LMS/RFS/47373

Rocky Flats Site, Colorado, Surface Water Configuration Adaptive Management Plan Quarterly Report

First Quarter Calendar Year 2024

April 2024

U.S. DEPARTMENT OF ENERGY | Legacy Management

This document has been designed for online viewing.

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Tables

Abbreviations

AMP	Adaptive Management Plan
COU	Central Operable Unit
CY	calendar year
DOE	U.S. Department of Energy
EA	Environmental Assessment
POC	Point of Compliance

1.0 Introduction

The Proposed Action assessed in the *Rocky Flats Site, Colorado, Surface Water Configuration Environmental Assessment* (DOE 2011), hereafter referred to as the Environmental Assessment (EA), is to breach the remaining retention pond dams at the Rocky Flats Site, Colorado, to allow surface water flow to return to the approximate conditions that prevailed before the retention ponds were constructed. As stated in the EA, based on extensive water quality monitoring data and a thorough environmental review, the U.S. Department of Energy (DOE) Office of Legacy Management has determined that the Proposed Action does not present a significant impact on the environment under the National Environmental Policy Act evaluation criteria.

Some members of the public have commented that additional information should be collected before implementing the final steps of the Proposed Action to help reduce uncertainty about whether completion of the Proposed Action will adversely impact the quality of water flowing from the Site into downstream community watersheds. In response to the requests, DOE initiated a cooperative effort with neighboring community representatives and other interested stakeholders to develop and implement an Adaptive Management Plan (AMP) to provide additional information. The AMP group is composed of these representatives and stakeholders. The resulting AMP, the *Surface Water Configuration Adaptive Management Plan for the Rocky Flats Site, Colorado* (DOE 2023), first published in 2011, reflects DOE's long-term commitment to implementing the activities presented in the AMP.

The AMP provides for a monitoring and data evaluation program to assist in deciding when to implement the final steps of the Proposed Action, which include breaching the terminal dams. The terminal dams will be operated in a flow-through condition until the completion of the Proposed Action, which will provide data similar to what can be expected postbreach. In addition to the monitoring program, the AMP identifies certain performance indicators that DOE will consider in deciding whether to adjust the time frame for completing the Proposed Action.

This AMP Quarterly Report for the first quarter of calendar year (CY) 2024 is provided in accordance with Section 5.0, "Reporting," of the AMP. Section 3.0 of this report describes the first quarter data summary tables, which include all validated analytical data for the AMP monitoring objectives that were available as of March 31, 2024. Subsequent AMP reports will include data that were not tabulated in previous AMP reports.

AMP monitoring objectives, locations, and sampling criteria are itemized in Table 2 of the AMP. Additional field implementation for the AMP monitoring objectives can be found in the *Additional Field Implementation Detail for Selected Monitoring Objectives at the Rocky Flats Site, Colorado* (DOE 2022).

This report routinely includes analytical data for the following AMP monitoring objectives:

- Predischarge sampling (Item 1, AMP Table 2)
- Targeted groundwater monitoring (Item 2, AMP Table 2)
- Monitoring to evaluate flow-through operations at terminal Ponds A-4, B-5, and C-2 (Item 4, AMP Table 2)
- Storm-event monitoring (Item 5, AMP Table 2)

- Continuous flow-paced composite sampling to evaluate uranium transport (Item 6, AMP Table 2)
- Grab sampling for uranium in North and South Walnut Creeks (Item 7, AMP Table 2)
- Grab sampling for nitrate + nitrite as nitrogen in North Walnut Creek (Item 8, AMP Table 2)

2.0 AMP Highlights: First Quarter CY 2024

- Ten informal emails were transmitted to AMP participants providing notification that composite samples had been retrieved from the Points of Compliance (POCs): Woman Creek at the Central Operable Unit (COU) boundary and Walnut Creek at the COU boundary.
- Three informal emails were transmitted to AMP participants providing notification that recent analytical data from the POCs had been validated and would soon be available through the Geospatial Environmental Mapping System (GEMS).
- Three informal emails were transmitted to AMP participants providing notification of individual analytical results from POCs and Points of Evaluation that were above the applicable surface water standard in Attachment 2, Table 1, in the *Rocky Flats Legacy Management Agreement* (CDPHE et al. 2007), which was revised in 2018.
- During the quarter, 62 samples were collected in support of AMP monitoring objectives.

3.0 Analytical Data: First Quarter CY 2024

Analytical data for the first quarter of CY 2024 are provided in Tables 1 and 2 (at the end of this report). Table 1 provides the analytical results, and Table 2 lists the water sampling events during the quarter.

4.0 References

CDPHE (Colorado Department of Public Health and Environment), DOE (U.S. Department of Energy), and EPA (U.S. Environmental Protection Agency), 2007. *Rocky Flats Legacy Management Agreement*, executed on March 14, Attachment 2 updated December 2018.

DOE (U.S. Department of Energy), 2011. *Rocky Flats Site, Colorado, Surface Water Configuration Environmental Assessment*, DOE/EA-1747, LMS/RFS/S06335, Office of Legacy Management, May.

DOE (U.S. Department of Energy), 2022. *Additional Field Implementation Detail for Selected Monitoring Objectives at the Rocky Flats Site, Colorado*, LMS/RFS/S08202, Office of Legacy Management, September.

DOE (U.S. Department of Energy), 2023. *Surface Water Configuration Adaptive Management Plan for the Rocky Flats Site, Colorado*, LMS/RFS/S07698, Office of Legacy Management, September.

Table 1. Analytical Results for Water Samples

LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE CODE	CAS Registry Number	ANALYTE	FILTRATION STATUS	RESULT	UNITS	LAB QUALIFIERS	SAMPLE TYPE	DETECTION LIMIT	UNCER-TAINTY	DATA VALIDATION QUALIFIERS	COLLECTION METHOD	LAB CODE
B3OUTFLOW	SL	1/31/24	RFS01-04.2401128-007	7440-61-1	Uranium	N	34	ug/L		F	0.03		J	G	STD
GS10	SL	12/29/23	RFS01-04.2401126-011	7440-61-1	Uranium	N	28	ug/L	W	F	0.03		J	G	STD
GS10	SL	1/31/24	RFS01-04.2401128-011	7440-61-1	Uranium	N	22	ug/L		F	0.03		J	G	STD
GS13	SL	1/31/24	RFS01-04.2401128-013	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	28	mg/L		F	0.44			G	STD
GS13	SL	1/31/24	RFS01-04.2401128-013	7440-61-1	Uranium	N	60	ug/L		F	0.03		J	G	STD
SPOUT	TS	1/18/24	RFS01-04.2401127-015	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	0.044	mg/L	U	F	0.044			G	STD
SPOUT	TS	1/31/24	RFS01-04.2401128-015	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	0.044	mg/L	U	F	0.044			G	STD
SPOUT	TS	1/31/24	RFS01-04.2401128-015	7440-61-1	Uranium	N	52	ug/L		F	0.03			G	STD
SW093	SL	1/31/24	RFS01-04.2401128-016	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	1.3	mg/L		F	0.044			G	STD
SW093	SL	1/31/24	RFS01-04.2401128-016	7440-61-1	Uranium	N	8.8	ug/L		F	0.03		J	G	STD
WOMPOC	SL	2/8/24	RFS01-13.2402109-018	14596-10-2	Americium-241	N	-0.0045	pCi/L	U	F		0.0113		C	GEN
WOMPOC	SL	2/8/24	RFS01-13.2402109-018	PU-239,240	Plutonium-239, 240	N	0.00444	pCi/L	U	F		0.0127		C	GEN
WOMPOC	SL	2/8/24	RFS01-13.2402109-018	7440-61-1	Uranium	N	2.29	ug/L		F	0.067			C	GEN

EXPLANATION

FILTRATION STATUS

N = Sample was not filtered.
Y = Sample was filtered.

UNITS

mg/L; ppm = milligrams per liter
pCi/L = picocuries per liter
ug/L = micrograms per liter
C = degrees celsius
mS/cm = milliSiemens per centimeter
NTU = normal turbidity units
s.u. = standard pH units
uS/cm = microSiemens per centimeter
umhos/cm = microSiemens per centimeter

SAMPLE TYPE

D = Duplicate
F = Field Sample

DATA VALIDATION QUALIFIERS

<blank>	No qualifiers needed for result.
F	Low flow sampling method used.
G	Possible grout contamination, pH > 9.
J	Estimated value.
L	Less than 3 bore volumes purged prior to sampling.
Q	Qualitative result due to sampling technique.
R	Unusable result.
U	Parameter analyzed for but was not detected.
X	Location is undefined.
999	Validation not complete.

LAB QUALIFIERS

<blank>	No qualifiers needed for result.
*	Replicate analysis not within control limits.
+	Correlation coefficient for MSA < 0.995.
>	Result above upper detection limit.
A	TIC is a suspected aldol-condensation product.
B	Inorganic: Result is between the IDL and CRDL. Organic & Radiochemistry: Analyte also found in method blank.
C	Pesticide result confirmed by GC-MS.
D	Analyte determined in diluted sample.
E	Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
H	Holding time expired, value suspect.
I	Increased detection limit due to required dilution.
J	Estimated.
M	GFAA duplicate injection precision not met.
N	Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compund (TIC).
P	> 25% difference in detected pesticide or Arochlor concentrations between 2 columns.
S	Result determined by method of standard addition (MSA).
U	Analytical result below detection limit.
W	Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
X	Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
Y	Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
Z	Laboratory defined (USEPA CLP organic) qualifier, see case narrative.

LOCATION TYPE

SL	Surface Location
TS	Treatment System
WL	Well

LAB CODE

GEN	Gel Laboratories
STD	Test America

COLLECTION METHOD

C	Composite
G	Grab

Table 2. Water Sampling Events: First Quarter CY 2024

	Sampling Dates		Sample Info			Analytes					Sample Tracking Info
Location Code	Start	End	Collection Method	Type	Filtered	VOC	U	Nitrate	Pu/Am	TSS	Sample ID
GS31	6/29/2023 10:51	1/2/2024 11:47	composite	F	No		X		X		RFS01-13.2401107-010
GS31	6/29/2023 10:51	1/2/2024 11:47	composite	D	No		X		X		RFS01-13.2401107-002
WOMPOC	12/4/2023 11:09	1/2/2024 11:29	composite	F	No		X		X		RFS01-13.2401107-018
GS11	6/29/2023 9:50	3/20/2024 14:25	composite	F	No		X		X		RFS01-13.2403114-007
WOMPOC	1/2/2024 11:29	2/8/2024 11:13	composite	F	No		X		X		RFS01-13.2402108-018
GS31	1/2/2024 11:47	1/24/2024 11:46	composite	F	No		X		X		RFS01-05.2401052-007
WALPOC	1/3/2024 11:14	3/19/2024 11:54	composite	F	No		X		X		RFS01-13.2403111-005
GS12	1/3/2024 11:46	3/21/2024 12:41	composite	F	No		X				RFS01-05.2403053-009
GS08	1/3/2024 12:03	3/21/2024 11:55	composite	F	No		X		X		RFS01-13.2403114-003
GS08	1/3/2024 12:03	3/21/2024 11:55	composite	D	No		X		X		RFS01-13.2403114-004
B5INFLOW	1/3/2024 12:10	3/5/2024 10:15	composite	F	No		X				RFS01-02.2403058-003
SPOUT	1/18/2024 13:25	1/18/2024 13:25	grab	F	No			X			RFS01-04.2401127-015
GS31	1/24/2024 11:46	2/14/2024 11:51	composite	F	No		X		X		RFS01-13.2402108-010
SPOUT	1/31/2024 11:05	1/31/2024 11:05	grab	F	No		X	X			RFS01-04.2401128-015
SW093	1/31/2024 11:20	1/31/2024 11:20	grab	F	No		X	X			RFS01-04.2401128-016
GS13	1/31/2024 11:40	1/31/2024 11:40	grab	F	No		X	X			RFS01-04.2401128-013
B3OUTFLOW	1/31/2024 12:35	1/31/2024 12:35	grab	F	No		X				RFS01-04.2401128-007
GS10	1/31/2024 12:45	1/31/2024 12:45	grab	F	No		X				RFS01-04.2401128-011
WOMPOC	2/8/2024 11:13	2/21/2024 12:17	composite	F	No		X		X		RFS01-13.2402109-018
SPOUT	2/14/2024 10:35	2/14/2024 10:35	grab	F	No			X			RFS01-04.2402129-015
SW093	2/14/2024 10:50	2/14/2024 10:50	grab	F	No			X			RFS01-04.2402129-016
GS13	2/14/2024 10:55	2/14/2024 10:55	grab	F	No			X			RFS01-04.2402129-013
A1EFF	2/14/2024 11:05	2/14/2024 11:05	grab	F	No			X			RFS01-04.2402129-004
GS31	2/14/2024 11:51	3/11/2024 11:43	composite	F	No		X		X		RFS01-13.2403110-010
WOMPOC	2/21/2024 12:17	3/11/2024 11:59	composite	D	No		X		X		RFS01-13.2403110-001
WOMPOC	2/21/2024 12:17	3/11/2024 11:59	composite	F	No		X		X		RFS01-13.2403110-002
GS10	2/28/2024 12:20	2/28/2024 12:20	grab	F	No		X				RFS01-04.2402130-011
B3OUTFLOW	2/28/2024 12:30	2/28/2024 12:30	grab	F	No		X				RFS01-04.2402130-007
B5INFLOW	2/28/2024 12:50	2/28/2024 12:50	grab	F	No		X				RFS01-04.2402130-008
A2EFF	2/28/2024 13:18	2/28/2024 13:18	grab	F	No		X	X			RFS01-04.2402130-005
A1EFF	2/28/2024 13:30	2/28/2024 13:30	grab	F	No		X	X			RFS01-04.2402130-004
GS13	2/28/2024 13:38	2/28/2024 13:38	grab	F	No		X	X			RFS01-04.2402130-013
SW093	2/28/2024 13:50	2/28/2024 13:50	grab	F	No		X	X			RFS01-04.2402130-016
SPOUT	2/28/2024 13:55	2/28/2024 13:55	grab	F	No		X	X			RFS01-04.2402130-015
B5INFLOW	3/5/2024 10:15	3/21/2024 13:06	composite	F	No		X				RFS01-05.2403053-008
GS31	3/11/2024 11:43	3/18/2024 12:28	composite	F	No		X		X		RFS01-13.2403111-010
WOMPOC	3/11/2024 11:59	3/18/2024 12:51	composite	F	No		X		X		RFS01-13.2403111-003
SW093	3/12/2024 12:08	3/12/2024 12:08	grab	F	No			X			RFS01-06.2403029-014
SPOUT	3/12/2024 12:12	3/12/2024 12:12	grab	F	No			X			RFS01-06.2403029-013
GS13	3/12/2024 12:20	3/12/2024 12:20	grab	D	No			X			RFS01-06.2403029-001
GS13	3/12/2024 12:20	3/12/2024 12:20	grab	F	No			X			RFS01-06.2403029-011
A1EFF	3/12/2024 12:25	3/12/2024 12:25	grab	F	No			X			RFS01-06.2403029-002
A2EFF	3/12/2024 12:30	3/12/2024 12:30	grab	F	No			X			RFS01-06.2403029-003
WOMPOC	3/18/2024 12:51	3/21/2024 11:31	composite	F	No		X		X		RFS01-13.2403113-007
WALPOC	3/18/2024 15:25	3/18/2024 15:25	grab	F	No			X			RFS01-06.2403030-005
WALPOC	3/19/2024 11:54	3/20/2024 13:49	composite	F	No		X		X		RFS01-13.2403113-004
WALPOC	3/19/2024 11:55	3/19/2024 11:55	grab	F	No			X			RFS01-06.2403030-006
WALPOC	3/20/2024 13:35	3/20/2024 13:35	grab	F	No			X			RFS01-13.2403112-016
WALPOC	3/20/2024 13:49	3/24/2024 11:53	composite	F	No		X		X		RFS01-13.2403113-005

Table 2. Water Sampling Events: First Quarter CY 2024

	Sampling Dates		Sample Info			Analytes					Sample Tracking Info
Location Code	Start	End	Collection Method	Type	Filtered	VOC	U	Nitrate	Pu/Am	TSS	Sample ID
GS11	3/20/2024 14:25	3/22/2024 13:21	composite	F	No		X		X		RFS01-13.2403114-001
GS11	3/20/2024 14:27	3/20/2024 14:27	grab	F	No			X			RFS01-13.2403112-002
WOMPOC	3/21/2024 11:31	3/24/2024 11:24	composite	F	No		X		X		RFS01-13.2403113-008
GS11	3/22/2024 13:22	3/22/2024 13:22	grab	F	No			X			RFS01-05.2403053-006
WALPOC	3/24/2024 11:57	3/24/2024 11:57	grab	F	No			X			RFS01-05.2403053-004
SPOUT	3/27/2024 13:25	3/27/2024 13:25	grab	F	No		X	X			RFS01-05.2403054-002
SW093	3/27/2024 13:16	3/27/2024 13:16	grab	F	No		X	X			RFS01-05.2403054-003
GS13	3/27/2024 13:35	3/27/2024 13:35	grab	F	No		X	X			RFS01-05.2403054-004
A1EFF	3/27/2024 13:55	3/27/2024 13:55	grab	F	No		X	X			RFS01-05.2403054-005
A2EFF	3/27/2024 14:00	3/27/2024 14:00	grab	F	No		X	X			RFS01-05.2403054-006
A3EFF	3/27/2024 12:00	3/27/2024 12:00	grab	F	No		X	X			RFS01-05.2403054-007
GS11	3/27/2024 10:38	3/27/2024 10:38	grab	F	No		X	X			RFS01-05.2403054-008
GS10	3/27/2024 14:25	3/27/2024 14:25	grab	F	No		X				RFS01-05.2403054-009
B3OUTFLOW	3/27/2024 14:40	3/27/2024 14:40	grab	F	No		X				RFS01-05.2403054-010
B5INFLOW	3/27/2024 12:50	3/27/2024 12:50	grab	F	No		X				RFS01-05.2403054-011
GS08	3/27/2024 11:00	3/27/2024 11:00	grab	F	No		X				RFS01-05.2403054-012
WALPOC	3/28/2024 12:05	3/28/2024 12:05	grab	F	No			X			RFS01-05.2403054-013

EXPLANATION

FILTRATION STATUS

No = Sample was not filtered.
Yes = Sample was filtered.

SAMPLE TYPE

D = Duplicate
F = Field Sample

ANALYTES

Pu/Am = plutonium and americium
TSS = total suspended solids
U = uranium
VOC = volatile organic compound