
Overview of the Third Quarter 2011 Surveillance and Maintenance Report for the LM Rocky Flats Site

July–September 2011



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Pond Operations – Third Quarter 2011

- Terminal Pond Discharges:
 - Valves at both A-4 and B-5 were opened on 9/12/11; A-4 and B-5 are now operated in a flow-through mode
- Transfers:
 - A-3 in flow-through to A-4
- Pond Levels:
 - As of October 1, 2011, Ponds A-3, A-4, B-5, and C-2 and the Landfill Pond were holding approximately 8.4 MG (8.5 percent of capacity)



January 13, 2012, Pond Levels

- Landfill (~6.0 percent)
- A-3 (0.0 percent)
- A-4 (9.6 percent)
- B-5 (10.2 percent)
- C-2 (2.4 percent)



Hydrologic Data – Third Quarter 2011

- Precipitation
 - 5.25 inches total precipitation
 - 129 percent of WY 1993–2010 average
- Flow rates (percentage of WY average)
 - GS01 (87 percent)
 - GS03 (96 percent)
 - GS10 (65 percent)
 - SW027 (no flow)
 - SW093 (128 percent)



Performance Monitoring – Third Quarter 2011 Original and Present Landfills

- **Original Landfill (OLF):** surface water quality results were all below standards for the quarter
- **Present Landfill (PLF):**
 - Both arsenic and selenium concentrations were above standards in the sample collected on July 26, 2011, from location PLFSYSEFF, triggering monthly sampling
 - Both arsenic and selenium concentrations were below standards in the first monthly sample collected on August 24, 2011, resulting in the discontinuation of monthly sampling



Changes to Points of Compliance

- RFLMA Attachment 2 modification for changes to monitoring locations was approved by CDPHE and EPA on May 2, 2011
- Designation of new Point of Compliance (POC) WALPOC inside the Central Operable Unit (COU) boundary, removing GS08 and GS11 as POCs in Walnut Creek, after completion of installation of the new flume for WALPOC
- Designation of new POC WOMPOC in Woman Creek inside the COU boundary, removing GS31 as a POC at the outfall of the Pond C-2 upstream of WOMPOC, after completion of installation of the new flume for WOMPOC

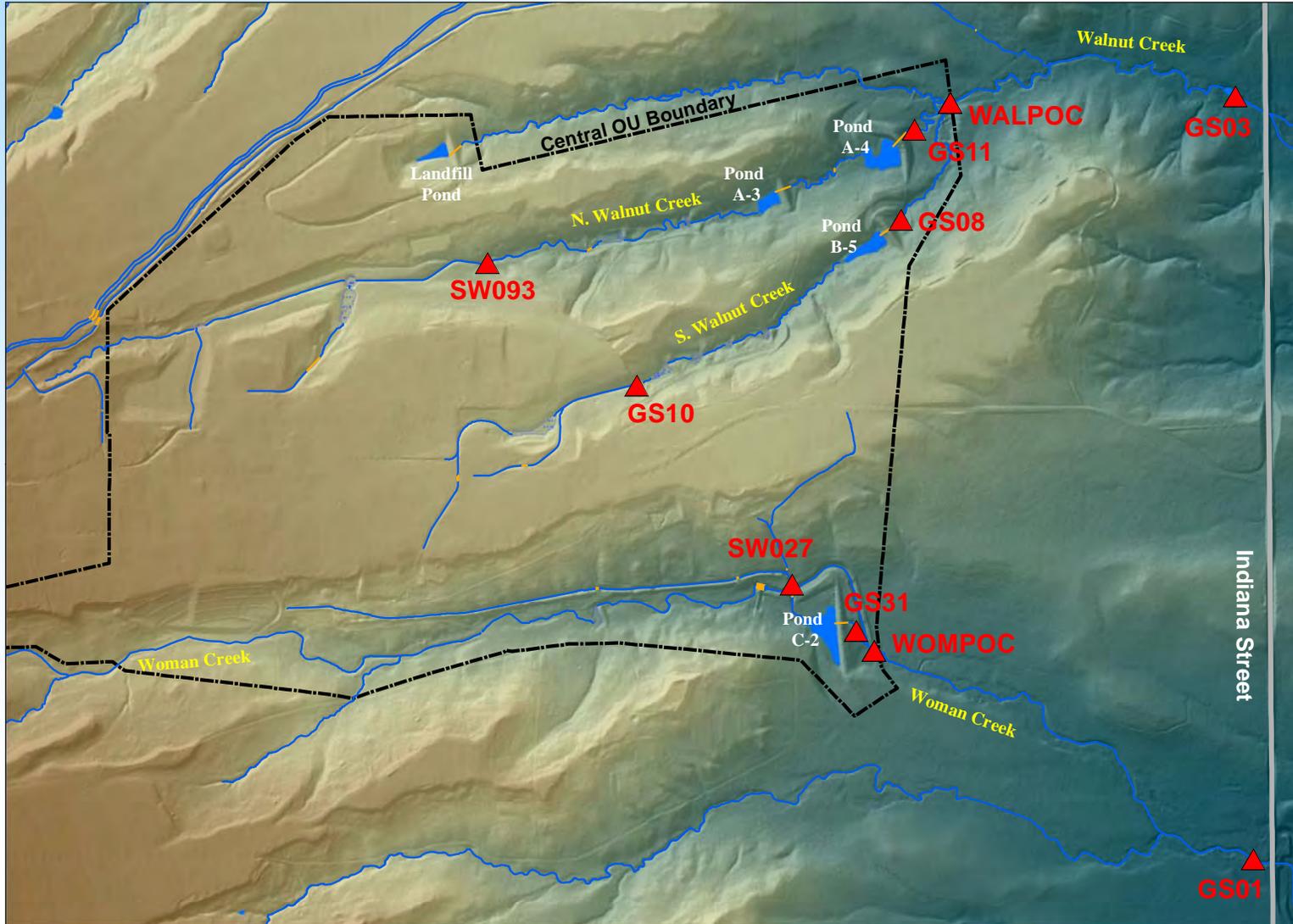


Changes to Points of Compliance (continued)

- DOE notified CDPHE and EPA on September 9, 2011, that construction was completed for WALPOC and provided notice on September 28, 2011, that construction was completed for WOMPOC
- Non-RFLMA monitoring of GS08, GS11, and GS31 continuing per Adaptive Management Plan
 - Results reported in AMP quarterly reports — posted to Rocky Flats website last day of month following end of quarter
 - Annual AMP status report using data validated as of December 31 each year — posted by end of February



Selected Surface Water Monitoring Locations

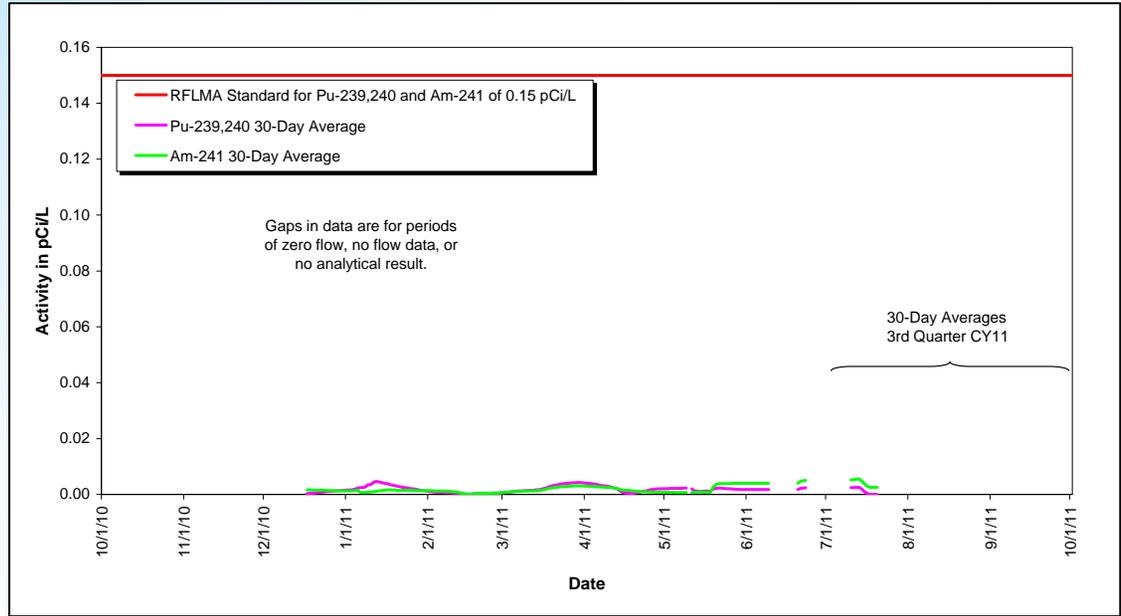


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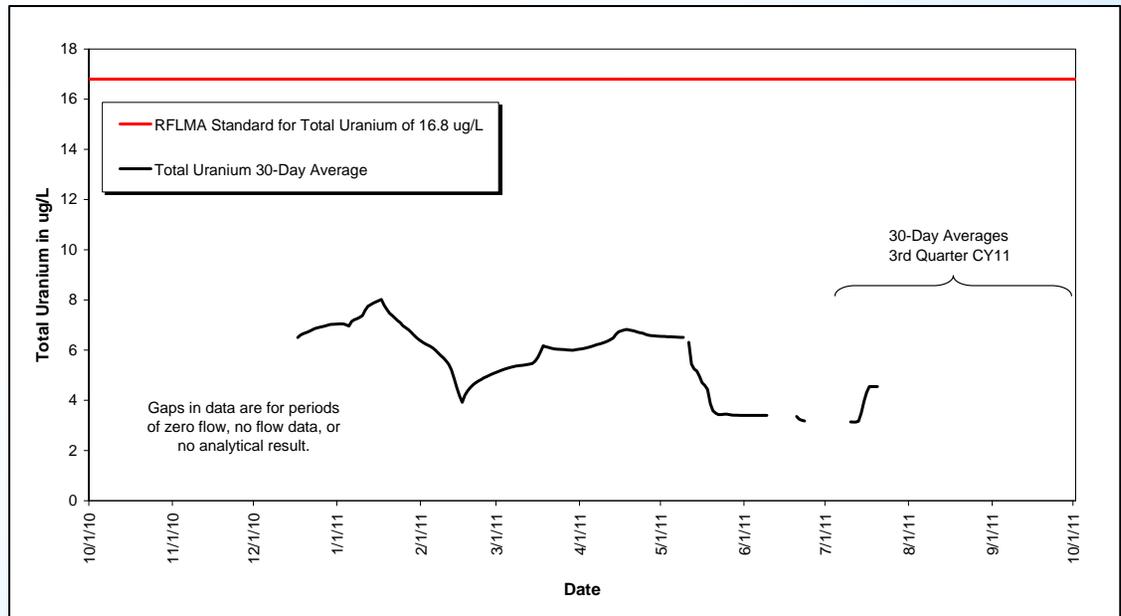
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POC GS01

■ Plutonium and Americium

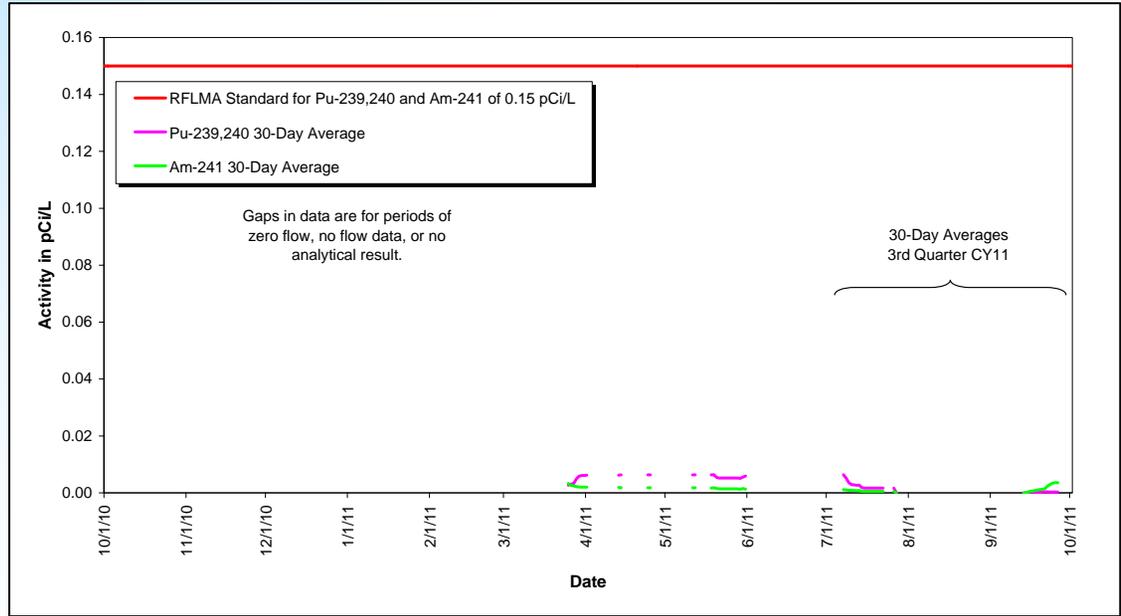


■ Total Uranium

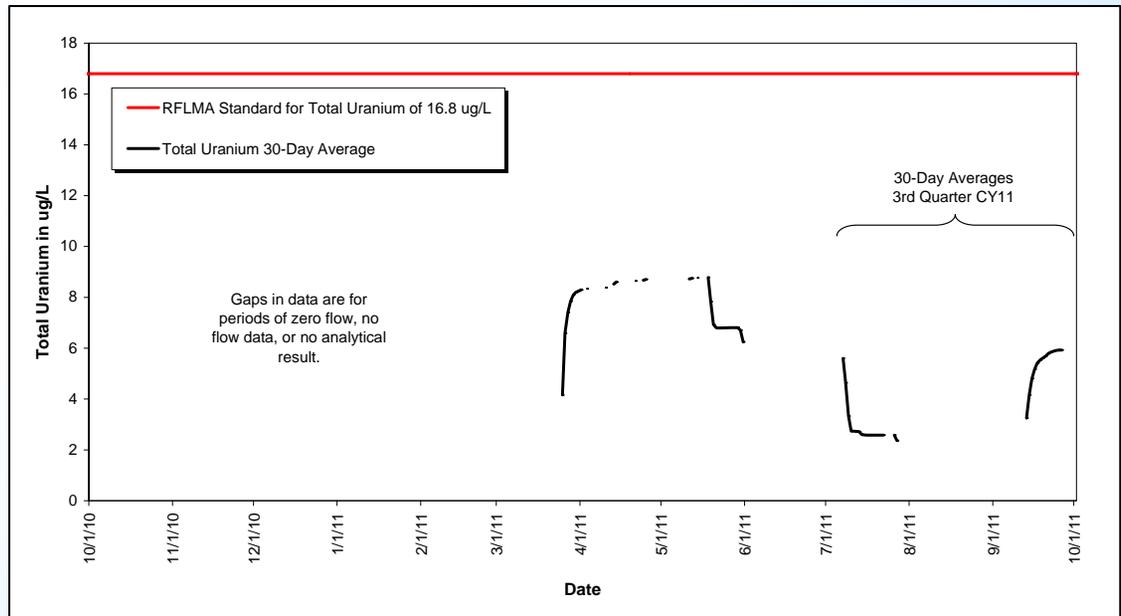


POC GS03

■ Plutonium and Americium

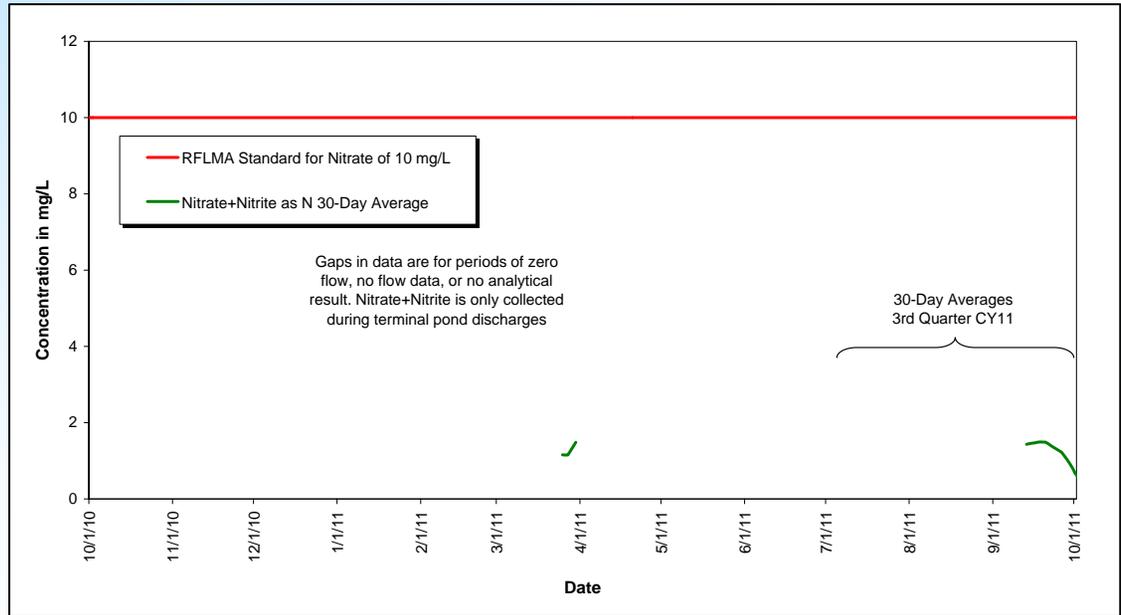


■ Total Uranium



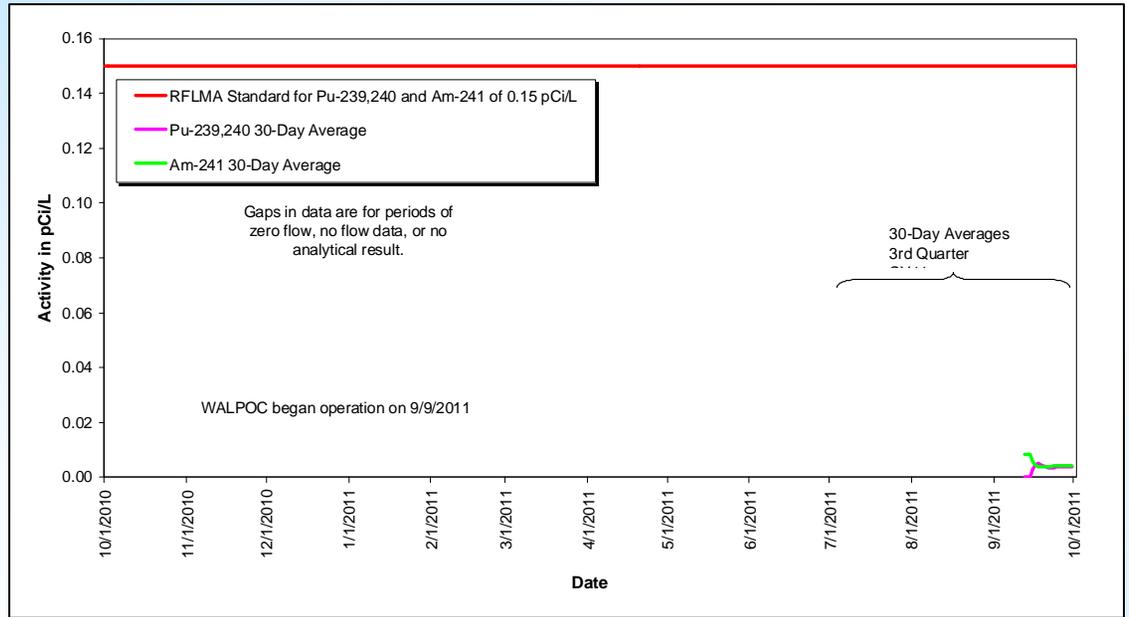
POC GS03

■ Nitrate + Nitrite as Nitrogen

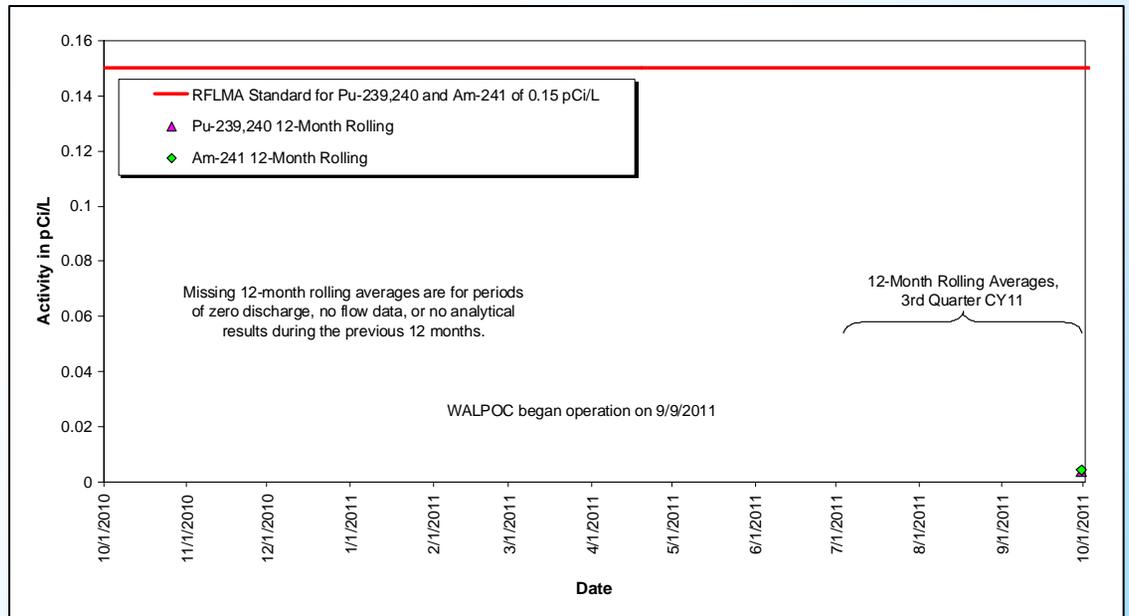


WALPOC

- Plutonium and Americium (30-Day Avg.)

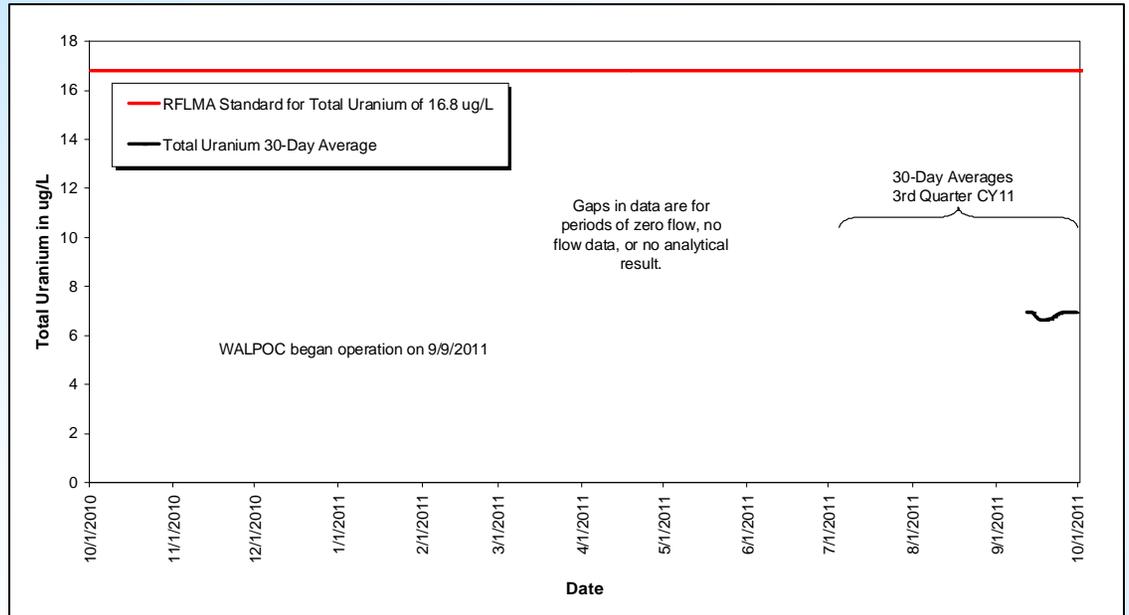


- Plutonium and Americium (12-Mo. Rolling Avg.)

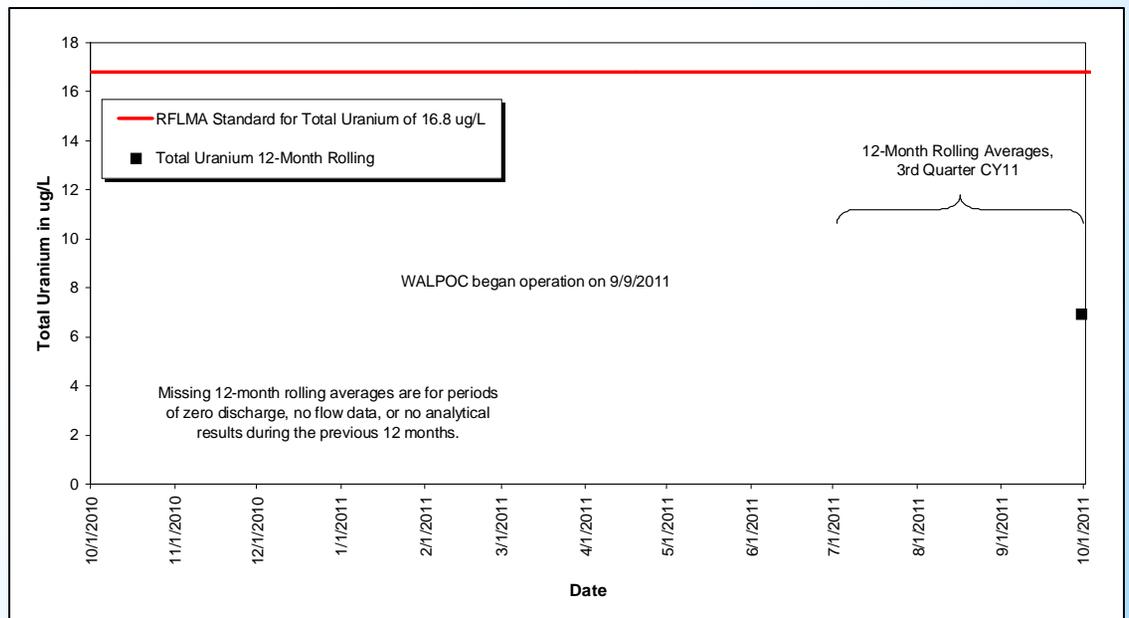


WALPOC

■ Uranium (30-Day Avg.)

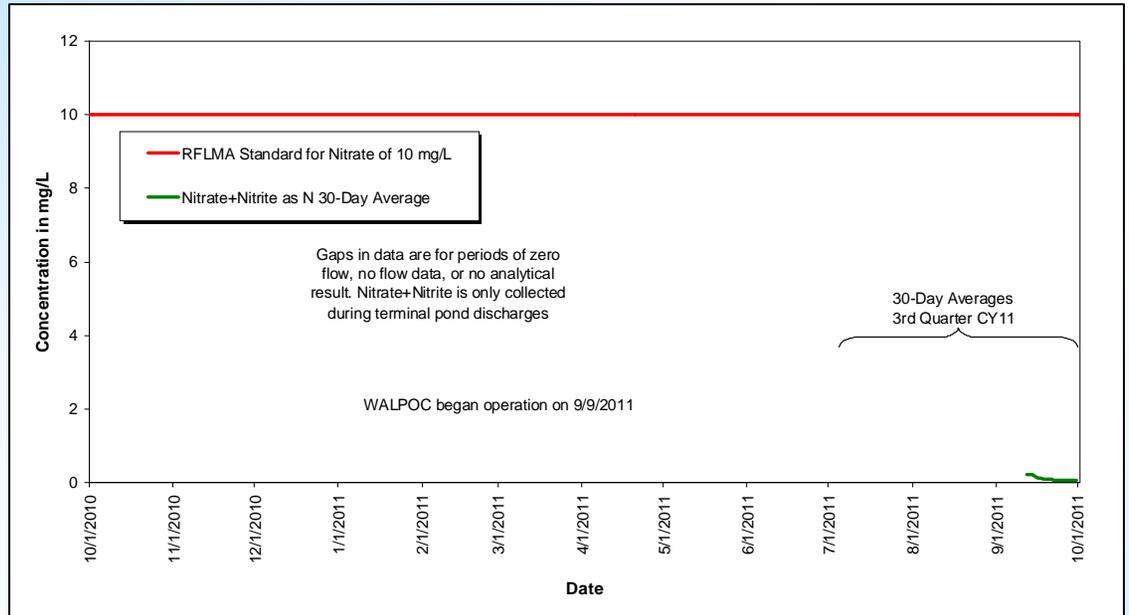


■ Uranium (12-Mo. Rolling Avg.)

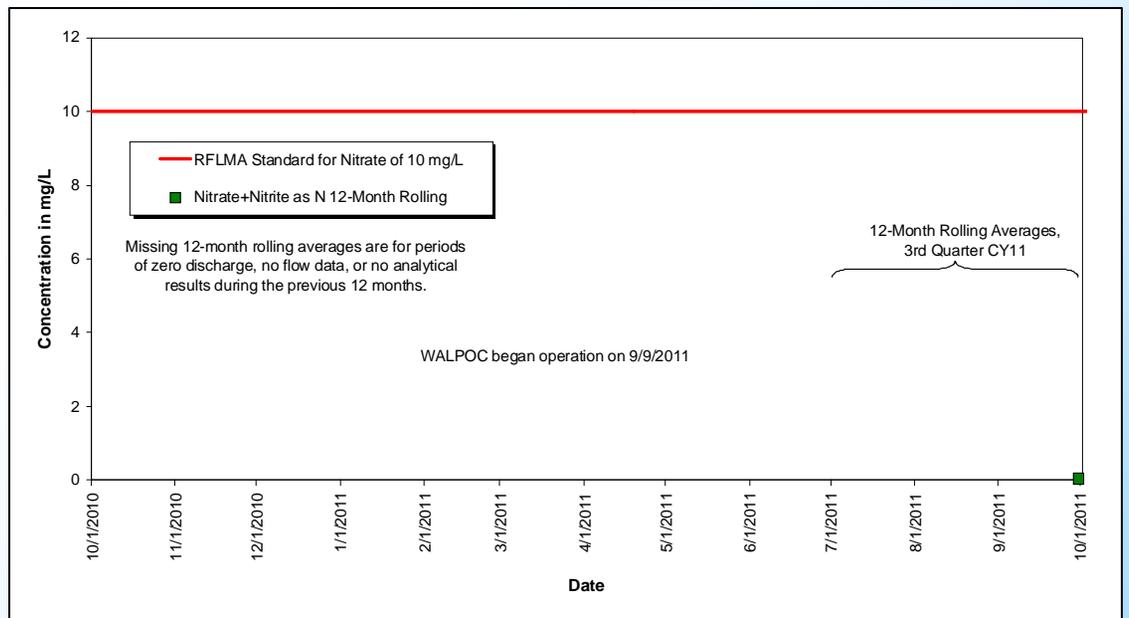


WALPOC

- Nitrate + Nitrite as Nitrogen (30-Day Avg.)

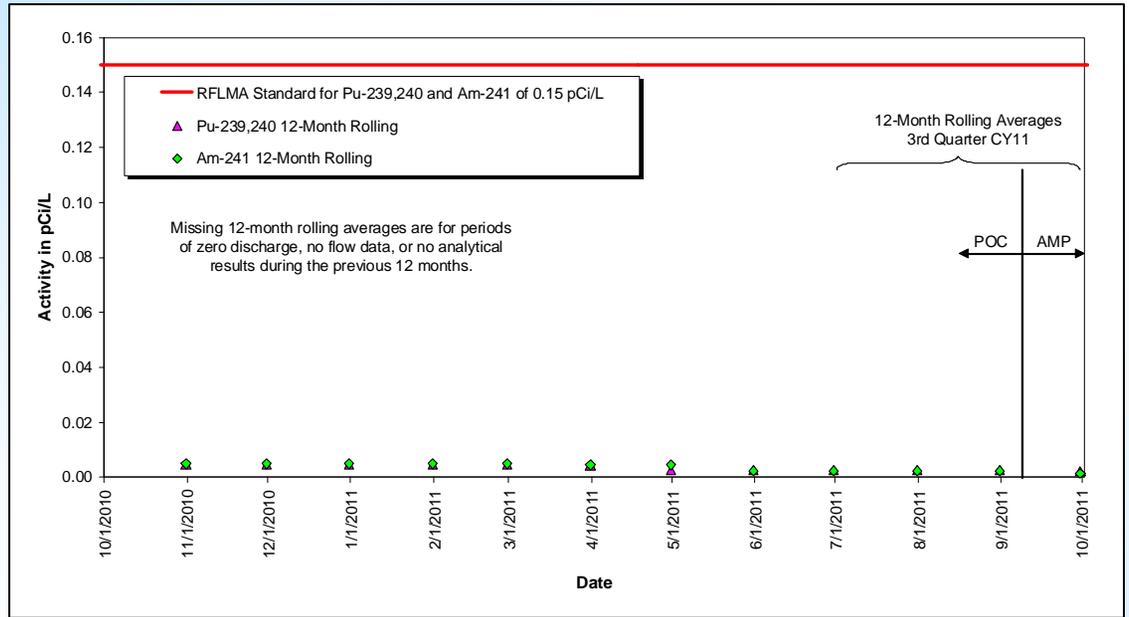


- Nitrate + Nitrite as Nitrogen (12-Mo. Rolling Avg.)

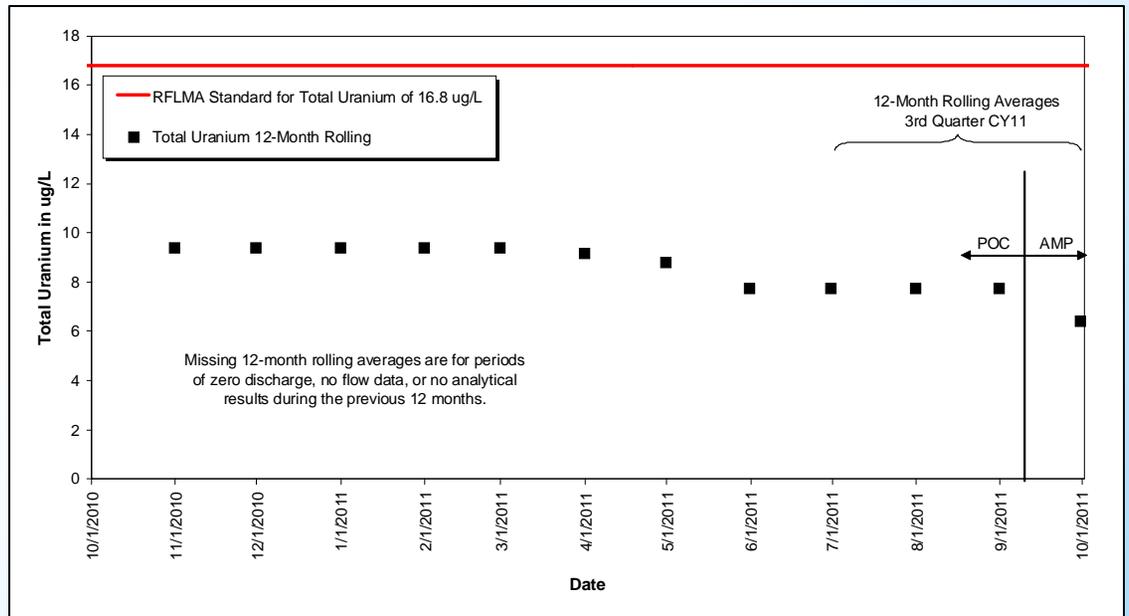


GS08

■ Plutonium and Americium (12-Mo. Rolling Avg.)

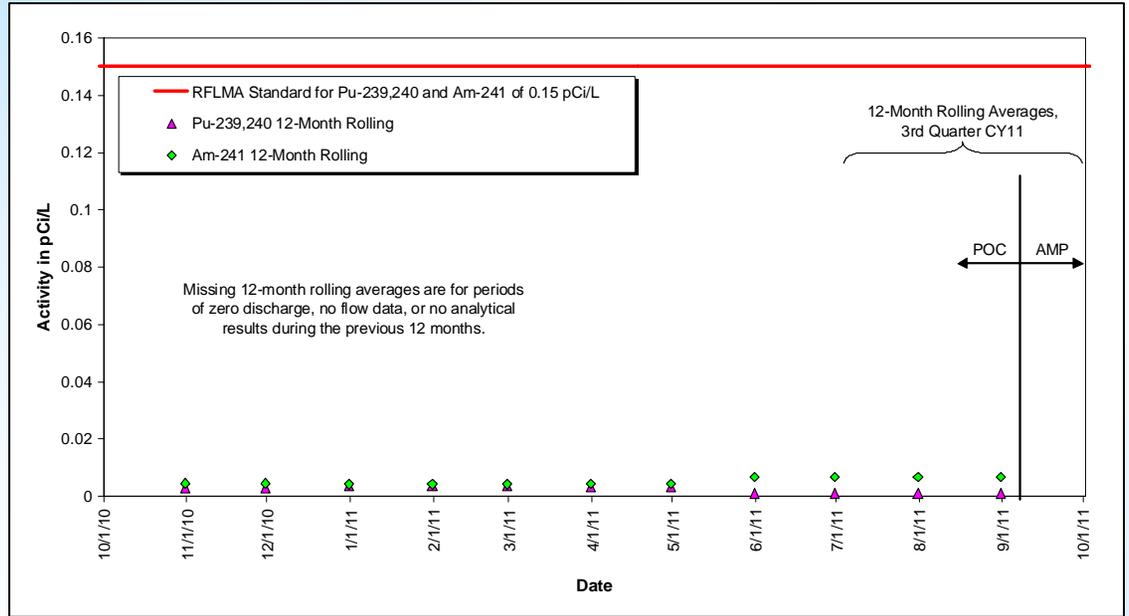


■ Uranium (12-Mo. Rolling Avg.)

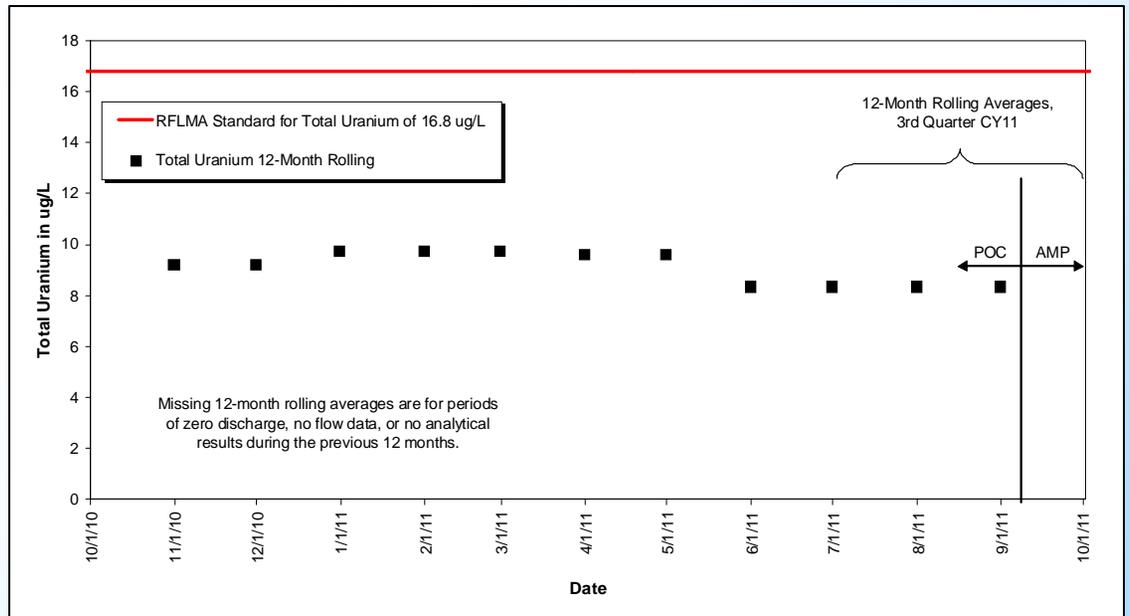


GS11

■ Plutonium and Americium (12-Mo. Rolling Avg.)



■ Uranium (12-Mo. Rolling Avg.)



WOMPOC

- Began operation on September 28, 2011
- Flow first observed on October 14, 2011
- Therefore, no data during the third quarter of 2011 (July–September 2011)



Point of Evaluation (POE) Monitoring – SW027 Plutonium

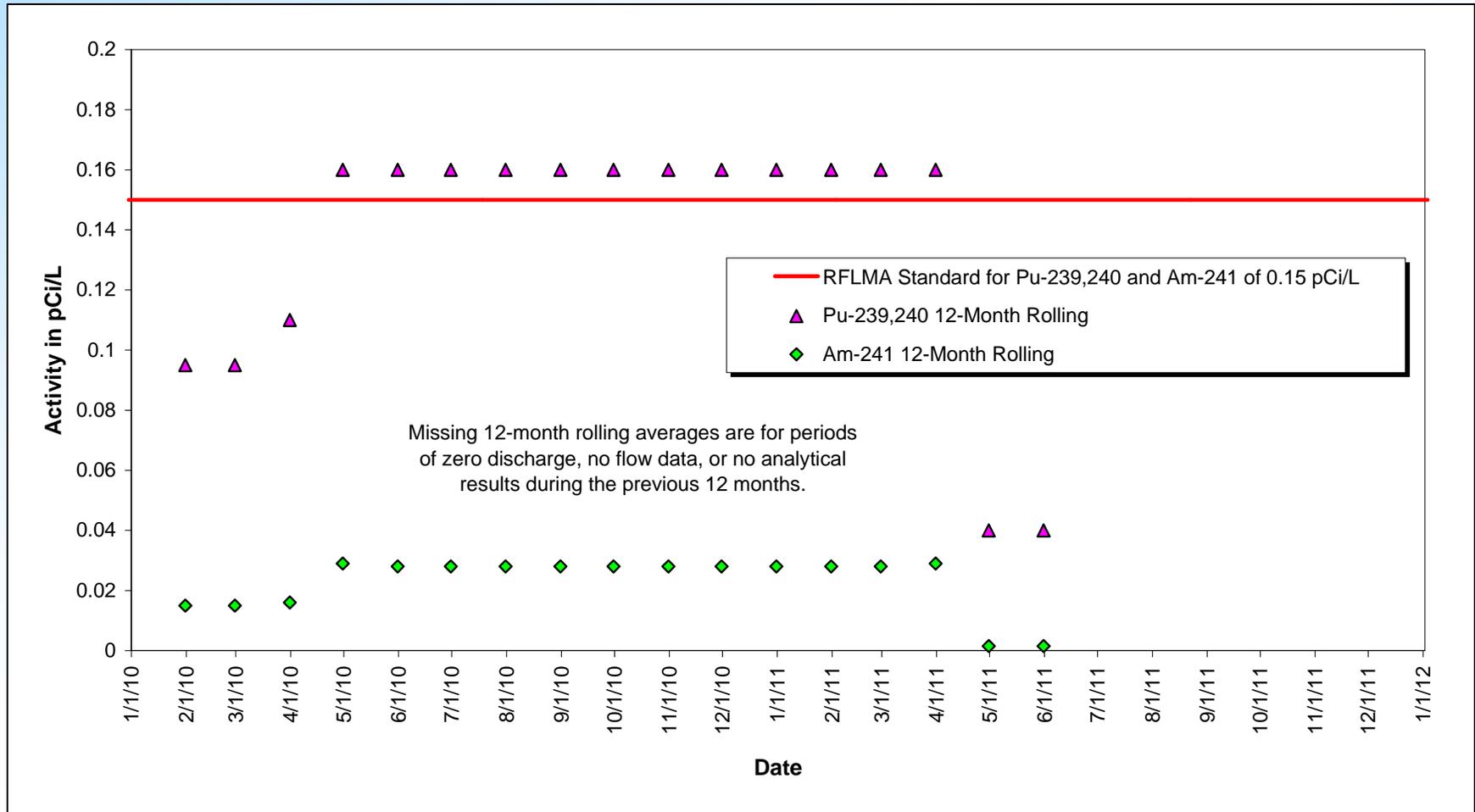
- 12-month rolling averages at POE SW027 for Pu-239,-240 are no longer reportable as of April 30, 2011
 - The continued lack of runoff yielded only one flow-paced grab in the composite sample started on February 17, 2011 (4,033 gallons of streamflow)
 - This single grab was discarded on January 9, 2012; a new composite was started at a slightly lower flow-pace
 - Once the February 17, 2011, composite was determined to be NSQ, and no results would be forthcoming, 12-month rolling averages through May 31, 2011, could be calculated
 - Pond C-2 started flow-through operation on November 7, 2011; pre-discharge sample result:
Pu = 0.017 pCi/L



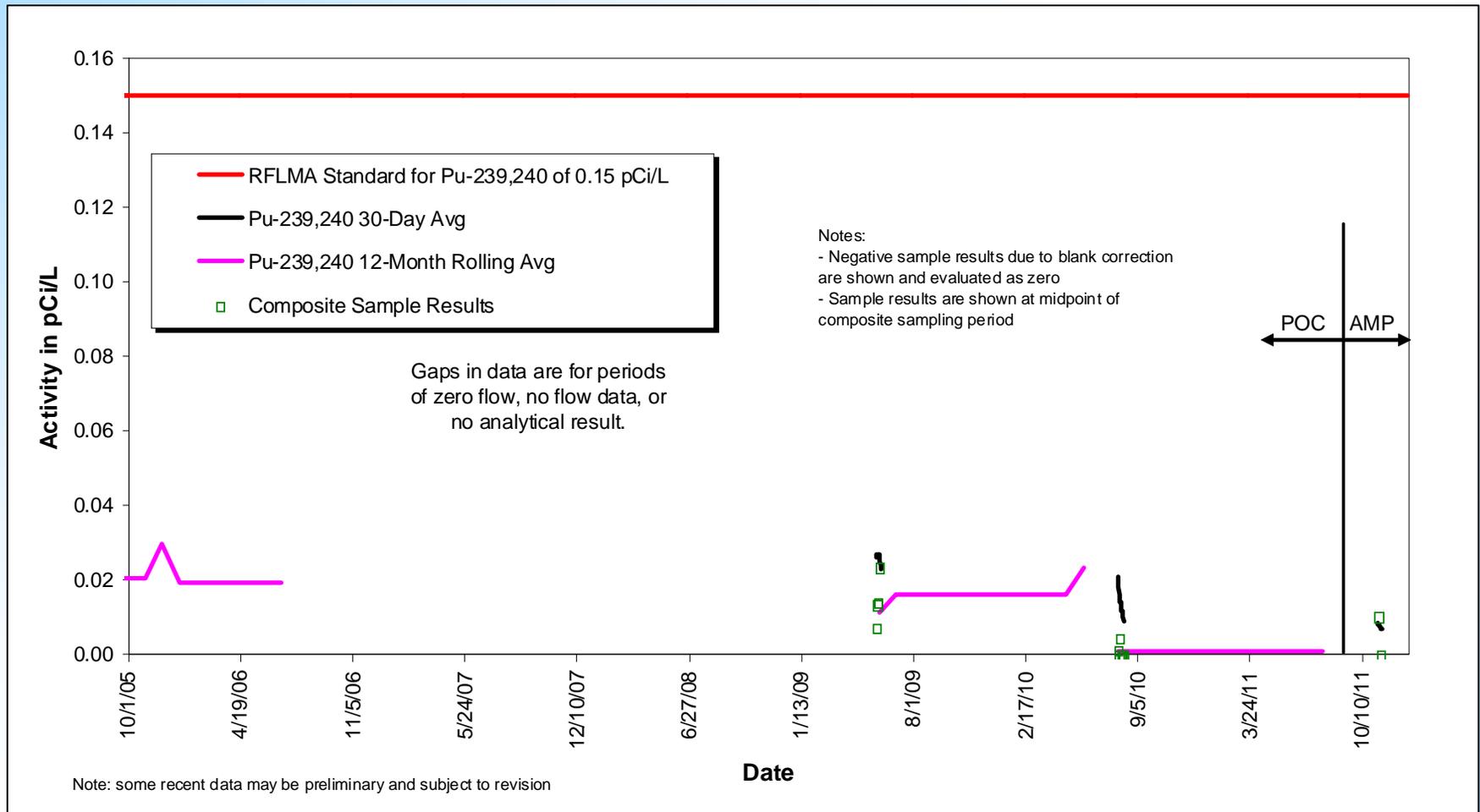
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POE Monitoring – Plutonium at POE SW027



Plutonium at C-2 Outlet Location GS31

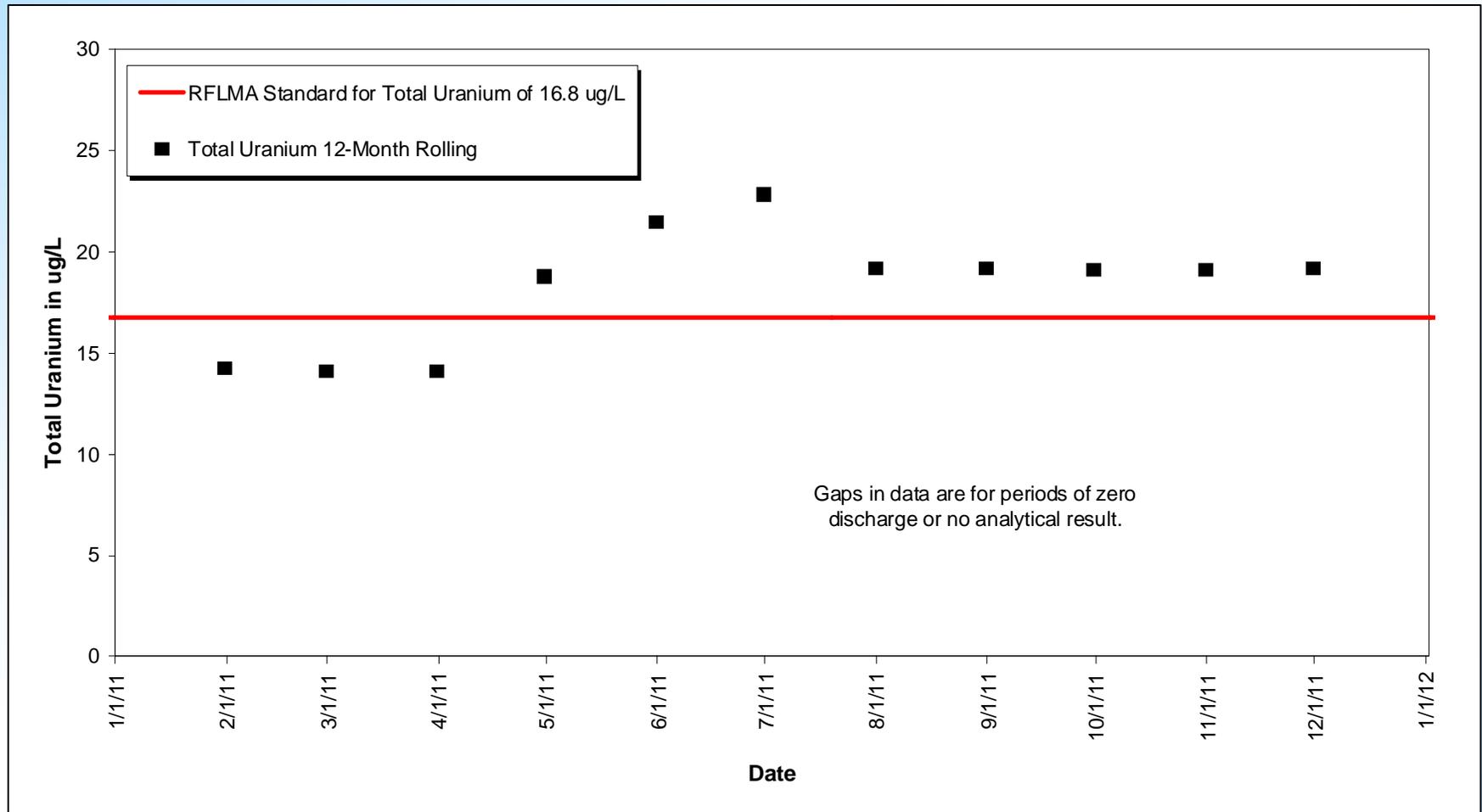


POE Monitoring – GS10 Uranium

- 12-month rolling averages at POE GS10 continue to exceed the standard for uranium ($16.8 \mu\text{g/L}$) through November 30, 2011
 - RFLMA Contact Record 2011-04, “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
 - The site is contracting with Los Alamos National Laboratory (LANL) for isotopic analyses and is performing additional sampling in the GS10 drainage
 - Additional sampling as detailed in the AMP is also ongoing



POE Monitoring – Uranium at POE GS10



POE Monitoring – GS10 Americium

- 12-month rolling averages at POE GS10 exceed the standard for americium (0.15 pCi/L) starting on August 31, 2011
 - RFLMA Contact Record 2011-08, “Reportable Condition for Americium-241 (Am) at Rocky Flats Legacy Management Agreement (RFLMA) Point of Evaluation (POE) GS10,” provides a discussion of the monitoring results and recaps the outcome of the RFLMA parties’ consultation regarding the evaluation steps to be taken
 - Though plutonium is not reportable, the evaluation includes both Pu and Am

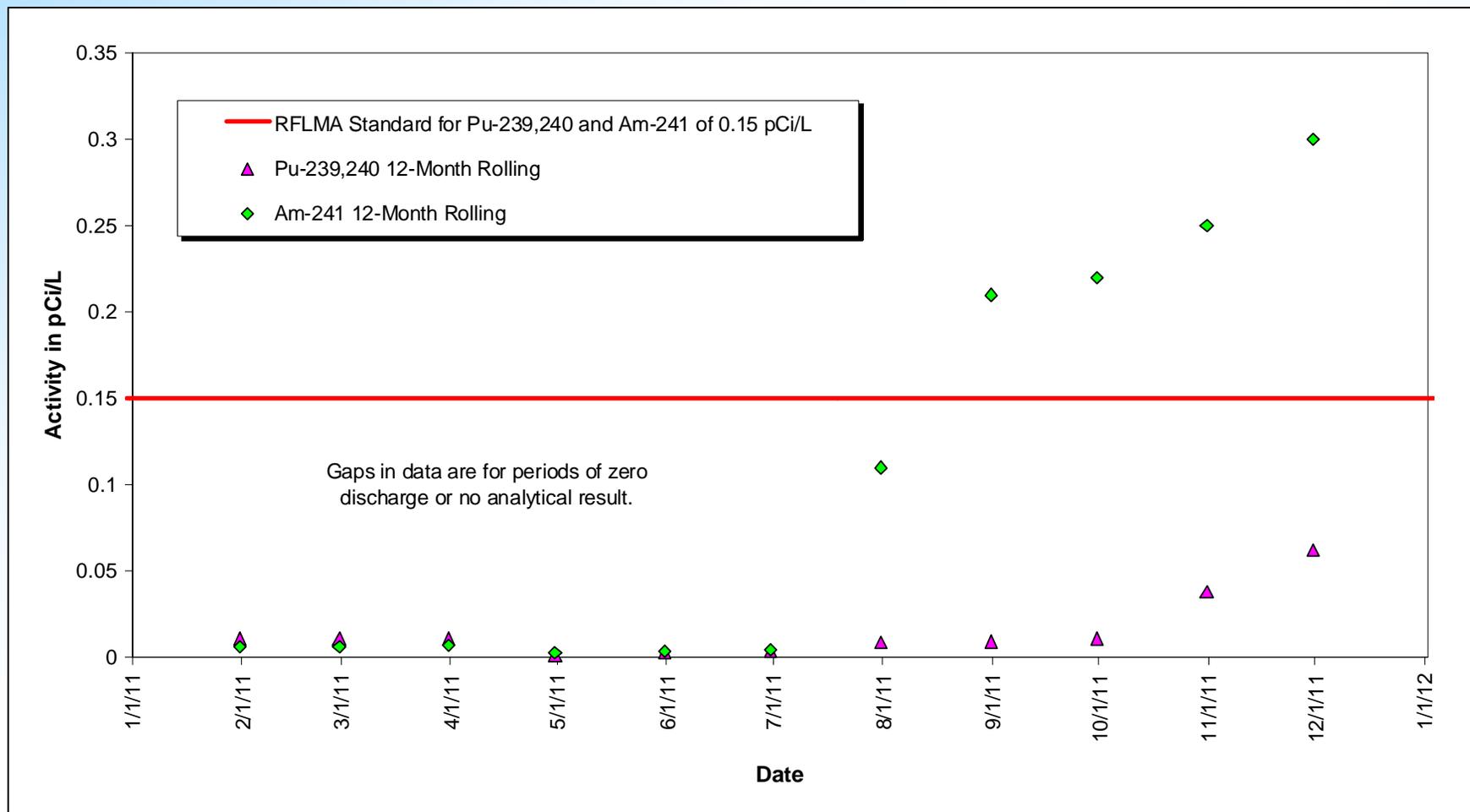


POE Monitoring – GS10 Americium

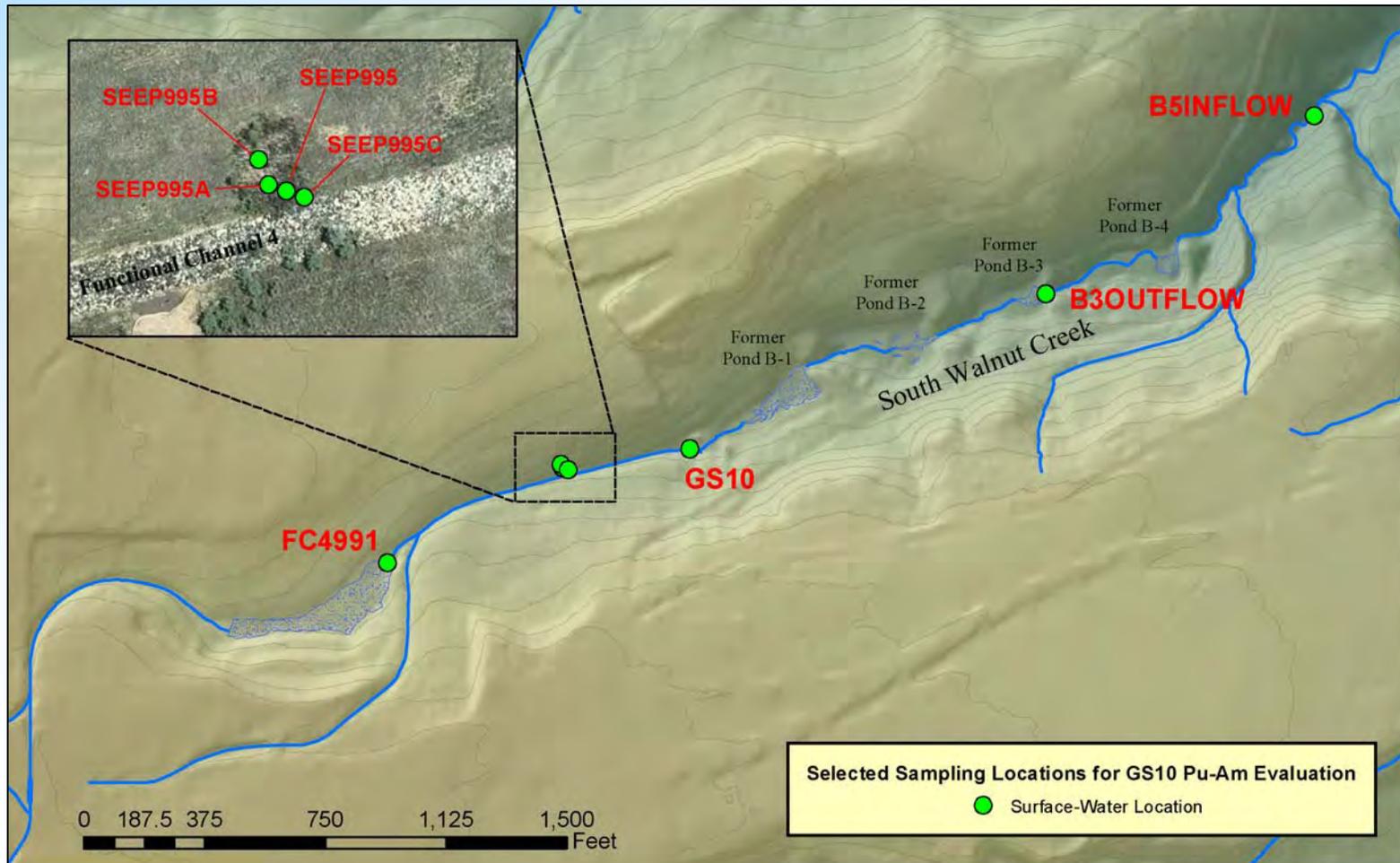
- The following actions have been taken or are ongoing:
 - Rocky Flats staff walked down the GS10 drainage on November 16, 2011, to see if any obvious conditions were promoting potential soil erosion
 - A closer examination of the drainage to focus on seeps and former utility corridors was conducted on November 22, 2011; representatives from DOE and EPA were in attendance
 - Grab samples were collected at several existing monitoring locations; several new sampling locations associated with seeps were also established
 - The frequency of composite sample collection at GS10 has been increased
 - Samples from GS10, GS08, and WALPOC are being analyzed with 2-week turnaround
 - Composite samples from B5INFLOW are periodically being analyzed for Pu and Am
 - Several new sampling locations in Functional Channel 4 have been established
 - Periodic inspections are being conducted for additional seeps in the drainage, and samples are collected when water is available



POE Monitoring – Pu and Am at POE GS10



POE Monitoring – Sampling Locations for POE GS10



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Groundwater Monitoring and Operations

Third Quarter 2011



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RFLMA Monitoring

- Third quarter (July–September) is a light-sampling quarter
 - All RCRA wells (OLF, PLF)
- Results reviewed in accordance with the RFLMA Attachment 2 decision flowcharts
 - Results consistent with previous
- Results will be discussed and statistically evaluated in the 2011 Annual Report



Additional RFMLA Groundwater Topics

- Extra groundwater sampling identified to support GS10 evaluation
 - Four wells upgradient of GS10: Uranium added to analytical suite
 - Samples collected October 10 and 11
 - Sentinel wells 45608, 91203, 91305, 15699
 - Three wells along SE portion of former SEPs: Uranium, nitrate
 - Evaluation wells 00203, 79502, 79605
 - No remarkable results
 - Sample from 91305 selected for analysis by LANL
 - Relatively higher concentration than others nearest GS10 (38 µg/L)
 - Located in valley bottom



Additional RFMLA Groundwater Topics

- Extra sampling at Sentinel well 33711
 - Monitors vinyl chloride plume
 - Installed in second quarter 2011
 - Extra data to compare with first samples and with data from original well (33703)
 - Replacement well appears more impacted by plume than original well
 - Annual report will provide comparisons and discussion

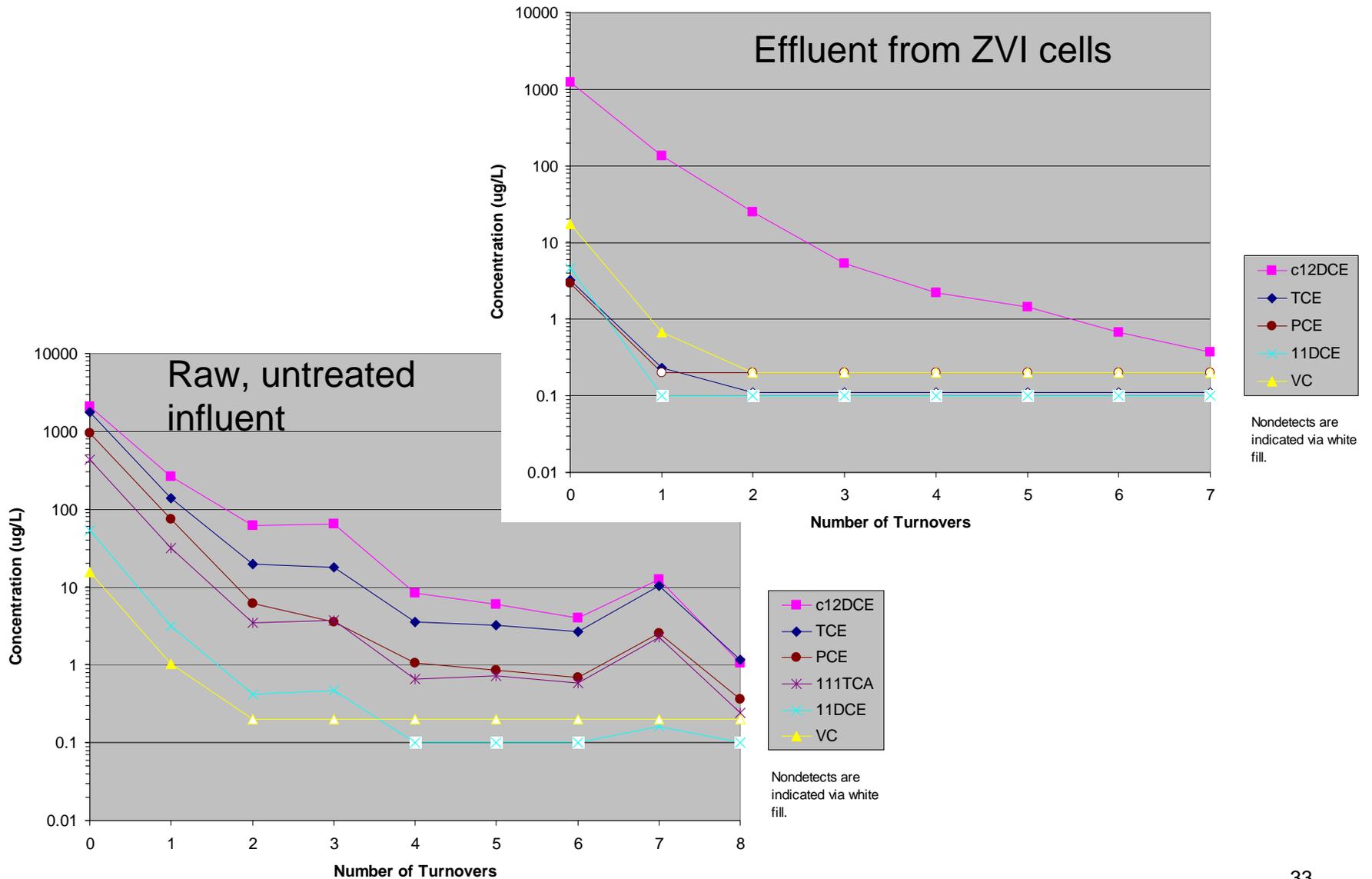


Additional (Non-RFLMA) Monitoring

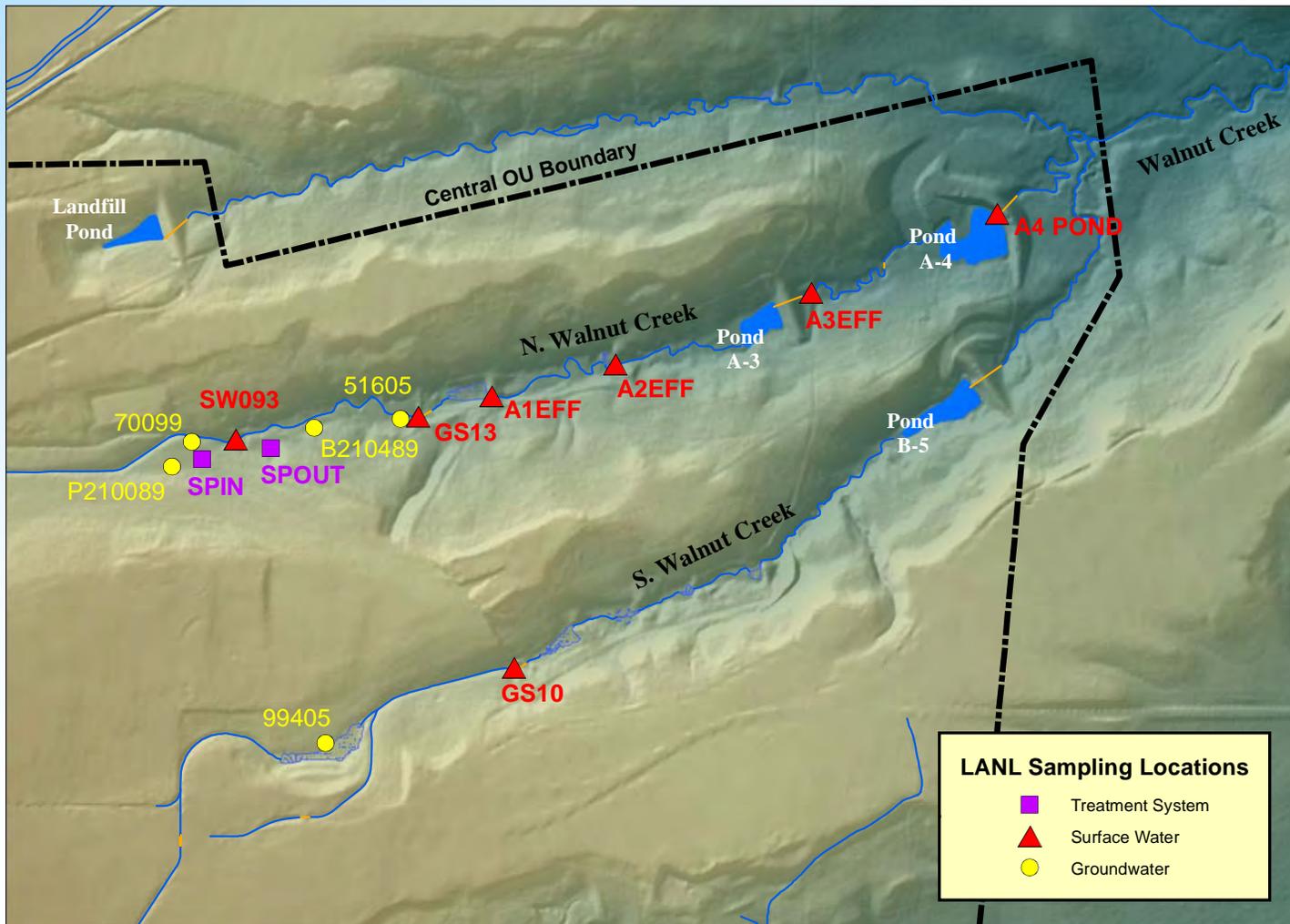
- Several locations associated with treatment systems
 - SPPTS: continued sampling to support optimization and evaluation of system performance
 - MSPTS: sampling to evaluate and optimize air stripper
 - Tested different nozzle configurations, one vs. two nozzles, different pumping rates
 - Tested extended air-stripping of water in “batch” mode
 - ZVI-treated water
 - Raw influent water



MSPTS Air-Stripper Results Summary



LANL Spring 2011 Sampling Locations



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PRELIMINARY LANL Results

- Spring 2011 samples (all April except GS10, June)
- Results summarized below, will be formally reported when final

Location	Area	Total U (µg/L)	% Natural	Comparison to Previous LANL Results (Rounded)
99405 ¹	B991	411.1	100.0	Consistent
P210089 ¹	SPP	52.7	82.7	November 2004: 9 µg/L, 100% natural
70099 ¹	SPPTS	306.5	100.0	June 2002: 222 µg/L, 99% natural
B210489 ¹	N. Walnut	52.6	85.1	Consistent
51605 ¹	N. Walnut	22.3	97.4	November 2004 (original well): 18 µg/L, 100% natural
SPIN ²	SPPTS	85.8	50.7	June, August 2008 (pre-Phase I): 41–46 µg/L, 62% natural
SPOUT ²	SPPTS	27.4	59.1	March 2010: 35 µg/L, 65% natural
SW093 ³	N. Walnut	8.8	91.0	Consistent
GS13 ³	N. Walnut	48.2	72.8	Consistent
A1EFF ³	N. Walnut	51.6	72.3	March 2010: 12 µg/L, 70% natural
A2EFF ³	N. Walnut	67.0	69.3	March 2010: 19 µg/L, 71% natural
A3EFF ³	N. Walnut	55.6	71.3	March 2010: 20 µg/L, 73% natural
A4POND ³	N. Walnut	10.0	71.9	September 2008: 1 µg/L, 77% natural
GS10 ³	S. Walnut	21.6	49.0	Concentration similar to recent, but now mostly anthropogenic

¹ Groundwater location

² Treatment system location

³ Surface water location



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Site Operations



Third Quarter 2011



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PLF Inspections and Surveys

- The quarterly inspection was completed on August 30
- No areas of concern were observed



OLF Inspections

- Monthly inspections at the OLF were completed on July 28, August 31, and September 20, 2011



OLF Features



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OLF Seeps

- Seeps 4, 5, 7, and 8 had minor surface flow throughout the third quarter (July–September 2011). Other seep locations were saturated during the quarter.
- Wetland vegetation on the OLF cover was prominent in the vicinity of Seeps 2 through 8 throughout the third quarter.



OLF Seeps

- Non-RFLMA sampling of Seeps 7 and 8 on September 7, 2011 to provide periodic documentation of seep water quality
 - Two locations for seep 7 sampled, designated locations 7 and 7A (7A about 30 feet south of 7)
- Periodic sampling can help support evaluation of CDPHE's termination of post-closure care criteria
- Sampled for americium, plutonium, and uranium, metals, semivolatile organic compounds, and volatile organic compounds



OLF Seeps

- Seep 8 arsenic detected at 23.8 $\mu\text{g/L}$ —
RFLMA surface water standard is 0.02–10 $\mu\text{g/L}$
 - 10 $\mu\text{g/L}$ is applied as trigger for RFLMA party consultation where arsenic monitoring is required
 - Colorado applies arsenic standard at intake to public drinking water supply
- Seep 7 diethyl phthalate detected at 134 $\mu\text{g/L}$ —
RFLMA surface water standard is 5.6 $\mu\text{g/L}$
 - Not detected in location 7A
- Detected analytes copper, lead, nickel, and zinc inadvertently analyzed for total concentration —
RFLMA standard is for dissolved concentration
- Other analytes below RFLMA standard or nondetect



OLF Settlement Monuments

- Settlement monuments were surveyed on September 8, 2011; data are within the expected range per the *Original Landfill Monitoring and Maintenance Plan*



OLF Inclinometers

- Inclinometers were measured July 29, August 31, and September 27, 2011
 - Readings showed very little deflection
 - July 7 — precipitation event of more than 1 inch
 - For past year little deflection noted in localized slumping area on western side of OLF after precipitation events
- Will review in Annual Report



OLF Slumps

- Berm 1 crack was filled and compacted in 2010; no new cracking appeared in third quarter 2011



OLF Maintenance Project

- Survey fieldwork completed March 21, 2011
- Geotechnical engineer review
- Maintenance required for approximately 700 feet of diversion berm
 - Add several inches of soil to maintain minimum berm height
 - Recontour and fill minor depressions in localized areas to minimize potential for ponding in berm channels
 - Work completed August 2011



OLF Maintenance Project



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OLF Maintenance Project



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OLF Maintenance Project



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Ecological Monitoring



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Eco Monitoring Conducted During Third Quarter 2011

- Revegetation monitoring
- Preble's mouse mitigation monitoring
- Wetland mitigation monitoring
- Weed mapping
- PLF/OLF quarterly vegetation surveys
- Nest box monitoring
- Photopoint monitoring
- EPA-sponsored revegetation monitoring



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CAD/ROD Amendment

- Approved September 21, 2011
- Clarifies description of institutional controls (ICs) for excavation and soil disturbance
- Work subject to ICs must meet CAD/ROD objective and rationale
 - Soil Disturbance Review Plan (SDRP)
 - Work can begin 10 days after posting of approved contact record
 - Contact Records 2011-07 (Roads Project) and -08 (Dam Breach Project) examples of SDRP
- Any future modification or termination of ICs will follow regulations and guidance in effect at that time



CAD/ROD Amendment (continued)

- Environmental covenant granted by DOE to CDPHE modified to incorporate CAD/ROD amendment
 - Recorded in Jefferson County Land Records
- Information posted on Rocky Flats website
http://www.lm.doe.gov/Rocky_Flats/Regulations.aspx



Third Five-Year Review Status

- Briefing at September 12, 2011, and November 14, 2011, RFSC Meeting
 - Summary in meeting minutes
- Publication of notice that review is being conducted
- Information is posted on the Rocky Flats website
- Working schedule
 - RFLMA monitoring data January 1, 2007 – December 31, 2011
 - Report completed by DOE May 2012
 - EPA HQ review and approval by September 14, 2012
- Status provided at RFSC meetings
- Report will be posted on the Rocky Flats website and public will be notified

