

Surface Water Configuration Adaptive Management Plan for the Rocky Flats Site, Colorado

December 2021



U.S. DEPARTMENT OF
ENERGY

Legacy
Management

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Document History

Date	Description of Changes
December 2021	Incorporates revisions made as a result of the 2021 2-year review. In addition to minor editorial changes, the following revisions were made:
	Section 7.0 – Updated for recap of the 2-year review for 2021
	Table 3 – Changed to reflect participants for 2021 AMP 2-year review
July 2019	Incorporates revisions as a result of the 2019 2-year review. In addition to minor editorial changes, the following revisions were made.
	Section 7.0 – Updated for recap of the 2-year review for 2019.
	Table 3 – Changed to reflect participants for 2019 AMP 2-year review.
August 2017	Incorporates revisions as a result of the 2017 2-year review. In addition to minor editorial changes, the following revisions were made.
	Figure 1 and Table 2 updated to remove locations at GS01, GS03, A4 Pond, and B5 Pond where monitoring has been discontinued under the AMP. Removed Notes from Table 2.
	Section 7.0 – Updated for recap of the 2-year review for 2017.
May 2015	Table 3 – Changed to reflect participants for 2017 AMP 2-year review.
	Incorporates revisions as a result of the 2015 2-year review. In addition to minor editorial changes, the following revisions were made.
	Section 6.0: Changed the 2-year review completion deadline to “August 31.”
May 2015	Section 7.0 – Updated for recap of the 2-year review for 2015.
	Table 2 Item 7; Locations – Changed Pond A4 to GS11 (Pond A4 Outfall) and Pond B5 to GS08 (Pond B5 Outfall).
	Table 2 Item 8 Locations – Changed Pond A4 to GS11 (Pond A4 Outfall).
	Table 2 added Notes 2: Periodic grab sampling for uranium will be collected in Ponds A4 and B5 and their respective outfalls, GS11 and GS08 until November 1, 2015, when sampling in Ponds A4 and B5 will be discontinued. 3: Periodic grab sampling for nitrate will be collected in Pond A4 and GS11 until November 1, 2015, when sampling in Pond A4 will be discontinued.
	Table 3 – Changed to reflect participants for 2015 AMP 2-year review.
	Table 3 – Changed to reflect participants for 2015 AMP 2-year review.
May 2013	Incorporates revisions as a result of the 2-year review. In addition to minor editorial changes, the following revisions were made.
	Section 2.0 – updated to reflect that the PLF and A-3 Dams were breached in 2012 and that the terminal ponds are now operated in flow-through mode.
	Section 3.0 – updated to reflect that the terminal ponds are now operated in flow-through mode and an additional vegetation growing season complete at SW027 drainage area.
	Section 7.0 – Changed heading from “Participants” to “Participants and Periodic Reviews” and included a recap of the 2-year review for 2013.
	Figure 1 – Updated to reflect PLF and A-3 Dam breach and to reflect new NOTE 1 in Table 2.
	Table 2 – Updated to reflect completion of certain AMP activities since 2011 and added a new Note 1 to item 4 regarding the duration of monitoring at GS01 and GS03. Based on consideration of stakeholder comments related to DOE’s initial proposal to discontinue GS01 and GS03 as AMP monitoring locations on October 1, 2013, and the cooperative approach for review and implementation of the AMP, the date was changed to October 1, 2015. Section 7.0 includes a discussion of the initial proposal and the outcome of the 2-year review evaluation.
	Note 1 - GS01 and GS03 are scheduled to cease being RFLMA Points of Compliance on September 9 and 28, 2013, respectively. After this occurs, GS01 and GS03 will be discontinued as AMP monitoring locations on October 1, 2015. AMP Section 7.0 provides additional information.
	Table 3 – Added to reflect participants for original 2011 AMP and for 2013 AMP two-year review.
June 2011	Original AMP document LMS/RFS/S07698

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Abbreviations

AMP	Adaptive Management Plan
CAD/ROD	Corrective Action Decision/Record of Decision
CDPHE	Colorado Department of Public Health and Environment
COU	Central Operable Unit
DOE	U.S. Department of Energy
EA	Environmental Assessment
EPA	U.S. Environmental Protection Agency
FONSI	Finding of No Significant Impact
GEMS	Geospatial Environmental Mapping System
NEPA	National Environmental Policy Act
PIP	Public Involvement Plan
POC	Point of Compliance
POE	Point of Evaluation
RFLMA	<i>Rocky Flats Legacy Management Agreement</i>
SID	South Interceptor Ditch

1.0 Introduction

The proposed action assessed in the *Rocky Flats Site, Colorado, Surface Water Configuration Environmental Assessment* (DOE 2011) is to breach the remaining retention pond dams at the Rocky Flats Site (Site) to allow surface water flow to return to the approximate conditions that existed before the retention ponds were constructed. As stated in the Rocky Flats Surface Water Configuration Environmental Assessment (hereafter called the EA), based on extensive water quality monitoring data and thorough environmental review, the U.S. Department of Energy (DOE) Office of Legacy Management determined that the proposed action does not present a significant impact on the environment under National Environmental Policy Act (NEPA) evaluation criteria and issued a finding of no significant action (FONSI). The FONSI was incorporated into the final EA (DOE 2011).

Some members of the public have commented that additional information should be collected prior to 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 and 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 this plan describes.

The term "adaptive management" is used to address potential options for adjusting the implementation of the proposed action after the NEPA decision document has been signed. An AMP establishes monitoring and evaluation that are generally performed prior to or during the proposed action. This process allows flexibility to respond to changing conditions, within the parameters and processes assessed in the EA, without requiring new or supplemental NEPA analysis. The AMP process also informs the public regarding site conditions and possible adaptations to implementing the proposed action as described in the EA.

This 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 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, this AMP identifies certain performance indicators that DOE will consider when deciding whether to adjust the time frame for completing the proposed action.

DOE will implement the AMP using a cooperative process and approach as provided in this plan. This AMP is a dynamic document and may be revised based on monitoring results or changes in regulatory requirements.

For context, Section 2.0 of this AMP summarizes the steps involved in the proposed action. Detailed descriptions of the Site, the proposed action, current monitoring requirements pursuant to the *Rocky Flats Legacy Management Agreement* (RFLMA) (CDPHE et al. 2007), and environmental conditions are available in the EA and are not repeated in this AMP. RFLMA provides the regulatory framework for implementing the final response action in the *Corrective*

Action Decision/Record of Decision for Rocky Flats Plant (USDOE) Peripheral Operable Unit and Central Operable Unit (DOE et al. 2006), hereafter called the Corrective Action Decision/Record of Decision (CAD/ROD). The remaining dams to be breached are not part of the CAD/ROD remedy-related controls for residual contamination.

2.0 Proposed Actions

Twelve dams were constructed in the current Central Operable Unit (COU) of the Site during the operation of the Rocky Flats Plant. Of these, nine dams were previously breached by constructing notches in the dam embankments.

The following terminal pond dams remain:

- Dam A-4 on North Walnut Creek
- Dam B-5 on South Walnut Creek
- Dam C-2 near Woman Creek

Breaching the dams at the terminal Ponds A-4, B-5, and C-2 was initially proposed to be completed during the 2018–2020 time frame. Dams A-4, B-5, and C-2 began operating in flow-through configuration in the fall of 2011.

In flow-through operation, pond water levels may be at the elevation of the inlet to the discharge pipes, with outflow rates equivalent to inflow rates. Low runoff influent volumes may result in pond water levels dropping below the elevation of the inlet to the discharge pipes due to evaporation in the ponds. If high runoff influent volumes exceed the capacity of the discharge pipes, and the pool levels (i.e., pond levels just upstream of the dam) rise correspondingly, the rate of discharge would then be controlled by adjusting the discharge valves such that pool levels would not be drawn down more than 1 foot per day to ensure dam safety.

To provide background information for this AMP, Table 1 provides an overview of the expected impacts and mitigation measures described in the EA.

3.0 AMP Activities

In addition to the mitigation activities described in the 2011 EA, which are presented in Table 1, and the flow-through operation initiated in 2011, the activities associated with the final dam breach include:

- Collecting samples at designated monitoring points until the AMP process is complete.
- Providing information evaluation and reporting.
- Implementing adaptive management activities as described in this AMP.
- Revisiting this AMP to evaluate potential changes at 2-year intervals.
- Conducting AMP-related monitoring for no longer than 2 years following the final breach of the terminal dams.

The following sections provide the AMP objectives, implementation details, and anticipated duration of specific activities.

Table 1. Summary of Resource-Specific Impacts and Mitigation as Reported in the 2011 EA

Resource	Proposed Action—Impacts	Proposed Action—Mitigation
Wildlife	<ul style="list-style-type: none"> Restoration of a more natural, seasonally variable flow system to provide more consistent water for downstream habitat. Temporary disturbance from construction noise. Elimination of surface water habitat for species. Reduced disturbance from human activities for monitoring and maintenance. 	<ul style="list-style-type: none"> Water levels in the ponds will be drawn down prior to construction activities to provide the opportunity for species to use nearby habitats. Vegetation at the construction footprint will be mowed to 6 inches or less to help encourage species to use other habitat locations.
Migratory Birds	<ul style="list-style-type: none"> Noise and construction impacts to foraging and nesting activities in the adjacent habitat, but no fatalities are expected because of prescribed mitigation measures. Reductions in the abundance of waterfowl at the ponds; however, these types of habitats are available within a few miles of the Rocky Flats Site. Potential increase in species that forage and nest in emergent and shrub wetland habitat types following reclamation. Reduced disturbance from human activities for monitoring and maintenance. 	<p>Activities are planned to occur throughout the primary nesting season for birds (April 1 through August 31). Therefore:</p> <ul style="list-style-type: none"> A qualified biologist will conduct field nest surveys prior to and regularly throughout construction. If the survey identifies active nests that cannot be avoided, the USFWS will be contacted immediately for guidance. Results of the surveys and information regarding the qualifications of the biologist will be documented and maintained on file for potential review by USFWS (if requested) until the proposed action activities have been completed. Water levels in the ponds will rise, and vegetation clearing will occur as described under Wildlife Mitigation. <p>Based on the results of surveys, and determination from USFWS, additional nesting deterrents may be warranted.</p>
Threatened and Endangered Plant and Wildlife Species	<ul style="list-style-type: none"> Impact to approximately 1 acre of Preble’s meadow jumping mouse habitat during construction. Expected increase in Preble’s mouse habitat with conversion from open water to emergent wetland or shrubland. Possible impacts to individual garter snakes and northern leopard frogs. Minimal long-term effect because the reestablished stream channels would provide habitat. 	<ul style="list-style-type: none"> In compliance with Section 7 of the Endangered Species Act, consultation with USFWS will be conducted via an amendment to the existing Programmatic Biological Assessment. No earthmoving activities will start until either the approval letter or Biological Opinion from USFWS has been obtained. <p>Mitigation for impacts will be conducted in situ and follow guidelines in the Programmatic Biological Assessment.</p>
Vegetation, Wetlands, and Floodplains		
Vegetation	<ul style="list-style-type: none"> Clearing of 26 acres of vegetation (including noxious weeds) due to construction. Higher-quality ecosystem due to reseeded of native species and ongoing weed control. 	<ul style="list-style-type: none"> Appropriate erosion controls will be used throughout and after the project. The guidance in DOE’s <i>Erosion Control Plan for the Rocky Flats Property Central Operable Unit</i> (DOE 2007) will be followed. Temporarily disturbed areas will be reclaimed following project completion, using native plant species. Revegetation will occur as soon as possible. Noxious weeds will be controlled using appropriate weed control measures. <p>A qualified ecologist, botanist, or environmental scientist will oversee all mitigation measures.</p>

Table 1. Summary of Resource-Specific Impacts and Mitigation as Reported in the 2011 EA (continued)

Resource	Proposed Action—Impacts	Proposed Action—Mitigation
Wetlands	<ul style="list-style-type: none"> • Less than 0.5 acre of palustrine emergent or shrubland wetland and approximately 4 acres of open water habitat. • Increase in aquatic resources, functions, and services due to the 5 to 6 acres of palustrine emergent or shrubland wetland created in the former open water habitat. 	<ul style="list-style-type: none"> • A Section 404 permit in accordance with the Clean Water Act will be required and obtained prior to any earth-disturbing activities. • USACE review comments indicate that a Nationwide Permit 27 will apply. <p>Impacts to jurisdictional waters will be mitigated according to USACE requirements.</p>
Floodplains	<ul style="list-style-type: none"> • Minimal and limited to construction areas. • Approximate reestablishment of the historical floodplain and stream channel through the pond bottoms (except at Pond C-2). 	Same as mitigation measures for wetlands.
Surface Water Resources		
Surface Water Flow	<ul style="list-style-type: none"> • Larger flows and volumes downstream compared to current conditions with return to flood conditions prior to the original construction of the dams. • Short-term erosion associated with construction. • Eventual elimination of the evaporative depletions associated with the retention of out-of-priority water. 	<ul style="list-style-type: none"> • A construction general permit for stormwater discharge from EPA will be required prior to commencing the work.
Surface Water Quality	<ul style="list-style-type: none"> • No direct impacts on water quality. • Increased variability expected in individual sample results downstream. Data indicate that remedy-related soil and infrastructure removal, revegetation, land configuration, and reductions in runoff would continue to result in water quality summary statistics that meet applicable standards. • RFLMA monitoring requirements would remain the same. 	<ul style="list-style-type: none"> • Monitoring in accordance with RFLMA requirements will continue. • A construction general permit for stormwater discharge from EPA will be required prior to commencing the work.
Air Resources		
Air Quality	<ul style="list-style-type: none"> • Releases of PM₁₀, PM_{2.5} (particles less than 10 and 2.5 micrometers in diameter, respectively), and ozone expected to be minimal during construction. 	<ul style="list-style-type: none"> • The contractor will obtain any required air quality construction permits prior to start of the construction work. • The contractor will provide proof of age of equipment, in accordance with Colorado Department of Public Health and Environment requirements. • Construction activities will stop during periods of high winds.

Abbreviations:

EPA = U.S. Environmental Protection Agency
 PM = particulate matter
 USACE = U.S. Army Corps of Engineers
 USFWS = U.S. Fish and Wildlife Service

3.1 Ecological Monitoring

Objective: Allow for additional vegetation growth in the SW027 drainage prior to flow-through operations at Dam C-2.

Implementation: In 2010, seeding was completed within the SW027 drainage at selected locations in the South Interceptor Ditch (SID) and on the 903 Hillside north of the SID. Several hundred feet of wattles filled with compost and woodchips were placed across the hillside, and erosion matting was installed at the seeded locations in the SID. Prior to initiating flow-through at Dam C-2, DOE provided the AMP group with an evaluation of the additional erosion controls and seeding performed in the SW027 drainage.

Anticipated Duration of Activity: This activity was complete at the end of the 2011 growing season.

Note: In 2015, after a very wet spring, several localized spots showed minor erosion on the 903 Hillside and in the SID. Initially, several additional wattles were installed in these areas, along with a row of pallets that was installed at one location in the SID to slow water flow and trap sediment. After further evaluation, additional areas were interseeded and WoodStraw (an engineered wood-strand mulch) was distributed on top of the seeded areas to protect the soil surface and enhance germination conditions. At the same time, additional straw wattles and check dams (erosion control structures that slow water flow and trap sediment) were placed at strategic locations on the hillside. Selected locations in the bottom of the SID were seeded, and turf reinforcement matting was installed on top of the seed. Check dams were also installed at several locations in the SID on top of the turf reinforcement matting. In 2016, a few localized areas in the SID were reseeded, and additional turf reinforcement matting was installed. Inspection and maintenance of erosion controls in this area are ongoing.

Although this specific objective has been completed as defined here, reportable conditions at Point of Evaluation (POE) SW027 for the 12-month rolling average plutonium concentration continue to be observed. These reportable conditions are addressed through the RFLMA (Comprehensive Environmental Response, Compensation, and Liability Act) process in consultation with Colorado Department of Public Health and Environment (CDPHE) and the U.S. Environmental Protection Agency (EPA). Information regarding the actions taken to address these reportable conditions can be found in RFLMA contact records, as well as RFLMA quarterly and annual reports. These documents can be obtained from the Rocky Flats website: <https://www.energy.gov/lm/rocky-flats-site-colorado>.

3.2 Water Quality Monitoring

Objective: Provide additional data and evaluation of water quality to address public uncertainty associated with implementation of the proposed action.

Implementation: Figure 1 shows the locations of the activities, and Table 2 provides specific information for the additional monitoring that will be implemented at the Site in support of this AMP. The table provides a description of the monitoring, location, sample type and frequency, and analytes. Table 2 also describes the purpose and implementation date for each monitoring objective. Monitoring and data evaluation required under RFLMA will also be used to meet

monitoring objectives identified in this AMP. Specific procedures associated with implementing monitoring activities are described in detail in the *Additional Field Implementation Detail for Selected Monitoring Objectives at the Rocky Flats Site, Colorado* (DOE 2021).

Anticipated Duration of Activity: The activities in Table 2 will continue until the specific activity is no longer needed to provide data to meet the AMP monitoring objective, as determined using the AMP cooperative process, or until the AMP process is complete, whichever comes first.

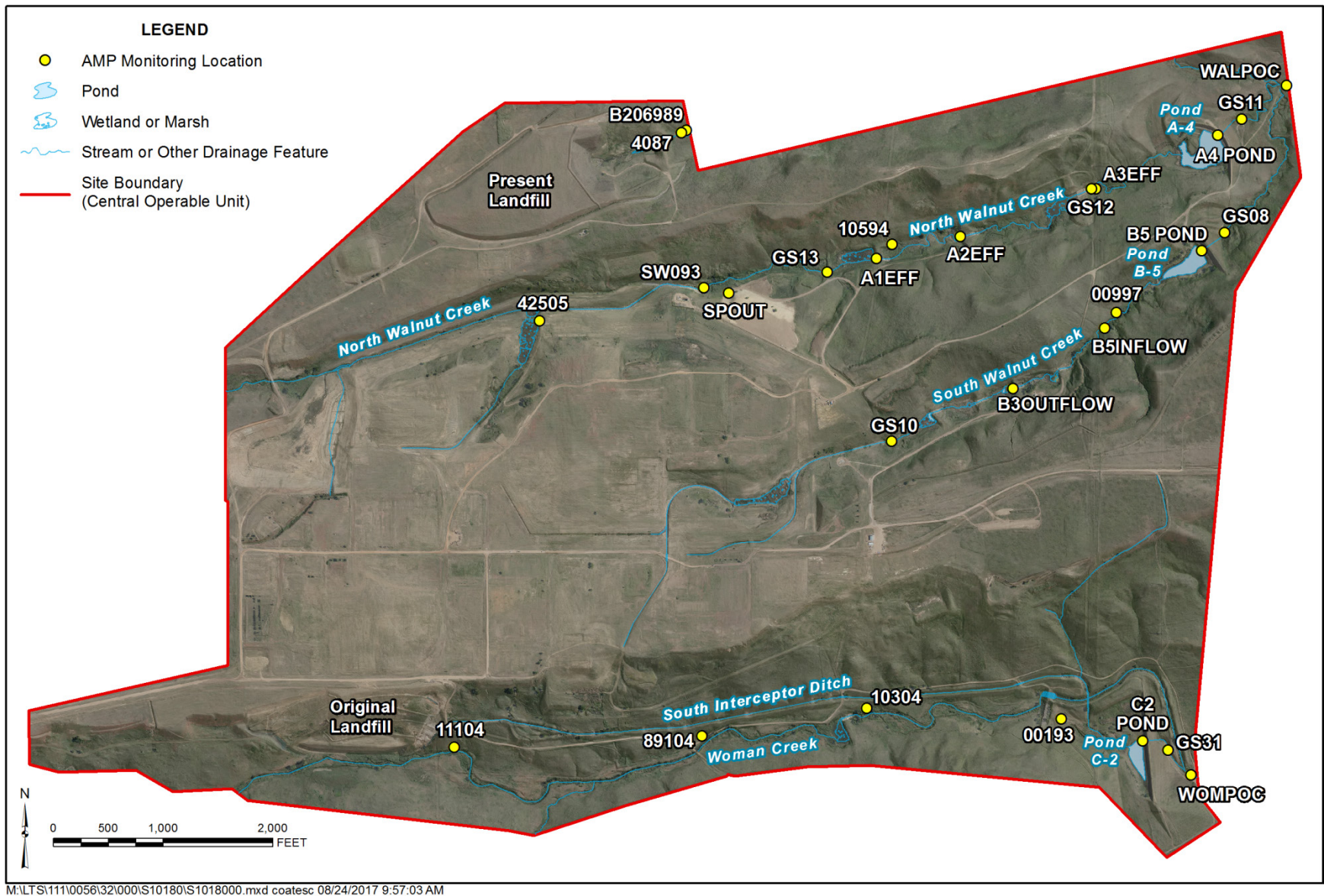


Figure 1. AMP Monitoring Locations

Table 2. AMP Monitoring

Item	Description	Locations	Sample Type ^a /Frequency	Analyte(s)	Purpose	Implementation Date
1	Pre-discharge sampling	A4 POND, B5 POND, and C2 POND	Grabs collected prior to opening valve at Dams A-4, B-5, and C-2	Pu, Am, U, at A-4, B-5, and C-2; nitrate + nitrite as N at A-4 and B-5 Pond	Evaluate whether pond water is expected to meet water quality standards at downstream AMP monitoring locations prior to opening a valve to initiate flow-through discharge.	Pre-discharge sampling completed prior to flow-through in 2011. (Any future pre-discharge sampling will be as required by RFLMA.)
2	Targeted groundwater monitoring	Wells 4087, B206989, 11104, 10594, 00997, 00193, 42505, 89104, and 10304	Semiannual grabs	VOCs, U, nitrate + nitrite as N depending on location	These wells are located within a drainage and downgradient of a contaminant plume or group of contaminant plumes. Collect water quality data to determine whether plumes may be discharging to surface water.	Ongoing—currently implemented.
3	Use of larger composite sample carboys	WALPOC and WOMPOC	Continuous flow-paced composites; sample collection frequency varies depending on flow rate	Pu, Am, U	Since the sample collection is flow-paced, smaller composite carboys may fill to capacity during large runoff events. As a result, some flow may not be sampled. Larger carboys will reduce this potential.	Ongoing—currently implemented.
4	Evaluate flow-through water quality	GS08, GS11, GS31, WALPOC, and WOMPOC	Continuous flow-paced composites; sample collection frequency varies depending on flow rate	Pu, Am, U	Collect water quality data during flow-through operations to simulate post-breach conditions to demonstrate that water leaving the COU will be in attainment of water quality standards after the terminal dams are breached.	Ongoing—currently implemented.
		GS11 and WALPOC	Grabs collected at the start of each continuous flow-paced composite; could implement automated flow-paced composite sampling if needed and feasible; frequency varies depending on flow rate	Nitrate + nitrite as N	Collect water quality data during flow-through operations to simulate post-breach conditions to demonstrate that water leaving the COU will be in attainment of water quality standards after the terminal dams are breached.	Ongoing—currently implemented.
5	Evaluate storm-event water quality conditions	GS31	Multi-bottle composites during rising- and falling-limb portions of runoff hydrograph; triggered by substantial increases in flow due to large precipitation events	Pu, Am, TSS	Collect targeted water quality data during runoff periods to assess actinide and solids transport. Develop correlations between flow rate, actinide concentrations, and TSS to further describe short-term, event-driven variability. Assess the effects of ongoing	Ongoing—currently implemented.

Table 2. AMP Monitoring (continued)

Item	Description	Locations	Sample Type ^a /Frequency	Analyte(s)	Purpose	Implementation Date
					revegetation and erosion control practices.	
6	Automated composite sampling upstream of Ponds A-4 and B-5	GS12 and B5INFLOW	Continuous flow-paced composites; sample collection frequency varies depending on flow rate	U	Evaluate the in-stream transport of U, specifically for Ponds A-4 and B-5, by assessing correlations, patterns, variability, and loading.	Ongoing—currently implemented.
7	Collect uranium grabs in North and South Walnut Creeks	North Walnut: SW093, SPOUT, GS13, A1EFF, A2EFF, A3EFF, and GS11 South Walnut: GS10, B3OUTFLOW, B5INFLOW, and GS08	Monthly grab samples	U	Evaluate the transport of U in North and South Walnut Creeks by assessing correlations, patterns, variability, and loading. Define the relative impacts of the SPPTS contributions on surface water in North Walnut Creek.	Ongoing—currently implemented.
8	Collect nitrate grabs in North Walnut Creek	SW093, SPOUT, GS13, A1EFF, A2EFF, A3EFF, and GS11	Semi-monthly grab samples	Nitrate + nitrite as N	Evaluate the transport of nitrate in North Walnut Creek by assessing correlations, patterns, variability, and loading. Define the relative impacts of SPPTS contributions on surface water in North Walnut Creek.	Ongoing—currently implemented.

Note:

^a The description of sample type is found in the *Rocky Flats Site, Colorado, Site Operations Guide* (DOE 2018).

Abbreviations:

Am = americium, N = nitrogen, Pu = plutonium, SPPTS = Solar Ponds Plume Treatment System, TSS = total suspended solids, U = uranium, VOCs = volatile organic compounds

3.3 Responses to Water Quality Reportable Conditions

Objective: Identify the process for notifying the public if a water-quality-related reportable condition, as defined by RFLMA Attachment 2, occurs during flow-through.

Implementation: In the event of a water-quality-related reportable condition, DOE will:

- Notify the AMP group as soon as is practicable.
- Schedule a meeting with the AMP group within 2 weeks.
- Discuss the DOE response to the condition in the scheduled meeting, including potentially closing a valve at the appropriate dam until resolution is met.

If mitigating actions are time-critical, they will be initiated at DOE's discretion, without delaying to discuss with the AMP group. However, the communication steps involving the AMP group described above will still be followed.

DOE will notify the AMP group and maintain communication until the reportable condition is resolved; however, the RFLMA process takes precedence over this AMP because regulations drive the monitoring required under RFLMA. The RFLMA process requires consultation with the RFLMA parties, which can result in mitigating actions being implemented by DOE. Also, the mitigation and monitoring described in the EA will be implemented through the Mitigation Action Plan required by NEPA.

If a reportable condition occurs, consultation among the RFLMA parties may determine that closing specific dam discharge valves is an appropriate mitigating action. If closing a valve is part of an RFLMA mitigating action, the Mitigation Plan will address the data to be evaluated in making the determination to reopen the valve.

Additionally, DOE may require temporary closure of the valves to perform maintenance activities, such as repairing a downstream valve or monitoring location. The process to reopen a valve will follow the most up-to-date RFLMA protocols for pre-discharge sampling prior to reopening the valve. The AMP group will be notified using the standard Rocky Flats Public Involvement Plan (PIP) process.

Anticipated Duration of Activity: Notification to the AMP group, and the related meetings and discussions, will continue throughout the duration of this AMP.

3.4 Responses to Wildfire

Objective: Respond to wildfire to avoid possible water quality issues during flow-through configuration.

Implementation: If a wildfire occurs onsite, the AMP group will be informed of the situation as soon as is practicable. Valve closure will be immediately considered in response to a wildfire, depending on the location, extent, and weather forecast. Appropriate mitigating actions for the area where vegetation cover is poor after a wildfire include deploying erosion controls (short term) and reseeding (long term).

Anticipated Duration of Activity: Notification to the AMP group will continue throughout the duration of this AMP. There is no AMP-related duration for erosion control activities because erosion control will continue at the Site.

3.5 Data Exchange

Objective: Obtain more timely validated data and share information with the AMP group.

Implementation: An informal email notification of individual water quality results above the standards for POEs and Points of Compliance (POCs) will be sent to the AMP group, even if the individual result will not result in a reportable condition. DOE will continue routine review and evaluation of preliminary data as they are received, and an expedited validation will continue to be requested for data indicating a possible reportable condition (expedited validation can be completed in 1 to 2 days).

The water quality data, including AMP data, will continue to be posted to the Geospatial Environmental Mapping System (GEMS) as they are validated. AMP group members will have immediate access to routine validated data when they are posted to GEMS. DOE will follow the RFLMA process and the PIP for RFLMA-related issues. Additionally, informal email notification of the GEMS posting of results from the downstream-most POCs, as well as notification when composite samples are retrieved from the field, will be provided to the AMP group as soon as is practicable.

To further reduce the time between sample collection and the availability of analytical results, a shortened 14-day turnaround time for laboratory analysis will be requested for samples collected at RFLMA POCs.

Anticipated Duration of Activity: DOE will continue the specific notification and reporting items as stated in this objective as long as this AMP remains active.

4.0 Adaptive Management Performance Indicators

DOE, in cooperation with the AMP group, will evaluate and consider the following generalized performance indicators prior to DOE deciding when to complete the proposed action, which includes breaching the terminal dams:

- Water quality at surface water and groundwater monitoring points at all locations on Table 2
- Statistically valid trends of increasing levels of analytes at any of the AMP monitoring points
- Groundwater treatment systems sustained functional performance
- A review of reportable conditions and responses that may have occurred during performance of the AMP, such as fires, storm or precipitation events, erosion, landslides, soil or earth slippage, slope failure, and other geological activity where soils and earth are mobilized or disturbed.

5.0 Reporting

Summaries of the relevant data will be provided to the AMP group in quarterly and annual reports and posted to the Rocky Flats Site webpage.

The quarterly reports will be prepared using all validated data available as of the end of that quarter and will consist of a simple data summary. This summary will be posted to the Rocky Flats Site webpage on the last day of the first month following the end of the quarter. However, this does not apply to the fourth quarter, which will be included in the annual AMP status report. The annual AMP status report will be prepared using all validated data available as of December 31 of that year. The report will be posted on the Rocky Flats Site webpage by February 28 (or 29) of the following year.

DOE will also present the findings in the annual report to the AMP group and any other interested parties in a public meeting. The meeting notification will follow the protocol in the PIP. Additional technical meetings to discuss monitoring results will be scheduled upon request. Additionally, in response to specific requests, provisional data will be provided to the AMP group prior to the production of quarterly reports.

Public access to validated analytical data is available through GEMS. Data are posted to GEMS upon validation and can be accessed as follows:

- Use the URL link https://www.lm.doe.gov/Rocky_Flats/.
- Under “Site Links,” Click **Rocky Flats Site Mapping and Monitoring (GEMS)**.
- In the top menu on the GEMS page that appears, click **Data**.
- In the **Environmental Data** tab on the Map Data is a Report Type drop-down menu where a report, a location, a duration, or an analyte can be selected.
- In the **Finish** area, click **Generate Report**.

The GEMS webpage, under “Contact Us,” also includes an option for users to send an email to request assistance with technical issues with the website.

6.0 Administrative Provisions for AMP Modifications

AMP group engagement throughout follow-up monitoring, assessment, and decision making is essential to a successful AMP process over the long term. Because this AMP is a dynamic document, DOE and the AMP group will review the AMP provisions and implementation at least every 2 years to determine whether changes to the AMP activities are recommended. This review will consider the evaluation of the data and information collected through the AMP monitoring, as well as the impact of changes to regulations or regulated activities at the Rocky Flats Site. The AMP group will use a cooperative approach to modify the AMP and any of the AMP monitoring provisions to implement the recommendations. The first 2-year review occurred in 2013; the second 2-year review occurred in 2015; the third 2-year review occurred in 2017, the fourth 2-year review occurred in 2019, and the fifth 2-year review occurred in 2021. Two-year reviews will be completed no later than August 31 of the year of the review. The

2-year reviews by the AMP group will provide guidance, suggestions, and recommendations to DOE concerning the level of success of the AMP monitoring program. The review meetings, and any other requested meetings, will be scheduled using the process described in the PIP.

The cooperative approach to reach consensus does not preempt the authority of the state or any federal agency to take an authorized action. Although consensus is strongly preferred, if it cannot be reached in a timely manner, DOE will decide the course of action for implementing this AMP.

7.0 Participants and Periodic Reviews

DOE and the AMP group, consisting of stakeholders from surrounding communities, developed the original AMP through a cooperative process that included suggestions and recommendations from the AMP group. This cooperative approach will continue as this AMP is implemented. DOE also invited the RFLMA regulatory agencies, CDPHE and EPA, to participate in the AMP development and information-sharing process. This AMP does not describe policy or other requirements enforceable under RFLMA by CDPHE or EPA, nor does it contain enforceable regulatory elements.

Stakeholder involvement and input are essential to a successful AMP process over the long term. DOE intends to work with interested stakeholders on implementation and any subsequent revisions of this AMP until this AMP is terminated.

DOE notified stakeholders of the AMP annual report meeting and the AMP 2-year review meeting on August 4, 2021. The meeting was held on August 26, 2021. A few participants—the cities of Broomfield, Northglenn, and Westminster—sent a combined feedback letter on September 16, 2021, containing several comments and proposed edits. DOE formally responded on November 4, 2021, and subsequently made several modifications to this document. Table 3 lists elected officials and representatives from the communities, organizations, and agencies that participated in developing the original AMP and in the 2-year AMP reviews in cooperation with DOE.

Table 3. Original AMP and 2-Year AMP Review Participants

Representatives of	Original AMP 2011	2-Year Review 2013	2-Year Review 2015	2-Year Review 2017	2-Year Review 2019	2-Year Review 2021
CDPHE	✓	✓	✓	✓	✓	✓
City of Arvada	✓					✓
City and County of Broomfield	✓	✓	✓	✓	✓	✓
EPA	✓	✓	✓	✓	✓	
Jefferson County Public Health	✓		✓			
City of Northglenn	✓	✓	✓	✓	✓	✓
Rocky Flats Stewardship Council	✓	✓	✓	✓	✓	✓
Town of Superior	✓					
Woman Creek Reservoir Authority	✓	✓	✓	✓	✓	

Table 3. Original AMP and 2-Year AMP Review Participants (continued)

Representatives of	Original AMP 2011	2-Year Review 2013	2-Year Review 2015	2-Year Review 2017	2-Year Review 2019	2-Year Review 2021
City of Westminster	✓	✓	✓	✓	✓	✓
U.S. Representative Ed Perlmutter	✓					✓
U.S. Representative Jared Polis	✓					
U.S. Senator Mark Udall	✓					

Note:

✓ Indicates participation

Participation in the periodic review process does not indicate that the participants agree in full to the AMP. In addition, participation is expected to change over time, and anyone interested in participating in the AMP process or receiving AMP information is welcome. Interested parties should contact DOE.

8.0 Anticipated Duration for the AMP

The AMP became effective upon completion of the NEPA evaluation process in June 2011. The monitoring objectives, implementation, and activity duration described in Section 3.0 address the individual activities. Periodic review of this AMP and the results of implementing the monitoring objectives by DOE and the AMP group may result in early termination of this AMP. This AMP will be closed no later than 2 years after the final dam breach.

9.0 Funding

DOE will request the budget to perform the activities in this AMP for items that are not components of the 2021 and out-year DOE baseline for the Rocky Flats Site. However, if funding is unavailable, DOE will inform the AMP group and will meet to discuss any AMP activities that may be impacted by the actual or projected lack of funding and will work in a cooperative manner to adjust implementation of this AMP to available funding.

10.0 References

All of the documents cited in References are available on the Rocky Flats Site website (https://www.lm.doe.gov/Rocky_Flats).

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

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