

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

Second Quarter Calendar Year 2018

July 2018



U.S. DEPARTMENT OF
ENERGY

Legacy
Management

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Abbreviations

AMP	Adaptive Management Plan
COU	Central Operable Unit
CY	calendar year
DOE	U.S. Department of Energy
EA	<i>Rocky Flats Surface Water Configuration Environmental Assessment</i>
POC	point of compliance
POE	point of evaluation
RFLMA	<i>Rocky Flats Legacy Management Agreement</i>
Site	Rocky Flats Site

1.0 Introduction

The Proposed Action assessed in the *Rocky Flats Surface Water Configuration Environmental Assessment* (EA) is to breach the remaining retention pond dams at the Rocky Flats Site, Colorado (the Site), 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 must be collected prior to implementing the final steps of the Proposed Action to help reduce uncertainty as to whether completion of the Proposed Action will adversely impact the quality of water flowing from the Site into downstream communities. 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 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 DOE in deciding whether to implement the final steps of the Proposed Action by breaching the terminal dams during the planned time frame of 2018–2020, or to delay the completion of the Proposed Action to gather additional information for evaluation. The terminal dams will be operated in a flow-through condition during the period leading up to the completion of the Proposed Action, which will provide data similar to what can be expected post-breach. In addition to the AMP 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 second quarter of calendar year (CY) 2018 is provided in accordance with Section 5.0, "Reporting," in the AMP. Section 3.0 of this report provides the second quarter data summary tables, which include all validated analytical data for the AMP monitoring objectives available as of June 30, 2018. 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 *Additional Field Implementation Detail for Selected Monitoring Objectives at the Rocky Flats Site, Colorado*.

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

- Pre-discharge 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 Walnut Creek (Item 8, AMP Table 2)

2.0 AMP Highlights: Second Quarter CY 2018

- Three informal emails were transmitted to AMP participants providing notification that composite samples had been retrieved from the Points of Compliance (POCs) (WOMPOC—Woman Creek at the Central Operable Unit (COU) boundary and WALPOC—Walnut Creek at 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).
- Five informal emails were transmitted to AMP participants providing notification of individual analytical results from POCs and points of evaluation (POEs) that were above the applicable *Rocky Flats Legacy Management Agreement* (RFLMA) surface water standard (RFLMA Attachment 2, Table 1).
- During the quarter, 102 samples were collected in support of AMP monitoring objectives.

3.0 Analytical Data: Second Quarter CY 2018

Table 1, “Analytical Results for Water Samples,” is available at the end of this report.

Table 2, “Water Sampling Events: Second Quarter CY 2018,” is available at the end of this report.

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
WALPOC	SL	3/2/2018	RFS01-13.1803003-005	7440-61-1	Uranium	N	0.0195	mg/L		F	0.000067		valid	Y	GEN
WALPOC	SL	3/26/2018	RFS01-06.1803004-014	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	0.06	mg/L		F	0.019		U	N	STD
WALPOC	SL	3/28/2018	RFS01-13.1803003-007	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	0.017	mg/L	U	F	0.017		valid	N	GEN
WALPOC	SL	3/28/2018	RFS01-05.1804007-001	14596-10-2	Americium-241	N	0.00831	pCi/L	U	F		0.00865	valid	Y	GEN
WALPOC	SL	3/28/2018	RFS01-05.1804007-001	13981-16-3	Plutonium-238	N	-0.0013	pCi/L	U	F		0.00848	valid	Y	GEN
WALPOC	SL	3/28/2018	RFS01-05.1804007-001	PU-239,240	Plutonium-239, 240	N	0.0143	pCi/L	U	F		0.0112	valid	Y	GEN
WALPOC	SL	3/28/2018	RFS01-05.1804007-001	7440-61-1	Uranium	N	0.0162	mg/L		F	0.000067		valid	Y	GEN
WALPOC	SL	4/4/2018	RFS01-05.1804007-002	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	0.685	mg/L		F	0.085		valid	N	GEN
WALPOC	SL	4/4/2018	RFS01-01.1804004-009	14596-10-2	Americium-241	N	-0.00124	pCi/L	U	F		0.00809	valid	Y	GEN
WALPOC	SL	4/4/2018	RFS01-01.1804004-009	13981-16-3	Plutonium-238	N	0.00387	pCi/L	U	F		0.0194	valid	Y	GEN
WALPOC	SL	4/4/2018	RFS01-01.1804004-009	PU-239,240	Plutonium-239, 240	N	0.0135	pCi/L	U	F		0.019	valid	Y	GEN
WALPOC	SL	4/4/2018	RFS01-01.1804004-009	7440-61-1	Uranium	N	0.0166	mg/L		F	0.000067		valid	Y	GEN
WALPOC	SL	4/26/2018	RFS01-01.1804004-010	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	0.0214	mg/L	J	F	0.017		valid	N	GEN
WALPOC	SL	5/30/2018	RFS01-06.1805006-014	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	0.067	mg/L		F	0.019		U	N	STD
WOMPOC	SL	3/2/2018	RFS01-05.1803004-001	14596-10-2	Americium-241	N	0.00237	pCi/L	U	F		0.00465	valid	Y	GEN
WOMPOC	SL	3/2/2018	RFS01-05.1803004-001	13981-16-3	Plutonium-238	N	0.00287	pCi/L	U	F		0.00689	valid	Y	GEN
WOMPOC	SL	3/2/2018	RFS01-05.1803004-001	PU-239,240	Plutonium-239, 240	N	0.00574	pCi/L	U	F		0.0089	valid	Y	GEN
WOMPOC	SL	3/2/2018	RFS01-05.1803004-001	7440-61-1	Uranium	N	0.00443	mg/L		F	0.000067		valid	Y	GEN
WOMPOC	SL	3/20/2018	RFS01-05.1804006-001	14596-10-2	Americium-241	N	0.00359	pCi/L	U	F		0.00705	valid	Y	GEN
WOMPOC	SL	3/20/2018	RFS01-05.1804006-001	13981-16-3	Plutonium-238	N	0.00306	pCi/L	U	F		0.012	valid	Y	GEN
WOMPOC	SL	3/20/2018	RFS01-05.1804006-001	PU-239,240	Plutonium-239, 240	N	0.00306	pCi/L	U	F		0.012	valid	Y	GEN
WOMPOC	SL	3/20/2018	RFS01-05.1804006-001	7440-61-1	Uranium	N	0.00335	mg/L		F	0.000067		valid	Y	GEN
WOMPOC	SL	3/29/2018	RFS01-13.1804004-003	14596-10-2	Americium-241	N	0.00685	pCi/L	U	F		0.00638	valid	Y	GEN
WOMPOC	SL	3/29/2018	RFS01-13.1804004-003	13981-16-3	Plutonium-238	N	0.00221	pCi/L	U	F		0.00752	valid	Y	GEN
WOMPOC	SL	3/29/2018	RFS01-13.1804004-003	PU-239,240	Plutonium-239, 240	N	0.00221	pCi/L	U	F		0.00532	valid	Y	GEN
WOMPOC	SL	3/29/2018	RFS01-13.1804004-003	7440-61-1	Uranium	N	0.00271	mg/L		F	0.000067		valid	Y	GEN
WOMPOC	SL	4/10/2018	RFS01-01.1804004-001	14596-10-2	Americium-241	N	-0.0144	pCi/L	U	F		0.0237	valid	Y	GEN
WOMPOC	SL	4/10/2018	RFS01-01.1804004-001	13981-16-3	Plutonium-238	N	0.00284	pCi/L	U	F		0.0167	valid	Y	GEN
WOMPOC	SL	4/10/2018	RFS01-01.1804004-001	PU-239,240	Plutonium-239, 240	N	0.00994	pCi/L	U	F		0.0122	valid	Y	GEN
WOMPOC	SL	4/10/2018	RFS01-01.1804004-001	7440-61-1	Uranium	N	0.00316	mg/L		F	0.000067		valid	Y	GEN
WOMPOC	SL	5/14/2018	RFS01-01.1805009-001	14596-10-2	Americium-241	N	0	pCi/L	U	F		0.0141	valid	Y	GEN
WOMPOC	SL	5/14/2018	RFS01-01.1805009-001	13981-16-3	Plutonium-238	N	-0.00477	pCi/L	U	F		0.0168	valid	Y	GEN
WOMPOC	SL	5/14/2018	RFS01-01.1805009-001	PU-239,240	Plutonium-239, 240	N	0.00636	pCi/L	U	F		0.00988	valid	Y	GEN
WOMPOC	SL	5/14/2018	RFS01-01.1805009-001	7440-61-1	Uranium	N	0.00092	mg/L		F	0.000067		valid	Y	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

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.

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
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DATA_VALIDATION_QUALIFIERS

valid Result is valid.
 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

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: Second Quarter CY 2018

Location Code	Sampling Dates		Sample Info			Analytes					Sample Tracking Info
	Start	End	Collection Method	Type	Filtered	VOC	U	Nitrate	Pu/Am	TSS	Sample ID
WALPOC	4/4/2018 11:32	4/4/2018 11:32	grab	F	No			X			RFS01-05.1804007-002
WALPOC	3/28/2018 10:29	4/4/2018 11:47	composite	F	No		X		X		RFS01-05.1804007-001
GS11	4/4/2018 12:08	4/4/2018 12:08	grab	F	No			X			RFS01-05.1804007-004
GS11	1/3/2018 11:54	4/4/2018 12:20	composite	F	No		X		X		RFS01-05.1804007-003
B5INFLOW	11/17/2017 11:07	4/4/2018 12:39	composite	F	No		X				RFS01-05.1804007-005
GS12	3/28/2018 11:27	4/10/2018 11:51	composite	F	No		X				RFS01-13.1804004-002
WOMPOC	3/29/2018 11:24	4/10/2018 12:48	composite	F	No		X		X		RFS01-13.1804004-003
SPOUT	4/16/2018 11:37	4/16/2018 11:37	grab	F	No		X	X			RFS01-04.1804002-006
SW093	4/16/2018 11:40	4/16/2018 11:40	grab	F	No		X	X			RFS01-04.1804002-004
GS13	4/16/2018 11:55	4/16/2018 11:55	grab	F	No		X	X			RFS01-04.1804002-007
A1EFF	4/16/2018 12:09	4/16/2018 12:09	grab	F	No		X	X			RFS01-04.1804002-011
A2EFF	4/16/2018 12:12	4/16/2018 12:12	grab	F	No		X	X			RFS01-04.1804002-010
A3EFF	4/16/2018 12:28	4/16/2018 12:28	grab	F	No		X	X			RFS01-04.1804002-009
GS11	4/16/2018 12:40	4/16/2018 12:40	grab	F	No		X	X			RFS01-04.1804002-013
GS08	4/16/2018 13:18	4/16/2018 13:18	grab	F	No		X				RFS01-04.1804002-012
B5INFLOW	4/16/2018 13:38	4/16/2018 13:38	grab	F	No		X				RFS01-04.1804002-003
B3OUTFLOW	4/16/2018 13:58	4/16/2018 13:58	grab	F	No		X				RFS01-04.1804002-002
GS10	4/16/2018 14:04	4/16/2018 14:04	grab	F	No		X				RFS01-04.1804002-001
GS10	4/16/2018 14:04	4/16/2018 14:04	grab	D	No		X				RFS01-04.1804002-014