetation and erosion controls are in place. Optimization of the upgrades and monitoring is ongoing. Contact record will be closed when testing is completed and as-built drawings are completed.
2008-06	Management of Intercepted Groundwater During SPPTS Repair or Maintenance Activities	7/3/2008	Actions continuing.
2007-06	Evaluation of Elevated Nitrate in Groundwater Samples from AOC (Area of Concern) Well B206989	10/12/2007	Actions completed. Closed.

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