



Department of Energy

ROCKY FLATS FIELD OFFICE
10808 HIGHWAY 93, UNIT A
GOLDEN, COLORADO 80403-8200

DEC 28 2000

00-DOE-04330

Mr. Steven Gunderson
Rocky Flats Cleanup Agreement Project Coordinator
Colorado Department of Public Health and Environment
4300 Cherry Creek Drive South, OE-B2
Denver, Colorado 80246-1530

Mr. Timothy Rehder
Rocky Flats Team Lead
United States Environmental Protection Agency, Region VIII
999 18th Street, Suite 500
Denver, Colorado 80202-2466

Dear Mr. Gentlemen:

This Plan for source evaluation is provided in accordance with the Final Rocky Flats Cleanup Agreement (RFCA) (Attachment 5, §2.4(B)) under "Action Determinations." This Plan addresses the November 30, 2000, Rocky Flats Environmental Technology Site (Site) report of 30-day moving averages for plutonium (Pu) water-quality results for the RFCA Point of Compliance (POC) surface-water monitoring location GS08, which is located at the outfall from Pond B-5 on South Walnut Creek.

As first suggested in the December 12, 2000, notification letter, the Site believes the circumstances and conditions associated with this event cast serious doubt on its validity (probable false positive). This source evaluation will address these circumstances and conditions of concern, and further evaluate available sediment sampling data from Pond B-5.

RFCA Reporting Protocol

Within thirty (30) business days of confirming these reportable values, RFCA requires that the Department of Energy (DOE) submit to the Environmental Protection Agency (EPA) and the Colorado Department of Public Health and Environment (CDPHE) a source evaluation plan and schedule. This plan must be transmitted by December 30, 2000.

Data Summary

Calculated 30-day moving averages for Pu triggered the reporting requirements under RFCA Attachment 5, Section 2.4 (B) on September 14, 2000. The reportable 30-day moving value is summarized in Table 1 and the analytical results for the composite samples that contributed to the 30-day average calculation are summarized in Table 2.

1/5

ADMIN RECORD

BZ-A-000379

This was a one-day reportable event that ended the following day (September 15, 2000) as determined by analytical results from the next composite sample (see Table 2 for the September 14, 2000 sample results). Americium (Am) did not exceed reportable concentrations for these monitoring periods.

Table 1 - Calculated 30-Day Average Value at RFCA POC Monitoring Location GS08

Analyte	Date of Reportable Value	Reportable 30-day Avg. Value (pCi/L)
Plutonium	9/14/00 (Reportable Date)	0.151

Table 2 - Validated Analytical Results for Composite Sample Collected at GS08

Composite Sample Period (Starting and Ending Dates)	Composite Sample Analytical Results (pCi/L) for Pu-239/240	Composite Sample Analytical Results (pCi/L) For Am-241
5/2/00-5/10/00	0.008	0.275
6/14/00-6/18/00	0.000*	0.000*
6/19/00-8/26/00	0.000*	0.002
8/3/00-8/6/00	0.000*	0.000*
8/7/00-8/10/00	0.005	0.041
8/11/00-8/17/00	0.864	0.043
9/14/00-9/19/00	0.000*	0.000*

* Actual lab results were less than zero as reported by the laboratory

Upstream Water Quality Monitoring

Analytical results from the CDPHE predischarge sampling of Pond B-5 on July 18, 2000, were 0.061 pCi/L for Pu and 0.005 pCi/L for Am. Since this predischarge sample was collected just two days after a significant summer storm on July 16, 2000, any water quality problems induced by storm water runoff should have been identified by this predischarge sampling event. This expectation that the sample included storm water runoff that could impact Pond B-5 water quality was not supported by this predischarge sample result.

Further upstream, surface water monitoring results from the RFCA Point of Evaluation (POE) GS10 were slightly above the reportable threshold for both Pu and Am during this period. The GS10 reportable period started April 14, 2000, and April 28, 2000, for Am and Pu respectively. This event at GS10 is a discontinuous event (several minor periods dropped slightly below the reporting threshold) through August 14, 2000, and September 18, 2000, for Am and Pu respectively.

Downstream Water Quality Monitoring

Water flowing through GS08 during this period is again sampled at RFCA POC GS03 before flowing offsite. The 30-day moving averages for Pu at GS03 were below the 0.15 pCi/l standard for all periods of flow.

Prior Walnut Creek RFCA Source Evaluation Findings and Conclusions

An exhaustive, year-long source evaluation was conducted during 1997 and 1998 for RFCA reportable values at RFCA POC GS03 and POEs GS10 and SW093. A thorough review of Site activities (i.e., Decontamination and Decommissioning, and environmental remediation projects, excavations, or other routine operations) was conducted for this source evaluation, and none of the activities were found to contribute to increased contamination and reportable values. The results of the Walnut Creek source investigation were documented in three progress reports:

- 1) RF/RMRS-97-089.UN - Progress Report #1 to the Source Evaluation and Preliminary Mitigation Plan for Walnut Creek;
- 2) RF/RMRS-97-115.UN - Progress Report #2 to the Source Evaluation and Preliminary Mitigation Plan for Walnut Creek; and
- 3) RF/RMRS-97-131.UN - Progress Report #3 to the Source Evaluation and Preliminary Mitigation Plan for Walnut Creek; and one final summary report: RF/RMRS-98-234.UN – Final Report to the Source Evaluation and Preliminary Mitigation Plan for Walnut Creek.

The investigators concluded that no localized areas of radiological contamination were identified – either historical or resulting from then current operation – that could have caused the 1997 reportable values. The likely source of the reportable values was diffused contamination from past Site operations released into the environment through events and conditions over the history of the Site. No specific remedial action(s) were indicated as the 1997/1998 source investigation did not identify localized source(s) of contamination.

Although this is the first RFCA reportable event for Pu at GS08, the prior Walnut Creek source evaluation concluded that remobilization of legacy contamination to be the primary source of water quality problems in Walnut Creek.

Source Evaluation for RFCA POC GS08

The Site will continue to review activities that were conducted during the GS08 sampling period, but because of the relative isolation of this particular sampling location, the extent of the investigation will be somewhat limited. In consideration of past source evaluation findings and conclusions, the Site proposes the following in response to these reportable values at GS08:

- **Continuation of Existing Monitoring at GS08**

Flow-paced sampling of the GS08 drainage area will continue as specified by the RFCA Site Integrated Monitoring Plan (IMP). Existing data combined with future RFCA sampling analytical results will be used to evaluate trends in the 30-day moving average values at this location. This information may indicate water-quality patterns that lend insight into the cause of the recent reportable values measured at GS08.

- **Further Evaluate the Accuracy of the GS08 Sample Results**

Analysis of the August 11, 2000, sample provided a substantial analytical challenge. Laboratory problems (i.e., failed internal quality assurance, problems with blank correction) resulted in multiple reruns with the third (and final) attempt producing an analytical result of 0.864 pCi/L for Pu. Although this analytical result has been validated, the unusual 20:1 Pu/Am ratio (Pu 0.864 pCi/L, Am 0.043 pCi/L) suggests other analytical errors may have occurred that was not identified by the validation process. For this reach of South Walnut Creek, the typical Pu-to-Am ratio is three to one. Therefore, the Pu analytical result that triggered this event is suspect based on the isotopic ratio observed.

For the source evaluation, a chronological review of the analytical processes and problems will be conducted. Results of this review will be documented and an opinion as to whether the analytical results are still questionable will be formulated.

- **Review of Site Activities**

As previously stated, the July 16, 2000, large storm event that occurred just prior to collection of the Pond B5 pre-discharge sample (on July 18, 2000) did not appear to degrade Pond B-5 water quality. Analytical results for this pre-discharge sample (0.061 pCi/L for Pu) were well below the Segment 4 standard of 0.15 pCi/L. Additionally, no storm events occurred during this Pond B5 discharge.

For this source evaluation, a chronological review of Site activities and events in and around Pond B-5 during the discharge that could have impacted Pond B-5 water quality during collection of the August 11, 2000, GS08 sample will be conducted. This review will expand on information already known: 1) the pre-discharge water quality sampling on July 18, 2000, just two weeks prior to the August 3, 2000, through August 17, 2000, Pond B-5 discharge event did not indicate water quality problems; and 2) the analytical results from the preceding discharge event samples (August 3, 2000, and August 7, 2000) were well below the Segment four water quality standard for Pu.

- **Review of Available Pond B-5 Sediment Data**

Both legacy and more recent Pond B-5 sediment data collected for the outlet works upgrade project will be reviewed. The Pond B-5 outlet works upgrade project was started in November 1997 when the pond was dewatered. Sediment samples were collected and analyzed to determine whether the sediments posed a construction health risk that would require any special controls to limit the spread of contamination during construction. Construction activities proceeded during the winter months and were completed in March 1998, after which Pond B-5 was returned to service.

Mr. Steven Gunderson
Mr. Timothy Rehder
00-DOE-04330

5

DEC 28 2000

For this source evaluation, legacy and construction period Pond B-5 sediment sampling data will be compiled and evaluated. An emphasis will be placed on both the maximum concentrations of Pu and Am in the sediments, and the ratio of Pu to Am. Site knowledge from the Actinide Migration Studies will be used to develop a fate and transport model to test the hypothesis that agitated pond sediments provide a source for this type of event.

• **Reevaluate Numeric Precision for Reporting of RFCA Sampling Results**

This one-day reportable event has refocused attention on the numeric precision used for reporting of RFCA monitoring results. The GS08 event is a one day event based on a calculated 30-day moving average for Pu that is 0.001 pCi/L (0.151 pCi/L) above the standard. The difference between this calculated value and the standard is well within the measurement error of the laboratory analysis equipment. Although laboratories report analytical results using three significant figures, confidence in the third significant figure that triggered the reporting requirement may be very low and the use of three significant figures for reporting may be inappropriate (high risk of false positives).

For this source evaluation, the Site will reevaluate the appropriateness of the use of three significant figures for reporting RFCA analytical results. If this review indicates a lack of confidence in the third significant figure, then a reporting process change will be proposed to the Surface Water IMP working group.

If you have any questions regarding this transmittal, please contact me at (303) 966-5918

Sincerely,



for Joseph A. Legare
Assistant Manager
for Environment and Infrastructure

cc:
G. Doyle, EI, RFFO
J. Stover, AI, RFFO
D. Shelton, K-H
R. Nininger, K-H
L. Brooks, K-H
Administrative Record



5/5