

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

First Quarter Calendar Year 2023

April 2023



U.S. DEPARTMENT OF
ENERGY

Legacy
Management

Contents

Abbreviations	ii
1.0 Introduction	1
2.0 AMP Highlights: First Quarter CY 2023	2
3.0 Analytical Data: First Quarter CY 2023	2
4.0 References	2

Tables

Table 1. Analytical Results for Water Samples	At end of report
Table 2. Water Sampling Events: First Quarter CY 2023	At end of report

Abbreviations

AMP	Adaptive Management Plan
COU	Central Operable Unit
CY	calendar year
DOE	U.S. Department of Energy
EA	Environmental Assessment
GEMS	Geospatial Environmental Mapping System
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 2021b), first published in 2011, reflects DOE's long-term commitment to implementing the activities that the AMP describes.

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 includes 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) 2023 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, 2023. 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 2021a).

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 2023

- Three 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.
- Two 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).
- During the quarter, 25 samples were collected in support of AMP monitoring objectives.

3.0 Analytical Data: First Quarter CY 2023

Analytical data for the first quarter of CY 2023 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

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), 2021a. *Additional Field Implementation Detail for Selected Monitoring Objectives at the Rocky Flats Site, Colorado*, LMS/RFS/S08202, Office of Legacy Management, July.

DOE (U.S. Department of Energy), 2021b. *Surface Water Configuration Adaptive Management Plan for the Rocky Flats Site, Colorado*, LMS/RFS/S07698, Office of Legacy Management, December.

Table 1. Analytical Results for Water Samples

LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE CODE	CAS	ANALYTE	FILTRATION STATUS	RESULT	UNITS	LAB QUALIFIERS	SAMPLE TYPE	DETECTION LIMIT	UNCERTAINTY	DATA VALIDATION QUALIFIERS	COLLECTION METHOD	LAB CODE
GS10	SL	1/4/23	RFS01-04.2212103-010	7440-61-1	Uranium	N	22	ug/L		F	0.03			G	STD
GS13	SL	1/17/23	RFS01-04.2301104-012	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	28	mg/L		F	0.22			G	STD
GS13	SL	2/2/23	RFS01-04.2302105-012	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	31	mg/L		F	0.44			G	STD
GS13	SL	2/2/23	RFS01-04.2302105-012	7440-61-1	Uranium	N	46	ug/L		F	0.03			G	STD
GS13	SL	2/21/23	RFS01-04.2302106-012	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	12	mg/L		F	0.088			G	STD
SPOUT	TS	12/15/22	RFS01-04.2212102-014	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	0.11	mg/L		F	0.044			G	STD
SPOUT	TS	1/4/23	RFS01-04.2212103-014	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	0.1	mg/L		F	0.044			G	STD
SPOUT	TS	1/4/23	RFS01-04.2212103-014	7440-61-1	Uranium	N	14	ug/L		F	0.03			G	STD
SPOUT	TS	1/17/23	RFS01-04.2301104-014	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	0.091	mg/L		F	0.044			G	STD
SPOUT	TS	2/2/23	RFS01-04.2302105-014	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	0.051	mg/L		F	0.044			G	STD
SPOUT	TS	2/2/23	RFS01-04.2302105-014	7440-61-1	Uranium	N	25	ug/L		F	0.03			G	STD
SPOUT	TS	2/21/23	RFS01-04.2302106-014	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	0.13	mg/L		F	0.044			G	STD
SW093	SL	1/4/23	RFS01-04.2212103-015	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	2.7	mg/L		F	0.044			G	STD
SW093	SL	1/4/23	RFS01-04.2212103-015	7440-61-1	Uranium	N	12	ug/L		F	0.03			G	STD
SW093	SL	1/17/23	RFS01-04.2301104-015	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	0.68	mg/L		F	0.044			G	STD
SW093	SL	2/21/23	RFS01-04.2302106-015	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	0.22	mg/L		F	0.044			G	STD
WOMPOC	SL	10/25/22	RFS01-13.2212085-015	14596-10-2	Americium-241	N	0.00313	pCi/L	U	F		0.00752		C	GEN
WOMPOC	SL	10/25/22	RFS01-13.2212085-015	PU-239,240	Plutonium-239, 240	N	0.00395	pCi/L	U	F		0.00683		C	GEN
WOMPOC	SL	10/25/22	RFS01-13.2212085-015	7440-61-1	Uranium	N	1.56	ug/L		F	0.067			C	GEN
WOMPOC	SL	12/12/22	RFS01-13.2301086-001	14596-10-2	Americium-241	N	0.00412	pCi/L	U	D		0.00808		C	GEN
WOMPOC	SL	12/12/22	RFS01-13.2301086-015	14596-10-2	Americium-241	N	-0.00128	pCi/L	U	F		0.00663		C	GEN
WOMPOC	SL	12/12/22	RFS01-13.2301086-001	PU-239,240	Plutonium-239, 240	N	0.00162	pCi/L	U	D		0.0182		C	GEN
WOMPOC	SL	12/12/22	RFS01-13.2301086-015	PU-239,240	Plutonium-239, 240	N	0.00568	pCi/L	U	F		0.00983		C	GEN
WOMPOC	SL	12/12/22	RFS01-13.2301086-001	7440-61-1	Uranium	N	2.3	ug/L		D		0.067		C	GEN
WOMPOC	SL	12/12/22	RFS01-13.2301086-015	7440-61-1	Uranium	N	2.34	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

F = Field Sample
D = Duplicate

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

* 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 compound (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

G Grab
C Composite

Table 2. Water Sampling Events: First Quarter CY 2023

Location Code	Sampling Dates		Sample Info			Analytes					Sample Tracking Info
	Start	End	Collection Method	Type	Filtered	VOC	U	Nitrate	Pu/Am	TSS	Sample ID
GS10	1/4/2023 14:25	1/4/2023 14:25	grab	F	No		X				RFS01-06.2207027-013
SW093	1/4/2023 15:12	1/4/2023 15:12	grab	F	No		X	X			RFS01-04.2208094-014
SPOUT	1/4/2023 15:25	1/4/2023 15:25	grab	F	No		X	X			RFS01-04.2208095-014
WOMPOC	12/12/2022 12:11	1/17/2023 11:13	composite	D	No		X		X		RFS01-04.2208096-014
WOMPOC	12/12/2022 12:11	1/17/2023 11:13	composite	F	No		X		X		RFS01-04.2209097-014
GS13	1/17/2023 12:57	1/17/2023 12:57	grab	F	No			X			RFS01-13.2209083-015
SW093	1/17/2023 13:06	1/17/2023 13:06	grab	F	No			X			RFS01-04.2210099-015
SPOUT	1/17/2023 13:09	1/17/2023 13:09	grab	F	No			X			RFS01-04.2210099-014
SPOUT	2/2/2023 10:03	2/2/2023 10:03	grab	F	No		X	X			RFS01-10.2209052-012
GS13	2/2/2023 10:43	2/2/2023 10:43	grab	F	No		X	X			RFS01-10.2209052-012
WOMPOC	1/17/2023 11:13	2/21/2023 13:10	composite	F	No		X		X		RFS01-04.2209098-014
SW093	2/21/2023 14:05	2/21/2023 14:05	grab	F	No			X			RFS01-10.2209052-027
SPOUT	2/21/2023 14:11	2/21/2023 14:11	grab	F	No			X			RFS01-10.2209052-019
GS13	2/21/2023 14:19	2/21/2023 14:19	grab	F	No			X			RFS01-10.2209052-019
B3OUTFLOW	3/2/2023 11:08	3/2/2023 11:08	grab	F	No		X				RFS01-10.2209052-059
A1EFF	3/2/2023 11:27	3/2/2023 11:27	grab	F	No		X	X			RFS01-10.2209052-059
A1EFF	3/2/2023 11:27	3/2/2023 11:27	grab	D	No		X	X			RFS01-10.2209052-001
A2EFF	3/2/2023 11:35	3/2/2023 11:35	grab	F	No		X	X			RFS01-10.2209052-001
GS13	3/2/2023 11:57	3/2/2023 11:57	grab	F	No		X	X			RFS01-10.2209052-010
SW093	3/2/2023 12:21	3/2/2023 12:21	grab	F	No		X	X			RFS01-10.2209052-010
SPOUT	3/2/2023 12:39	3/2/2023 12:39	grab	F	No		X	X			RFS01-10.2209052-076
SPOUT	3/15/2023 9:24	3/15/2023 9:24	grab	F	No			X			RFS01-10.2209052-076
SW093	3/15/2023 9:32	3/15/2023 9:32	grab	F	No			X			RFS01-10.2209052-046
GS13	3/15/2023 9:47	3/15/2023 9:47	grab	F	No			X			RFS01-10.2209051-074
A1EFF	3/15/2023 9:59	3/15/2023 9:59	grab	F	No			X			RFS01-13.2210084-001
A2EFF	3/15/2023 10:04	3/15/2023 10:04	grab	F	No			X			RFS01-13.2210084-015
WOMPOC	2/21/2023 13:10	3/20/2023 12:38	composite	F	No		X		X		RFS01-10.2209052-027

FILTRATION STATUS

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

SAMPLE_TYPE

F = Field Sample
D = Duplicate

ANALYTES

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