

ROCKY FLATS STEWARDSHIP COUNCIL

P.O. Box 17670
Boulder, CO 80308-0670
www.rockyflatssc.org

(303) 412-1200
(303) 600-7773 (f)

Jefferson County -- Boulder County -- City and County of Broomfield -- City of Arvada -- City of Boulder
City of Golden -- City of Northglenn -- City of Thornton -- City of Westminster -- Town of Superior
League of Women Voters -- Rocky Flats Cold War Museum -- Rocky Flats Homesteaders
Arthur Widdowfield

Board of Directors Meeting – Agenda

Monday, February 4, 2013, 8:30 AM – 11:45 AM

**Rocky Mountain Metropolitan Airport, Terminal Building, Mount Evans Room
11755 Airport Way, Broomfield, Colorado**

- 8:30 AM Convene/Introductions/Agenda Review
- 8:35 AM Chairman’s Review of January 14th Executive Committee meeting
- 8:40 AM Business Items (briefing memo attached)
1. Election of Stewardship Council Officers for 2013
Action Item: Elect Officers
 2. Consent Agenda
 - o Approval of meeting minutes and checks
 3. Approval 2013 Meeting Dates and Notice Provisions Resolution
Action item: Adopt resolution and meeting notice provisions
 4. Approval of letter supporting Rocky Flats workers
Action item: Approve letter
 5. Executive Director’s Report
- 9:10 AM Public Comment
- 9:20 AM Host DOE Quarterly Meeting (briefing memo attached)
- o DOE will brief the Stewardship Council on site activities for the third quarter of 2012 (July – September).
 - o DOE has posted the report on its website and will provide a summary of its activities.
 - o Activities include surface water monitoring, groundwater monitoring, ecological monitoring, and site operations (inspections, maintenance, etc.).

- 10:30 AM Briefing/Discussion on Off-Site Contamination (briefing memo attached)
- DOE and CDPHE will brief on contamination levels on lands adjacent to and in close proximity to Rocky Flats.
 - This conversation will principally focus on DOE's decision in 1996 to delist from the CERCLA Superfund list all off-site lands, and the 1993-1994 citizen sampling study.
 - The key issues we will address include:
 - Where contamination is found
 - At what levels contamination is found
 - What is the risk

11:15 AM Public comment

- 11:25 PM Updates/Big Picture Review
1. Executive Director
 2. Member Updates
 3. Review Big Picture

Adjourn

Next Meetings: April 1 (proposed date; actual date to be determined at this meeting)
June 3 (proposed date; actual date to be determined at this meeting)

Acronym or Term	Means	Definition
Alpha Radiation		A type of radiation that is not very penetrating and can be blocked by materials such as human skin or paper. Alpha radiation presents its greatest risk when it gets inside the human body, such as when a particle of alpha emitting material is inhaled into the lungs. Plutonium, the radioactive material of greatest concern at Rocky Flats, produces this type of radiation.
Am	americium	A man-made radioactive element which is often associated with plutonium. In a mass of Pu, Am increases in concentration over time which can pose personnel handling issues since Am is a gamma radiation-emitter which penetrates many types of protective shielding. During the production era at Rocky Flats, Am was chemically separated from Pu to reduce personnel exposures.
AME	Actinide Migration Evaluation	An exhaustive years-long study by independent researchers who studied how actinides such as Pu, Am, and U move through the soil and water at Rocky Flats
AMP	Adaptive Management Plan	Additional analyses that DOE is performing beyond the normal environmental assessment for breaching the remaining site dams.
AOC well	Area of Concern well	A particular type of groundwater well
B	boron	Boron has been found in some surface water and groundwater samples at the site
Be	beryllium	A very strong and lightweight metal that was used at Rocky Flats in the manufacture of nuclear weapons. Exposure to beryllium is now known to cause respiratory disease in those persons sensitive to it
Beta Radiation		A type of radiation more penetrating than alpha and hence requires more shielding. Some forms of uranium emit beta radiation.
BMP	best management practice	A term used to describe actions taken by DOE that are not required by regulation but warrant action.
BZ	Buffer Zone	The majority of the Rocky Flats site was open land that was added to provide a

		"buffer" between the neighboring communities and the industrial portion of the site. The buffer zone was approximately 6,000 acres. Most of the buffer zone lands now make up the Rocky Flats National Wildlife Refuge.
CAD/ROD	corrective action decision/record of decision	The complete final plan for cleanup and closure for Rocky Flats. The Federal/State laws that governed the cleanup at Rocky Flats required a document of this sort.
CCP	Comprehensive Conservation Plan	The refuge plan adopted by the U.S. Fish and Wildlife Service in 2007.
CDPHE	Colorado Department of Public Health and Environment	State agency that regulates the site.
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act	Federal legislation that governs site cleanup. Also known as the Superfund Act
cfs	cubic feet per second	A volumetric measure of water flow.
COC	Contaminant of Concern	A hazardous or radioactive substance that is present at the site.
COU	Central Operable Unit	A CERCLA term used to describe the DOE-retained lands, about 1,500 acres comprised mainly of the former Industrial Area where remediation occurred
CR	Contact Record	A regulatory procedure where CDPHE reviews a proposed action by DOE and either approves the proposal as is or requires changes to the proposal before approval. CRs apply to a wide range of activities performed by DOE. After approval the CR is posted on the DOE-LM website and the public is notified via email.
Cr	chromium	Potentially toxic metal used at the site.
CRA	comprehensive risk assessment	A complicated series of analyses detailing human health risks and risks to the environment (flora and fauna).
D&D	decontamination and decommissioning	The process of cleaning up and tearing down buildings and other structures.
DG	discharge gallery	This is where the treated effluent of the SPPTS empties into North Walnut Creek.
DOE	U.S. Department of Energy	The federal agency that manages portions of Rocky Flats. The site office is the Office of

		Legacy Management (LM).
EA	environmental assessment	Required by NEPA (see below) when a federal agency proposes an action that could impact the environment. The agency is responsible for conducting the analysis to determine what, if any, impacts to the environment might occur due to a proposed action.
EIS	environmental impact statement	A complex evaluation that is undertaken by a government agency when it is determined that a proposed action by the agency may have significant impacts to the environment.
EPA	U.S. Environmental Protection Agency	The federal regulatory agency for the site.
ETPTS	east trenches plume treatment system	The treatment system near the location of the east waste disposal trenches which treats groundwater contaminated with organic solvents emanating from the trenches. Treated effluent flows into South Walnut Creek.
FC	functional channel	Man-made stream channels constructed during cleanup to help direct water flow.
FACA	Federal Advisory Committee Act	This federal law regulated federal advisory boards. The law requires balanced membership and open meetings with published Federal Register meeting dates.
Gamma Radiation		This type of radiation is very penetrating and requires heavy shielding to keep it from exposing people. Am is a strong gamma emitter.
GAO	Government Accountability Office	Congressional office which reports to Congress. The GAO did 2 investigations of Rocky Flats relating to the ability to close the site for a certain dollar amount and on a certain time schedule. The first study was not optimistic while the second was very positive.
g	gram	metric unit of weight
gpm	gallons per minute	A volumetric measure of water flow in the site's groundwater treatment systems and other locations.
GWIS	groundwater intercept system	Refers to a below ground system that directs contaminated groundwater toward the Solar Ponds and East Trenches treatment systems.
IA	Industrial Area	Refers to the central core of Rocky Flats

		where all production activities took place. The IA was roughly 350 of the total 6,500 acres at the site.
IC	Institutional Control	ICs are physical and legal controls geared towards ensuring the cleanup remedies remain in place and remain effective.
IHSS	Individual Hazardous Substance Site	A name given during cleanup to a discrete area of known or suspected contamination. There were over two hundred such sites at Rocky Flats.
ITPH	interceptor trench pump house	The location where contaminated groundwater collected by the interceptor trench is pumped to either the Solar Ponds and East Trenches treatment systems
L	liter	Metric measure of volume, a liter is slightly larger than a quart.
LANL	Los Alamos National Laboratory	One of the US government's premier research institutions located near Santa Fe, NM. LANL is continuing to conduct highly specialized water analysis for Rocky Flats. Using sophisticated techniques LANL is able to determine the percentages of both naturally-occurring and man-made uranium which helps to inform water quality decisions.
LM	Legacy Management	DOE office responsible for overseeing activities at closed sites.
LMPIP	Legacy Management Public Involvement Plan	This plan follows DOE and EPA guidance on public participation and outlines the methods of public involvement and communication used to inform the public of site conditions and activities. It was previously known as the Post-Closure Public Involvement Plan (PCPIP).
M&M	monitoring and maintenance	Refers to ongoing activities at Rocky Flats.
MOU	Memorandum of Understanding	MOU refers to the formal agreement between EPA and CDPHE which provides that CDPHE is the lead post-closure regulator with EPA providing assistance when needed.
MSPTS	Mound site plume treatment system	The treatment system for treating groundwater contaminated with organic solvents which emanates from the Mound site where waste barrels were buried.

		Treated effluent flows into South Walnut Creek.
NEPA	National Environmental Policy Act	Federal legislation that requires the federal government to perform analyses of environmental consequences of major projects or activities.
nitrates		Contaminant of concern found in the North Walnut Creek drainage derived from Solar Ponds wastes. Nitrates are very soluble in water and move readily through the aquatic environment
Np	neptunium	A man-made radioactive isotope that is found as a by-product of nuclear reactors and plutonium production.
NPL	National Priorities List	A listing of Superfund sites. The refuge lands were de-listed from the NPL while the DOE-retained lands are still on the NPL due to ongoing groundwater contamination and associated remediation activities.
OLF	Original Landfill	Hillside dumping area of about 20 acres which was used from 1951 to 1968. It underwent extensive remediation with the addition of a soil cap and groundwater monitoring locations.
OU	Operable Unit	A term given to large areas of the site where remediation was focused.
PCE	perchloroethylene	A volatile organic solvent used in past operations at the site. PCE is also found in environmental media as a breakdown product of other solvents.
pCi/g	picocuries per gram of soil	A unit of radioactivity measure. The soil cleanup standard at the site was 50 pCi/g of soil.
pCi/L	picocuries per liter of water	A water concentration measurement. The State of Colorado has a regulatory limit for Pu and Am which is 0.15 pCi/L of water. This standard is 100 times stricter than the EPA's national standard.
PLF	Present Landfill	Landfill constructed in 1968 to replace the OLF. During cleanup the PLF was closed under RCRA regulations with an extensive cap and monitoring system.
PMJM	Preble's Meadow Jumping Mouse	A species of mouse found along the Front Range that is on the endangered species list. There are several areas in the Refuge and

Rocky Flats Acronym List
 Prepared by Rik Getty, Rocky Flat Stewardship Council
 November 2012

		COU that provide an adequate habitat for the mouse, usually found in drainages. Any operations that are planned in potential mouse habitat are strictly controlled.
POC	Point of Compliance (surface water)	A surface water site that is monitored and must be found to be in compliance with federal and state standards for hazardous constituents. Violations of water quality standards at the points of compliance could result in DOE receiving financial penalties.
POE	Point of Evaluation (surface water)	These are locations at Rocky Flats at which surface water is monitored for water quality. There are no financial penalties associated with water quality exceedances at these locations, but the site may be required to develop a plan of action to improve the water quality.
POU	Peripheral Operable Unit	A CERCLA term used to describe the Wildlife Refuge lands of about 4,000 acres.
Pu	plutonium	Plutonium is a metallic substance that was fabricated to form the core or "trigger" of a nuclear weapon. Formation of these triggers was the primary production mission of the Rocky Flats site. Pu-239 is the primary radioactive element of concern at the site. There are different forms of plutonium, called isotopes. Each isotope is known by a different number. Hence, there are plutonium 239, 238, 241 and others.
RCRA	Resource Conservation and Recovery Act	Federal law regulating hazardous waste. In Colorado, the EPA delegates CDPHE the authority to regulate hazardous wastes.
RFCA	Rocky Flats Cleanup Agreement	The regulatory agreement which governed cleanup activities. DOE, EPA, and CDPHE were signors.
RFCAB	Rocky Flats Citizen Advisory Board	This group was formed as part of DOE's site-specific advisory board network. They provided community feedback to DOE on a wide variety of Rocky Flats issues from 1993-2006.
RFCLOG	Rocky Flats Coalition of Local Governments	The predecessor organization of the Rocky Flats Stewardship Council
RFETS	Rocky Flats Environmental Technology Site	The moniker for the site during cleanup years.

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RFLMA	Rocky Flats Legacy Management Agreement	The post-cleanup regulatory agreement between DOE, CDPHE, and EPA which governs site activities. The CDPHE takes lead regulator role, with support from EPA as required.
RFNWR	Rocky Flats National Wildlife Refuge	The approximate 4,000 acres which compose the wildlife refuge.
RFSOG	Rocky Flats Site Operations Guide	The nuts-and-bolt guide for post-closure site activities performed by DOE and its contractors.
SPPTS	solar ponds plume treatment system	System used to treat groundwater contaminated with uranium and nitrates. The nitrates originate from the former solar evaporation ponds which had high levels of nitric acid. The uranium is primarily naturally-occurring with only a slight portion man-made. Effluent flows into North Walnut Creek
SVOCs	semi-volatile organic compounds	These compounds are not as volatile as the solvent VOCs. They tend to be similar to oils and tars. They are found in many environmental media at the site. One of the most common items to contain SVOCs is asphalt.
TCE	trichloroethylene	A volatile organic solvent used in past operations at the site. TCE is also found in environmental media as a breakdown product of other solvents.
U	uranium	Naturally occurring radioactive element. There were two primary isotopes of U used during production activities. The first was enriched U which contained a very high percentage (>90%) of U-235 which was used in nuclear weapons. The second isotope was U-238, also known as depleted uranium. This had various uses at the site and only had low levels of radioactivity..
USFWS	United States Fish & Wildlife Service	An agency within the US Department of the Interior that is responsible for maintaining the nation-wide system of wildlife refuges, among other duties. The regional office is responsible for the RFNWR.
VOC	volatile organic compound	These compounds include cleaning solvents that were used in the manufacturing operations at Rocky Flats. The VOCs used

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		at Rocky Flats include carbon tetrachloride (often called carbon tet), trichloroethene (also called TCE), perchloroethylene (also called PCE), and methylene chloride.
WCRA	Woman Creek Reservoir Authority	This group is composed of the three local communities, the Cities of Westminster, Northglenn, and Thornton, who use Stanley Lake as part of their drinking water supply network. Water from the site used to flow through Woman Creek to Stanley Lake but the reservoir severed that connection. The Authority has an operations agreement with DOE to manage the Woman Creek Reservoir.
WQCC	Water Quality Control Commission	State board within CDPHE tasked with overseeing water quality issues throughout the state. DOE has petitioned the WQCC several times in the last few years regarding water quality issues.
ZVI	zero valent iron	A type of fine iron particles used to treat VOC's in the ETPTS and MSPTS.

Business Items

- Cover memo
- November 4, 2012, draft board meeting minutes
- List of Stewardship Council checks
- 2012 meeting dates resolution
- Letter in support of Rocky Flats workers

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Arthur Widdowfield

MEMORANDUM

TO: Board
FROM: David Abelson
SUBJECT: Business Items
DATE: January 24, 2013

In addition to approving the consent agenda (minutes and checks), the board will need to

1. Appoint officers for 2013,
2. Adopt a resolution regarding 2013 meeting dates, and
3. Approve a letter supporting former Rocky Flats workers.

Election of officers

In accordance with the Stewardship Council bylaws, "the Chair, Vice Chair, and Secretary/Treasurer shall be elected annually by the Board of Directors. The terms shall commence at the first meeting of the Board held on or after February 1 of each year." There are no limitations as to the number of terms one can serve.

If you are interested in serving as an officer and have not yet let me know of your interest, please email or call me ASAP. That way I can notify your fellow board members of your interest. As of the drafting of this memo, the following people expressed interest in serving on the executive committee:

Bob Briggs (Westminster) – Chairman
Joyce Downing (Northglenn) – Any position
Deb Gardner (Boulder County) – Secretary/Treasurer

Action Item: Elect officers

Resolution Re: 2013 Meeting Dates and Notice Provisions

Each year, the board is required to adopt a resolution establishing the meeting dates for the year. In 2012, we met the first Monday of February, April, June, and November and the second Monday of September. For 2013, the executive committee proposes we follow this schedule, with the exception of the November meeting in which we meet the week prior (the last Monday of October). The primary reason for the change to the last Monday in October is that Election

Day follows the first Monday in November, and with local elections scheduled for 2013, the executive committee thought it would be best to move the meeting to one week earlier.

If we follow that plan, the board would meet:

February 4

April 1

June 3

September 9 (second Monday of the month)

October 28 (last Monday of the month)

The attached notice provisions track the Stewardship Council's bylaws.

Action item: Adopt resolution and meeting notice provisions

Letter in Support of Rocky Flats workers

Last fall, the board agreed to send a letter to the Colorado Congressional delegation supporting efforts to secure compensation due under the Energy Employees Occupational Illness Compensation Program Act (EEOICPA). The letter has been vetted with board members and includes all input and edits we received.

Action Item: Approve letter

ROCKY FLATS STEWARDSHIP COUNCIL

Monday, November 5, 2012, 8:30 AM – 12:00 PM

**Rocky Mountain Metropolitan Airport, Terminal Building, Mount Evans Room
11755 Airport Way, Broomfield, Colorado**

Board members in attendance: Shelley Cook (Director, Arvada), Lisa Morzel (Director, City of Boulder), Tim Plass (Alternate, City of Boulder), Deb Gardner (Director, Boulder County), Megan Davis (Alternate, Boulder County), Greg Stokes (Director, Broomfield), David Allen (Alternate, Broomfield), Bill Fisher (Director, Golden), Faye Griffin (Director, Jefferson County), Kate Newman (Alternate, Jefferson County), Shelly Stanley (Alternate, Northglenn), Eric Tade (Director, Thornton), Emily Hunt (Alternate, Northglenn), Joe Cirelli (Director, Superior), Bob Briggs (Director, Westminster), Jeannette Hillery (League of Women Voters), Shirley Garcia (Director, Rocky Flats Cold War Museum), Ann Lockhart (Alternate, Rocky Flats Cold War Museum), Roman Kohler (Director, Rocky Flats Homesteaders), Arthur Widdowfield (citizen).

Stewardship Council staff members and consultants in attendance: David Abelson (Executive Director), Rik Getty (Technical Program Manager), Barb Vander Wall (Seter & Vander Wall, P.C), Erin Rogers (consultant).

Attendees: Cathy Shugarts (City of Westminster), Judith Mohling (Rocky Mountain Peace and Justice Center), Leroy Moore (Rocky Mountain Peace and Justice Center), Vera Moritz (EPA), John Dalton (EPA), Carl Spreng (CDPHE), Charles Adams (CDPHE), Jeremiah McLaughlin (Stoller), Bob Darr (Stoller), Rick DiSalvo (Stoller), John Boylan (Stoller), Jody Nelson (Stoller), George Squibb (Stoller), Linda Kaiser (Stoller).

Convene/Agenda Review

Chair Lisa Morzel convened the meeting at 8:34 a.m. She asked if there were any suggested changes to the agenda and there were not.

Consent Agenda

Bill Fisher moved to approve the September Board meeting minutes (with minor spelling changes) and the checks. The motion was seconded by Ann Lockhart. The motion to accept the minutes and checks passed 13-0.

Adopt Resolution Supporting Rocky Flats Cold War Museum

Ann Lockhart said that while the Rocky Flats Coalition of Local Governments passed a resolution in support of the Cold War Museum in 2004, the Stewardship Council had not made a similar endorsement. She explained that such a resolution would help the Museum Board with their fundraising efforts. A draft resolution was provided in Board packet. Deb Gardner said she would support the resolution. She added that the Boulder County Commissioners would be offering their support as well, with a slight modification to include a bit more history of Rocky Flats. Lisa Morzel said that the City of Boulder was interested in doing same. Other Board

members expressed an interest in getting copies of the resolution that the Boulder County Commissioners would be using. Deb said she would distribute copies. Joe Cirelli moved to approve the resolution supporting the Rocky Flats Cold War Museum. The motion was seconded by Eric Tade. The motion passed 13-0.

Chairman's Review of October 17 Executive Committee meeting

Lisa Morzel noted that an Executive Committee meeting was held on October 17, 2012. Meeting attendees included Lisa Morzel, Bob Briggs, Tim Plass and David Abelson. The purpose was to develop the agenda for this meeting. These meetings are always open to public.

Executive Director's Report

David Abelson noted that Rik Getty had sent out a briefing memo about OU3 (offsite areas). A question had originated with Murph Widdowfield in relation to development to the south of Rocky Flats. David noted that all of these areas were released with no land use restrictions. He added that additional information will be presented at the February Board meeting.

David next reported that on a recent trip to Washington D.C. for another client, he was able to meet with the head of DOE-Legacy Management Dave Geiser. They spoke a bit about the US Fish and Wildlife Service plan for Rocky Flats. They also discussed the recently-published book about Rocky Flats by Kristin Iverson and agreed that no deep concerns had been raised in the press or elsewhere. He also was reassured that DOE continues to recognize that groups such as the Stewardship Council serve a useful purpose and provide great value at Legacy Management sites.

In December, David will be attending an annual Intergovernmental Meeting. This meeting brings together DOE, the Energy Communities Alliance (ECA), National Governors Association, National Association of Attorneys General, State and Tribal Government Working Group, and Environmental Council of States to discuss issues related to nuclear cleanup. David noted that most of his expenses are covered by ECA.

David also mentioned that once the new Congress is seated, the Stewardship Council would likely weigh in again regarding support for compensation claims by former Rocky Flats workers. Staff will draft a letter after the beginning of the year for the Board to discuss.

David distributed the Board's quarterly financial report last week, and said he would be happy to answer any questions.

Public Comment

There was none.

Host DOE Quarterly Meeting

DOE briefed on site activities for the second quarter of 2012 (April – June). Activities included surface water monitoring, groundwater monitoring, ecological monitoring, and site operations (inspections, maintenance, etc.).

Surface Water – George Squibb

Since 2011, all terminal ponds were being operated in a flow-through mode, so there were no terminal pond discharges. Pond levels were very low. As of June, the terminal ponds were holding approximately 6.4 percent of capacity. October levels were similarly low.

George next reviewed sampling results for plutonium and americium, uranium, and nitrates at the Points of Compliance (POC's). All were below applicable standards. Lisa Morzel asked how often the site looked at isotopic results for uranium. George noted that this analysis was very expensive, and they primarily use it at highly targeted locations such as the solar ponds. This type of analysis is done approximately twice a year. Shelley Stanley asked about an increase in the 30-day rolling average at WALPOC. George said this happened when they started flow-through in October 2011. She asked what level of flow there was during that time period. George said it was very low. Deb Gardner referred to results where analysis was pending and asked George if he will add this information to his graphs when the results come in. He said he will.

At the Original Landfill (OLF), surface water quality results were all below standards for the quarter. At the Present Landfill (PLF), the selenium concentration was preliminarily reported as above the standard in the sample collected in April. This result triggered monthly sampling; however, subsequent data validation determined that selenium was not detected. The selenium concentration was below the standard in the first monthly sample collected in May, resulting in the discontinuation of monthly sampling (this sample was collected prior to data validation for the routine quarterly sample).

Reportable 12-month rolling average values for uranium at GS10 continued to be observed through the quarter. Additional sampling is being conducted both upstream and downstream of GS10. Contact Records 2011-04 and 2011-05, which address this issue, can be found on the Rocky Flats website. These reportable results have been cyclical.

Reportable 12-month rolling average values for americium at GS10 continued to be observed through the quarter. Reportable 12-month rolling average values for plutonium at GS10 were observed starting on May 31, 2012. Notification was made on July 24, 2012. Additional sampling is being conducted both upstream and downstream of GS10; no downstream results have been detected. There is not sufficient water to be able to sample upstream. Contact Record 2011-08 can be found on the Rocky Flats website. David Abelson asked for an explanation of why plutonium is not showing up downstream after it had been detected at GS10. John said that the levels they have detected at GS10 are extremely low, and that there could be some dropping off and some dilution downstream.

Tim Plass noted that at GS10, the ratios of natural vs. anthropogenic uranium did not match up with historical data. John Boylan noted that only one of the samples came out at a 50/50 ratio rather than the normal 70/30. Deb Gardner asked whether soil sampling in these areas was an option in lieu of water sampling (since the conditions were so dry). She also asked what would trigger mitigation actions. John said that whenever it was possible to mitigate, they do so. He said that in this case, the best alternative was to prevent movement of contaminants. Shelley Stanley asked what size filter they used to look at the size of colloids. George said it was a 0.45 micron filter.

Groundwater Monitoring - John Boylan

The second quarter (April through June) is a heavy sampling quarter, especially in even-numbered years. All of the following were sampled:

- All RCRA wells (OLF, PLF)
- All AOC wells
- All sentinel wells
 - One well was dry
- All evaluation wells (only in even-numbered years)
- Surface water support locations
- All RFLMA treatment system locations

Analytical results were reviewed in accordance with the RFLMA Attachment 2 decision flowcharts. Overall, results were consistent with previous conditions. No new reportable conditions were indicated. All results will be discussed and evaluated in the 2012 Annual Report.

Additional (non-RFLMA) activities included continued maintenance and optimization of pilot air stripper at the Mound Site Plume Treatment System (MSPTS). No freezing was observed. Reduced solar availability (i.e. less sunlight) reduced available power, causing the pump to stop. These power issues were resolved. They added a second pump to test higher flow through nozzles. Also, preparations were made to install powered ventilation fan (completed in July).

At the East Trenches Plume Treatment System (ETPTS), the site began planning for installation of an air stripper at the influent manhole. This one differs from the unit at the MSPTS, which polishes ZVI-treated effluent.

At the Solar Ponds Plume Treatment System (SPPTS), microcell (small media-filled containers) testing to treat uranium continued. This work involved automated sampling, usually about every 12 hours. Zero Valent Ion (ZVI) and ion-exchange resins were tested. Early results showed that ZVI provided better treatment than resins. Bench-scale testing of lagoons to treat nitrate also began. This system involved trash cans filled with carbon-dosed influent and small amount of inoculum (de-nitrifying bacteria). One was periodically agitated, while the second was left stagnant. Early results showed that nitrate was successfully removed via lagoon-style treatment. John said that they are now using existing large cells to do pilot scale testing of lagoon method.

Rik Getty asked how effective the bacteria will be in winter. John said he was not sure yet. The cells have not been insulated yet, but they will be monitoring the conditions and will insulate if

necessary. Tim Plass asked what the residence time was for this treatment. John said they were targeting 50 days. They do two pulses a day, which results in a mix of batch and flow-through treatments. He said they needed to adjust the grain size of ZVI, and will likely test new mixes. Shelley asked what carbon source they are using. John said it was called MicroCG. It is a biologically-based food grade substance similar to vegetable oil.

Shelley Cook asked if Rocky Flats has been faced with any budget issues. Linda Kaiser said that they have not been having any problems, and that she had not heard anything regarding across the board federal cuts.

Shirley Garcia asked about a dry sentinel well mentioned in the report. John said that this monitoring location (which was placed for east trenches plume bypass) has had water in it only one time. Murph Widdowfield asked how contaminated ZVI was disposed. John said that uranium contamination in the spent ZVI was below levels that would make it a DOT-regulated hazardous material. However, DOE requires controlled disposal, so it is shipped to a site in Utah. Shelley Stanley asked if there were any wells in a utility corridor mentioned earlier. John said that there were not.

Site Operations - Jeremiah McLaughlin

Jeremiah reported that the quarterly inspection at the Present Landfill (PLF) was completed in May and no areas of concern were observed. Monthly inspections were completed at the Original Landfill (OLF). Seep locations were active throughout the second quarter. Wetland vegetation was found to have had proficient growth. Since woody vegetation on the waste footprint must be removed, it was sprayed in June with 'Garlon A'.

Shirley Garcia asked if they used pesticides that biodegrade. Jody Nelson said that all pesticides used onsite are listed in the Annual Report.

Settlement monuments were surveyed in June and data were within the expected range per the OLF Monitoring and Maintenance Plan. Inclinometers were measured monthly and no noticeable deflection was found, which continued a trend going back two years. Jeremiah noted that previous work to improve drainage and regrade the west channel, along with routine maintenance, seems effective in mitigating localized instability.

Ecological Monitoring - Jody Nelson

The following ecological monitoring was conducted during the second quarter:

- Weed mapping
- PLF/OLF quarterly vegetation surveys
- Nest box monitoring
- Prairie dog surveys
- Wetland water level
- Wetland weed surveys
- Preparations under way for revegetation monitoring, Prebles Meadow Jumping Mouse, and wetland mitigation monitoring

Jody said that approximately 167 acres in the Central Operating Unit (COU) were treated with spring herbicide. Site ecologists also seeded the ridge top road from Pond A-3 to the PLF and installed erosion controls.

Briefing by CDPHE and EPA on Role of Regulators

Carl Spreng (CDPHE) was asked to brief the Board on the roles of the regulatory agencies at Rocky Flats, and offer perspectives on the effectiveness of the cleanup remedies and ongoing management activities. Carl began by noting that he would cover the regulatory framework at Rocky Flats, regulatory agreements, their roles during cleanup, post-closure roles, and additional regulator activities and studies.

Carl explained that although more than 20 federal laws and regulations applied at the site, the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA or Superfund) provided the umbrella authority for regulators at the site. CERCLA created the Superfund Program, based on a National Priorities List (to which Rocky Flats was added in 1989). Cleanup decisions were to be based on Applicable or Relevant and Appropriate Requirements (ARARs), drawn from all of the applicable federal laws. Cleanup standards under CERCLA employed risk-based decisions, with an acceptable risk range of 1:10,000 – 1:1 million.

The Resource Conservation and Recovery Act (RCRA) is the federal law that controls hazardous waste from ‘cradle to grave’. Under this program, Colorado is an authorized state, meaning the State has authority to regulate hazardous and ‘mixed’ (hazardous and radioactive) wastes under guidelines that are at least as stringent as the federal laws. In Colorado, the Colorado Hazardous Waste Act (CHWA) is the governing statute and the Colorado Hazardous Waste Regulations (6 CCR 1007-3) provide the policy and guidance. Carl said that the goal of these regulations is to ensure the protection of human health and environment, as well as compliance with environmental laws. Carl noted that other state programs that impact Rocky Flats are Radiation Control, Solid Waste Disposal, Air Pollution Prevention and Water Quality Control.

Carl explained that there have been a series of regulatory agreements at Rocky Flats. A Compliance Agreement in 1986 allowed regulation of radioactive and hazardous waste. This agreement was followed by an Agreement in Principle in 1989. A 1991 Interagency Agreement laid out plans to remediate 178 Individual Hazardous Substance Sites (IHSS), which were grouped into 16 Operable Units (OUs). This framework laid out a rigid schedule with detailed milestones, including treatability studies and characterizations. DOE, CDPHE and EPA found that this process led to too much time being spent on renegotiating milestones and not enough on actual remediation.

After 18 months of negotiations, the Rocky Flats Cleanup Agreement (RFCA) was signed in 1996. This new agreement was intended to guide active remediation through an adaptive regulatory structure. This agreement served as a Compliance Order on Consent under CHWA, and an Interagency Agreement under CERCLA. The plan was to perform cleanup under ‘interim actions’, which provided much greater efficiency and allowed for a quicker process and less paperwork. RFCA also divided the lead regulatory agency role by area. CDPHE had the lead role

in the Industrial Area (IA) and EPA was the lead agency in the Buffer Zone (BZ). OU's were consolidated, and a consultative process was developed to allow for in-the-field decisions. RFCA also defined Standard Operating Protocols (SOPs) that allowed the regulators to make decisions once for the same actions taking place in different areas.

RFCA created a public involvement system that involved stakeholders early and often. Many of these public involvement opportunities were required by CERCLA and RFCA, such as public comment periods for regulatory documents. Public involvement also included various workshops, focus groups and technical working groups, as well as involvement by a number of organizations such as the Rocky Flats Citizens Advisory Board (RFCAB), the Rocky Flats Local Impacts Initiative (RFLII), and later, the Rocky Flats Coalition of Local Governments (RFCLOG).

Carl went on to describe the role of the regulators during cleanup. CDPHE and EPA responsibilities included oversight of building commissioning, oversight of environmental cleanup, and emergency preparedness and response planning. Tasks included setting cleanup standards and assessing environmental conditions related to surface water, groundwater, soil and air. Some of the specific activities included independent monitoring, approving monitoring protocols, and approving sampling methodology. Regulators were also extremely active in public involvement activities.

Once remediation was complete, the parties entered into a post-closure agreement in 2007 called the Rocky Flats Legacy Management Agreement (RFLMA). Around this same time, the Rocky Flats site was transferred from DOE-Environmental Management to DOE-Legacy Management. Under RFLMA, the Central Operable Unit (COU) refers the areas that remain in DOE control, after the majority of the former Rocky Flats site was transferred to the US Fish and Wildlife Service as a National Wildlife Refuge.

RFLMA set up a monitoring and maintenance framework, reporting schedule, and a system for Contact Records and notifications. A Memorandum of Understanding between the State and EPA is attached to RFLMA and defines regulatory roles for post-cleanup period. The State is lead for most regulatory actions, and works in consultation with EPA. Joint approval is required for decisions or revisions that affect RFLMA. RFLMA also defines a consultative process for decisions.

Post-closure regulation activities include reviewing routine reports such as landfill inspection reports, surveillance and maintenance activity reports, and surface and ground water monitoring results. CDPHE is also involved in any terminal pond releases from the site through sampling and independent analyses of water prior to release. Other responsibilities include approving actions and changes proposed in Contact Records, public involvement, coordinating with other State agencies, and participating as a Trustee in Natural Resource Damage (NRD) Restoration Projects.

EPA-specific roles include leading CERCLA-required 5-Year Reviews and de-listing processes, providing access to EPA resources and topic experts, approving changes to RFLMA, and consultation.

Carl also reviewed several other projects that have involved the regulatory agencies over the years, such as Rocky Flats Health Studies, and various soil sampling and contamination studies. Additionally, CDPHE and EPA maintain communication with a number of organizations throughout the country that work on similar issues, such as the State and Tribal Government Working Group, the National Governors Association, the Environmental Council of States, and several others.

Joe Cirelli asked if CDPHE was involved in the decision to change the method of transport for low-level waste from trucking to rail. Carl said that this decision did not fall under regulator authority, but that the regulators were involved in deciding where the tracks would be laid. Tim Plass asked for some more information about the ability of CDPHE to perform independent water sampling onsite. Carl said that they have the authority to take samples at any time, as well as to observe collection procedures. He added that, since closure, CDPHE has only taken pre-release samples at the terminal ponds. These samples are run through State labs, and the results were right in line with the results from DOE samples. Shirley Garcia requested a copy of Carl's presentation. David Abelson said he would make sure Board members get a copy.

Approve Fiscal Year 2013 Work Plan

The Board reviewed the draft work plan at the September meeting. No changes were offered at that meeting. Bob Briggs moved to approve the 2013 Stewardship Council Work Plan. The motion was seconded by Jeannette Hillery. The motion passed 14-0.

Fiscal Year 2013 Budget Hearing

The Board reviewed the draft budget at the September meeting. No changes were offered. The Board's attorney Barb Vander Wall explained the required budget review process. Prior to finalizing the budget, the Board must hold a budget hearing and allow time for public comment. Following the public hearing, the Board must approve the budget resolution. This must occur before the end of each year. She also noted that after the budget is approved, it is filed with the State by the end of the year. She reported that a notice for this meeting was published in the *Denver Post* as required.

Chair Lisa Morzel officially opened the budget hearing. There were no comments from the public. Lisa then closed the budget hearing. David Abelson noted that there were no changes since the last meeting. There were no comments from Board members.

Deb Gardner moved to approve the Fiscal Year 2013 budget. The motion was seconded by Roman Kohler. The motion passed 14-0.

Public comment

There was none.

Joe Cirelli raised the issue of a recently-released Notice of Scoping regarding the NREL wind test site, which is adjacent to Rocky Flats to the northwest. He said that future plans may include expansion of this site, and he was wondering if this would have any impact on Rocky Flats. David Abelson noted that when the Rocky Flats Refuge bill was approved in 2001, there was a 25 acre parcel of additional land transferred to another DOE department for NREL. He said he had not seen any plans that would go beyond these 25 acres. David noted that this issue was probably similar to the Candelas development and the Northwest Parkway construction in terms of impacts related to Rocky Flats (i.e. the Stewardship Council would simply monitor unless additional issues warranted involvement). Tim Plass suggested that the Stewardship Council might want to consider potential effects on weather conditions at Rocky Flats caused by the wind turbines, such as humidity or precipitation patterns. Faye Griffin noted that the NREL expansion was approved quite a while ago by the Jefferson County Commissioners, subject to certain regulations. Lisa Morzel asked for additional information on this topic from Jefferson County.

Updates/Big Picture Review

David asked Board Members to review the upcoming issues and Big Picture schedule and let him know if there were any additional issues they felt that the Stewardship Council should be addressing. Shirley Garcia suggested a DOE presentation in April about plans for removal of the previously-used Points of Compliance, such as how they are going to close out wells, and their emergency plans. Bob Darr and Vera Moritz both explained that sampling will continue, and that the only thing that will change is what they are called.

Deb Gardner brought up the issue of how climate change/drought will affect vegetation and monitoring plans. Tim Plass added that they should not only look at drought, but also additional extreme weather conditions. Murph Widdowfield asked if there was anything the Board could do to push for USFWS funding for the Rocky Flats Refuge. David Abelson said that they had tried, but that it had not been effective. He said it would be best to talk with federal representatives, or raise the question in Washington, D.C. However, he added, the bottom line is budget limitations and that Interior Secretary Salazar, along with Senator Udall, and Reps. Polis and Perlmutter were the only ones with a say in the matter who are really interested. The Administration would need to put this funding in their budget, and this has not happened. David added that it was common to have a 5-year period during which new Refuges were not funded. Lisa Morzel said that Sec. Salazar was planning to attend an event at the Rocky Mountain Arsenal in October. Although that did not happen, local governments are still working to get him to this area.

February 4, 2013

Potential Business Items

- Elect 2013 officers
- Adopt resolution re: 2013 meeting dates
- Approve letter re: worker benefits

Potential Briefing Items

- Host LM Quarterly public meeting
- Original landfill performance

- Off-site contamination

April 1, 2013

Potential Briefing Items

- NRD update
- Solar Ponds Performance
- AMP Monitoring Update

At 10:50 a.m. Lisa Morzel made a motion to move into Executive Session for the purpose of discussing personnel issues, and to receive legal advice on such issues, as authorized under Sections 24-6-402(4)(b) and (f), C.R.S. Joe Cirelli seconded the motion. The motion passed 14-0.

The Board reconvened from Executive Session at 11:02 a.m. and affirmed that no actions had been taken during Executive Session.

David Abelson said staff and the Executive Committee would look at structuring some sort of dialogue regarding issues such as resiliency and climate change that would incorporate local government expertise. The Board could be out front on this issue and interface with representatives from the site. David Allen said he wondered about how climate change might affect cleanup issues and standards. Deb Gardner said she would like to get ahead of the curve and think about what could happen versus waiting for any changes and then reacting. David Abelson suggested that this could be a whole session, perhaps in April, and the Board could bring in a climatologist. Tim Plass suggested finding out if there is a DOE-LM person who might be looking into these issues nationally. He added that this discussion should also include wildfires. Faye Griffin said she would like to see a comparison of monitoring results over time so any cyclical trends could be seen. David Allen said that these are in DOE's reports. David Abelson suggested that DOE include this as a slide in their quarterly presentations.

Issues to watch:

Americium and uranium levels upstream of pond B-3

Member Updates:

The meeting was adjourned at 11:17 a.m.

Respectfully submitted by Erin Rogers.

5:46 PM
01/19/13

Rocky Flats Stewardship Council
Check Detail-2013
October 21, 2012 through January 19, 2013

Type	Num	Date	Name	Account	Paid Amount	Original Amount
Check		10/26/2012		CASH-Wells Fargo-Operating		-3.50
				Admin Services-Misc Services	-3.50	3.50
TOTAL					-3.50	3.50
Check		11/29/2012		CASH-Wells Fargo-Operating		-3.50
				Admin Services-Misc Services	-3.50	3.50
TOTAL					-3.50	3.50
Check		12/29/2012		CASH-Wells Fargo-Operating		-3.50
				Admin Services-Misc Services	-3.50	3.50
TOTAL					-3.50	3.50
Bill P...	1585	11/4/2012	Crescent Strategies...	CASH-Wells Fargo-Operating		-7,551.25
Bill	10/3...	10/31/2012		Personnel - Contract	-6,850.00	6,850.00
				Telecommunications	-143.85	143.85
				TRAVEL-Local	-58.83	58.83
				Postage	-215.99	215.99
				Printing	-178.80	178.80
				Misc Expense-Local Government	-14.78	14.78
				TRAVEL-Out of State	-89.00	89.00
TOTAL					-7,551.25	7,551.25
Bill P...	1586	11/4/2012	Jennifer A. Bohn	CASH-Wells Fargo-Operating		-357.00
Bill	12-77	10/31/2012		Accounting Fees	-357.00	357.00
TOTAL					-357.00	357.00
Check	1587	11/4/2012	Century Link	CASH-Wells Fargo-Operating		-27.35
				Telecommunications	-27.35	27.35
TOTAL					-27.35	27.35
Bill P...	1588	12/7/2012	Blue Sky Bistro	CASH-Wells Fargo-Operating		-220.85
Bill		11/5/2012		Misc Expense-Local Government	-220.85	220.85
TOTAL					-220.85	220.85
Bill P...	1589	12/7/2012	Crescent Strategies...	CASH-Wells Fargo-Operating		-7,459.05
Bill	11/3...	11/30/2012		Personnel - Contract	-6,850.00	6,850.00
				Telecommunications	-143.85	143.85
				TRAVEL-Local	-61.61	61.61
				Postage	-15.99	15.99
				TRAVEL-Out of State	-387.60	387.60
TOTAL					-7,459.05	7,459.05
Bill P...	1590	12/7/2012	Jennifer A. Bohn	CASH-Wells Fargo-Operating		-170.00
Bill	12-85	11/30/2012		Accounting Fees	-170.00	170.00
TOTAL					-170.00	170.00
Bill P...	1591	12/7/2012	Setter & Vander Wal...	CASH-Wells Fargo-Operating		-2,365.67

5:46 PM

01/19/13

Rocky Flats Stewardship Council
Check Detail-2013
 October 21, 2012 through January 19, 2013

Type	Num	Date	Name	Account	Paid Amount	Original Amount
Bill	64557	10/31/2012		Attorney Fees	-1,264.50	1,264.50
Bill	64687	11/30/2012		Attorney Fees	-1,101.17	1,101.17
TOTAL					-2,365.67	2,365.67
Bill P...	1592	12/7/2012	The Rogers Group, ...	CASH-Wells Fargo-Operating		-500.00
Bill	11/1...	11/18/2012		Personnel - Contract	-500.00	500.00
TOTAL					-500.00	500.00
Check	1593	12/7/2012	Century Link	CASH-Wells Fargo-Operating		-26.58
				Telecommunications	-26.58	26.58
TOTAL					-26.58	26.58
Check	1594	1/12/2013	Century Link	CASH-Wells Fargo-Operating		-26.18
				Telecommunications	-26.18	26.18
TOTAL					-26.18	26.18
Bill P...	1595	1/12/2013	Crescent Strategies...	CASH-Wells Fargo-Operating		-8,385.03
Bill	12/3...	12/31/2012		Personnel - Contract	-6,850.00	6,850.00
				Telecommunications	-143.85	143.85
				TRAVEL-Local	-73.82	73.82
				Postage	-275.99	275.99
				TRAVEL-Out of State	-779.40	779.40
				Supplies	-261.97	261.97
TOTAL					-8,385.03	8,385.03
Bill P...	1596	1/12/2013	Jennifer A. Bohn	CASH-Wells Fargo-Operating		-306.00
Bill	12-91	12/31/2012		Accounting Fees	-306.00	306.00
TOTAL					-306.00	306.00
Bill P...	1597	1/12/2013	Seter & Vander Wal...	CASH-Wells Fargo-Operating		-352.00
Bill	64935	12/31/2012		Attorney Fees	-352.00	352.00
TOTAL					-352.00	352.00

**RESOLUTION
OF THE
BOARD OF DIRECTORS
OF
ROCKY FLATS STEWARDSHIP COUNCIL**

regarding

2013 MEETING SCHEDULE AND NOTICE PROVISIONS

WHEREAS, pursuant to an Intergovernmental Agreement dated as of February 13, 2006, and as amended thereafter, (the "IGA"), the Rocky Flats Stewardship Council ("Stewardship Council") was established; and

WHEREAS, the Stewardship Council was created to allow local governments to work together on the continuing local oversight of the activities occurring on the Rocky Flats site to ensure that government and community interests are met with regards to long term stewardship of residual contamination and refuge management; and

WHEREAS, the Board of Directors of the Stewardship Council has a duty to perform certain obligations in order to assure the efficient operation of the Stewardship Council; and

WHEREAS, on March 6, 2006, the Board of Directors of the Stewardship Council adopted Bylaws regarding the operations of the Stewardship Council, governing, *inter alia*, meeting and notice requirements; and

WHEREAS, § 24-6-402, C.R.S., of the Colorado Sunshine Law, specifies the duty of the Board of Directors at its first regular meeting of the calendar year to designate a public posting place within the boundaries of the Stewardship Council for notices of meetings, in addition to any other means of notice; and

WHEREAS, pursuant to its Bylaws and Colorado laws, the Stewardship Council desires to establish its regular meeting schedule and location, and to designate its public posting place(s) for 2013.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF DIRECTORS OF THE ROCKY FLATS STEWARDSHIP COUNCIL THAT:

1. Meeting Schedule/Location. The Board of Directors determines to hold regular meetings the **first Monday of February, April, and June, the second Monday of September, and the fourth Monday of October at 8:30 AM** at the Rocky Mountain Metropolitan Airport Terminal Building, 11755 Airport Way, Broomfield, Colorado; and to hold special meetings as may be necessary, in accordance with the Bylaws of the Stewardship Council.

2. Regular Meeting Notice. The Board of Directors determines to annually post its regular meeting schedule at the Clerk and Recorder's office of the following counties: Jefferson, Boulder, Broomfield, Adams and Weld; and at the City or Town Clerk's Office of the following cities and/or towns: Arvada, Boulder, Broomfield, Westminster, Golden, Superior, Thornton, and Northglenn, for posting in a public place. In addition, the Board shall post its regular meeting schedule on the website established for the Stewardship Council. These notices shall remain posted throughout the year. At least seven (7) days advance notice of the regular meeting time, place and date shall be provided to the

{00049168}

directors and alternate directors, and to those members of the public who so request. The general nature of the business proposed to be transacted or the purpose of any meeting of the Board of Directors shall be specified in the notices of such meeting where possible.

3. Special Meeting Notice. In the event of a special meeting, a notice of such special meeting shall be posted at least seventy-two (72) hours in advance at the clerks' offices of the counties, cities and towns indicated above, for posting in a public place. At least seventy-two (72) hours advance notice of the special meeting time, place and date shall be provided to the directors and alternate directors, and to those members of the public who so request. The general nature of the business proposed to be transacted at or the purpose of any meeting of the Board of Directors shall be specified in the notices of such meeting where possible. The Board of Directors' ability to act on matters brought before it at a special meeting is restricted to those items specified in the notice.

4. Emergency Meeting Notice. Should the Board of Directors determine an emergency special meeting is necessary, a notice of such emergency meeting shall be posted at least twenty-four (24) hours in advance at the clerks' offices of the counties, cities and towns indicated above in accordance with the Colorado Open Meetings Act. The general nature of the business proposed to be transacted at, or the purpose of, any meeting of the Board of Directors shall be specified in the notices of such meeting where possible. The Board of Directors' ability to act on matters brought before it at a special meeting is restricted to those items specified in the notice.

5. Written Notice Requirements. Written notice of each meeting of the Board of Directors shall be given by telefax or electronic mail; provided, however, that in the instance of any Director who in writing requests that such notice not be given by telefax or electronic mail, the notice shall be by hand delivery to an address within the boundaries of the Parties designated in writing.

6. Additional Notification. The Stewardship Council shall maintain a list of persons who, within the previous two years, have requested notification of all meetings, or of meetings with discussions of certain specified policies, and shall provide reasonable advance notification of such meetings to the individuals.

APPROVED AND ADOPTED THIS _____ DAY OF _____, 2013.

(SEAL)

ROCKY FLATS STEWARDSHIP COUNCIL

By: _____
Chair

ATTEST:

By: _____

ROCKY FLATS STEWARDSHIP COUNCIL

P.O. Box 17670
Boulder, CO 80308-0670
www.rockyflatssc.org

(303) 412-1200
(303) 600-7773 (f)

Jefferson County -- Boulder County -- City and County of Broomfield -- City of Arvada -- City of Boulder
City of Golden -- City of Northglenn -- City of Thornton -- City of Westminster -- Town of Superior
League of Women Voters -- Rocky Flats Cold War Museum -- Rocky Flats Homesteaders
Arthur Widdowfield

February _____, 2013

To Colorado Congressional Delegation

Re: Compensation for former Rocky Flats nuclear workers

Dear _____:

On behalf of the Board of Directors of the Rocky Flats Stewardship Council, we are once again writing to voice our support, and the support of our constituents and members, for Congress taking strong action to strengthen the Energy Employees Occupational Illness Compensation Program Act of 2000 (EEOICPA). The EEOICPA, which was approved with strong bipartisan support, is critical to ensuring that workers at current and former nuclear weapons facilities, including Rocky Flats, are appropriately compensated for health impacts resulting from their service. Unfortunately, and unnecessarily, workers have faced numerous roadblocks as they have sought just compensation under the law.

Amendments to the EEOICPA are needed, but will not come without cost. The vast majority of Stewardship Council members are elected officials, and we appreciate the fiscal challenges Congress faces in addressing the economy and getting deficit spending under control. However, these workers cannot and should not be viewed as an economic cost. They should be viewed as people who worked for the security of this country, who were made sick due to workplace exposures. These individuals and their families must live with the consequences and challenges of these illnesses on a daily basis.

Moreover, Congress did not caveat the EEOICPA by saying compensation would be paid only in strong fiscal times. What Congress determined was that workers would be compensated for illnesses resulting from their defense mission work. We therefore respectfully request that the delegation work together and with colleagues representing other DOE facilities to develop and secure passage of legislation aimed at strengthening the EEOICPA.

Sincerely,

Chair

Vice Chair

Secretary/Treasurer

DOE Quarterly Report Briefing

- Cover memo
- Quarterly report outline

Briefing on Off-site Contamination

- Cover memo
- Map of OU3

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League of Women Voters -- Rocky Flats Cold War Museum -- Rocky Flats Homesteaders
Arthur Widdowfield

MEMORANDUM

TO: Stewardship Council Board
FROM: Rik Getty
SUBJECT: DOE Quarterly Report
DATE: January 23, 2013

We have scheduled 70 minutes for DOE to present its quarterly update for the third quarter of 2012 (July-September).

Note: The full report including appendices (132 pages) can be found at: http://www.lm.doe.gov/Rocky_Flats/Documents.aspx . The electronic copy of this meeting packet contains the report (54 pages), minus the attachments. The printed copy of this meeting packet only includes the table of contents.

DOE will brief on the following topics in a format similar to past quarterly and annual report updates:

- surface water monitoring;
- groundwater monitoring;
- ecological monitoring; and,
- site operations (inspections, improvements to groundwater treatment systems, general maintenance, etc.).

THIRD QUARTER 2012 QUARTERLY REPORT

Highlights of the surveillance and maintenance activities are as follows (largely quoting from the report).

Water Monitoring Highlights

During the quarter, water monitoring successfully met the targeted monitoring objectives as required by the RFLMA (Rocky Flats Legacy Management Agreement) and was in conformance with RFSOG (Rocky Flats Site Operations Guide) implementation guidance. Water quality data at the four RFLMA POCs (Points of Compliance) remained below the applicable standards through the quarter.

The routine RFLMA network consists of 10 automated gaging stations, 12 surface water grab-sampling locations, 8 treatment system locations, 97 wells, and 10 precipitation gages. Additional locations are occasionally sampled in support of investigations in response to reportable conditions. During the quarter, seven flow-paced composite samples, 16 surface water grab samples, ten treatment system samples, and ten groundwater samples were collected (in accordance with RFLMA protocols) and submitted for analysis. Analysis is pending for two flow-paced composites that were started during the quarter and have been retrieved from the field. Five additional flow-paced composites are still in progress, so analytical data for those composites were not available for this report.

Reportable 12-month rolling average uranium concentrations were observed starting on April 30, 2011, in surface water at RFLMA POE (Point of Evaluation) monitoring station GS10, which is located on South Walnut Creek upstream of former Pond B-1. Reportable 12-month rolling average for americium (Am) and plutonium (Pu) activities were also observed starting on August 31, 2011, and May 31, 2012, respectively. As of the end of the quarter, these three analytes were still reportable. GS10 is extensively evaluated in Section 3.1.3.1 of this report, and DOE will provide an update on the numerous additional sampling locations they have used upstream and downstream of GS10 in order to pinpoint the possible source(s). To date, they have not identified a definitive source for these actinides. Importantly, Pu and Am values downstream of GS10 meet applicable water quality standards.

Except for the GS10 analytes discussed above, all other analyte concentrations at POEs were less than the applicable RFLMA Attachment 2 water quality standards as of the end of the quarter.

Landfills

Present Landfill (PLF)

The routine quarterly PLF inspection for the quarter was performed on August 30, 2012. No significant problems were observed during this inspection. Copies of the landfill inspection forms are presented in Appendix A.

Original Landfill (OLF)

The OLF is inspected monthly, in accordance with the requirements in the OLF M&M Plan and the RFLMA. It was anticipated that after the first year, the inspection frequency might be reduced to quarterly for an additional four years. However, because of observed localized slumping and seep areas, and investigation and repairs to the OLF cover completed in 2009, no change to the monthly inspection frequency was recommended in the recently completed third CERCLA five-year review of the Site.

Routine monthly OLF inspections during the quarter were performed on July 30, August 30, and September 27, 2012. The quarterly landfill cover vegetation was evaluated on September 13, 2012. The completed inspection forms are presented in Appendix A. No significant issues were observed.

Groundwater Treatment Systems

Mound Site Plume Treatment System (MSPTS)

Routine maintenance activities and optimization of the small effluent-polishing air stripper installed in the MSPTS effluent manhole continued through the quarter. A solar powered ventilation fan was installed on the manhole cover to enhance volatilization of residual volatile organic compounds in the system effluent. The fan operated when the sun shined on the small solar panel that directly powered the fan (i.e., the fan has no battery backup). The two inexpensive pumps used to test the feasibility and effectiveness of the prototype air stripper did not operate continuously through the quarter, as each malfunctioned at some point. As a result, only one pump at a time was operating for most of the quarter.

Testing continued to identify adjustments needed to achieve optimal effectiveness, and efforts were underway to develop the design of a full-scale, full-time air stripper to be installed within the same effluent manhole, and to utilize the same foundation installed for the prototype solar array. This larger air stripper and the associated solar power components will be installed in the fourth quarter of 2012 and first quarter of 2013.

Refer to Section 3.1.9.1 for information on water quality sampling.

East Trenches Plume Treatment System (ETPTS)

Routine maintenance activities continued at the ETPTS through the quarter. These activities included checking influent and effluent flow conditions, measuring water levels in the cells, and clearing accumulations of biofilm that can lead to clogging. Planning continued for the installation of an air stripper at the ETPTS that is similar in concept to that at the MSPTS, but which will be installed in the influent manhole rather than the effluent manhole. The ETPTS air stripper will therefore pre-treat influent to that system, rather than polish its effluent. This air stripper and the associated solar power components will be installed in the fourth quarter of 2012 and first quarter of 2013.

Refer to Section 3.1.9.2 for information on water quality sampling.

Solar Ponds Plume Treatment System (SPPTS)

Routine maintenance activities continued at the SPPTS through the quarter. These activities included weekly inspections of the solar/battery systems that power the pumps, the operation of the pumps, and influent and effluent flow conditions. Redevelopment of SPIN, the collection well, is planned for the fourth quarter. This activity was performed twice prior to site closure to address reduced influent availability and flow, but has not been done since. (Although there have been no indications that the screened interval is clogging, periodic redevelopment of the collection well is a prudent maintenance activity.)

Tests continued on the feasibility of treating uranium (U) with a smaller-scale treatment component, referred to informally as a “microcell.” Microcell tests performed in the third quarter focused on continued tests of zero-valent iron (ZVI) treatment media; tests conducted during the second quarter of 2012 of ion exchange resins designed to remove uranium did not generate attractive results. ZVI is the basis of the existing treatment media at the SPPTS.

In addition, bench-scale tests focusing on a “lagoon” approach to nitrate treatment, in which the high-nitrate influent is dosed with nutrients and then stored in a pool or lagoon that is rich in bacteria, continued. During the third quarter, the first bench-scale tests (begun in the second quarter and referred to as the Part 1 tests) were concluded, a second (Part 2) test was conducted, and a third (Part 3) test began. These bench-scale tests utilize the same nutrients used to dose Phase III Cell A (i.e., MicroCg). Trash cans were used as the bench-scale test lagoons, with each trash can containing between 25 and 30 gallons of water. The Part 1 lagoon tests focused on proving the principle (essentially confirming that this style of treatment is effective), and also compared results from a completely stagnant lagoon to a lagoon that was periodically agitated with a low-volume pump. These tests confirmed the treatment approach is effective at removing nitrate from SPPTS influent. The Part 2 series involved two stagnant lagoons that were provided different doses of the nutrient, MicroCg. The Part 3 tests, which began in the third quarter, included one container intended to replicate the most successful test from the Part 2 series, and a second that investigated a lower MicroCg dose but higher ratio of inoculum (the bacteria-rich water) to untreated influent.

Both the microcell and lagoon tests are expected to continue for the next several months. As the third quarter ended, preparations were underway to retrofit the Phase III pilot-scale cells for nitrate treatment using the lagoon approach. This pilot-scale testing of the lagoon approach to nitrate treatment is scheduled to begin in the fourth quarter of 2012.

Microcell and lagoon tests and associated results will be discussed in greater detail in the annual report for 2012. Refer to Section 3.1.9.3 for information on water quality sampling.

Present Landfill Treatment System (PLFTS)

Routine maintenance activities continued at the PLFTS through the quarter. These activities generally consisted of inspecting the system for potential problems. Refer to Section 3.1.9.4 for information on water quality sampling.

Erosion Control and Revegetation

Maintenance of the erosion control features required continued effort throughout the quarter, especially following high-wind or precipitation events. Erosion wattles and matting loosened and displaced by high winds or rain were repaired. Erosion controls were installed and maintained for the various projects that were ongoing during the quarter.

Sign Inspection

“U.S. Department of Energy - No Trespassing” signs are required to be posted at intervals around the perimeter of the COU to notify persons that they are at the boundary of the COU. Signs listing the use restrictions (institutional controls) and providing contact information are also required to be posted at access points to the COU. The signs are required as physical controls of the remedy, are inspected quarterly, and are maintained by repairing or replacing signs as needed. Physical controls protect the engineered components of the remedy, including landfill covers, groundwater treatment systems, and monitoring equipment, which are also inspected routinely during monitoring and maintenance activities.

The signs were inspected on September 5, 2012, and they met the requirements.

Rocky Flats, Colorado, Site

**Quarterly Report of Site Surveillance
and Maintenance Activities
Third Quarter Calendar Year 2012**

January 2013



U.S. DEPARTMENT OF
ENERGY

Legacy
Management

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Appendixes

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Abbreviations

Am	americium
AOC	Area of Concern
CAD/ROD	Corrective Action Decision/Record of Decision
CDPHE	Colorado Department of Public Health and Environment
COU	Central Operable Unit
CY	calendar year
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
ETPTS	East Trenches Plume Treatment System
LANL	Los Alamos National Laboratory
LM	Office of Legacy Management
µg/L	micrograms per liter
M&M	monitoring and maintenance
MSPTS	Mound Site Plume Treatment System
OLF	Original Landfill
pCi/L	picocuries per liter
PLF	Present Landfill
PLFTS	Present Landfill Treatment System
PMJM	Preble's meadow jumping mouse
POC	point-of-compliance
POE	point-of-evaluation
Pu	plutonium
RCRA	Resource Conservation and Recovery Act
RFLMA	<i>Rocky Flats Legacy Management Agreement</i>
RFSOG	<i>Rocky Flats Site Operations Guide</i>
Site	Rocky Flats Site
SPPTS	Solar Ponds Plume Treatment System
U	uranium
USFWS	U.S. Fish and Wildlife Service
ZVI	zero-valent iron

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 *Corrective Action Decision/Record of Decision for Rocky Flats Plant (USDOE) Peripheral Operable Unit and Central Operable Unit (CAD/ROD)* (DOE, EPA, and CDPHE 2006) issued on September 29, 2006, and amended on September 21, 2011 (DOE, EPA, and CDPHE 2011), for the Rocky Flats Site (the Site) in Colorado. DOE, the U.S. Environmental Protection Agency (EPA), and the Colorado Department of Public Health and Environment (CDPHE) have chosen to implement the monitoring and maintenance requirements of the CAD/ROD as described in the *Rocky Flats Legacy Management Agreement (RFLMA)* (DOE 2007). Attachment 2 of the RFLMA defines the Central Operable Unit (COU) remedy surveillance and maintenance requirements, the frequency for each required activity, and the monitoring and maintenance locations. The requirements include environmental monitoring; maintenance of the erosion controls, access controls (signs), landfill covers, and groundwater treatment systems; and operation of the groundwater treatment systems. The RFLMA also requires that the institutional controls, in the form of use restrictions as established in the CAD/ROD, be maintained.

This report is required in accordance with Section 7.0 of RFLMA Attachment 2. The purpose of this report is to inform the regulatory agencies and stakeholders of the remedy-related surveillance, monitoring, and maintenance activities being conducted at the Site. LM provides periodic communications through several means, such as this report, web-based tools, and public meetings.

LM prepared the *Rocky Flats, Colorado, Site Site Operations Guide (RFSOG)* (DOE 2012a) to serve as the primary internal document to guide work to satisfy the requirements of the RFLMA and to implement best management practices at the Site.

Several other Site-specific documents provide additional detail regarding the requirements described in RFLMA Attachment 2, including all aspects of surveillance, monitoring, and maintenance activities, as well as data evaluation protocols.

Monitoring data and summaries of surveillance and maintenance activities for past quarters are available in the quarterly reports. Extensive discussion and evaluation of surveillance, monitoring, and maintenance activities are presented each calendar year in the annual report of Site surveillance and maintenance activities.

This report addresses remedy-related surveillance, monitoring, and operations and maintenance activities conducted at the Site during the third quarter of calendar year (CY) 2012 (July 1 through September 30). This report describes the following activities:

- Maintenance and inspection of the Original Landfill (OLF) and Present Landfill (PLF)
- Maintenance and inspection of the four groundwater treatment systems
- Erosion control and revegetation activities
- Routine (in accordance with the RFLMA and the RFSOG) water monitoring
- Inspection of signs posted at the perimeter of the COU as physical controls.

2.0 Site Operations and Maintenance

2.1 Landfills

2.1.1 Present Landfill

The PLF is inspected quarterly in accordance with the requirements of the PLF Monitoring and Maintenance (M&M) Plan (DOE 2008a) and the RFLMA (DOE 2007). Vegetation monitoring has been conducted on the PLF according to the requirements in RFLMA Attachment 2, Table 3.

2.1.1.1 Inspection Results

The routine PLF inspection for the third quarter of CY 2012 was performed on August 30, 2012. No significant problems were observed during this inspection. Copies of the landfill inspection forms are presented in Appendix A.

2.1.1.2 Settlement Monuments

The annual settlement monument surveys were performed on December 13, 2011. The 2012 survey of the PLF settlement monuments will be completed at the end of the calendar year. Additional information on the settlement monuments is included in the *Rocky Flats Site Quarterly Report of Site Surveillance and Maintenance Activities, First Quarter Calendar Year 2008* (DOE 2008b).

2.1.2 Original Landfill

The OLF is inspected monthly, in accordance with the requirements in the OLF M&M Plan (DOE 2009a) and the RFLMA. It was anticipated that after the first year, the inspection frequency might be reduced to quarterly for an additional 4 years. However, because of observed localized slumping and seep areas, and investigation and repairs to the OLF cover completed in 2009, no change to the monthly inspection frequency was recommended in the third five-year review of the Site (DOE 2012b).

2.1.2.1 Inspection Results

Routine OLF inspections during the third quarter of CY 2012 were performed on July 30, August 30, and September 27, 2012. The landfill cover vegetation was evaluated on September 13, 2012. The completed inspection forms are presented in Appendix A.

2.1.2.2 Settlement Monuments

The OLF settlement monuments were surveyed on September 21, 2012. Survey data indicate that settling at each monument does not exceed the limits published in the OLF M&M Plan (DOE 2009a). The survey results are presented in Appendix A.

2.1.2.3 *Inclinometers*

As discussed in the quarterly report for the second quarter of CY 2009 (DOE 2009b), seven inclinometers were installed in boreholes at the OLF in 2008 as part of the geotechnical investigation of localized areas of instability (Figure 1).

Movement of the inclinometers has been monitored approximately monthly since installation. Inclinometers deflect by lateral movement of the ground in which they are located and can deflect enough to cause the inclinometer tubes to break. Once an inclinometer tube breaks, the inclinometer will no longer be monitored. Inclinometer monitoring data provide information on localized soil movement and serve to focus the periodic inspections of the soil cover surface on signs of potential instability, such as cracking, vertical displacement, and slumping. A deflection of more than 1 inch is used as a trigger for evaluation of the data by a qualified geotechnical engineer. The engineer determines the significance of the deflection in relation to recommendations for maintenance or repairs to address potential instability in accordance with the OLF M&M Plan (DOE 2009a).

Inclinometer measurements were taken on July 25, August 22, and September 25, 2012. The data logger recording for inclinometer 82708I (Tt-7) contained erroneous data, so a measurement was taken on October 1, 2012. The October 1, 2012, reading was satisfactorily logged. The readings showed very little deflection for any inclinometer over this quarter. Very little deflection has been noted over the past approximately 2 years. Based on the geotechnical investigation, maintenance and repairs in 2009 were made to minimize the effects of lubrication of a subsurface organic layer by groundwater and precipitation infiltration. As discussed in the annual report for 2011, routine maintenance to fill any surface cracking noted in inspections to minimize infiltration of precipitation appears to be an effective way to address conditions that may lead to localized instability.

2.1.2.4 *Slumps*

As discussed in the 2009 annual report (DOE 2010), areas where the landfill cover is pushed up or rolling are noticeable on the western end of the OLF between Berms 2 and 3; however, no new slumps were observed during the third quarter of 2012. It has been approximately 2 years since significant movement has been observed on the OLF cover.

2.1.2.5 *Seeps*

Seeps at the OLF were evaluated during the monthly inspections and during unscheduled visits. Individual seep location flow rates can be found in the monthly inspection reports.

2.2 Groundwater Treatment Systems

Four groundwater treatment systems are operated and maintained in accordance with requirements defined in the RFLMA and the RFSOG. Three of these systems (the Mound Site Plume Treatment System [MSPTS], East Trenches Plume Treatment System [ETPTS], and Solar Ponds Plume Treatment System [SPPTS]) include a groundwater intercept trench (collection trench), which is similar to a French drain with an impermeable membrane on the downgradient side. Groundwater entering the trench is routed through a drainpipe into one or more treatment

cells, where it is treated and then discharged. The fourth system, the PLF Treatment System (PLFTS), treats water from the northern and southern components of the Groundwater Intercept System and flow from the PLF seep.

2.2.1 Mound Site Plume Treatment System

Routine maintenance activities and optimization of the small effluent-polishing air stripper installed in the MSPTS effluent manhole continued through the third quarter of CY 2012. A solar powered ventilation fan was installed on the manhole cover to enhance volatilization of residual volatile organic compounds in the system effluent. The fan operated when the sun shined on the small solar panel that directly powered the fan (i.e., the fan has no battery backup). The two inexpensive pumps used to test the feasibility and effectiveness of the prototype air stripper did not operate continuously through the quarter, as each malfunctioned at some point. As a result, only one pump at a time was operating for most of the quarter.

Testing continued to identify adjustments needed to achieve optimal effectiveness, and efforts were underway to develop the design of a full-scale, full-time air stripper to be installed within the same effluent manhole, and to utilize the same foundation installed for the prototype solar array. This larger air stripper and the associated solar power components will be installed in the fourth quarter of 2012 and first quarter of 2013.

The annual report for 2012 will provide a more detailed discussion of the MSPTS air stripper, including operation and testing results.

Refer to Section 3.1.9.1 for information on water quality sampling.

2.2.2 East Trenches Plume Treatment System

Routine maintenance activities continued at the ETPTS through the third quarter of CY 2012. These activities included checking influent and effluent flow conditions, measuring water levels in the cells, and clearing accumulations of biofilm that can lead to clogging. Planning continued for the installation of an air stripper at the ETPTS that is similar in concept to that at the MSPTS, but which will be installed in the influent manhole rather than the effluent manhole. The ETPTS air stripper will therefore pre-treat influent to that system, rather than polish its effluent. This air stripper and the associated solar power components will be installed in the fourth quarter of 2012 and first quarter of 2013.

Refer to Section 3.1.9.2 for information on water quality sampling.

2.2.3 Solar Ponds Plume Treatment System

Routine maintenance activities continued at the SPPTS through the third quarter of CY 2012. These activities included weekly inspections of the solar/battery systems that power the pumps, the operation of the pumps, and influent and effluent flow conditions. Redevelopment of SPIN, the collection well, is planned for the fourth quarter. This activity was performed twice prior to Site closure to address reduced influent availability and flow, but has not been done since. (Although there have been no indications that the screened interval is clogging, periodic redevelopment of the collection well is a prudent maintenance activity.)



Figure 1. Original Landfill Features

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Tests continued on the feasibility of treating uranium (U) with a smaller-scale treatment component, referred to informally as a “microcell.” Microcell tests performed in the third quarter focused on continued tests of zero-valent iron (ZVI) treatment media; tests conducted during the second quarter of 2012 of ion exchange resins designed to remove uranium did not generate attractive results. ZVI is the basis of the existing treatment media at the SPPTS.

In addition, bench-scale tests focusing on a “lagoon” approach to nitrate treatment, in which the high-nitrate influent is dosed with nutrients and then stored in a pool or lagoon that is rich in bacteria, continued. During the third quarter, the first bench-scale tests (begun in the second quarter and referred to as the Part 1 tests) were concluded, a second (Part 2) test was conducted, and a third (Part 3) test began. These bench-scale tests utilize the same nutrients used to dose Phase III Cell A (i.e., MicroCg). Trash cans were used as the bench-scale test lagoons, with each trash can containing between 25 and 30 gallons of water. The Part 1 lagoon tests focused on proving the principle (essentially confirming that this style of treatment is effective), and also compared results from a completely stagnant lagoon to a lagoon that was periodically agitated with a low-volume pump. These tests confirmed the treatment approach is effective at removing nitrate from SPPTS influent. The Part 2 series involved two stagnant lagoons that were provided different doses of the nutrient, MicroCg. The Part 3 tests, which began in the third quarter, included one container intended to replicate the most successful test from the Part 2 series, and a second that investigated a lower MicroCg dose but higher ratio of inoculum (the bacteria-rich water) to untreated influent.

Both the microcell and lagoon tests are expected to continue for the next several months. As the third quarter ended, preparations were underway to retrofit the Phase III pilot-scale cells for nitrate treatment using the lagoon approach. This pilot-scale testing of the lagoon approach to nitrate treatment is scheduled to begin in the fourth quarter of CY 2012.

Microcell and lagoon tests and associated results will be discussed in greater detail in the annual report for 2012. Refer to Section 3.1.9.3 for information on water quality sampling.

2.2.4 Present Landfill Treatment System

Routine maintenance activities continued at the PLFTS through the third quarter of CY 2012. These activities generally consisted of inspecting the system for potential problems.

Refer to Section 3.1.9.4 for information on water quality sampling.

2.3 Sign Inspection

“U.S. Department of Energy - No Trespassing” signs are required to be posted at intervals around the perimeter of the COU to notify persons that they are at the boundary of the COU. Signs listing the use restrictions (institutional controls) and providing contact information are also required to be posted at access points to the COU. The signs are required as physical controls of the remedy, are inspected quarterly, and are maintained by repairing or replacing signs as needed. Physical controls protect the engineered components of the remedy, including landfill covers, groundwater treatment systems, and monitoring equipment, which are also inspected routinely during monitoring and maintenance activities.

The signs were inspected on September 5, 2012, and they met the requirements.

2.4 Erosion Control and Revegetation

Maintenance of the Site erosion control features required continued effort throughout the third quarter of CY 2012, especially following high-wind or precipitation events. Erosion wattles and matting loosened and displaced by high winds or rain were repaired. Erosion controls were installed and maintained for the various projects that were ongoing during the third quarter of CY 2012.

3.0 Environmental Monitoring

This section summarizes the environmental monitoring conducted in accordance with the RFLMA.

3.1 Water Monitoring

This section includes:

- A discussion of analytical results for the Point of Compliance (POC), Point of Evaluation (POE), PLF, and OLF surface-water monitoring objectives.
- Summaries of Area of Concern (AOC) well, Evaluation well, Sentinel well, and Resource Conservation and Recovery Act (RCRA) well groundwater monitoring; treatment system monitoring; and Surface Water Support monitoring at the Site.

RFLMA Attachment 2 and the RFSOG offer details about the monitoring locations, sampling criteria, and evaluation protocols for the water monitoring objectives mentioned in the following sections. Appendix B provides analytical water quality data for the third quarter of CY 2012. A more detailed interpretation and discussion will be provided in the annual report for CY 2012.

3.1.1 Water Monitoring Highlights

During the third quarter of CY 2012, water monitoring successfully met the targeted monitoring objectives as required by the RFLMA and was in conformance with RFSOG implementation guidance. The routine RFLMA network consists of 10 automated gaging stations, 12 surface water grab-sampling locations, 8 treatment system locations, 97 wells, and 10 precipitation gages. Additional locations are occasionally sampled in support of investigations in response to reportable conditions. During the quarter, 7 flow-paced composite samples, 16 surface water grab samples, 10 treatment system samples, and 10 groundwater samples were collected (in accordance with RFLMA protocols) and submitted for analysis.¹ Analysis is pending for two flow-paced composites that were started during the quarter and have been retrieved from the field. Five additional flow-paced composites are still in progress, so analytical data for those composites were not available for this report.

¹ Composite samples consist of multiple aliquots (“grabs”) of identical volume. Each grab is delivered by the automatic sampler to the composite container at each predetermined flow volume or time interval. During the third quarter of CY 2012, the 7 flow-paced composites comprised 319 individual grabs.

Water quality data at the RFLMA POCs remained below the applicable standards through the third quarter of CY 2012.

Reportable 12-month rolling average uranium concentrations were observed starting on April 30, 2011, in surface water at RFLMA POE monitoring station GS10, which is located on South Walnut Creek upstream of former Pond B-1. Reportable 12-month rolling average americium (Am) and plutonium (Pu) activities were also observed starting on August 31, 2011, and May 31, 2012, respectively. As of the end of the third quarter of CY 2012, these three analytes were still reportable. GS10 is evaluated in Section 3.1.3.1 of this report.

Except for the GS10 analytes discussed above, all other analyte concentrations at POEs were less than the applicable RFLMA Attachment 2 water quality standards as of the end of the third quarter of CY 2012.

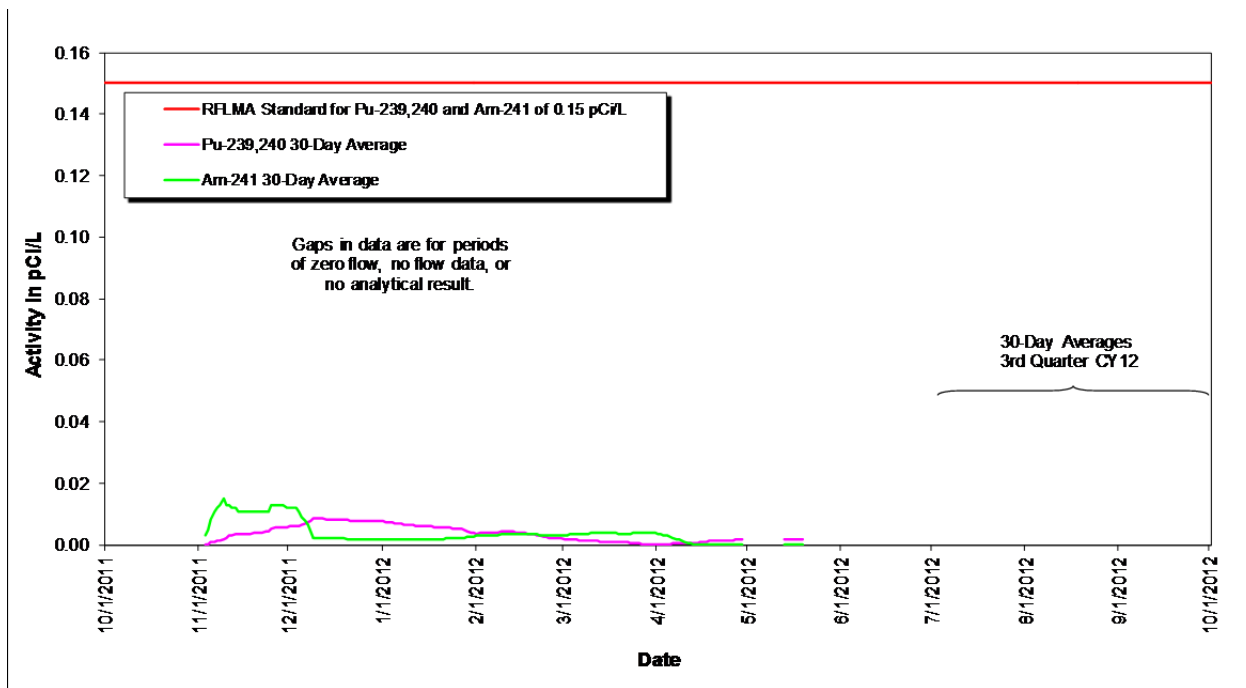
Groundwater monitoring results will be evaluated as part of the annual report for CY 2012.

3.1.2 POC Monitoring

The following sections include summary tables and plots showing the applicable 30-day and 12-month rolling averages for the POC analytes.

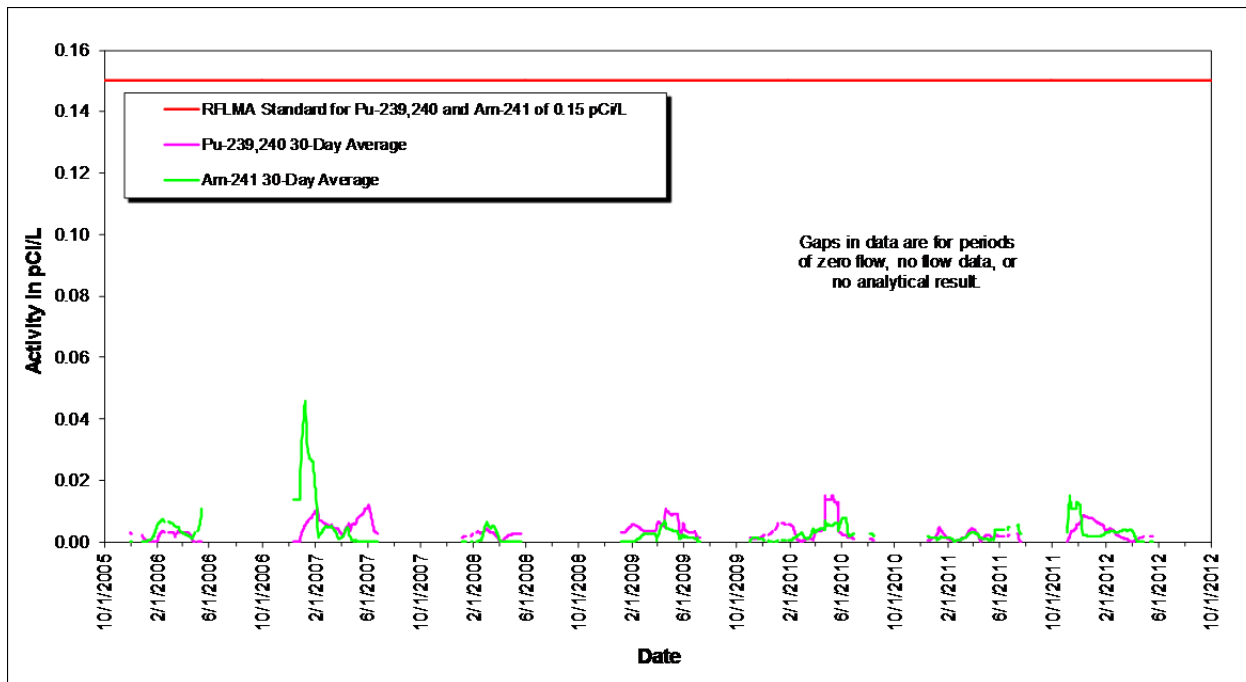
3.1.2.1 Monitoring Location GS01

Monitoring location GS01 is on Woman Creek at Indiana Street. Figure 2 and Figure 4 show no occurrences of reportable 30-day averages for the quarter using the available data. Figure 3 and Figure 5 show sampling data from 2005 through the third quarter of CY 2012. There has been no flow at GS01 since May 23, 2012.



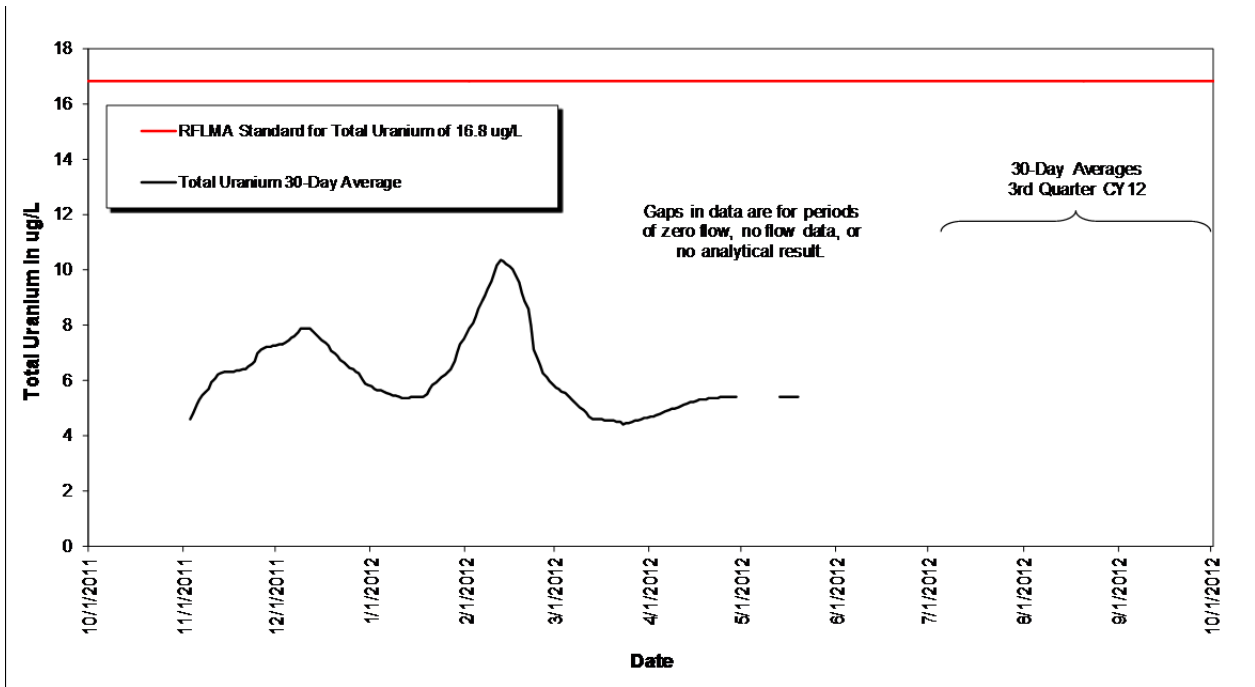
As of this report, the composite sample started on June 6, 2012, was still in progress.
pCi/L = picocuries per liter

Figure 2. Volume-Weighted 30-Day Average Plutonium and Americium Activities at GS01: Year Ending Third Quarter CY 2012



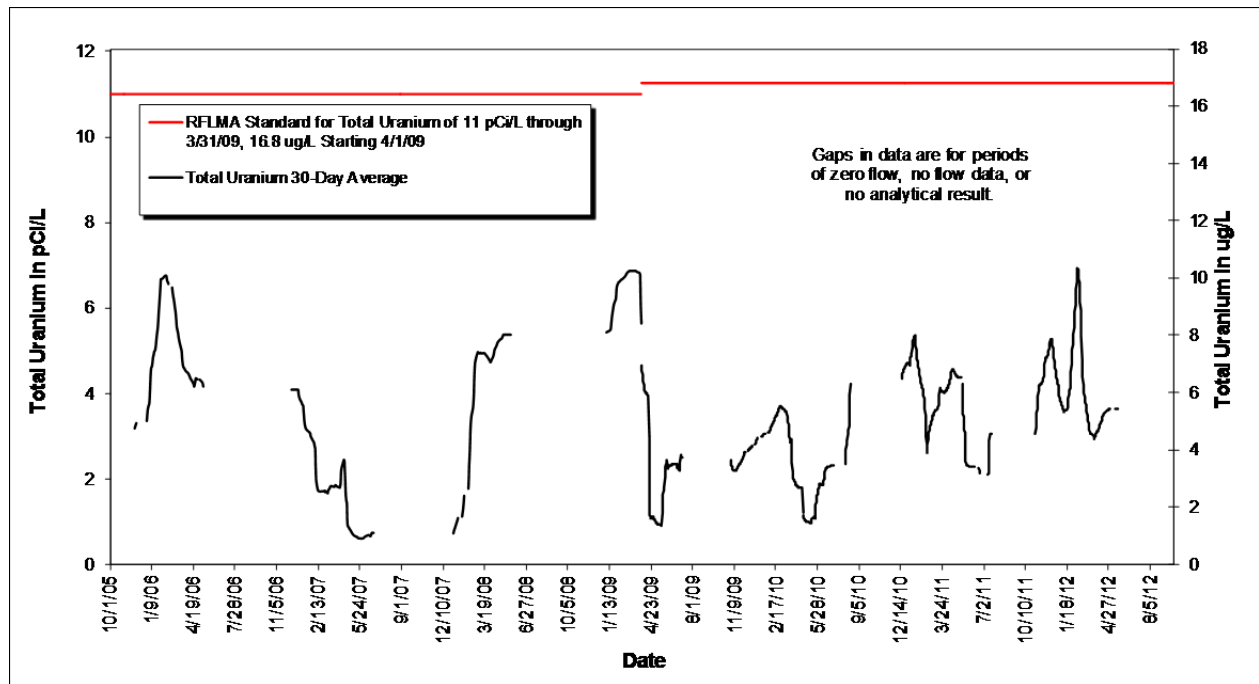
As of this report, the composite sample started on June 6, 2012, was still in progress.
pCi/L = picocuries per liter

Figure 3. Volume-Weighted 30-Day Average Plutonium and Americium Activities at GS01: Post-Closure Period Ending Third Quarter CY 2012



As of this report, the composite sample started on June 6, 2012, was still in progress.
 µg/L = micrograms per liter

Figure 4. Volume-Weighted 30-Day Average Total Uranium Concentrations at GS01: Year Ending Third Quarter CY 2012

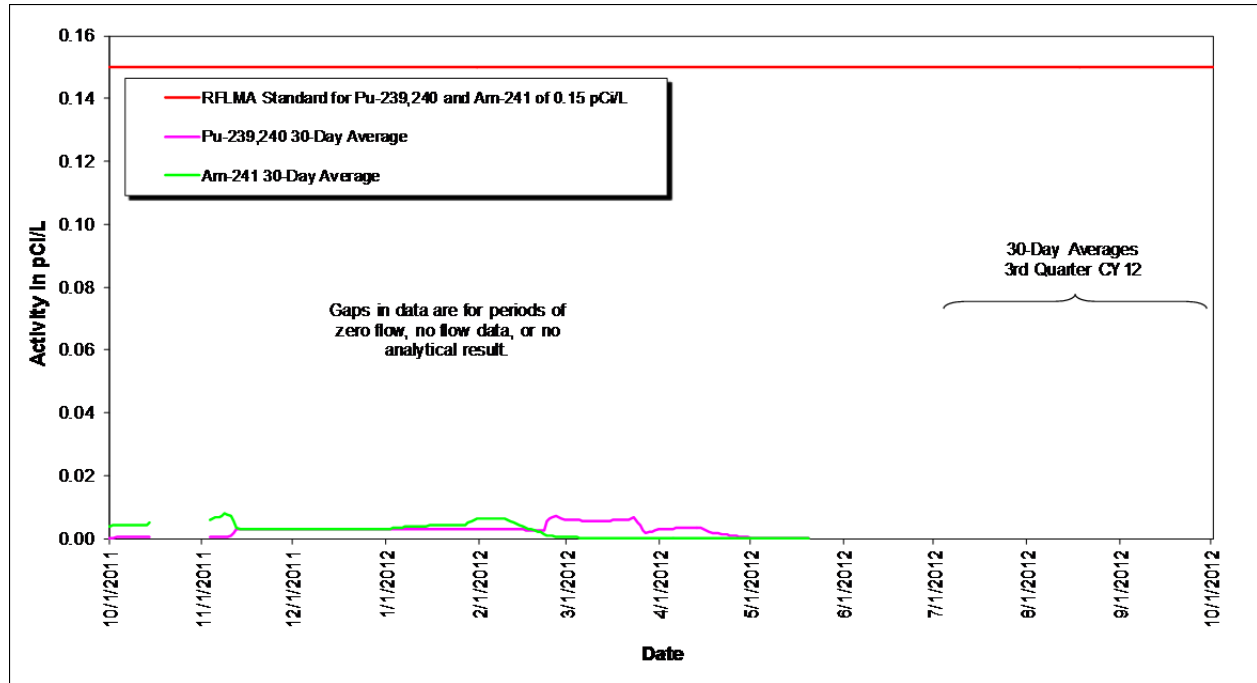


As of this report, the composite sample started on June 6, 2012, was still in progress.
 µg/L = micrograms per liter
 pCi/L = picocuries per liter

Figure 5. Volume-Weighted 30-Day Average Total Uranium Concentrations at GS01: Post-Closure Period Ending Third Quarter CY 2012

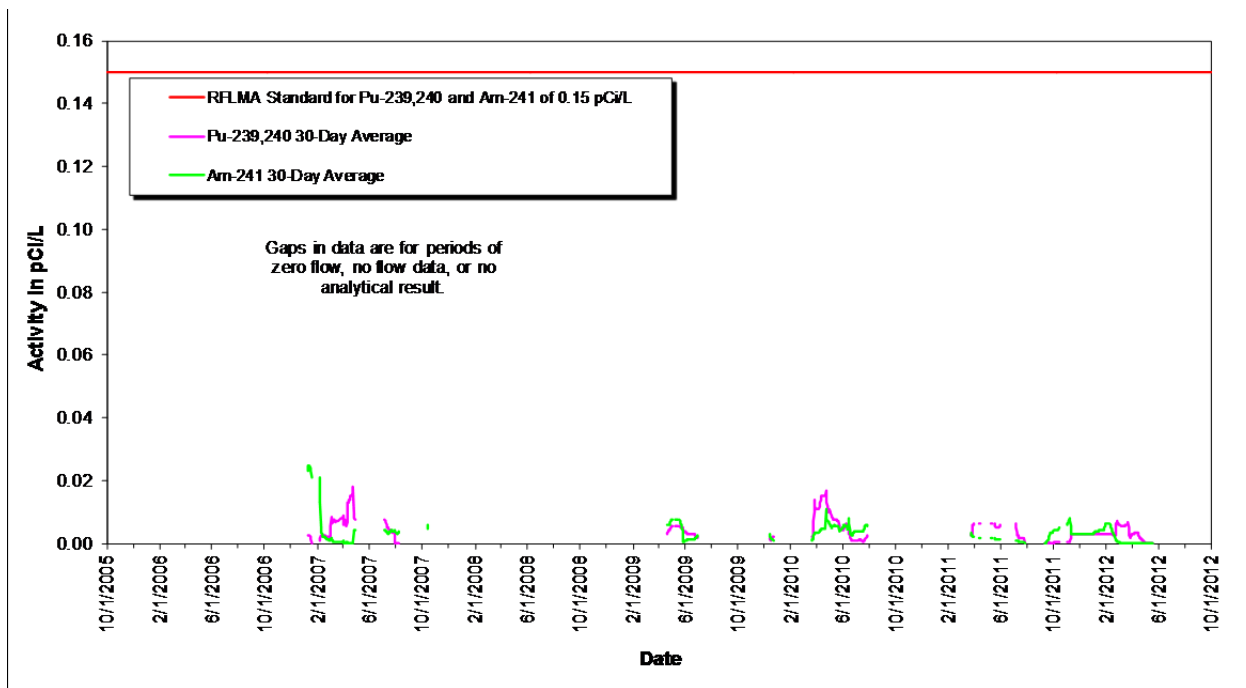
3.1.2.2 Monitoring Location GS03

Monitoring location GS03 is on Walnut Creek at Indiana Street. Figure 6, Figure 8, and Figure 10 show no occurrences of reportable water quality for the quarter using the available data. Figure 7, Figure 9, and Figure 11 show sampling data from 2005 through the third quarter of CY 2012. There has been no flow at GS03 since May 23, 2012.



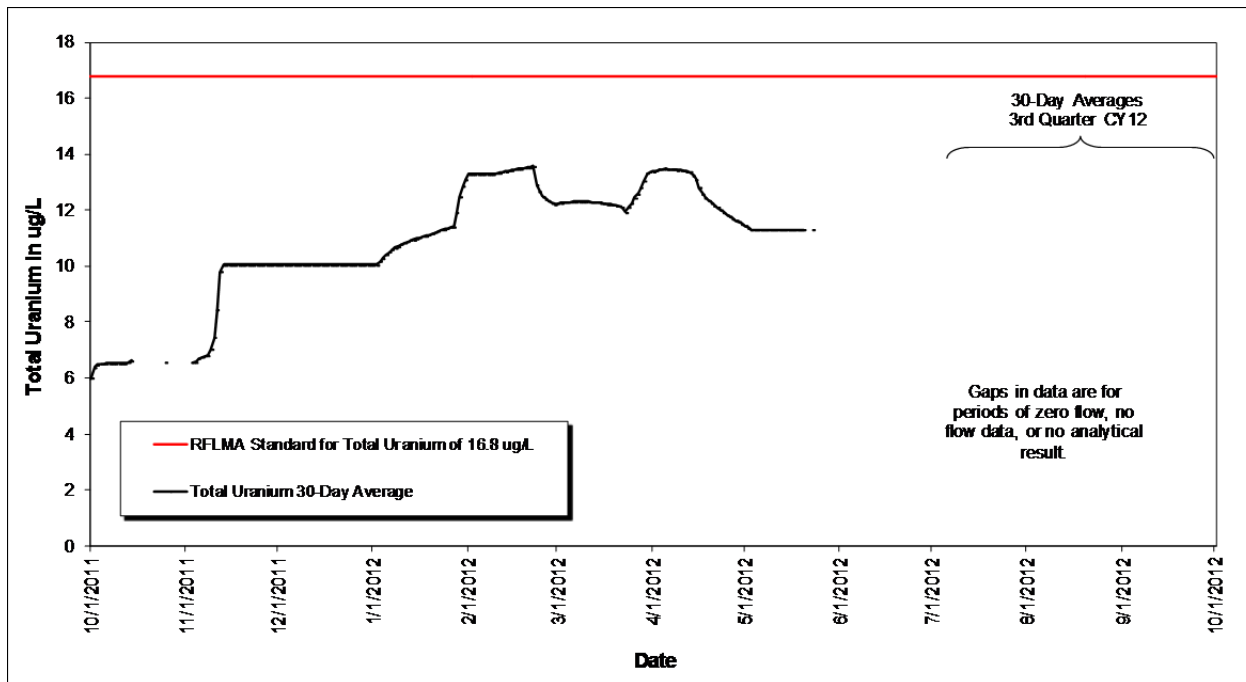
As of this report, the composite sample started on June 6, 2012, was still in progress.
pCi/L = picocuries per liter

Figure 6. Volume-Weighted 30-Day Average Plutonium and Americium Activities at GS03: Year Ending Third Quarter CY 2012



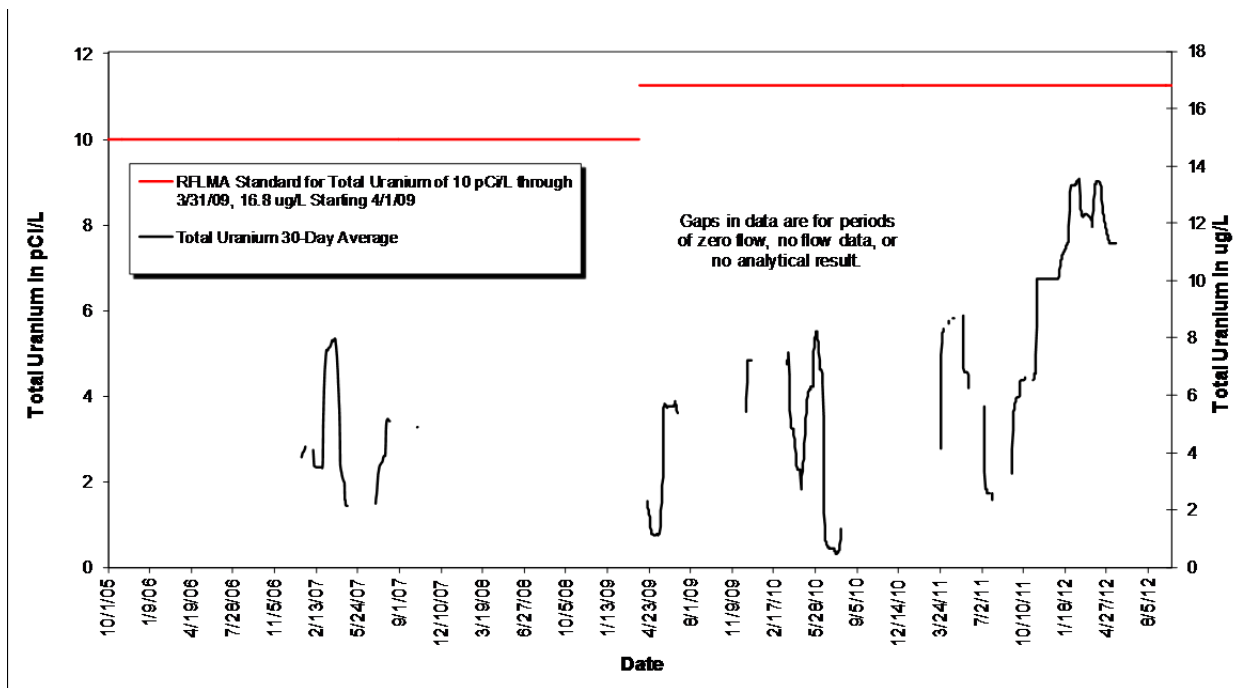
As of this report, the composite sample started on June 6, 2012, was still in progress.
pCi/L = picocuries per liter

Figure 7. Volume-Weighted 30-Day Average Plutonium and Americium Activities at GS03: Post-Closure Period Ending Third Quarter CY 2012



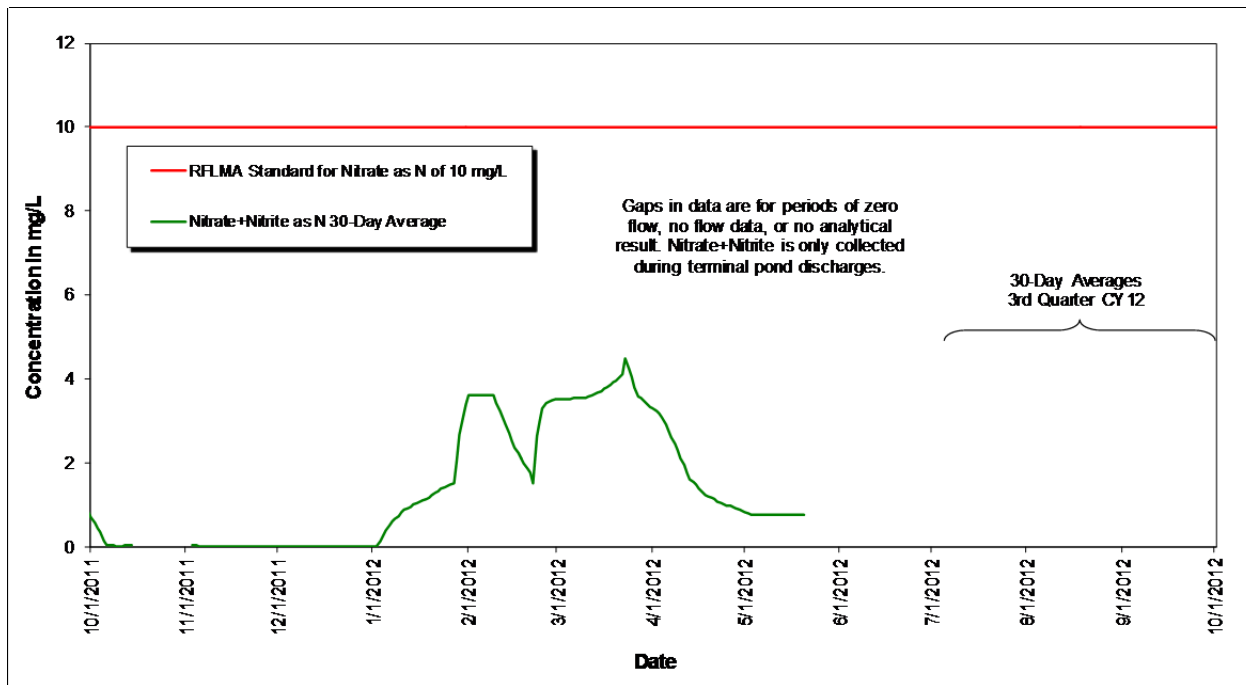
As of this report, the composite sample started on June 6, 2012, was still in progress.
µg/L = micrograms per liter

Figure 8. Volume-Weighted 30-Day Average Total Uranium Concentrations at GS03: Year Ending Third Quarter CY 2012



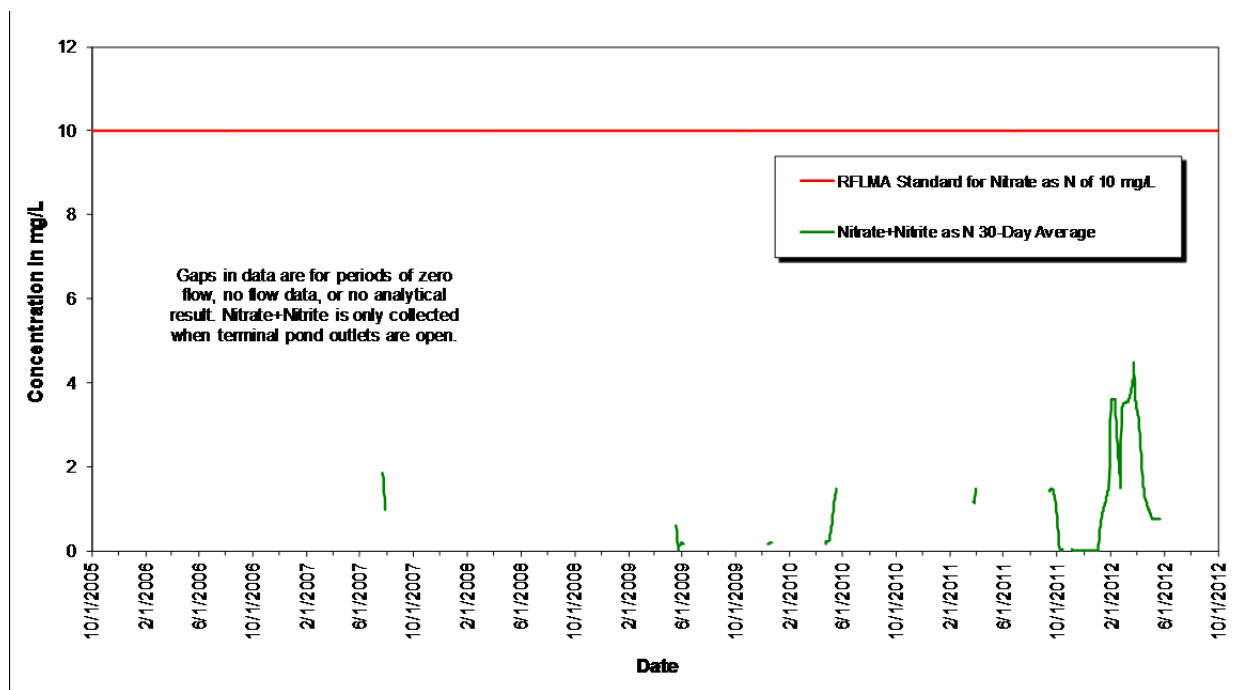
As of this report, the composite sample started on June 6, 2012, was still in progress.
 µg/L = micrograms per liter
 pCi/L = picocuries per liter

Figure 9. Volume-Weighted 30-Day Average Total Uranium Concentrations at GS03: Post-Closure Period Ending Third Quarter CY 2012



mg/L = milligrams per liter

Figure 10. Volume-Weighted 30-Day Average Nitrate + Nitrite as Nitrogen Concentrations at GS03: Year Ending Third Quarter CY 2012



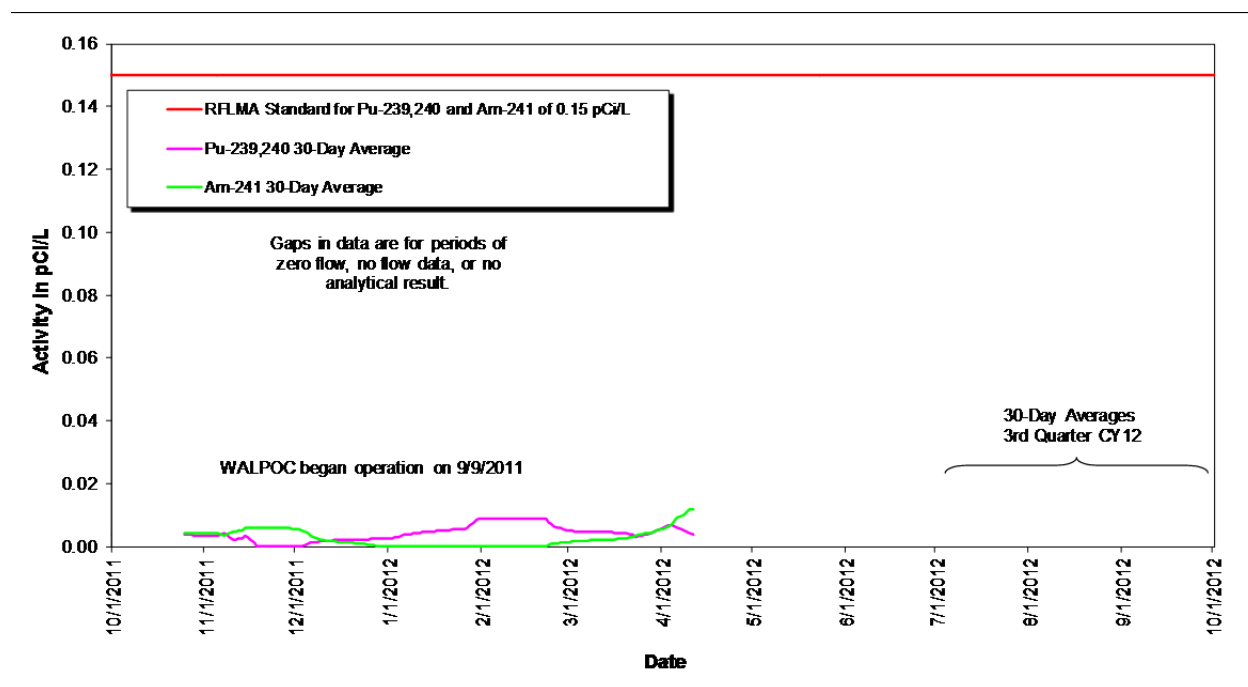
mg/L = milligrams per liter

Figure 11. Volume-Weighted 30-Day Average Nitrate + Nitrite as Nitrogen Concentrations at GS03: Post-Closure Period Ending Third Quarter CY 2012

3.1.2.3 Monitoring Location WALPOC

Monitoring location WALPOC is on Walnut Creek at the eastern COU boundary. Figure 12 through Figure 17 show no occurrences of reportable 12-month rolling or 30-day averages for the quarter using the available data. There has been no flow at WALPOC since May 26, 2012.

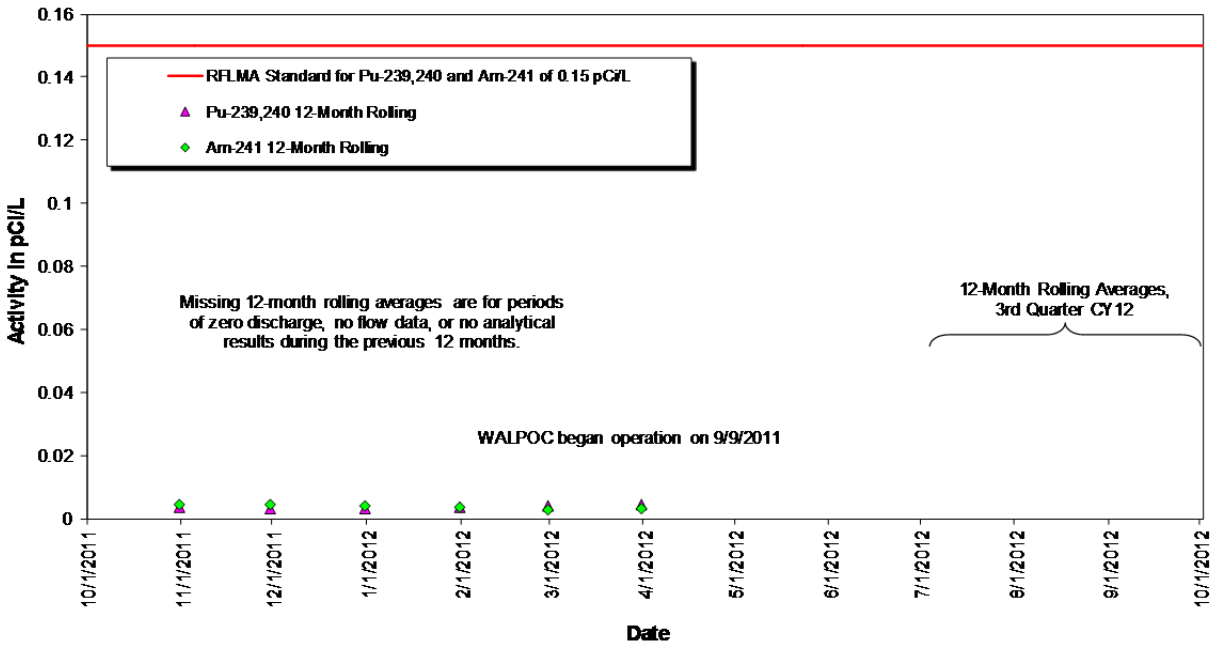
WALPOC began operation as a RFLMA POC on September 9, 2011. The first flow was observed (and sample collection began) at WALPOC on September 12, 2011. Therefore, based on routine data evaluation protocols, a 12-month rolling average cannot be formally calculated until at least 1 year has elapsed from the date WALPOC began operation as a RFLMA POC. Since WALPOC began operation as a POC on September 9, 2011, the first formal 12-month rolling average will be calculated for September 30, 2012.² Therefore, the values shown here for WALPOC are for information only and use only the available data.



As of this report, the composite sample started on April 13, 2012, was still in progress.
pCi/L = picocuries per liter

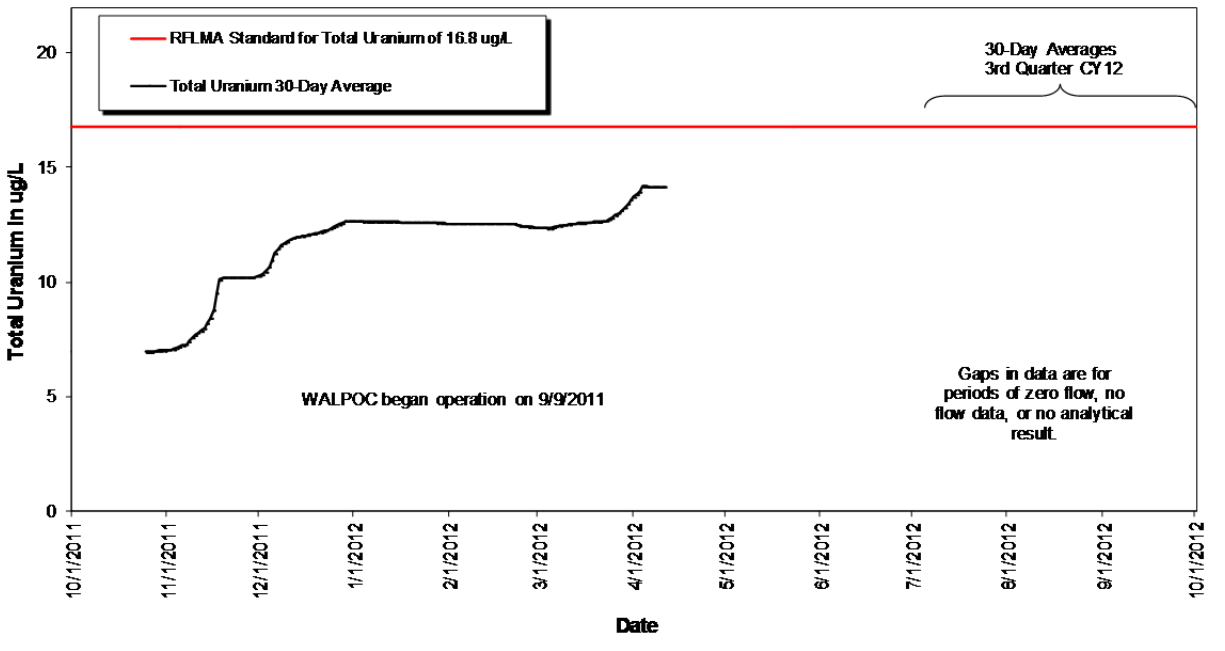
Figure 12. Volume-Weighted 30-Day Average Plutonium and Americium Activities at WALPOC: Year Ending Third Quarter CY 2012

² Individual 12-month rolling average values are only calculated for the last day of each month.



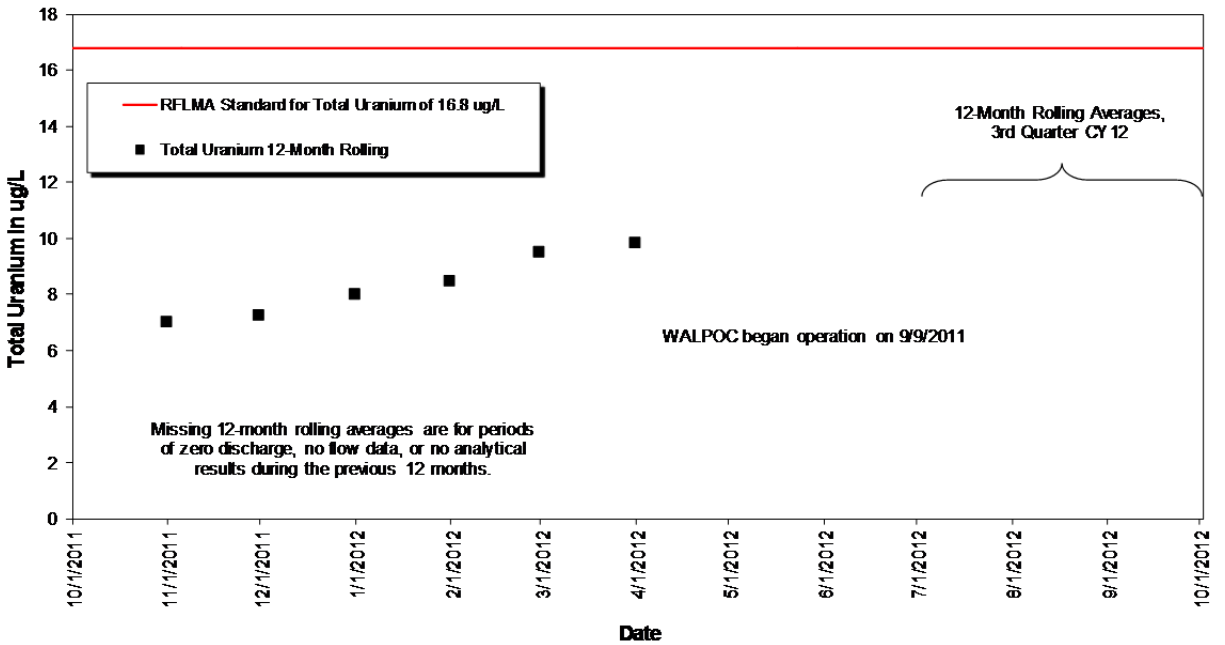
As of this report, the composite sample started on April 13, 2012, was still in progress.
pCi/L = picocuries per liter

Figure 13. Volume-Weighted 12-Month Rolling Average Plutonium and Americium Activities at WALPOC: Year Ending Third Quarter CY 2012



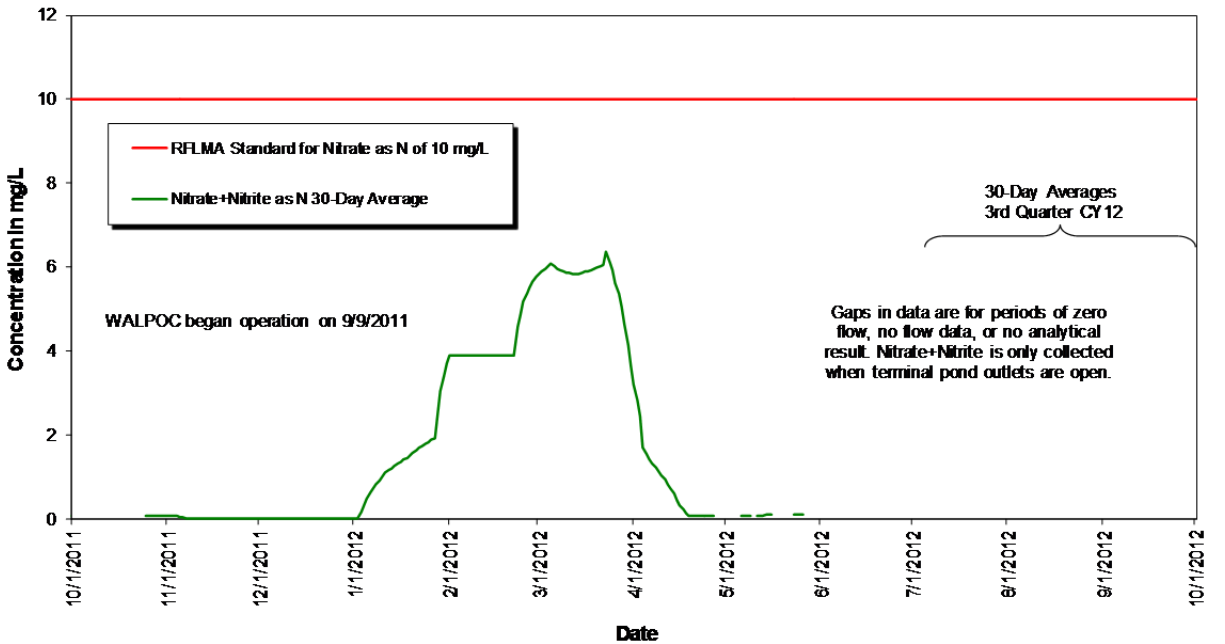
As of this report, the composite sample started on April 13, 2012, was still in progress.
µg/L = micrograms per liter

Figure 14. Volume-Weighted 30-Day Average Total Uranium Concentrations at WALPOC: Year Ending Third Quarter CY 2012



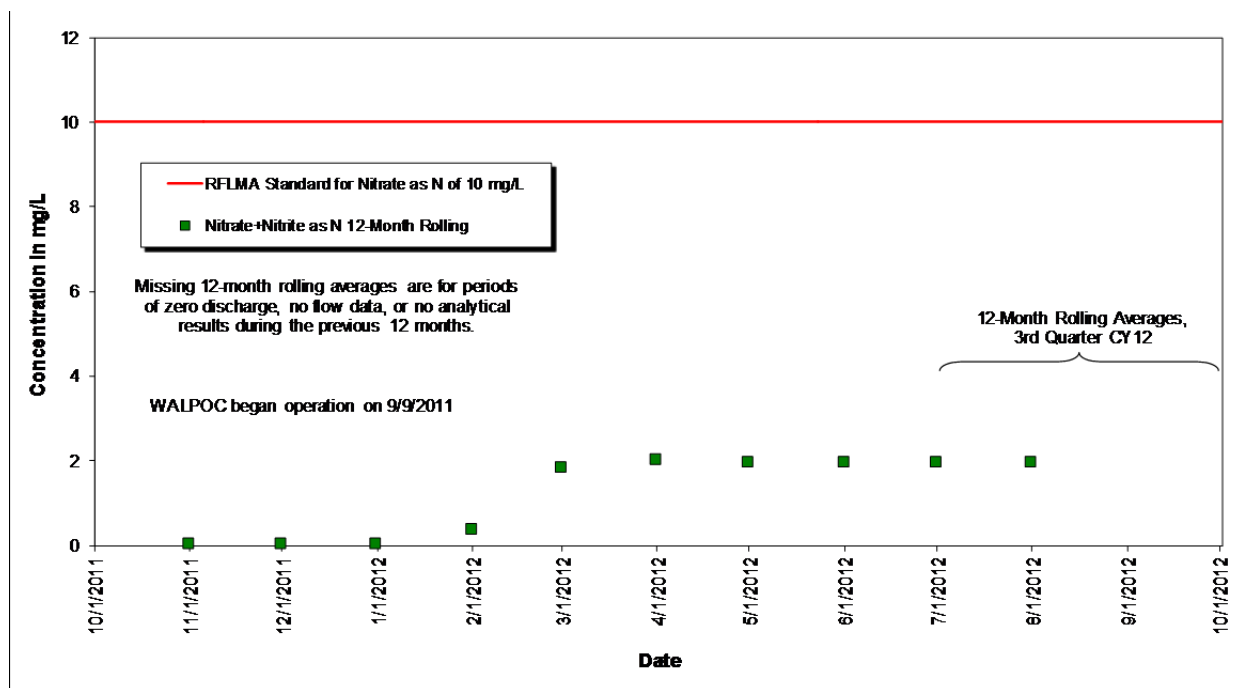
As of this report, the composite sample started on April 13, 2012, was still in progress.
 µg/L = micrograms per liter

Figure 15. Volume-Weighted 12-Month Rolling Average Total Uranium Concentrations at WALPOC: Year Ending Third Quarter CY 2012



mg/L = milligrams per liter

Figure 16. Volume-Weighted 30-Day Average Nitrate + Nitrite as Nitrogen Concentrations at WALPOC: Year Ending Third Quarter CY 2012



Nitrate + nitrite as nitrogen 12-month averages are conservatively compared to the nitrate standard only.
 mg/L = milligrams per liter

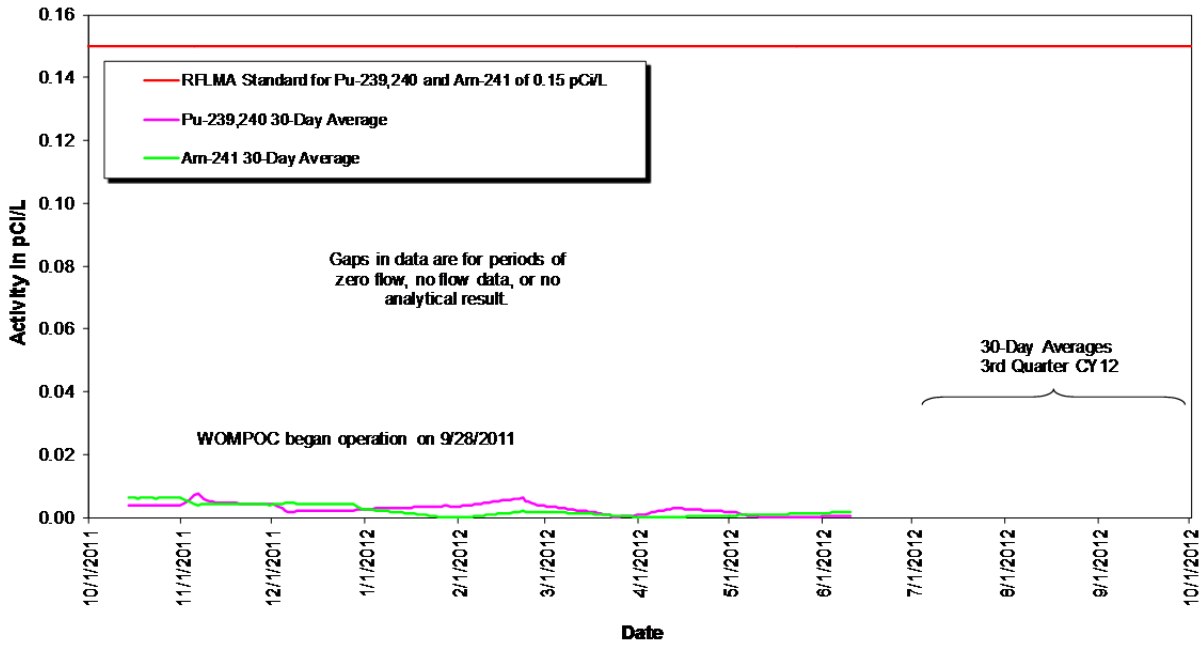
Figure 17. Volume-Weighted 12-Month Rolling Average Nitrate + Nitrite as Nitrogen Concentrations at WALPOC: Year Ending Third Quarter CY 2012

3.1.2.4 Monitoring Location WOMPOC

Monitoring location WOMPOC is on Woman Creek at the eastern COU boundary. Figure 18 through Figure 21 show no occurrences of reportable 12-month rolling or 30-day averages for the quarter using the available data. There was no flow at WOMPOC for the period June 11, 2012, through October 17, 2012.

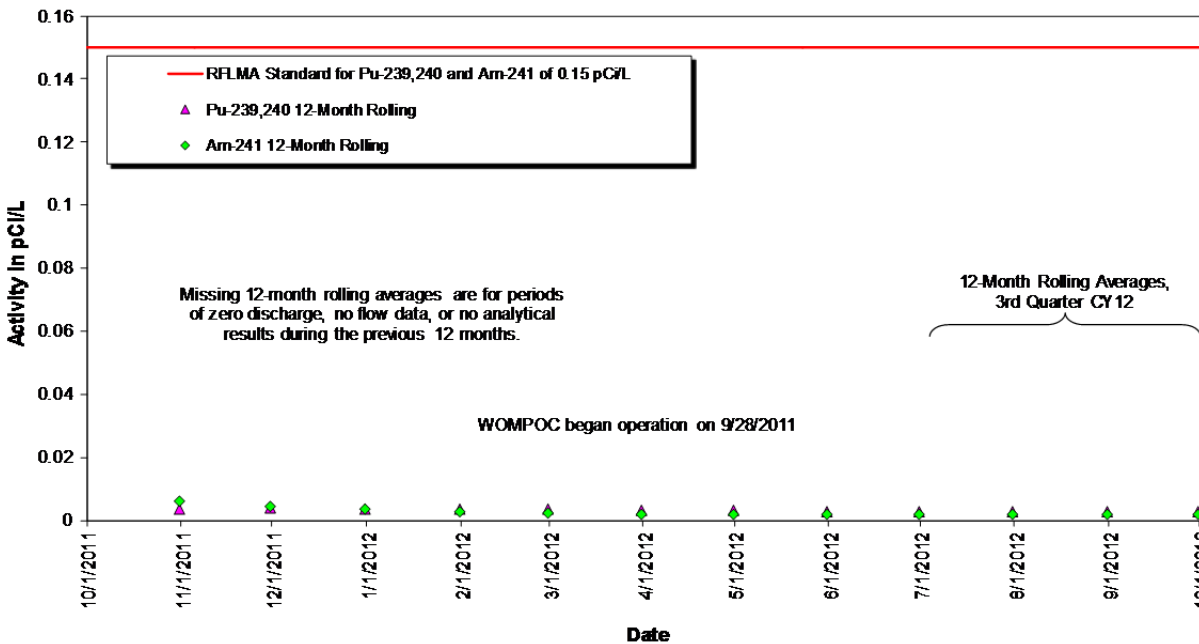
WOMPOC began operation as a RFLMA POC on September 28, 2011. The first flow was observed (and sample collection began) at WOMPOC on October 14, 2011. Therefore, based on routine data evaluation protocols, a 12-month rolling average cannot be formally calculated until at least 1 year has elapsed from the date WOMPOC began operation as a RFLMA POC. Since WOMPOC began operation as a POC on September 28, 2011, the first formal 12-month rolling average is calculated for September 30, 2012.³

³ Individual 12-month rolling average values are calculated using only the last day of each month.



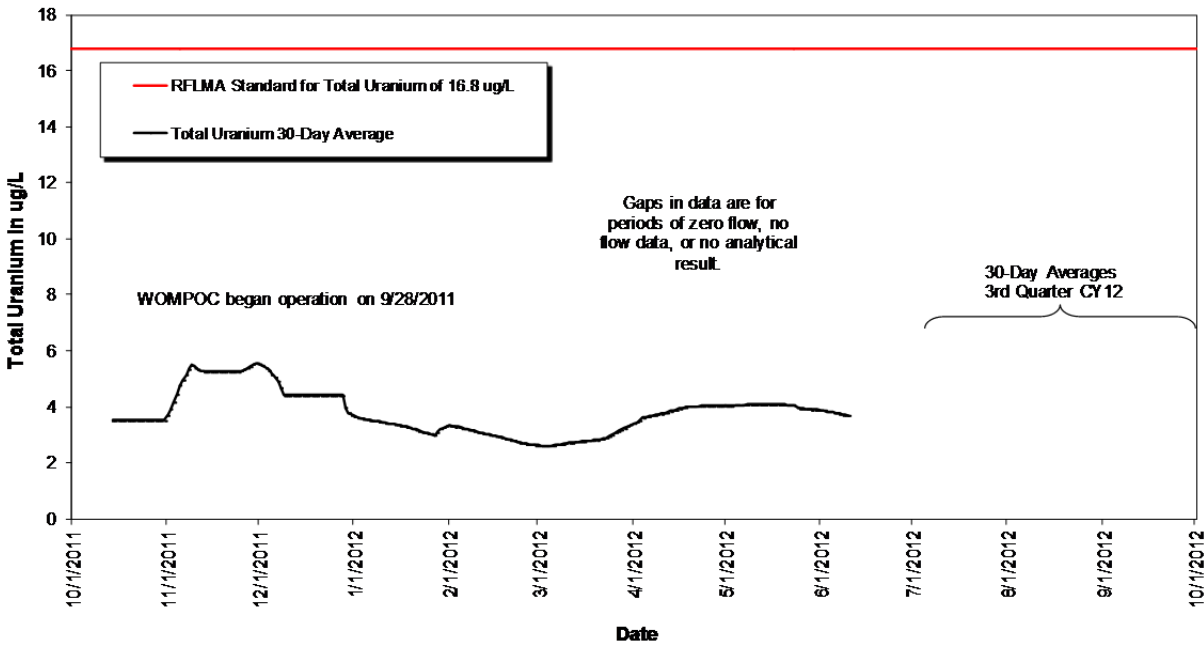
pCi/L = picocuries per liter

Figure 18. Volume-Weighted 30-Day Average Plutonium and Americium Activities at WOMPOC: Year Ending Third Quarter CY 2012



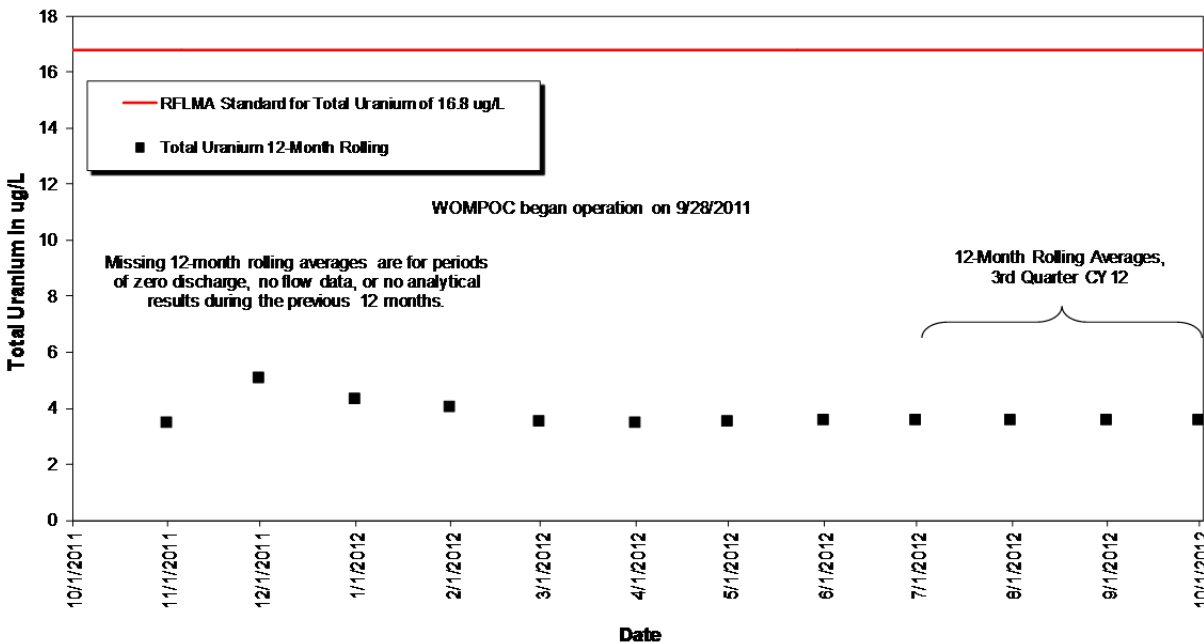
pCi/L = picocuries per liter

Figure 19. Volume-Weighted 12-Month Rolling Average Plutonium and Americium Activities at WOMPOC: Year Ending Third Quarter CY 2012



µg/L = micrograms per liter

Figure 20. Volume-Weighted 30-Day Average Total Uranium Concentrations at WOMPOC: Calendar Year Ending Third Quarter CY 2012



µg/L = micrograms per liter

Figure 21. Volume-Weighted 12-Month Rolling Average Total Uranium Concentrations at WOMPOC: Calendar Year Ending Third Quarter CY 2012

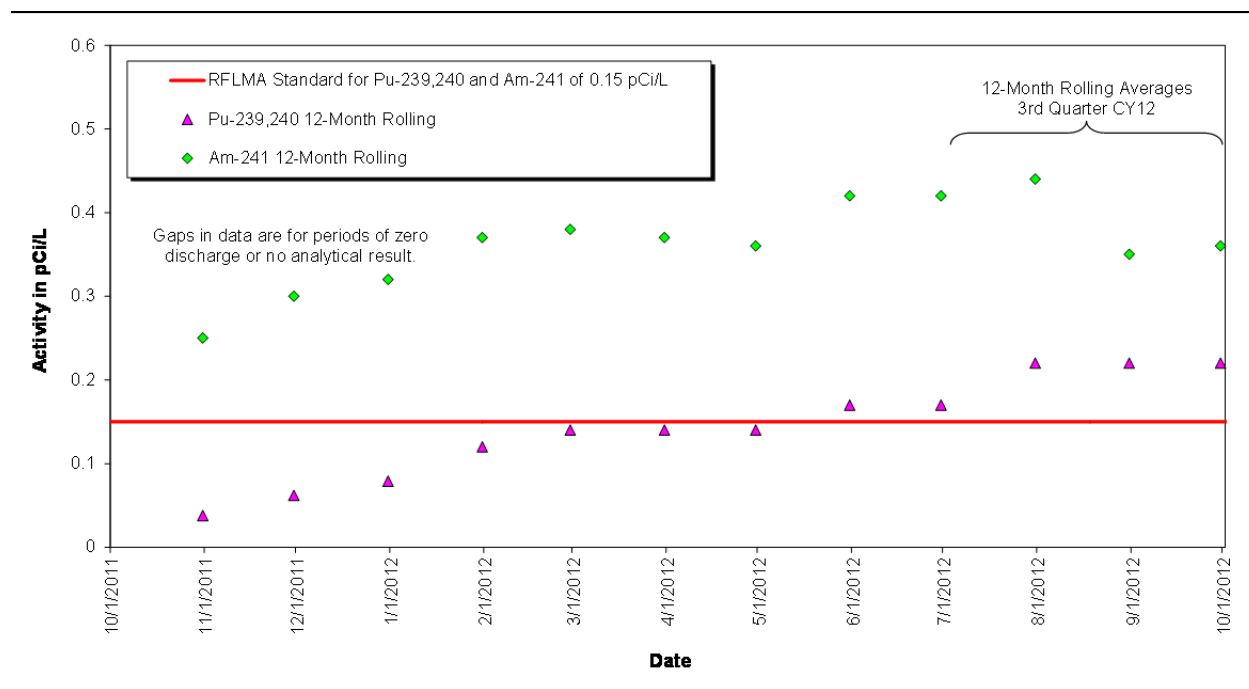
3.1.3 POE Monitoring

The following sections include summary plots showing the applicable 12-month rolling averages for the POE analytes.

3.1.3.1 Monitoring Location GS10

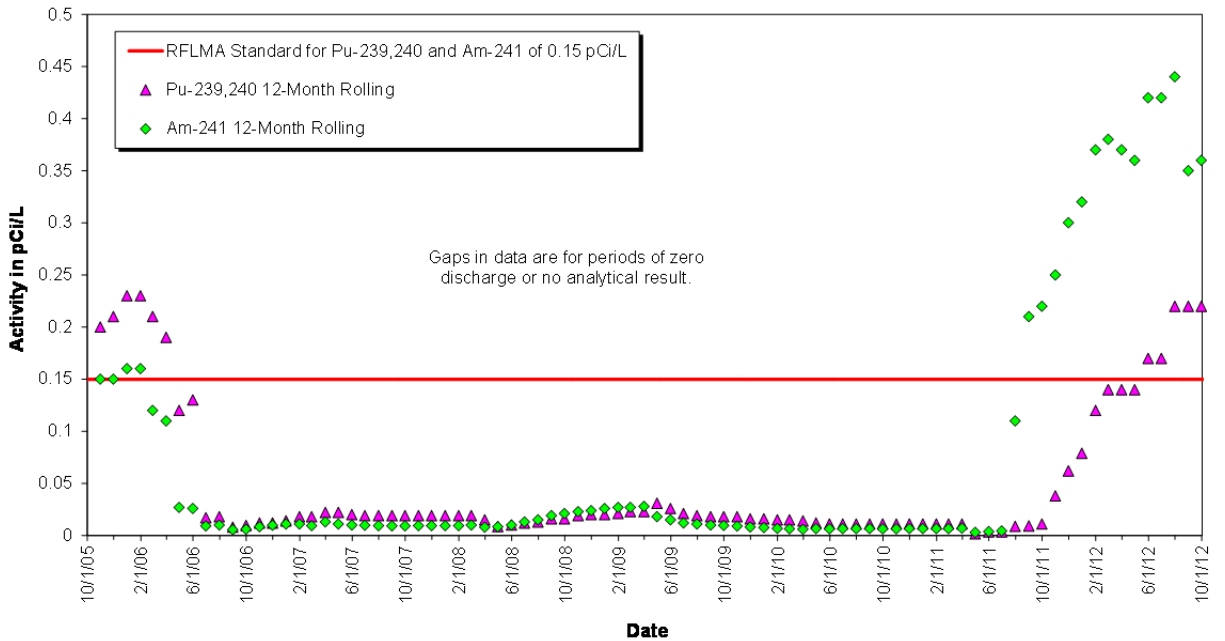
Monitoring location GS10 is on South Walnut Creek just upstream of the B-Series ponds. Figure 22 and Figure 24 show the 12-month rolling averages for Pu, Am, and total uranium values during the quarter. Figure 23 and Figure 25 show sampling data from 2005 through the third quarter of CY 2012.

Reportable 12-month rolling average uranium concentrations were observed starting on April 30, 2011, in surface water at RFLMA POE monitoring station GS10. Reportable 12-month rolling average Am and Pu activities were also observed starting on August 31, 2011, and May 31, 2012, respectively. As of the end of the third quarter of CY 2012, these three analytes were still reportable. No other analytes were reportable during the third quarter of CY 2012.



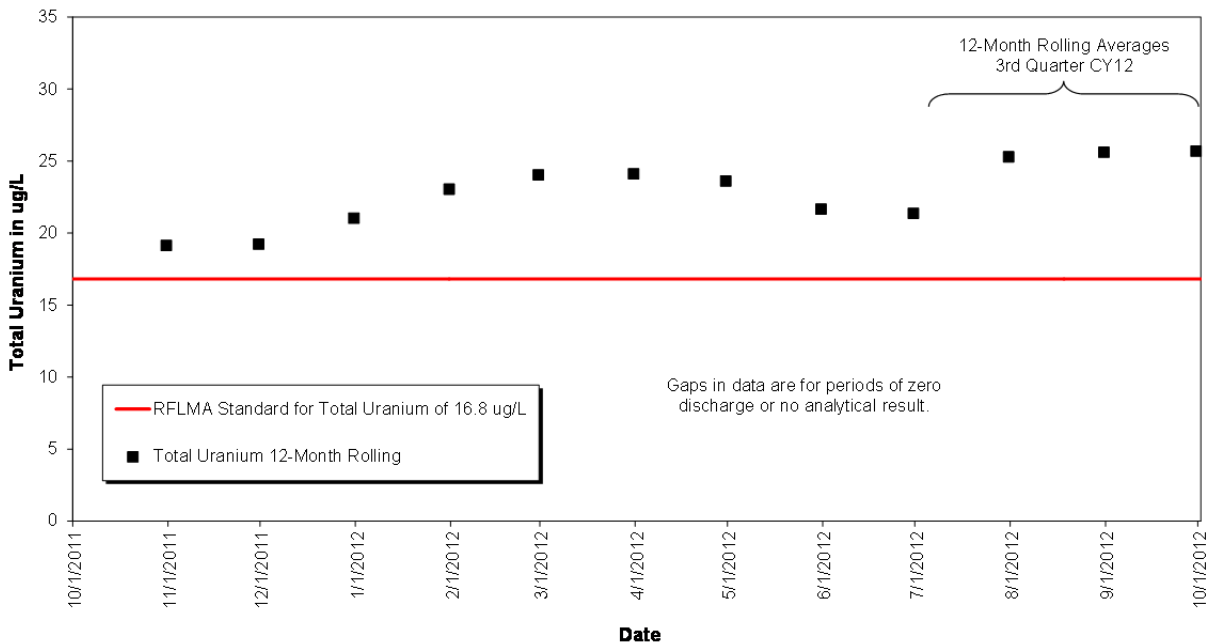
pCi/L = picocuries per liter

Figure 22. Volume-Weighted 12-Month Rolling Average Plutonium and Americium Activities at GS10: Year Ending Third Quarter CY 2012



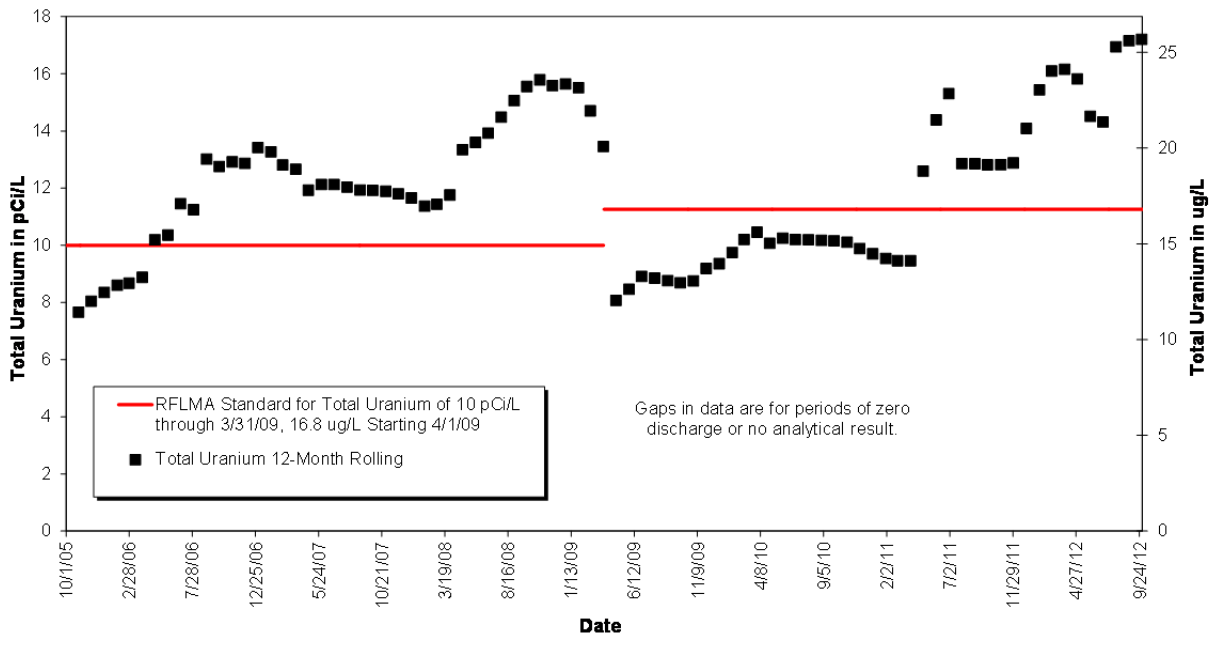
pCi/L = picocuries per liter

Figure 23. Volume-Weighted 12-Month Rolling Average Plutonium and Americium Activities at GS10: Post-Closure Period Ending Third Quarter CY 2012



µg/L = micrograms per liter

Figure 24. Volume-Weighted 12-Month Rolling Average Total Uranium Concentrations at GS10: Year Ending Third Quarter CY 2012



µg/L = micrograms per liter
 pCi/L = picocuries per liter

Figure 25. Volume-Weighted 12-Month Rolling Average Total Uranium Concentrations at GS10: Post-Closure Period Ending Third Quarter CY 2012

The sampling results for plutonium, americium, and uranium from composite samples collected at GS10 during 2011–2012 are given in Table 1.

Table 1. CY 2011–2012 Composite Sampling Results at GS10

Date-Time Start	Date-Time End	Am-241 Result (pCi/L)	Pu-239, 240 Result (pCi/L)	Uranium Result (µg/L)
1/3/2011–10:25	2/16/2011–9:47	0.000	0.000	21.8
2/16/2011–9:47	4/11/2011–10:50	0.000	0.013	89.2
4/11/2011–10:50	5/4/2011–11:39	0.023	0.021	71.0
5/4/2011–11:39	5/13/2011–12:25	0.019	0.017	46.5
5/13/2011–12:25	5/20/2011–12:03	0.003	0.007	18.6
5/20/2011–12:03	6/3/2011–10:56	0.004	0.001	35.8
6/3/2011–10:56	6/13/2011–10:22	0.015	0.000	20.1
6/13/2011–10:22	7/1/2011–9:00	0.010	0.004	10.6
7/1/2011–9:00	7/8/2011–11:08	0.008	0.008	7.75
7/8/2011–11:08	7/10/2011–11:05	0.015	0.005	4.36
7/10/2011–11:05	7/11/2011–10:59	0.020	0.011	6.06
7/11/2011–10:59	7/21/2011–8:56	0.058	0.037	11.3
7/21/2011–8:56	8/24/2011–9:41	3.490	^a	7.82
8/24/2011–9:41	9/29/2011–12:35	0.044	0.020	8.16
9/29/2011–12:35	10/25/2011–10:27	0.877	0.658	8.24
10/25/2011–10:27	11/17/2011–10:40	0.904	0.405	16.5
11/17/2011–10:40	12/14/2011–12:17	0.349	0.189	16.4
12/14/2011–12:17	1/5/2012–13:19	0.435	0.238	44.5
1/5/2012–13:19	1/23/2012–10:43	1.140	0.735	49.7
1/23/2012–10:43	2/2/2012–12:36	0.037	0.021	38.3
2/2/2012–12:36	2/21/2012–11:18	0.776	0.466	49.0
2/21/2012–11:18	2/24/2012–9:34	0.214	0.267	25.1
2/24/2012–9:34	3/6/2012–12:04	0.074	0.050	33.9
3/6/2012–12:04	3/21/2012–9:37	0.150	0.114	38.7
3/21/2012–9:37	4/4/2012–10:20	0.318	0.246	35.5
4/4/2012–10:20	4/25/2012–9:31	0.052	0.034	27.6
4/25/2012–9:31	5/9/2012–13:36	0.478	0.264	16.1
5/9/2012–13:36	5/23/2012–9:37	0.159	0.107	12.9
5/23/2012–9:37	6/14/2012–10:08	0.034	0.033	8.98
6/14/2012–10:08	7/9/2012–11:53	0.085	0.049	4.68
7/9/2012–11:53	7/26/2012–8:58	0.224	0.173	7.07
7/26/2012–8:58	9/12/2012–13:06	0.464	0.314	4.20
9/12/2012–13:06	10/24/2012–10:19	0.012	0.009	3.75
10/24/2012–10:19	12/4/2012–10:43	^b	^b	^b
12/4/2012–10:43	in progress	^c	^c	^c

Recent results from the third quarter of CY 2012 are not yet validated and are subject to revision.

^a Through data validation, results determined to be unusable

^b Analysis pending

^c Sample in progress

µg/L = micrograms per liter

pCi/L = picocuries per liter

Reportable Americium and Plutonium Activities at GS10

Formal notification of a reportable condition for 12-month rolling average americium values at GS10 was made on December 12, 2011. Formal notification of a reportable condition for 12-month rolling average plutonium values at GS10 was made on July 24, 2012.

The above notifications were triggered by routine data evaluation performed in accordance with RFLMA Attachment 2, Figure 6, “Points of Evaluation,” which resulted in 12-month rolling

average values for Am of 0.21 picocuries per liter (pCi/L) on August 31, 2011, and 0.22 pCi/L on September 30, 2011. As of September 30, 2012, using validated data, the 12-month rolling average for Am remained above the standard at 0.36 pCi/L. Similarly, data evaluation resulted in a 12-month rolling average value for Pu of 0.17 pCi/L on May 31, 2012. As of September 30, 2012, using validated data, the 12-month rolling average for Pu remained above the standard at 0.22 pCi/L. The applicable RFLMA Table 1 standard for Am and Pu is 0.15 pCi/L.

Downstream monitoring at GS08, WALPOC, and GS03 continue to show Pu and Am activities well below the RFLMA standard of 0.15 pCi/L. Recent analytical results from these downstream locations are given in Table 2. All the locations in Table 2 have been dry since May 27, 2012. The latest available 12-month rolling and 30-day average Pu/Am activities calculated from flow-paced composite samples are shown on Figure 26 and Figure 27.

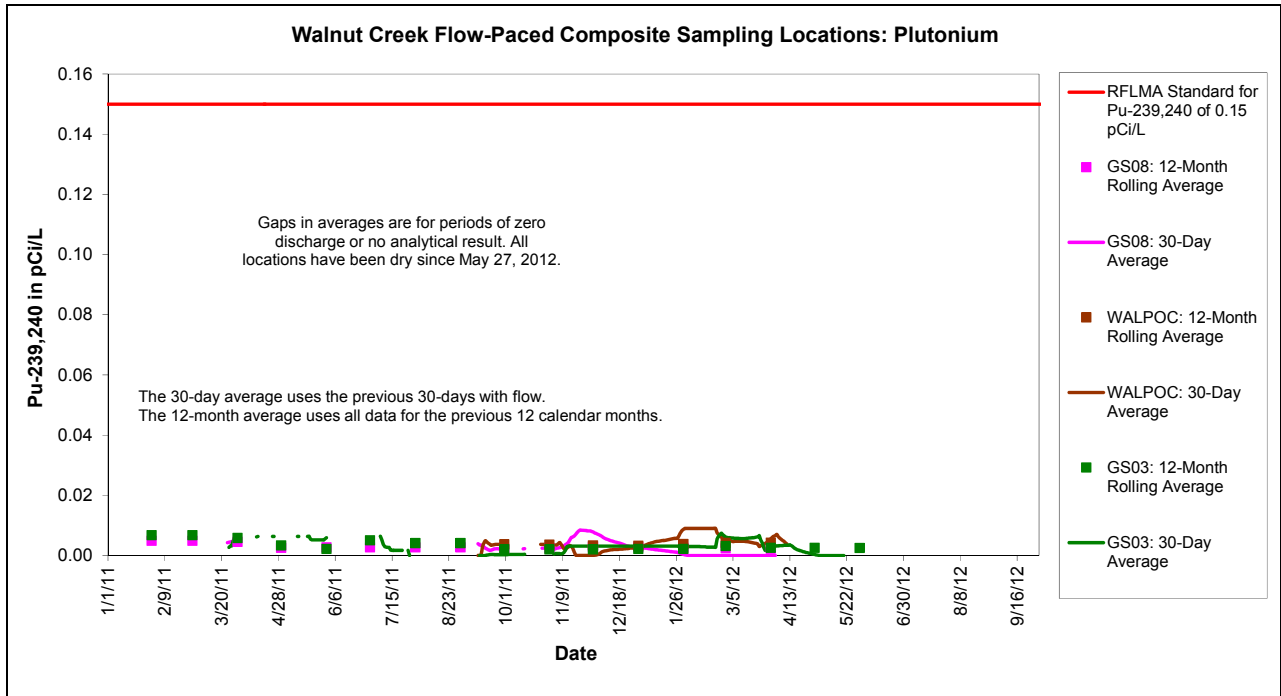
An aliquot from each flow-paced composite sample routinely being collected at B5INFLOW (supporting the GS10 uranium evaluation; Figure 28) is also being held for Pu and Am analysis if upstream sample results at GS10 suggest analysis would inform the evaluation. To date, five Pu/Am results have been obtained and all results are well below the RFLMA standard of 0.15 pCi/L. The highest single result is 0.01 pCi/L Pu for the April 13–May 21, 2012, composite sample.

Table 2. Recent Pu and Am Flow-Paced Composite Sample Results

GS08		WALPOC		GS03	
Sample Period	Result Am/Pu (pCi/L)	Sample Period	Result Am/Pu (pCi/L)	Sample Period	Result Am/Pu (pCi/L)
3/24–3/26/11	0.002/0.003			3/24–3/26/11	0.0/0.002
3/26–3/28/11	0.002/0.004			3/26–3/28/11	0.002/0.003
3/28–3/30/11	0.003/0.0			3/28–3/31/11	0.001/0.011
				3/31–5/20/11	0.002/0.007
				5/20–9/12/11	0.0/0.0
9/12–9/15/11	0.002/0.002	9/12–9/15/11	0.008/0.0	9/12–9/15/11	0.0/0.0
9/15–9/18/11	0.001/0.0	9/15–9/18/11	0.0/0.009	9/15–9/18/11	0.002/0.0
9/18–9/21/11	0.0/0.0	9/18–9/22/11	0.003/0.0	9/18–9/22/11	0.003/0.001
9/21–9/27/11	0.0/0.005	9/22–9/27/11	0.006/0.004	9/22–9/27/11	0.009/0.0
9/27–11/9/11	0.0/0.009	9/27–11/30/11	0.006/0.0	9/27/11–1/3/12	0.003/0.003
11/9–11/29/11	0.005/0.008				
11/29/11–1/5/12	0.005/0.003	11/30/11–1/3/12	0.0/0.003		
1/5–2/1/12	0.001/0.0	1/3–2/23/12	0.0/0.009	1/3–2/10/12	0.006/0.003
2/1–4/4/12	0.0/0.0			2/10–2/23/12	0.0/0.003
		2/23–3/6/12	0.003/0.001	2/23–2/27/12	0.0/0.012
				2/27–3/1/12	0.0/0.0
		3/6–3/21/12	0.004/0.009	3/1–3/15/12	0.0/0.002
		3/21–4/13/12	0.018/0.0	3/15–4/4/12	0.0/0.005
4/4/12–	^a	4/13/12–	^a	4/4–6/6/12	0.0/0.0
				6/6/12–	^a

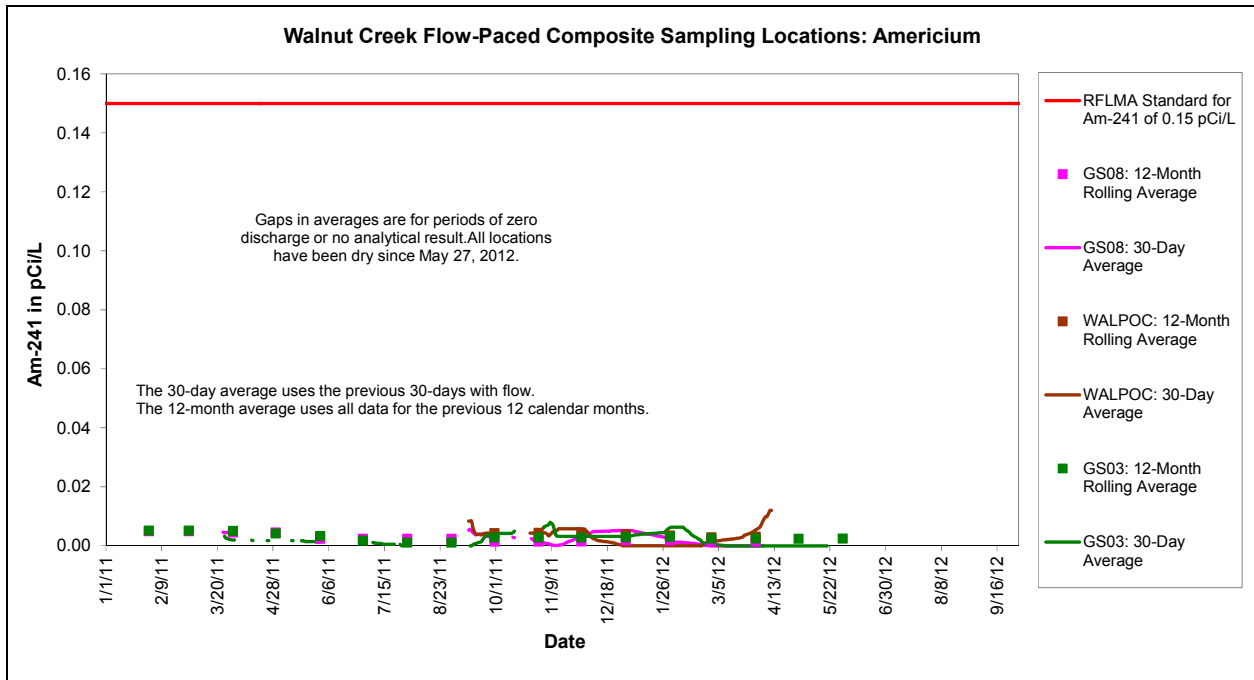
Some results are preliminary and subject to revision; negative results are set to zero.

^a Sample in progress



Plot includes data that are preliminary and subject to revision. Values for 12-month and 30-day averages shown here are presented for comparison purposes only.

Figure 26. Average Plutonium Activities at Locations Downstream of GS10



Plot includes data that are preliminary and subject to revision. Values for 12-month and 30-day averages shown here are presented for comparison purposes only.

Figure 27. Average Americium Activities at Locations Downstream of GS10


The dry conditions observed during late spring, summer, and fall of 2012 have made it all but impossible to collect additional water samples. Other than GS10, no new upstream or downstream locations have been sampled since the previous quarterly report. Although further evaluation and consultation is ongoing, the following list summarizes action to date:

- Rocky Flats staff walked down the GS10 drainage on November 16, 2011, to see if any obvious conditions were promoting potential soil erosion. Some thin vegetation spots were noted on the north side of the riprap upstream of GS10. Some reseeding/erosion matting may have been useful, but given that the current water quality does not appear to be a result of soil transport, additional erosion controls were not implemented. A closer examination of the drainage to focus on seeps and former utility corridors was conducted on November 22, 2011; representatives from DOE and EPA were in attendance. Additional seed was spread and raked into the ground along the riprap areas upstream of GS10 in FC-4 and at the confluence of FC-4/FC-5 on November 29, 2011.
- Historical Pu and Am well data from wells in the drainage have been reviewed. The review gave no indication that additional well sampling would be informative at this stage.
- The previous GS10 evaluation reports have been reviewed for information that may aid this current evaluation.
- Several of the sampling locations already designated for evaluation of the reportable condition for uranium at GS10 (FC4991, GS10, and B3OUTFLOW; Figure 28) were grab-sampled on November 25, 2011. Several seep sampling locations (SEEP995, SEEP995A, SEEP995B, and SEEP995C; Figure 28) were also grab-sampled on November 25, 2011. The Seep 995 area was chosen for sampling for the following reasons:
 - GS10 samples with elevated Pu/Am were collected during low-flow conditions, not during high-flow conditions when soil/sediment would be expected to be transported.
 - Visible surface flow from this seep was observed reaching FC-4.
 - This seep, which has increased in size since closure, is in the same location of the former Wastewater Treatment Plant outfall and a former utility corridor that included Original Process Waste Lines.

The results in Table 3 suggest that the SEEP995 locations could be contributing Pu and Am to GS10. However, activities at GS10 for this grab sample are low.

Table 3. Grab Sampling Results Upstream of GS10: November 25, 2011

Location Code	SEEP995	SEEP995A	SEEP995B	SEEP995C
Pu [pCi/L]	0.096	0.156	0.157	0.105
Am [pCi/L]	0.066	0.127	0.035	0.052



	Upstream	→	Downstream
Location Code	FC4991		GS10 B3OUTFLOW
Pu [pCi/L]	0.006		0.030 0.005
Am [pCi/L]	0.005		0.012 0.005

The arrow from the upper table indicates the relative location of the SEEP995 locations along FC-4.

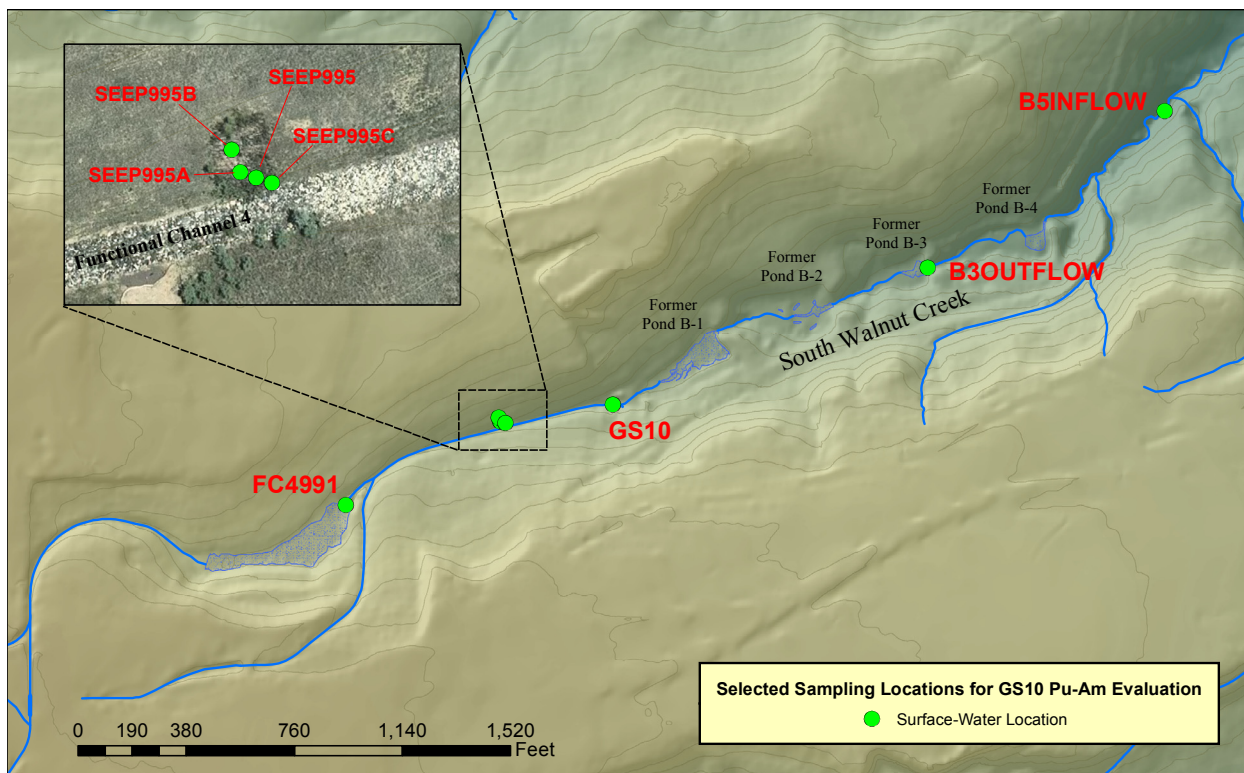


Figure 28. Pu/Am Evaluation Sampling Location Map for GS10 Drainage Area

- Additional samples are being collected at SEEP995A when water is available (i.e., unfrozen seep flow not affected by surface flow such as snowmelt). Samples were collected on January 6, January 24, and April 13, 2012. For the January 24 sample, analysis was performed for total Pu/Am (unfiltered) and also for filtered Pu/Am (sample filtered with 0.45-micron filter) to evaluate for the possibility of colloidal transport. Table 4 shows some measurable activity for the January 6 and April 13 samples. However, the low activities for the January 24 samples do not provide additional insight into the possibility of colloidal transport.

Additional samples will be collected when water is available.

Table 4. Grab Sampling Results from SEEP995A

SEEP995A	1/6/12 (total)	1/24/12 (total)	1/24/12 (filtered)	4/13/12 (total)
Pu [pCi/L]	0.079	0.007	0.000	0.052
Am [pCi/L]	0.052	0.000	0.000	0.040
U [ug/L]	12.3	13.7	NA	7.8

NA = not analyzed
 ug/L = micrograms per liter

- To evaluate whether there could be other seep-related contributions along FC-4 that are not visible due to the thick riprap, several sampling locations were established along FC-4 where water could be reached between the rock (Figure 29). These locations were grab-sampled on March 6, 2012, for both total and filtered analytes.

The results in Table 5 show low Pu and Am activities and no significant spatial trends for any of the analytes. Additional samples will be collected when water is available.

Table 5. Grab Sampling Results in FC-4 Upstream of GS10: March 6, 2012

Location Code	SEEP995A
Pu [pCi/L]	0.004
Am [pCi/L]	0.003
U [ug/L]	11.2
Alk as CaCO3 [mg/L]	143
Hardness as CaCO3 [mg/L]	384
pH	7.84@4.1C
TSS [mg/L]	6

	Upstream	→	→	Downstream
Location Code	FC4988	FC4995	FC4997	FC4EFF
Pu [pCi/L]	0.026	0.000	0.007	0.004
Am [pCi/L]	0.002	0.001	0.002	0.000
U [ug/L]	19.0	19.1	18.7	18.7
Alk as CaCO3 [mg/L]	261	256	246	246
Hardness as CaCO3 [mg/L]	478	468	464	462
pH	7.74@3.5C	7.62@3.2C	7.64@3.5C	7.71@3.7C
TSS [mg/L]	113	2	1	5

The arrow from the upper table indicates the relative location of SEEP995A along FC-4.

Alk = alkalinity

CaCO3 = calcium carbonate

ug/L = micrograms per liter

mg/L = milligrams per liter

TSS = total suspended solids

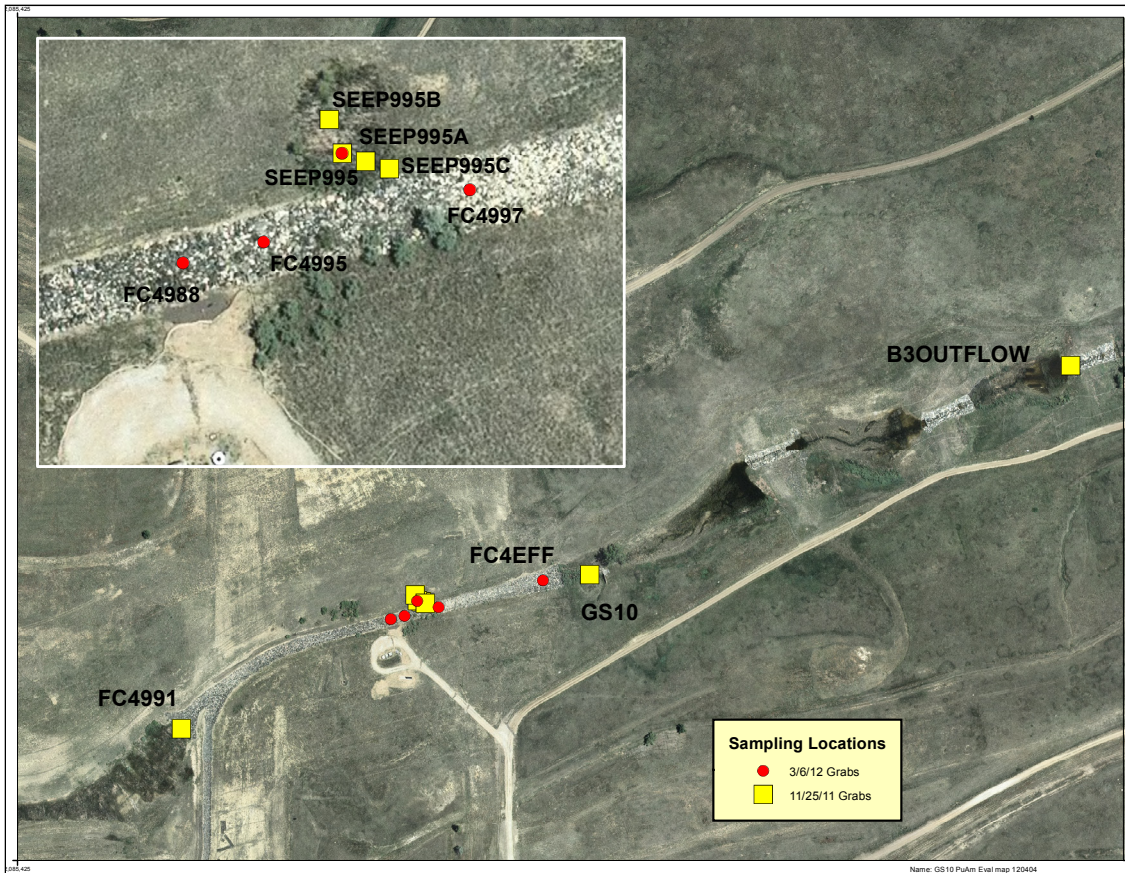


Figure 29. Pu/Am Evaluation Sampling Location Map in FC-4 and South Walnut Creek

- To evaluate for any Pu and Am transport characteristics specifically related to the dissolved, colloidal, and particulate mechanisms, water from the routine GS10 composite samples is periodically being analyzed after filtration with a 0.45-micron filter.

A filtered sample is prepared from selected composite carboys collected at GS10. The routine RFLMA sample is analyzed for total (unfiltered) Pu, Am, uranium, beryllium, chromium, and hardness. If the analytical results show Pu and Am concentrations above the 0.15 pCi/L standard, then the corresponding filtered sample may be submitted for analysis. To date, three GS10 composite samples have been analyzed as filtered and unfiltered (Table 6).

Table 6. Results for Filtered and Unfiltered Sample Pairs at GS10: March 21, April 25, and July 26, 2012, Composites

Analyte	3/21–4/4/12 Composite		4/25–5/9/12 Composite		7/26–9/12/12 Composite	
	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered
Am-241 (pCi/L)	0.318	0.000	0.478	0.000	0.464	0.000
Pu-239, 240 (pCi/L)	0.246	0.000	0.264	0.026	0.314	0.002
Uranium (µg/L)	35.5	34.2	16.1	not analyzed	3.75	3.63

µg/L = micrograms per liter

Table 6 shows that nearly all of the Pu and Am were removed by the 0.45-micron filter. Additionally, nearly all of the uranium passed through the filter. These results support the conclusions of previous research showing that Pu and Am move in association with particulates, while uranium is dissolved. However, these results indicate that the Pu and Am are only associated with particles larger than 0.45 micron once they reach GS10 and are processed for submittal to the laboratory. It is still possible that Pu and Am could reach surface water in association with sub-0.45 micron colloids, but then adsorb to other geologic materials or simply aggregate.

Additional unfiltered-filtered sample pairs are planned to be collected from seeps and surface water upstream of GS10 once the current extremely dry conditions end and water is available for sampling.

- Grab samples have been collected upstream of GS10 from both seeps and surface water in an attempt to define the spatial variability of Pu and Am activities. However, grab samples have failed to show activities similar to those measured in flow-paced composites collected at GS10. This suggests either that the source of the GS10 Pu/Am is not affecting the grab sample locations, the source could be very close to GS10, the Pu and Am follow a pathway that is difficult to sample (e.g., below the riprap and fill in FC-4), or the source is intermittent, such that grabs have missed the Pu/Am, while the flow-paced composites at GS10 (with up to 100 individual grabs) have been more successful.

Therefore, time-paced automated samplers were deployed at FC4997 and GS10 (Figure 29; the latter is a secondary sampler located at GS10) to collect 72 grabs (200 milliliters each) at 2-hour intervals over the course of 6 days. Table 7 presents the results, which show very low Pu/Am activities and give practically no indication of spatial variability.

Table 7. Results for Time-Paced Composites at GS10 and FC4997: May 22–28, 2012

Analyte	FC4997 (upstream)	GS10 (downstream)
Am-241 (pCi/L)	0.005	0.005
Pu-239, 240 (pCi/L)	0.00	0.00
Uranium (µg/L)	10.4	10.6
Alkalinity as CaCO ₃ (mg/L)	205	246
Hardness as CaCO ₃ (mg/L)	492	517

CaCO₃ = calcium carbonate

µg/L = micrograms per liter

mg/L = milligrams per liter

- Flow-paced composite samples routinely being collected at WALPOC will continue to be requested to be analyzed on a 2-week turnaround. Analyses for flow-paced composite samples routinely being collected at GS10 and GS08 are also currently being requested to be analyzed on a 2-week turnaround.

Updates to the ongoing evaluation for GS10 will periodically be communicated through public meetings, routine reports, and contact records. For additional information go to

http://www.lm.doe.gov/Rocky_Flats/ContactRecords.aspx

Reportable Uranium Concentrations at GS10

The routine GS10 uranium data evaluation is performed in accordance with RFLMA Attachment 2, Figure 6, “Points of Evaluation,” which resulted in a calculated 12-month rolling average concentration for uranium on April 30, 2011, of 18.8 micrograms per liter (µg/L). More recent 12-month rolling averages using validated data through September 30, 2012, continue to exceed the RFLMA applicable Table 1 standard of 16.8 µg/L.

Initial notification to the regulatory agencies and the public, in accordance with RFLMA Attachment 2, Figure 6, was made by e-mail on June 16, 2011. RFLMA Contact Record 2011-04 (July 8, 2011), “Reportable Condition for Uranium at Point of Evaluation GS10,” provides a discussion of the monitoring results and recaps the outcome of the RFLMA Parties consultation regarding the evaluation steps to be taken. RFLMA Contact Record 2011-05 (October 4, 2011), “Update for Reportable Condition for Uranium at Point of Evaluation GS10,” provides an update of the monitoring results and provides further discussion of the path forward. Both contact records are available on the Rocky Flats website,

http://www.lm.doe.gov/Rocky_Flats/ContactRecords.aspx.

Figure 30 shows the locations sampled during CY 2011–2012 in support of the uranium evaluation for GS10. (GS03, which is the current POC on Walnut Creek at Indiana Street, is not shown.)

The following is an update to the ongoing GS10 uranium evaluation:

- Downstream monitoring at B5INFLOW, GS08, WALPOC, and GS03 (Figure 30) continue to show uranium concentrations below 16.8 µg/L. Recent analytical results at downstream locations are given in Table 8. The latest available 12-month rolling and 30-day average uranium concentrations calculated from flow-paced composite samples are shown in Figure 31.

- Additional sampling and analysis for uranium within the GS10 drainage continues. Following the initial consultation, two temporary surface-water sample locations upstream of GS10 were established for biweekly uranium grab sampling (FC4991 and FC4750; Figure 30). Biweekly sampling at these locations was initiated on June 30, 2011.

These new locations supplement GS10, B3OUTFLOW, B5INFLOW, and B5 POND (Figure 30), which have been sampled biweekly for uranium since January 27, 2010. Data from these six locations are summarized in Table 9. The averages are shown on Figure 32.

- As noted in previous RFLMA quarterly reports, the following samples were sent to Los Alamos National Laboratory (LANL) for isotopic analysis during the spring of 2011. LANL determines the percentages of natural and anthropogenic uranium to compare with percentages in pre-closure and post-closure samples previously analyzed by LANL. The locations described below are shown on Figure 30:

- Flow-paced surface-water sample from GS10 for the period June 3 to June 13, 2011. (Historically, GS10 has shown approximately 70 percent natural uranium.)
- Groundwater sample from upgradient well 99405. (Historically, 99405 has shown uranium concentrations that typically exceed 100 µg/L and have been 99.9 to 100 percent natural uranium.)

The results of the LANL analysis have been reported by LANL to S.M. Stoller Corporation (Stoller) staff. The following highlights are noted:

- The signature results for GS10 do not match the historical natural uranium percentage of approximately 70 percent. Natural uranium was reported as 50.6 percent. The uranium concentration was 21.6 µg/L. The previous LANL sample, taken on March 17, 2010, was 24.1 µg/L and 72.3 percent natural uranium.
- The results for well 99405 were 411.1 µg/L uranium, with a 100 percent natural uranium signature. These results are consistent with historical data.

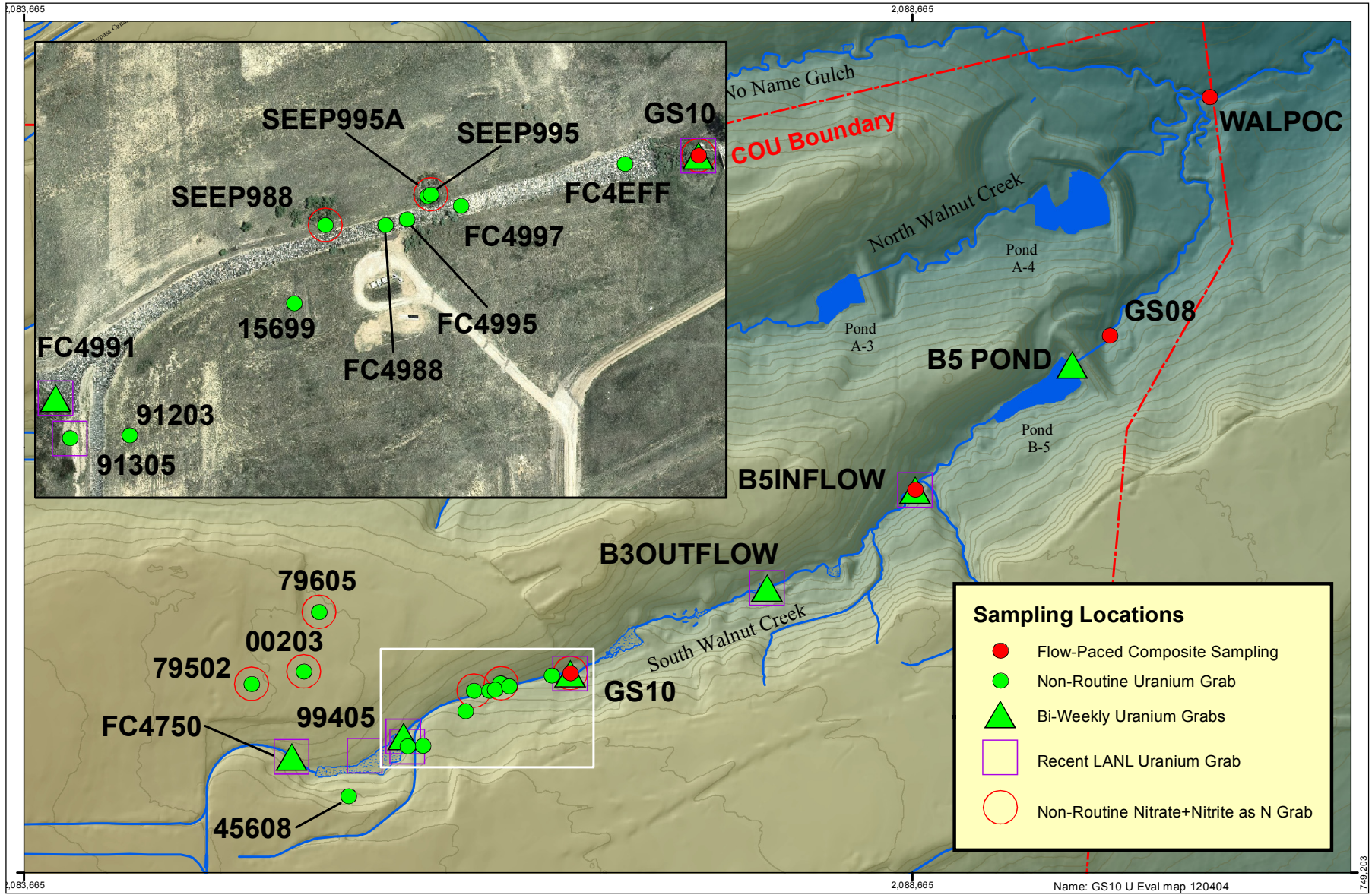


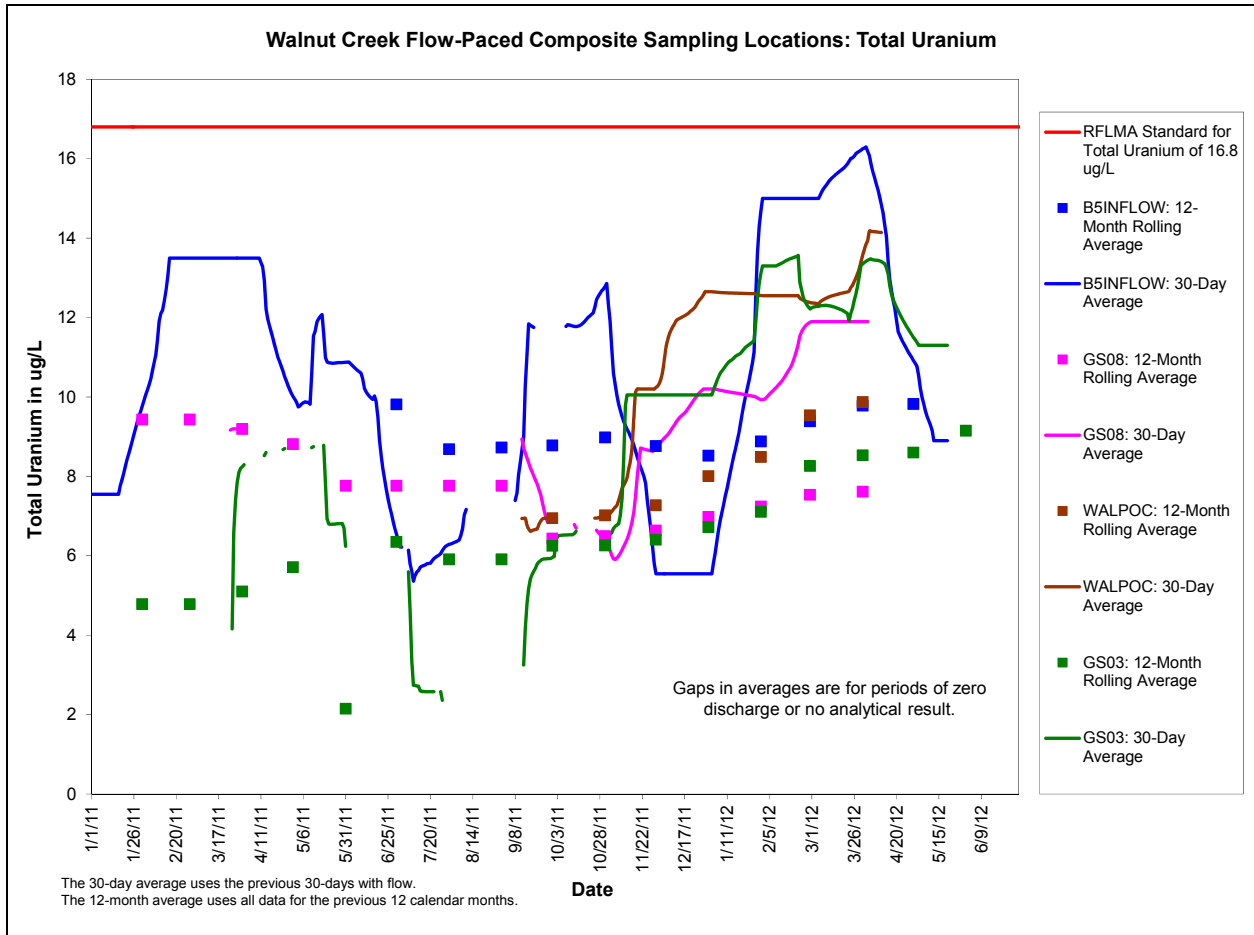
Figure 30. Uranium Evaluation Sampling Location Map for GS10 Drainage Area

Table 8. Recent Uranium Flow-Paced Composite Sample Results

B5INFLOW		GS08		WALPOC		GS03	
Sample Period	Result (µg/L)	Sample Period	Result (µg/L)	Sample Period	Result (µg/L)	Sample Period	Result (µg/L)
1/18–4/11/11	13.5	3/24–3/26/11	7.9			3/24–3/26/11	8.0
4/11–5/4/11	9.1	3/26–3/28/11	7.5			3/26–3/28/11	9.1
5/4–5/13/11	14.6	3/28–3/30/11	7.9			3/28–3/31/11	9.2
5/13–5/18/11	11.9					3/31–5/20/11	3.3
5/18–5/19/11	8.0					5/20–9/12/11	2.4
5/19–5/20/11	10.3						
5/20–6/3/11	10.5						
6/3–7/1/11	6.2						
7/1–7/10/11	5.3						
7/10–7/11/11	4.7						
7/11–7/21/11	6.2						
7/21–8/24/11	12.2	9/12–9/15/11	5.6	9/12–9/15/11	6.9	9/12–9/15/11	6.1
8/24–9/29/11	11.2	9/15–9/18/11	5.4	9/15–9/18/11	6.3	9/15–9/18/11	6.9
		9/18–9/21/11	5.7	9/18–9/22/11	6.8	9/18–9/22/11	6.7
9/29–11/1/11	13.3	9/21–9/27/11	6.0	9/22–9/27/11	7.6	9/22–9/27/11	6.2
11/1/11–1/3/12	5.6	9/27–11/9/11	8.8	9/27–11/30/11	10.2	9/27/11–1/3/12	10.1
		11/9–11/29/11	8.5				
		11/29/11–1/5/12	10.2	11/30/11–1/3/12	12.7		
1/3–3/6/12	15.0	1/5–2/1/12	9.9	1/3–2/23/12	12.6	1/3–2/10/12	13.3
		2/1–4/4/12	11.9			2/10–2/23/12	13.7
				2/23–3/6/12	12.2	2/23–2/27/12	11.2
						2/27–3/1/12	11.4
3/6–3/23/12	17.4			3/6–3/21/12	14.2	3/1–3/15/12	13.1
3/23–4/13/12	13.2			3/21–4/13/12	14.1	3/15–4/4/12	14.2
4/13–5/21/12	8.90	4/4/12–	^a	4/13/12–	^a	4/4–6/6/12	11.3
5/21/12–	^a					6/6/12–	^a

Some results are preliminary and subject to revision.

^a Sample in progress



Plot includes unvalidated analytical data that are preliminary and subject to revision.

Figure 31. Average Uranium Concentrations at Locations Downstream of GS10

Table 9. Summary of Biweekly Uranium Grab Sampling in South Walnut Creek

South Walnut Creek		Uranium (ug/L)			
		Location Code	Average	Sample Count	85th Percentile
Upstream ↓ ↓ ↓ ↓	FC4750	21.5	21	25.0	19.0
	FC4991	13.7	23	22.7	11.0
	GS10	14.4	73	21.2	13.0
	B3OUTFLOW	15.7	57	23.0	17.0
	B5INFLOW	12.4	53	18.0	11.0
Downstream	B5 POND	8.23	75	10.9	7.30

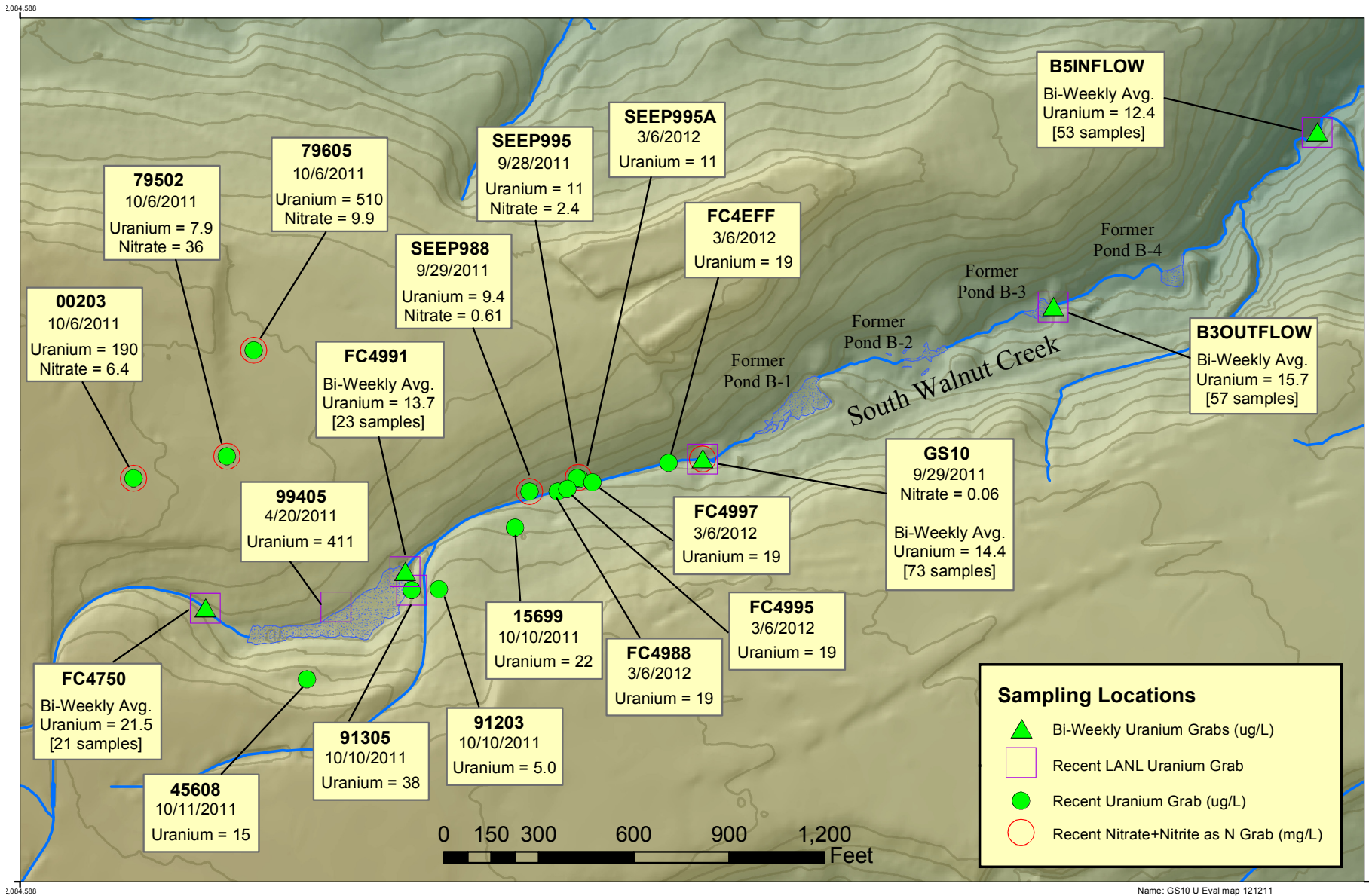


Figure 32. Uranium and Nitrate + Nitrite as N Results for Grab Samples Collected in South Walnut Creek

Name: GS10 U Eval map 121211

- Based on the above LANL results for GS10, the following additional samples were collected in the fall of 2011 and sent to LANL for isotopic analysis (the locations are shown on Figure 30):
 - Water from the routine flow-paced composite sample collected at GS10 during the period August 24–September 29, 2011, to help confirm the previous sample results.
 - Grab samples at FC4750 and FC4991 collected on September 28, 2011.
 - Water from the routine flow-paced composite sample collected at B5INFLOW during the period August 24–September 29, 2011. This location does not have previous LANL results.
 - A grab sample at B3OUTFLOW collected on September 27, 2011. One post-closure LANL sample has been collected at B3OUTFLOW. The result was a 74.7 percent natural uranium signature.
 - A grab sample at well 91305, which is upgradient of GS10, collected on October 10, 2011.

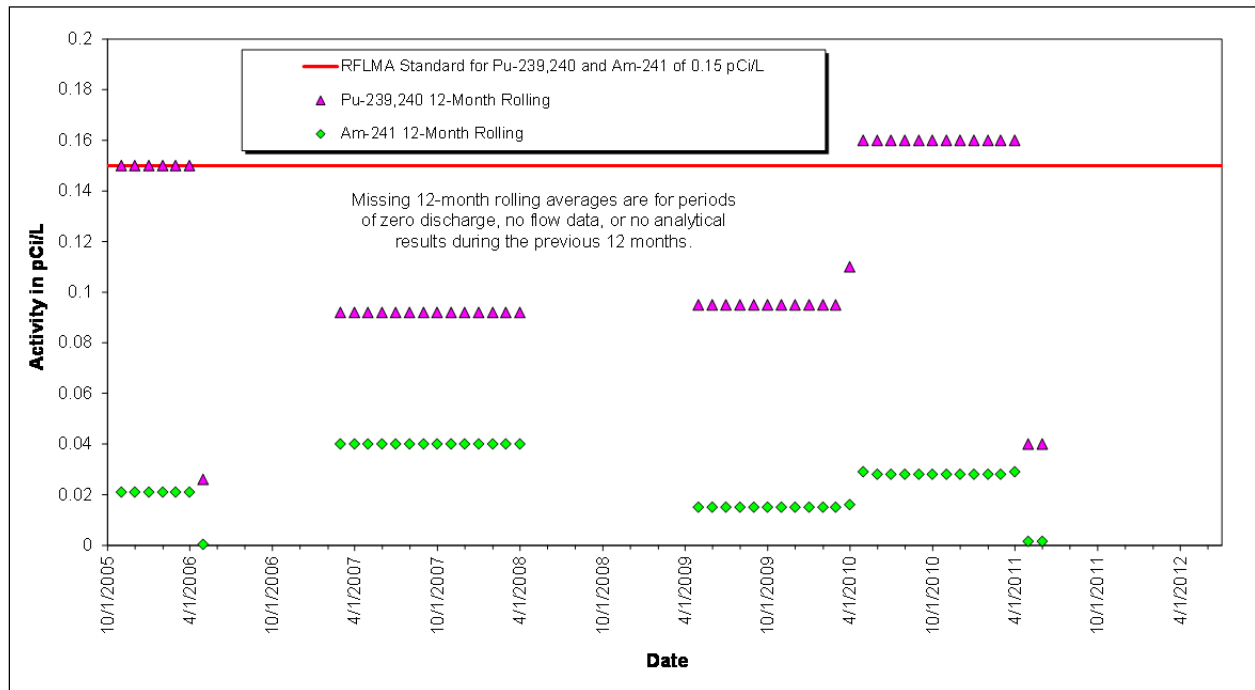
The results of the LANL analysis have been reported by LANL to Stoller staff. The following highlights are noted:

- The signature results for GS10 have returned to the historical natural uranium percentage of approximately 70 percent. Natural uranium was reported as 70.2 percent. The uranium concentration was 8.9 µg/L.
- The results for all of the other locations show natural uranium signatures between 70.9 and 90.8 percent. These results are consistent with historical data (where said data exist).
- Additional nonroutine grab samples have been collected to assist in the possible identification of a source that may have contributed to elevated uranium levels at GS10. The results are shown on Figure 32. These additional samples included the following:
 - Wells 15699, 45608, 91305, and 91203 were grab-sampled for uranium on October 10–October 11, 2011.
 - Wells 00203, 79502, and 79605 were grab-sampled for uranium and nitrate + nitrite as N on October 6, 2011.
 - GS10 and hillside seep locations SEEP988 and SEEP995 were also grab-sampled for uranium and nitrate + nitrite as N on September 28–September 29, 2011.
- Additional samples are scheduled to be sent to LANL for isotopic analysis in the near future. The locations are shown on Figure 30 and are described below:
 - Flow-paced surface-water sample from GS10 for the period March 6–21, 2012.
 - Flow-paced surface-water samples from WALPOC for the periods September 22–27, 2011; January 3–February 23, 2012; February 23–March 6, 2012; and March 6–21, 2012. Water from WALPOC has not been previously analyzed at LANL.

Updates to the ongoing evaluation for GS10 will periodically be communicated through public meetings, routine reports, and contact records. For additional information go to http://www.lm.doe.gov/Rocky_Flats/ContactRecords.aspx.

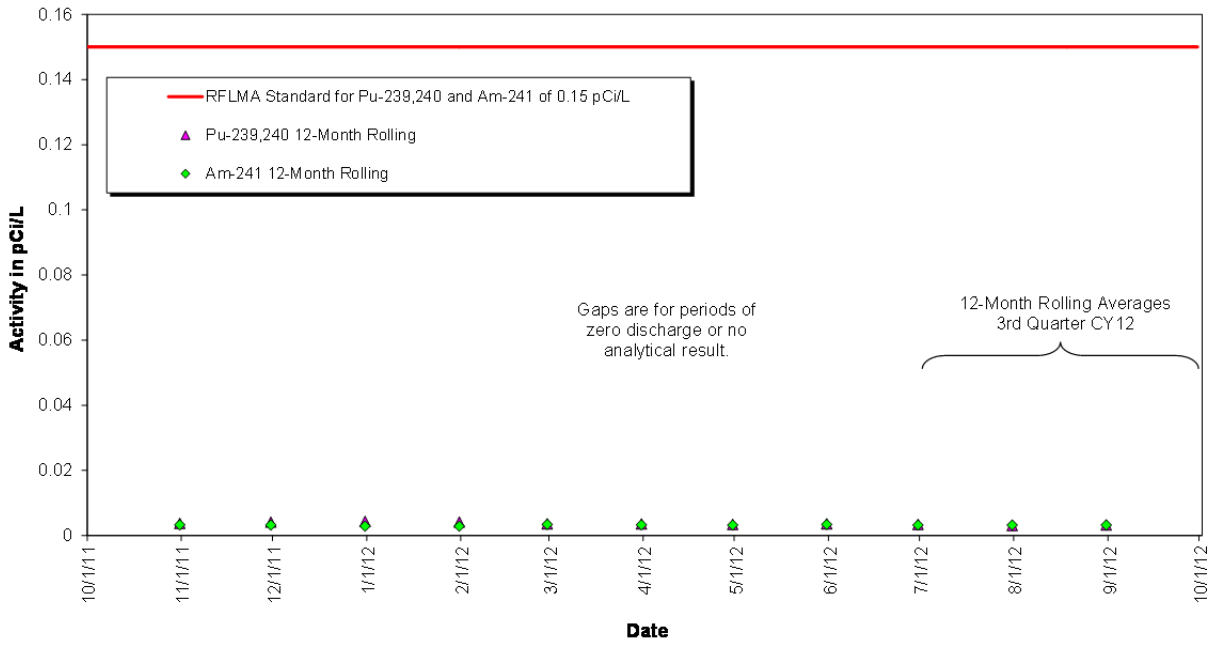
3.1.3.2 Monitoring Location SW027

Monitoring location SW027 is at the end of the South Interceptor Ditch at the inlet to Pond C-2. Since no samples have been successfully collected since 2010 (only 4,033 gallons of flow have been recorded at SW027 in the last 2.5 years), no 12-month rolling averages can be calculated for the year ending on September 30, 2012. Figure 33 and Figure 34 show water-quality data for plutonium, americium, and uranium from 2005 through the third quarter of CY 2012. The most recent 12-month rolling averages are all below the applicable standards. All other analytes were also not reportable for the quarter.



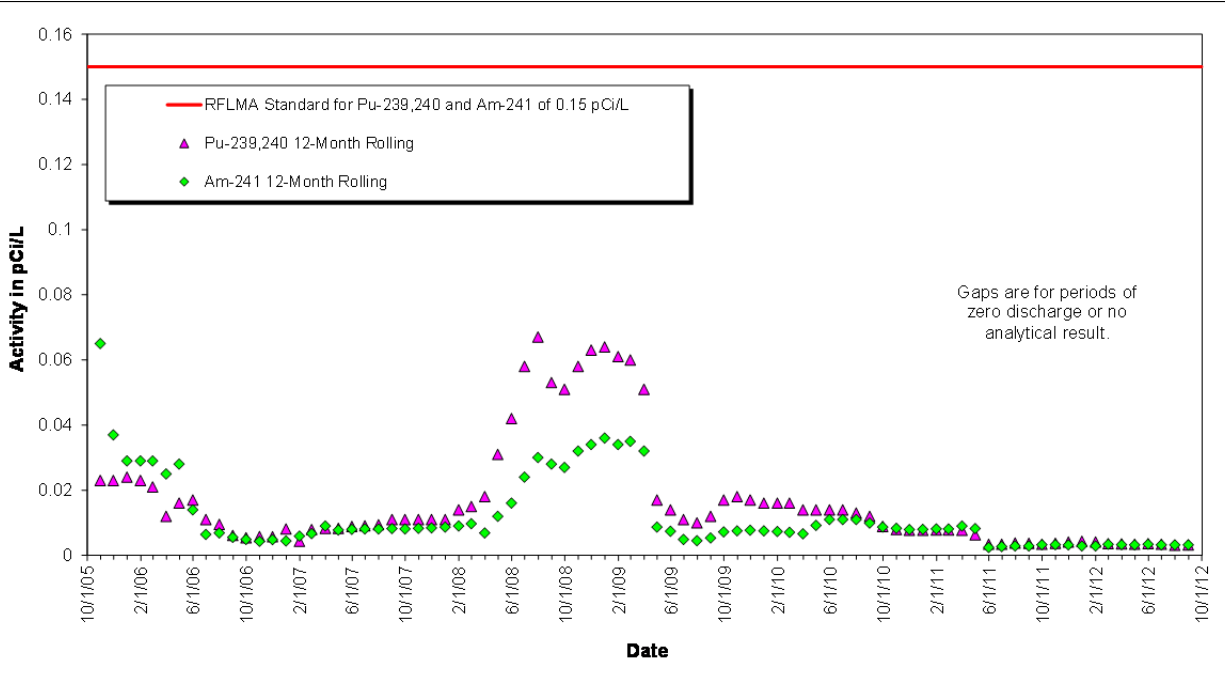
No samples have been successfully collected since 2010; only 4,033 gallons of flow have been recorded in the last 2.5 years.

Figure 33. Volume-Weighted 12-Month Rolling Average Plutonium and Americium Activities at SW027: Post-Closure Period Ending Third Quarter CY 2012



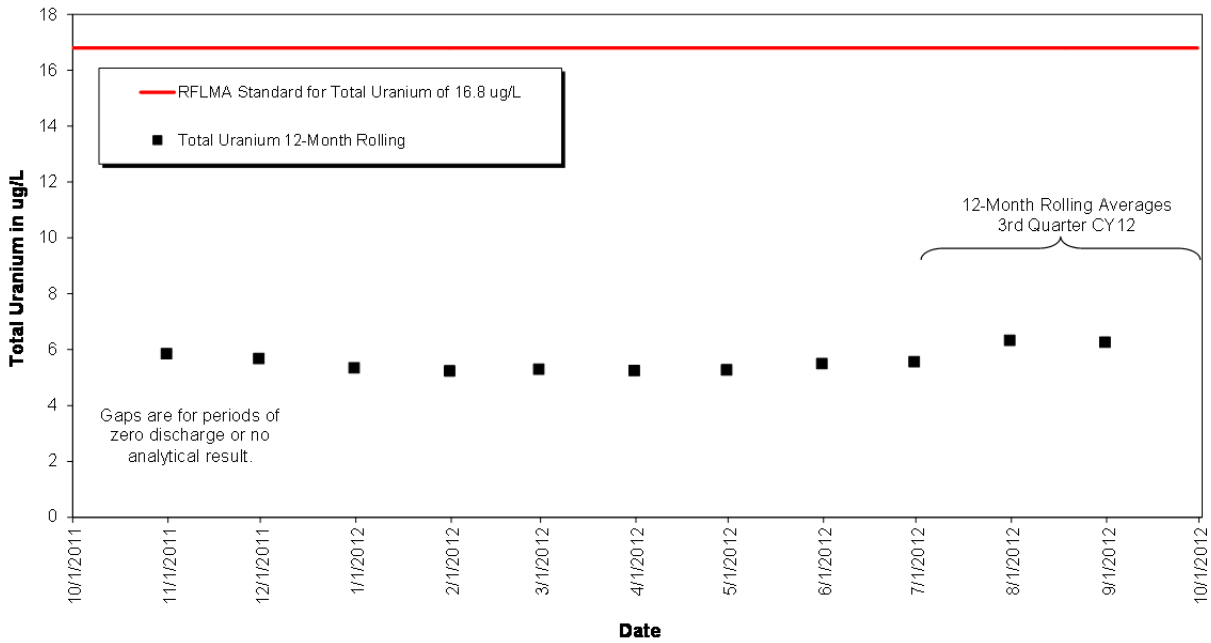
Results from the composite sample for the period September 12–November 15, 2012, have not been received.

Figure 35. Volume-Weighted 12-Month Rolling Average Plutonium and Americium Activities at SW093: Year Ending Third Quarter CY 2012



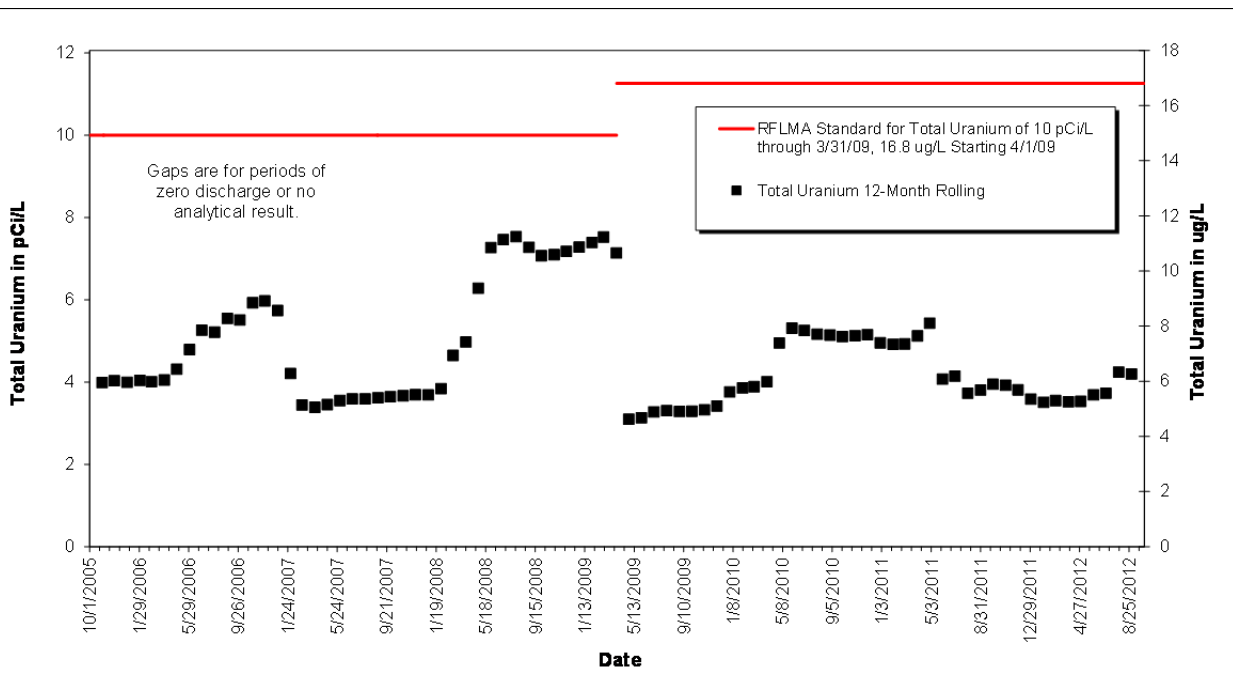
Results from the composite sample for the period September 12–November 15, 2012, have not been received.

Figure 36. Volume-Weighted 12-Month Rolling Average Plutonium and Americium Activities at SW093: Post-Closure Period Ending Third Quarter CY 2012



Results from the composite sample for the period September 12–November 15, 2012, have not been received.

Figure 37. Volume-Weighted 12-Month Rolling Average Total Uranium Concentrations at SW093: Year Ending Third Quarter CY 2012



Results from the composite sample for the period September 12–November 15, 2012, have not been received.

Figure 38. Volume-Weighted 12-Month Rolling Average Total Uranium Concentrations at SW093: Post-Closure Period Ending Third Quarter CY 2012

3.1.4 AOC Wells and Surface Water Location SW018

The AOC wells and SW018 were not scheduled for RFLMA monitoring in the third quarter of CY 2012.

3.1.5 Sentinel Wells

The Sentinel wells were not scheduled for RFLMA monitoring in the third quarter of CY 2012.

3.1.6 Evaluation Wells

The Evaluation wells were not scheduled for RFLMA monitoring in the third quarter of CY 2012.

3.1.7 PLF Monitoring

All RCRA groundwater monitoring wells at the PLF were sampled during the third quarter of CY 2012. Analytical results (Appendix B) were generally consistent with past samples and will be discussed and statistically evaluated as part of the annual report for CY 2012. Section 3.1.9.4 discusses monitoring the PLFTS.

3.1.8 OLF Monitoring

All RCRA groundwater monitoring wells at the OLF were sampled during the third quarter of CY 2012. Analytical results (Appendix B) were generally consistent with past samples and will be discussed and statistically evaluated as part of the annual report for CY 2012.

During the third quarter of CY 2012, when routine surface water sampling was performed in Woman Creek downstream of the OLF (GS59), all analytical results were less than the applicable surface water standards.

3.1.9 Groundwater Treatment System Monitoring

As described in Section 2.2, contaminated groundwater is intercepted and treated in four areas of the Site. The MSPTS, ETPTS, and SPPTS include a groundwater intercept trench. Groundwater entering the trenches is routed through a drainpipe into one or more treatment cells, where it is treated and then discharged to the subsurface. The PLFTS treats water from the northern and southern components of the Groundwater Intercept System and flow from the PLF seep.

3.1.9.1 Mound Site Plume Treatment System

MSPTS monitoring locations were not scheduled for RFLMA sampling in the third quarter of CY 2012. However, non-RFLMA samples were collected at the MSPTS to support continued optimization of the air stripper. The associated results (Appendix B) will be discussed in the annual report for 2012.

3.1.9.2 East Trenches Plume Treatment System

ETPTS monitoring locations were not scheduled for RFLMA sampling in the third quarter of CY 2012.

3.1.9.3 Solar Ponds Plume Treatment System

SPPTS monitoring locations were not scheduled for semiannual RFLMA sampling in the third quarter of CY 2012. However, other samples were collected at the SPPTS, some to support the Adaptive Management Plan (DOE 2011) and others to support continued testing of a small-scale uranium treatment component (referred to as a “microcell”) and small-scale nitrate treatment via lagoons. As stated in Section 2.2.3, both of these testing efforts will continue for some time. Additional information and discussion on these tests will be provided in the annual report for 2012. Appendix B contains the results from the third quarter samples collected in accordance with RFLMA protocols.

3.1.9.4 PLF Treatment System

During collection of the July 18, 2012, sample at the system influent (monitoring location PLFSEEPINF), the flow rate was 1.3 gallons per minute. Breaching of the PLF Dam was completed in June 2012, and since then any PLF effluent flows through the remaining wetland area. This flow configuration is now essentially equivalent to the historic open valve configuration.

During the third quarter of CY 2012, all routine sampling of the treated effluent exiting the system (monitoring location PLFSYSEFF) showed results below the RFLMA standards.

3.1.10 Pre-Discharge Monitoring

Pre-discharge samples are collected prior to opening the valves to initiate a discharge period at Ponds A-4, B-5, and C-2 on North Walnut Creek, South Walnut Creek, and Woman Creek, respectively.

No pre-discharge samples were collected at Ponds A-4, B-5, or C-2 during the third quarter of CY 2012. All three ponds were operated in a flow-through configuration during the entire quarter.

4.0 Adverse Biological Conditions

No evidence of adverse biological conditions (e.g., unexpected mortality or morbidity) was observed during monitoring and maintenance activities in the third quarter of CY 2012.

5.0 Ecology Monitoring

During the third quarter of CY 2012, Preble's meadow jumping mouse (PMJM) mitigation monitoring and wetland mitigation monitoring were conducted. The PMJM monitoring data were summarized and delivered to the U.S. Fish and Wildlife Service (USFWS) in the *Preble's Meadow Jumping Mouse Mitigation Monitoring Report for Biological Opinion ES/LK-6-CO-04-F-012 – 2012 Annual Report* (DOE 2012c). This report was delivered to USFWS on November 19, 2012. The wetland monitoring data will be summarized and delivered in two reports. As part of the Nationwide Permit #43 that was used to breach the PLF and A-3 dams, an annual wetland mitigation monitoring report for the mitigation wetlands at those locations is due to the USACE on December 31, 2012. Another report, the *2012 Rocky Flats Site Annual Wetland Mitigation Monitoring Report*, is due to the EPA on March 1, 2013. A brief summary of the information from these reports will be included in the annual report for CY 2012. Other ecological monitoring conducted during the third quarter included revegetation monitoring, weed mapping, PLF/OLF quarterly vegetation surveys, nest box surveys, prairie dog surveys, and photopoint monitoring.

Approximately 96 acres were treated this fall with herbicides to control noxious weeds in the COU. Several dozen small Russian olive trees and a few saltcedar (tamarisk) plants throughout the COU were also treated with herbicides to kill the plants. The former road between the A-3 pond and PLF pond was ripped and revegetated to return it to native prairie. Several roadside edges/centers were mowed to reduce wildfire potential, and some other off-road locations were mowed to control weeds. Thirty-six woody plants were installed on the SPPTS hillside in spring 2012 to increase habitat diversity on the hillside. Supplemental watering was continued throughout the summer and fall to increase the potential for successful establishment of the plants.

6.0 References

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DOE, EPA, and CDPHE (U.S. Department of Energy, U.S. Environmental Protection Agency, and Colorado Department of Public Health and Environment), 2011. *Corrective Action Decision/Record of Decision Amendment for Rocky Flats Plant (USDOE) Central Operable Unit*, U.S. Department of Energy, U.S. Environmental Protection Agency, and Colorado Department of Public Health and Environment, September 21.

ROCKY FLATS STEWARDSHIP COUNCIL

P.O. Box 17670
Boulder, CO 80308-0670
www.rockyflatssc.org

(303) 412-1200
(303) 600-7773 (f)

Jefferson County -- Boulder County -- City and County of Broomfield -- City of Arvada -- City of Boulder
City of Golden -- City of Northglenn -- City of Thornton -- City of Westminster -- Town of Superior
League of Women Voters -- Rocky Flats Cold War Museum -- Rocky Flats Homesteaders
Arthur Widdowfield

MEMORANDUM

TO: Board
FROM: Rik Getty
SUBJECT: Briefing by DOE and CDPHE on off-site contamination and decision to delist
DATE: January 23, 2013

We have scheduled 45 minutes for DOE and CDPHE to brief the Board on the 1996 decision to delist from the CERCLA superfund list lands adjacent to Rocky Flats. As this memo explains, these lands do contain very low-levels of contamination, primarily plutonium (Pu).

At the September 10, 2012, meeting, a board member asked about Pu contamination on lands adjoining Rocky Flats. While his specific question concerned lands south of Rocky Flats, it became clear in the ensuing conversation that the topic of radioactive contamination, which originated at Rocky Flats, being found outside the boundaries of the site continues to draw interest in the surrounding communities.

Background on off-site contamination

The primary mechanism for off-site dispersal of radioactive contamination was by wind. Some contamination was also spread via surface water run-off. These pathways correspond to the findings of the Actinide Migration Evaluation, which the board discussed at the June meeting. Simply put, there is contamination on off-site lands.

The key, albeit not exclusive questions to understand, are:

1. Where is the contamination found?
2. At what levels is contamination found?
3. What is the risk?
4. Where can people learn about off-site contamination and associated risk

According to DOE, the greatest single source of off-site contamination resulted from failed attempts to remediate the 903 pad in the late 1960s. The contamination arising from this area was more than the airborne contamination released in the 1957 Building 771 fire, and the 1969 Building 776 fire.

At the 903 pad, an area in the southeast part of the former Industrial Area, more than 5,000 drums of contaminated liquid wastes were stored outside. Of these 5,000 drums, approximately

3,500 were Pu-contaminated drums, and 1,500 were U-contaminated drums. Many of these drums leaked, resulting in an estimated 5,000 gallons of waste contaminated, with 150 grams of Pu, seeping into the soil. (The 150 grams of Pu is only a rough estimate, the actual amount could be much higher.) High winds and rain spread the radioactive contamination, while the VOCs seeped into the ground and reached groundwater tables. The spread of the radioactive contamination primarily to the east and southeast of the storage area resulted with the contaminated land being known as the 903 “Lip Area.”

It took the Atomic Energy Commission (AEC; DOE predecessor agency) until 1968 to completely remove the drums from the 903 drum storage area, install clean fill on top of the most contaminated area, and then cover it with an asphalt pad (about 146,000 square feet). Thus the 903 Pad name. The AEC transferred the contents of leaking drums into new drums and shipped them to the production facilities for inside storage.

Due to the leaking drums and spread of Pu contamination, the soils of the 903 Area (Pad and Lip Areas) became some of the most contaminated soils at Rocky Flats. It also led to contamination of off-site lands.

The other significant event contributing to offsite contamination occurred from 1970 to 1973 in which sediments from the Walnut Creek detention ponds were released during a re-engineering project. These sediments were suspended during construction and subsequently flowed into Great Western Reservoir. Plutonium has also been found in the sediments of Standley Lake Reservoir.

Investigation into contamination of off-site lands

In the 1970s, the AEC began to examine the airborne dispersal of contamination eastward and southeastward (prevailing wind directions) towards the site boundary at Indiana Street and onto off-site areas, particularly east and south of the site. Many soil samples were obtained for analysis. In addition to AEC testing, academic researchers began to gather soil samples. The head of the Jefferson County health department, Dr. Carl Johnson, also initiated a series of studies on both off-site soil characterization for radioactive contamination, and cancer rates in the population of surrounding areas. By the 1980s, many more samples were collected on the site as well as off-site. By the time serious environmental characterization and remediation efforts began at the site in the 1990s, a number of soil characterization studies of site and off-site areas had been conducted.

1993-1994 Citizen Sampling Study

One of the better known studies was performed by a group of concerned citizens in 1993 and 1994. Their work was catalogued in a report titled the *Soil and Sediment Study Summary by the Citizens' Environmental Sampling Committee* (CESC). The CESC the executive summary can be found at:

http://www.lm.doe.gov/cercla/documents/rockyflats_docs/OU03/OU03-A-000585.pdf).

The following is an excerpt from the executive summary:

The CESC study was designed to fill gaps where there were no existing data or where data were in question, and to generate a data set that could be used for comparison with results of other off-site sampling studies.

The CESC selected 28 soil-sampling sites, most of which were within a five to six mile radius of the Rocky Flats Plant. At each site, two samples were collected: one surface soil sample (0 to 1 inch deep) and one soil core sample (0 to 8 inches deep). In addition, one sediment core sample, divided into 10 one-inch layers, was taken at Standley Lake, a reservoir southeast of the Rocky Flats Plant. This reservoir serves as a drinking water supply for three nearby communities. Samples were analyzed for isotopes of plutonium (plutonium-238, plutonium-239,240) americium (americium-241), cesium (cesium-137), strontium (strontium-90) and uranium (uranium-235, uranium-238).

The sampling results confirm conclusions from past soil studies: plutonium was released by the Rocky Flats Plant to the nearby off-site environment, generating soil concentrations above the upper limit of background expected from nuclear weapons testing fallout. The elevated plutonium values correspond in magnitude and location to those reported by other researchers, but the scope of this study cannot exclude the possibility of having missed hot spots.

Care must be exercised in drawing further conclusions from this and similar studies. The CESC study was not designed to estimate total contaminant releases from the Rocky Flats Plant. However, it was intended to produce a picture of off-site conditions at specific locations at the time of sampling. An inventory of total amounts of plutonium released from the Rocky Flats Plant cannot be derived from such environmental studies.

High-wind events typical of the Rocky Mountain Front Range area are known to resuspend and further disperse contaminants in soil. The amount of plutonium moved over the years by this mechanism, as well as exposure to people during these wind events, cannot be determined by static soil sampling. Complete analyses of these potential exposures and corresponding risks from historical releases of radionuclides from the Rocky Flats Plant will be estimated in the final reports of the parent project, the Historical Public Exposures Studies.

The key contributions made by the CESC sampling study are:

1. unique participation by citizens in designing and implementing the study independent of government influence, and
2. collection of additional soil and sediment data that can be added to existing sampling data sets of the off-site environment surrounding the Rocky Flats Plant.

The CESC data from locations that had not been sampled previously create a better understanding of the environment surrounding the Rocky Flats Plant. The CESC data from sites that have been sampled in the past by other studies are available for purposes of comparison with these other studies.”

Pu was detected above background levels in surface soil samples (0.084 picocuries per gram of soil, pCi/g) at 6 of the 28 locations. The Pu levels ranged from 0.09 pCi/g to 4.5 pCi/g (location

east of site near Great Western Reservoir.) These Pu concentrations are consistent with what other studies reported.

Regulatory Path taken for investigation of Off-site Areas

In the early 1990s, DOE, EPA, and CDPHE began characterizing the nature and extent of contamination, both radioactive and non-radioactive, in the off-site areas which are named OU3 (Operable Unit 3; CERCLA nomenclature for an area under investigation for potential environmental remediation). Since Rocky Flats fell under both federal environmental regulations—Resource Conservation and Recovery Act (RCRA) hazardous waste regulations and CERCLA Superfund regulations—and state regulations—Colorado Hazardous Waste Act (CHWA)—a joint regulatory approach was taken by the three parties.

The OU3 studies focused on the impact of contaminants that had been released onto offsite areas. The process resulted in the DOE and the regulators issuing the OU3 Offsite Areas RCRA Facility Investigation/Remedial Investigation (RFI/RI) Report. The report represented the culmination of twenty-five years of studies and investigations designed to assess the nature and extent of contamination on OU3 offsite areas. The objective of the nature and extent assessment was to collect information necessary to determine the risk posed by contaminants released to the offsite areas, and their impact on human health and the environment. The determination of this risk provided a basis for making remedial action or risk management decisions.

OU3 Remedial Investigation

The following three links are to the three volumes of the RFI/RI report.

1. Volume 1, 26 MB, 291 pages
http://www.lm.doe.gov/cercla/documents/rockyflats_docs/OU03/OU03-A-000465.pdf
2. Volume 2, 22 MB, 467 pages
http://www.lm.doe.gov/cercla/documents/rockyflats_docs/OU03/OU03-A-000466.pdf
3. Volume 3, 26 MB, 578 pages
http://www.lm.doe.gov/cercla/documents/rockyflats_docs/OU03/OU03-A-000467.PDF

While OU3 technically included areas north, south, east, and west of the Rocky Flats boundary, a working definition of OU3 was developed to envelop suspected contaminated areas and to focus the remedial investigation on areas where previous data have indicated the presence of measurable contamination (Figure 1-2, attached, I apologize for the image quality of Figure 1-2 but many DOE documents are not high-resolution and this is the best I can obtain). These areas encompass approximately 38-square miles north, south, and primarily east of Rocky Flats. Sampling results indicated that areas west of Rocky Flats were representative of background conditions because it is upgradient from the prevalent wind direction, and upgradient with respect to groundwater and surface water drainage patterns. These areas were thus not the central focus on the OU3 analyses.

OU3 Proposed Plan

Based on extensive technical evaluations of soil and sediment characterization in the RFI/FFI report, in 1996 DOE released its Proposed Plan for the OU3 off-site areas. The Proposed Plan can be found at the following link:

http://www.lm.doe.gov/cercla/documents/rockyflats_docs/OU03/OU03-A-000471.PDF

The following is a short excerpt from the Proposed Plan.

The preferred remedial alternative proposed in this plan for OU3 is No Action (no remedial action taken). In accordance with the IAG, RFCA, EPA and CDPHE guidance, a No Action decision is appropriate at sites where a previous removal action or natural environmental processes mitigate the likelihood of an adverse effect on the health of a human or ecological population as a result of exposure to chemical and/or radiological constituents. Results of the ***RCRA Facility Investigation/Remedial Investigation (RF/RI)*** performed at OU3 show that OU3 meets risk standards promulgated by EPA and CDPHE as being protective of human health and the environment both now and in the future.

The Proposed plan document reports the highest value of Pu contamination to be 6.47 pCi/g at a location about 1,800 feet east of Indiana Street (similar to what the CESC study reported for their highest off-site Pu value). From an EPA risk assessment analysis, the excess cancer risk in a residential scenario would be about three in one million (three incidences of cancer in a population of one million). This risk was within acceptable EPA range at that time. For a recreational scenario the risk would be much lower, five in 50 million.

Final Site Remediation Documents for OU3

Following the release of the Proposed Plan for public comment, another series of regulatory activities occurred. These were the Corrective Action Decision (CAD) and the Record of Decision (ROD) known together as the CAD/ROD. Issuance of the CAD/ROD in short signaled the end of the regulatory cleanup for OU3.

The final 26-page CAD/ROD report resulting in a selection of no remedial actions for the OU3 offsite areas can be found at:

http://www.lm.doe.gov/cercla/documents/rockyflats_docs/OU03/OU03-A-000551.PDF

The following is excerpted from the CAD/ROD.

DESCRIPTION OF THE SELECTED REMEDY

The selected remedy for OU3 is no action. Based upon the Baseline Risk Assessment and the Environmental Risk Assessment contained in the RCRA Facility Investigation/ Remedial Investigation (RFI/RI) Report of June 1996, DOE, the lead agency under CERCLA for OU3, concludes that no action is appropriate for OU3. The RFI/RI Report concludes that all IHSS's within OU3 are already in a state protective of human health and the environment. The NCP provides for the selection of a no action remedy when an OU is in such a protective state. Therefore, no remedial action regarding OU3 or any of its constituent IHSS's is warranted.

DECLARATION STATEMENT

DOE, in consultation with CDPHE and EPA, has determined that no remedial action is necessary for OU3 to be protective of human health and the environment. No hazardous substances, pollutants or contaminants will remain within the boundaries of OU3 above levels that allow for unlimited use and unrestricted exposure, as these levels have been calculated in the OU3 RFI/RI Report. Since no national health-based standards have been

promulgated for the radioactive contaminants remaining in OU3, this Corrective Action Decision/Record of Decision will be reviewed in five years, consistent with CERCLA Section 12 1(c), to ensure consistency with such a national standard, if one is later promulgated. Since the conclusions contained in this Corrective Action Decision/Record of Decision are in part dependent upon calculated radiation exposure levels, the Corrective Action Decision/Record of Decision will additionally be reviewed if necessary, consistent with CERCLA Section 12 1 (c), to ensure consistency with any revisions to those calculated levels that may result from new regulations, or improved calculation methods or modeling parameters.”

Agency for Toxic Substances and Disease Registry (ATSDR)

In addition to the findings of the exhaustive RFI/RI report, DOE requested an independent review of the decision for no remedial action in OU3 by an agency of the U.S. Public Health Service, titled the Agency for Toxic Substances and Disease Registry (ATSDR). The short 6-page ATSDR letter can be found at:

http://www.lm.doe.gov/cercla/documents/rockyflats_docs/OU03/OU03-A-000530.PDF

I have excerpted two sections of the report as follows:

BACKGROUND AND STATEMENT OF ISSUES

The U S Department of Energy (DOE) Rocky Flats Field Office (RFFO) requested that the Agency for Toxic Substances and Disease Registry (ATSDR) review and provide public health comments on the Rocky Flats Environmental Technology Site Operable Unit 3 (OU3) Final Remedial Investigation (RI) report [RMRS, 1996]. In the specific request for this health consultation, the RFFO requested that ATSDR review the contaminant data and interpretation of the Human Health Risk Assessment portion of the RI. They further requested that ATSDR’s health consultation focus on the adequacy of the selection of the contaminants of concern for OU3 and, based on these contaminants, the selection of the proposed action for the OU [DOE, 1996]. In determining the contaminants of concern, the analyses included metals, pesticides, volatile chemicals and radiological materials. The environmental media sampled included soils, surface water and groundwater. RFFO states that based on their analyses, the only contaminants of concern are plutonium and americium [DOE, 1996].

CONCLUSIONS

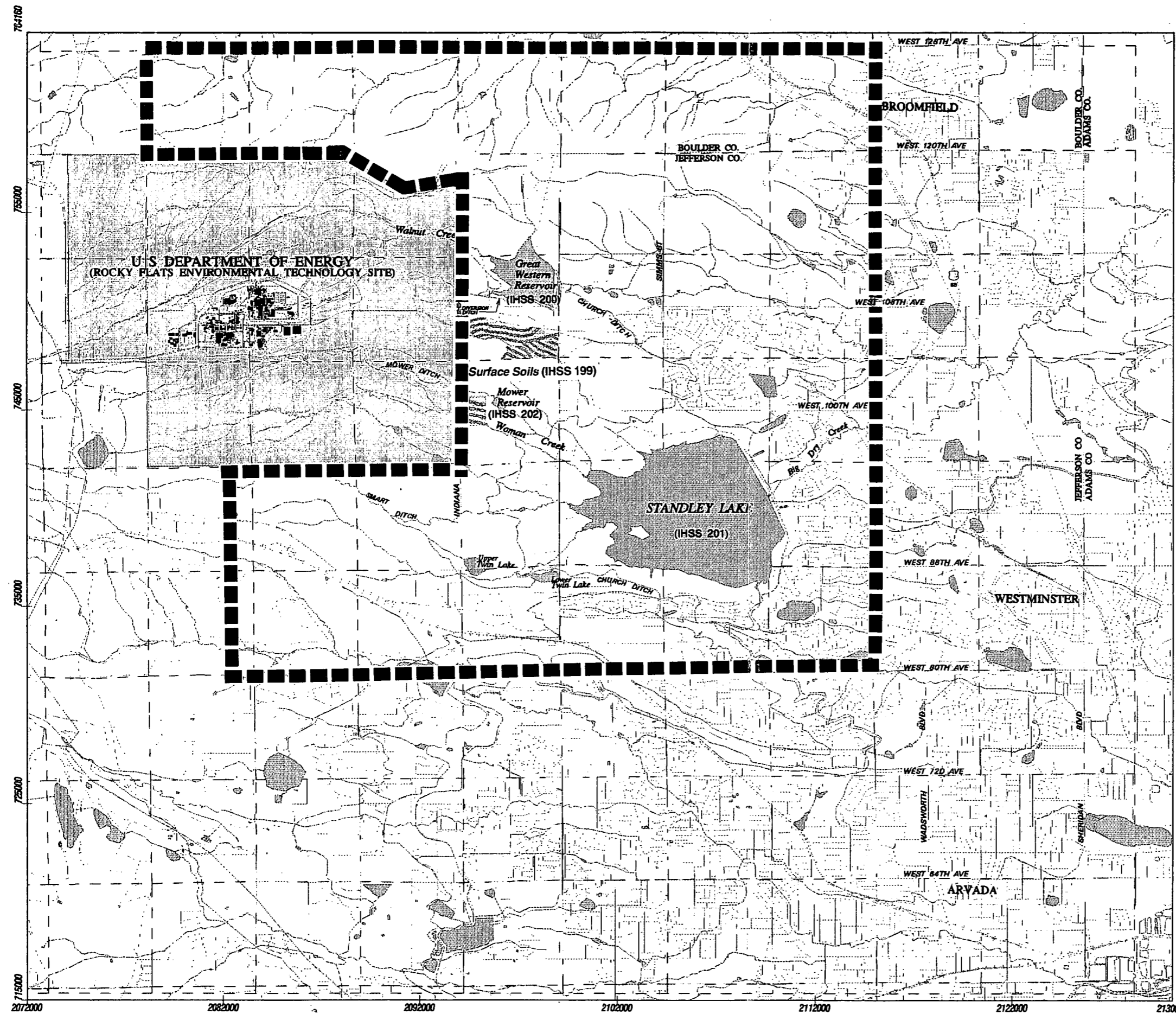
1. The concentration of heavy metals in environmental media (surface water, groundwater, and soils) are present at levels below health concern.
2. Concentrations of the radioisotopes, uranium and radium, are present at naturally occurring concentrations and are not expected to result in any adverse health effects.
3. The concentrations of most of the radioisotopes associated with either fallout or fission processes are not at levels of health concern. These isotopes include various Cesium and strontium isotopes.
4. The concentrations of plutonium and americium in surface water and groundwater are well below the proposed drinking water standards and are not considered health concerns.
5. Evaluation of radioactive constituents detected in the OU3 indicates that these levels do not pose a public health concern.

Based on these determinations by ATSDR, we agree with the findings of the Department of Energy in their Human Health Risk Assessment in that the selection of the DOE contaminants of concern were based on reasonable assumptions. Furthermore, additional evaluation of these contaminants indicates that no additional activities are needed by the Department of Energy to ensure the public's health.

Please contact me if you have any questions regarding this memo.

Figure 1-2
Operable Unit 3 Location Map

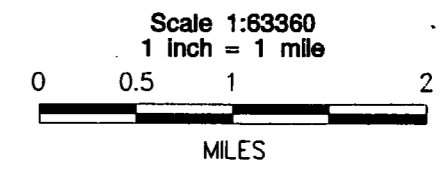
ROCKY FLATS
ENVIRONMENTAL TECHNOLOGY SITE
U.S. Department of Energy



OU3 Study Area
 untilled Remydy Lands Area
 tilled (IHSS 199)

Note: The OU3 study area shown is not intended to represent a definitive boundary and is subject to change.

Mapping Sources:
Jefferson County Mapping Dept.
EG&G Rocky Flats, Inc.
U.S. Geological Survey



Polyconic projection. 1927 North American datum.
Colorado central zone state plane coordinate system.

