

Appendix D

RFLMA Contact Records

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- CR-2017-02 Reportable condition for evaluation purposes for uranium at Walnut Creek Point of Compliance (WALPOC)
- CR-2017-01 Original Landfill Temporary Groundwater Intercept System
- CR-2016-04 Upgrade of the East Subsurface Drain Located in the East Perimeter Channel of the Original Landfill, with Soil Disturbance Review Plan
- CR-2016-03 Geoprobe Investigation of the Groundwater System Upgradient of the Original Landfill and the Soil Disturbance Review Plan
- CR-2016-02 Mound Site Plume Treatment System reconfiguration project Soil Disturbance Review Report and Explanation of Significant Differences
- CR 2016-01 Reportable condition for evaluation purposes for uranium at Walnut Creek Point of Compliance (WALPOC)
- CR 2015-10 Area of Concern Well 10304 Reportable Condition
- CR 2015-09 Soil Disturbance Review Plan for Solar Ponds Plume Treatment System Interim Configuration
- CR 2015-08 Solar Ponds Plume Treatment System Interim Design and Implementation
- CR 2015-07 Vinyl chloride results from the Present Landfill Treatment System (PLFTS) effluent triggered the consultative process
- CR 2015-06 Original Landfill (OLF) Implementation of Interim Action to Reestablish Surface Water Management on Portions of the OLF, with Soil Disturbance Review Plan
- CR 2015-05 Reportable condition for plutonium 12-month rolling average at Point of Evaluation SW027
- CR 2015-04 Mound Site Plume Treatment System (MSPTS) Reconfiguration Conceptual Approach
- CR 2015-03 Original Landfill (OLF) Immediate Response to Recent Precipitation
- CR 2015-02 Soil Disturbance Review Plan (SDRP) for Storage Shed Photovoltaic Upgrades
- CR 2015-01 Reportable condition for uranium 12-month rolling average at Point of Compliance WALPOC
- CR 2014-10 (rescinded) Reportable condition for uranium 12-month rolling average at Point of Compliance WALPOC

- CR 2014-09 Soil Disturbance Review Plan (SDRP) Update for Regrading the East Perimeter Channel (EPC) at the Original Landfill (OLF)
- CR 2014-08 Provide flexibility to the flow configuration at the Solar Ponds Plume Treatment System (SPPTS) as part of the ongoing optimization effort
- CR 2014-07 Abandonment of Sentinel well 88104 at the Rocky Flats Site, Colorado
- CR 2014-06 Vinyl chloride results from the Present Landfill Treatment System (PLFTS) effluent triggered the consultative process
- CR 2014-05 Reportable condition for evaluation purposes for uranium at Point of Compliance WALPOC
- CR 2014-04 Approval of the installation and operation of an air stripper and the associated Rocky Flats Legacy Management Agreement (RFLMA) Soil Disturbance Review Plan as part of the reconfiguration of the East Trenches Plume Treatment System (ETPTS)
- CR 2014-03 Minor modification to the March 2008 Present Landfill (PLF) Monitoring and Maintenance Plan (M&M Plan)
- CR 2014-02 Minor Modification of Rocky Flats Legacy Management Agreement (RFLMA) Attachment 2, "Legacy Management Requirements"
- CR 2014-01 East Trenches Plume Treatment System (ETPTS) media removal and reconfiguration for air stripper treatment
- CR 2013-03 Soil Disturbance Review Plan (SDRP) for Regrading the East Perimeter Channel (EPC) and Associated Diversion Berms at the Original Landfill (OLF)
- CR 2013-02 Reportable Condition at the Original Landfill (OLF)
- CR 2013-01 GS10 Flume Replacement Project and Soil Disturbance Review Plan
- CR 2012-03 Minor Modification of *Rocky Flats Legacy Management Agreement (RFLMA)* Attachment 1, "Site Map," and of RFLMA Attachment 2, "Legacy Management Requirements"
- CR 2012-02 Improving Treatment at the East Trenches Plume Treatment System (ETPTS) by adding an air stripper component
- CR 2012-01 Soil Disturbance Review Plan – Roads Maintenance, including grading the road to former A-3 Pond to convert the road to two-track vehicle use

- CR 2011-08 Reportable Condition for Americium-241 (Am) at Rocky Flats Legacy Management Agreement (RFLMA) Point of Evaluation (POE) GS10
- CR 2011-07 Soil Disturbance Review Plan—Pond A-3 and Present Landfill (PLF) Pond Dam Breach Project
- CR 2011-06 Soil Disturbance Review Plan—Roads upgrade project involving reconfiguration of a sharp curve west of Functional Channel 1
- CR-2011-05 Update for Reportable Condition for Uranium at Point of Evaluation GS10
- CR 2011-04 Reportable Condition for Uranium at Point of Evaluation GS10
- CR 2011-03 Resource Conservation and Recovery Act (RCRA) Well Monitoring Results at Original Landfill (OLF) and Present Landfill (PLF)
- CR 2011-02 Replace Sentinel Well 3370
- CR 2011-01 Replace Mound Site Plume Treatment System (MSPTS) Media and Maintain/Repair Discharge Gallery
- CR 2010-07 Monitoring Results and Water Treatment at the MSPTS and ETPTS
- CR 2010-06 Monitoring Results at Surface Water Point of Evaluation (POE) SW027
- CR 2010-05 Statistically Higher Concentrations of Analytes in Groundwater Downgradient of the Original Landfill (OLF) and Present Landfill (PLF)
- CR 2010-04 Rocky Flats Legacy Management Agreement Attachment 2: Modification to Revise Monitoring Points
- CR 2010-03 Non-Rocky Flats Legacy Management Agreement (RFLMA) Surface Water Monitoring Project for North and South Walnut Creeks
- CR 2010-02 Approval of Excavation Greater than 3-Foot Below Grade to Breach Dams A-3, A-4, B-5, C-2, and the Present Landfill Dam
- CR 2010-01 Targeted Soil Sampling at the Original Landfill (OLF) to Evaluate Residual Contamination Levels in Relation to the Colorado Department of Public Health and Environment's (CDPHE) August 2008 Policy, End of Post-Closure Care
- CR 2009-05 Installation of Snow Fencing North of the Original Landfill (OLF) and Approval of Work After Closeout of Contact Record
- CR 2009-04 Replace East Trenches Plume Treatment System (ETPTS) Media and Make Minor Changes to the Piping Configuration

- CR 2009-03 Soil Disturbance for Road Maintenance and Improvement Work Involving the Construction of Roadside Drainage Ditches that Will Not Return Excavation to Preexisting Grade
- CR 2009-02 Excavation by Xcel Energy for Valve Replacement on 12-Inch Golden Pipeline
- CR 2009-01 Phase II and III Upgrades to Solar Ponds Plume Treatment System
- CR 2008-09 Revision of Sampling Locations to Reflect Site Reconfiguration
- CR 2008-08 Construction of Collection Sump For SPPTS
- CR 2008-07 Path Forward for Original Landfill (OLF) Seep 7 Drain Extension, Berm Maintenance and Repair, Perimeter Channel Slope Cut and Fill, and Modification of the OLF Monitoring and Maintenance Plan (M&M Plan)
- CR 2008-06 Management of Intercepted Groundwater During SPPTS Repair or Maintenance Activities
- CR 2008-05 Boron and Uranium in Groundwater Downgradient of the Original Landfill
- CR 2008-04 Notification of Well Replacement and Well Identification Change
- CR 2008-03 Exploratory Excavations to Greater than 3 Feet Below Grade Generally Between the Former Interceptor Trench Pump House and Solar Ponds Plume Treatment System
- CR 2008-02 Discussion and Approval Of Excavation Greater than 3 Feet Below Grade to Breach Dams A-1, A-2, B-1, B-2, B-3, and B-4
- CR 2008-01 Completion of Additional Ecological Sampling in Accordance With RFLMA Attachment 2, Table 5
- CR 2007-08 Changes to Present Landfill Inspection and Monitoring Frequencies and Modification of the PLF Monitoring and Maintenance Plan
- CR 2007-07 Replacement of Monitoring Well 45605 (B991 Slump)
- CR 2007-06 Evaluation of Elevated Nitrate in Groundwater Samples From AOC Well B206989
- CR 2007-05 Grading the Slump Area South Of FC-4 and Former Building 991

- CR 2007-04 Discussion and Approval of Soil Disturbance for Phase III Road Improvement Work Involving the Construction Of Roadside Drainage Ditches that Will Not Return Excavation to Preexisting Grade
- CR 2007-03 Discussion and Approval of Excavation Greater than 3 Feet Below Grade in FC-1 Soil Borrow Area and Placement of Soil South of Former B371 Location to Eliminate Ponding Around Well Heads for Wells 33502, 33604, and 33703
- CR 2007-02 Discussion and Approval of Exploratory Excavations to Greater than 3 Feet Below Grade Around the Former Interceptor Trench Pump House
- CR 2007-01 Notification of Adverse Biological Condition, March 27, 2007, Central Operable Unit (COU) Boundary Fence Wildlife Deaths
- CR 2006-03 Disposition February–July 2006 Monitoring Results for Arsenic at the Present Landfill Treatment System (PLFTS)
- CR 2006-02 Disposition December–July 2006 Monitoring Results for Boron at the Present Landfill Treatment System (PLFTS)
- CR 2006-01 Disposition December 2005–May 2006 Monitoring Results for Manganese at the Present Landfill Treatment System (PLFTS)

ROCKY FLATS SITE REGULATORY CONTACT RECORD

Purpose: Replace Mound Site Plume Treatment System (MSPTS) media and maintain/repair discharge gallery.

Contact Record Approval Date: 1/14/11

Site Contact(s)/Affiliation(s): Scott Surovchak, U.S. Department of Energy (DOE); John Boylan, S.M. Stoller (Stoller); Rick DiSalvo, Stoller

Regulatory Contact(s)/Affiliation(s): Carl Spreng, Colorado Department of Public Health and Environment (CDPHE); Vera Moritz, U.S. Environmental Protection Agency (EPA)

Discussion: A routine maintenance activity to remove the MSPTS spent treatment media (zero valent iron [ZVI] filings) and replace it with new ZVI media is scheduled for January-February 2011. The last MSPTS media replacement was performed in 2006. See Contact Record 2010-07, which provides information about the MSPTS and the planned media replacement. The scope of the work was also discussed at a consultation meeting with DOE, CDPHE, EPA and Stoller staff on December 13, 2010. The work is summarized in this Contact Record.

The PVC piping in the two treatment cells will also be removed with the media (it is, by design, sacrificial). New PVC piping will be installed as part of the media replacement, but the piping configuration will be changed slightly to prepare for future plumbing changes, should they be desired, to allow easier field operational alignment to provide either up flow or down flow of water through the media. Although the system plumbing was improved in 2006 to allow both of these flow configurations, the currently proposed upgrades will provide improved components within the treatment cells; if desired in the future, additional components will be installed between cells to finalize these plumbing improvements. The end result of the completion of these plumbing improvements will be to provide for easier adjustments to flow configuration, and will eliminate subsurface valves that have proved problematic in some cases. The flexibility to switch the flow directions based on treatment system monitoring results allows flow characteristics to be optimized within the media as conditions warrant.

As discussed in Contact Record 2010-07, additional measures to reduce effluent concentrations of residual volatile organic compounds (VOCs) have been considered. In conjunction with the media replacement, a solar powered pump will be installed in the existing effluent metering manhole (which is approximately 5 feet diameter by 10 feet deep) to pump water from the bottom of the manhole up and through a spray nozzle (also situated within the effluent manhole). This optimization measure will reduce the residual low levels of VOCs via air stripping. Effluent water will only be sprayed within the manhole void space. The air space in the manhole will be vented using small vents installed in the lid and/or side of the manhole, as appropriate, and solar powered fans may assist in promoting ventilation. Data will be collected to help inform improvements in pump rate and spray pattern in order to optimize the effectiveness of this simple air stripping design. If these efforts lead to the conclusion that this air stripper does not perform satisfactorily or is not cost-effective, the RFLMA parties will consult on the feasibility of other air stripper designs.

The work will include excavation to approximately 4 to 5 feet below the ground surface to perform maintenance and make repairs as necessary on existing effluent discharge gallery components including the terminal section of discharge gallery pipe situated adjacent to FC-4 and the surrounding gravel drain. The work includes removing existing piping and aggregate, cleaning any excessive biological or mineralogical detritus, and replacing the piping components and aggregate. This work will be conducted generally within the footprint of the existing discharge gallery components. Attachment 1 shows the general location of the components to be excavated. Excavation at some locations along the run of the 2-inch pipe from the french drain manhole to the gravel drain components may also be done to investigate conditions and to verify locations for updating as-built drawings.

This excavation work will exceed the 3-foot depth limit specified by Rocky Flats Legacy Management Agreement (RFLMA) institutional control (IC) 2 (RFLMA, Attachment 2, Table 4, Control 2); thus, the procedures require preapproval.

The objective of IC 2 regarding excavations with a depth that exceeds 3 feet is to maintain the current depth to subsurface contamination or contaminated structures. These ICs also result in achieving compliance with the CDPHE risk management policy of ensuring that residual risks to the site user are at or below 1×10^{-6} . As discussed below, the proposed work achieves the risk management policy goal.

Excavation will be reduced to the extent feasible, and soils will be returned to approximately the preexisting grade. Excess soils and aggregate from the excavation after the new discharge gallery is installed will be used in the immediate area to reduce the potential for ponding, enhance drainage away from the treatment cells and associated components, and improve the road servicing the MSPTS. The best management practices in the *Erosion Control Plan for Rocky Flats Property Central Operable Unit, DOE-LM/1497-2007* (July 2007) will also be implemented to provide erosion controls for the construction area so that run-on and runoff will be minimized.

The MSPTS is expected to be shut down for several weeks to accomplish the work. Water within the treatment cells at the start of the project will be pumped out through the MSPTS effluent manhole. Water from precipitation in the excavation that may impact the construction work, or that accumulates in the treatment cells during the work, will be pumped to the ground in the area west of the excavation area. If water that collects in the MSPTS collection trench needs to be managed to reduce the levels in the trench, it will be transferred to the East Trenches Plume Treatment System.

CDPHE has requested that the following information related to ICs be included in contact records for soil excavation:

1) Provide information about any remaining subsurface structures in the vicinity so that the minimum cover assumption will not be violated (or state that there are none if that is the case).

The work is at the MSPTS. Except for MSPTS-related components, there are no other subsurface structures in the immediate vicinity.

2) Provide information about any former IHSSs/PACs [Individual Hazardous Substance Sites/Potential Areas of Concern] or other known soil or ground water contamination in the vicinity (or state that there is no known contamination).

The Mound Site Plume and Oil Burn Pit #2 Plume are upgradient of the MSPTS. There are no former IHSSs or PACs in the vicinity of the excavation area. Several former IHSSs or PACs are north, east, and south of the work area, but are not near the area to be disturbed. All of these were dispositioned by CDPHE and EPA approved "No Further Action Recommendations", and thus do not pose risk of contamination. These IHSSs/PACs are:

- Former IHSS 190, Caustic Leak (also referred to as the Central Avenue Ditch);
- Former IHSS 192, Anti-Freeze Discharge;
- Former PAC 900-1311, Septic Tank East of Building 991; and
- Former PAC 900-1312, OU 2 Water Spill.

The discharge gallery components function to carry the treated effluent water from the MSPTS. When flow to the MSPTS is shut down for the work, the effluent will stop. The volume of residual effluent in the components, if any, will be small. Contact Record 2010-07 includes an evaluation of MSPTS effluent concentrations and provides the basis for the conclusion that the effluent does not pose any significant risk to human health or the environment.

3) Resurvey any new surface established in subsurface soil, unless sufficient existing data is available to characterize the surface (or state that the excavated soil will be replaced and the original contours restored).

When completed, the surrounding soil will be generally consistent with the existing grade, with some very minor improvements to facilitate drainage and prevent ponding at the treatment cells.

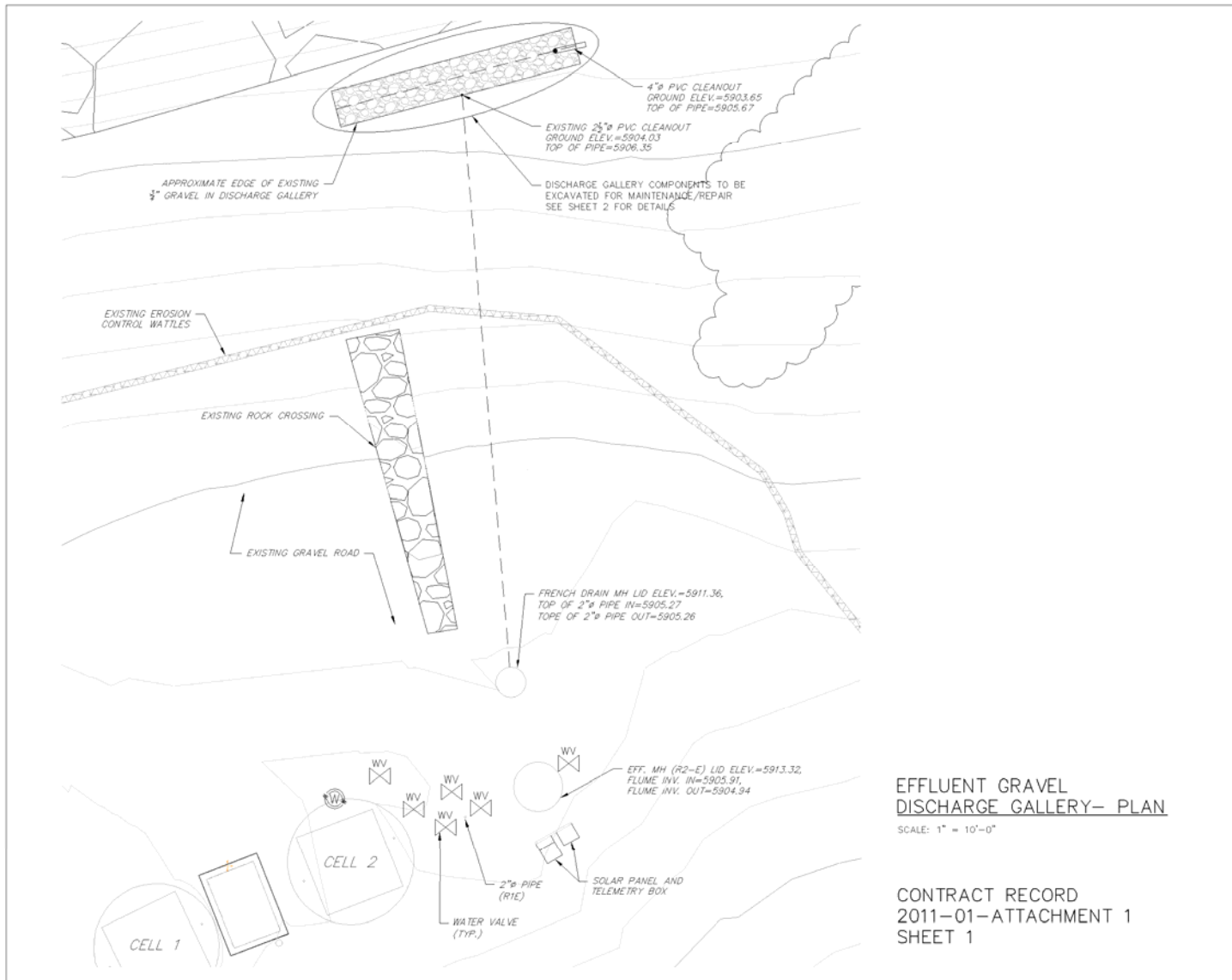
Closeout of Contact Record: This contact record will be closed when the work is completed and post-construction revegetation and erosion controls are in place.

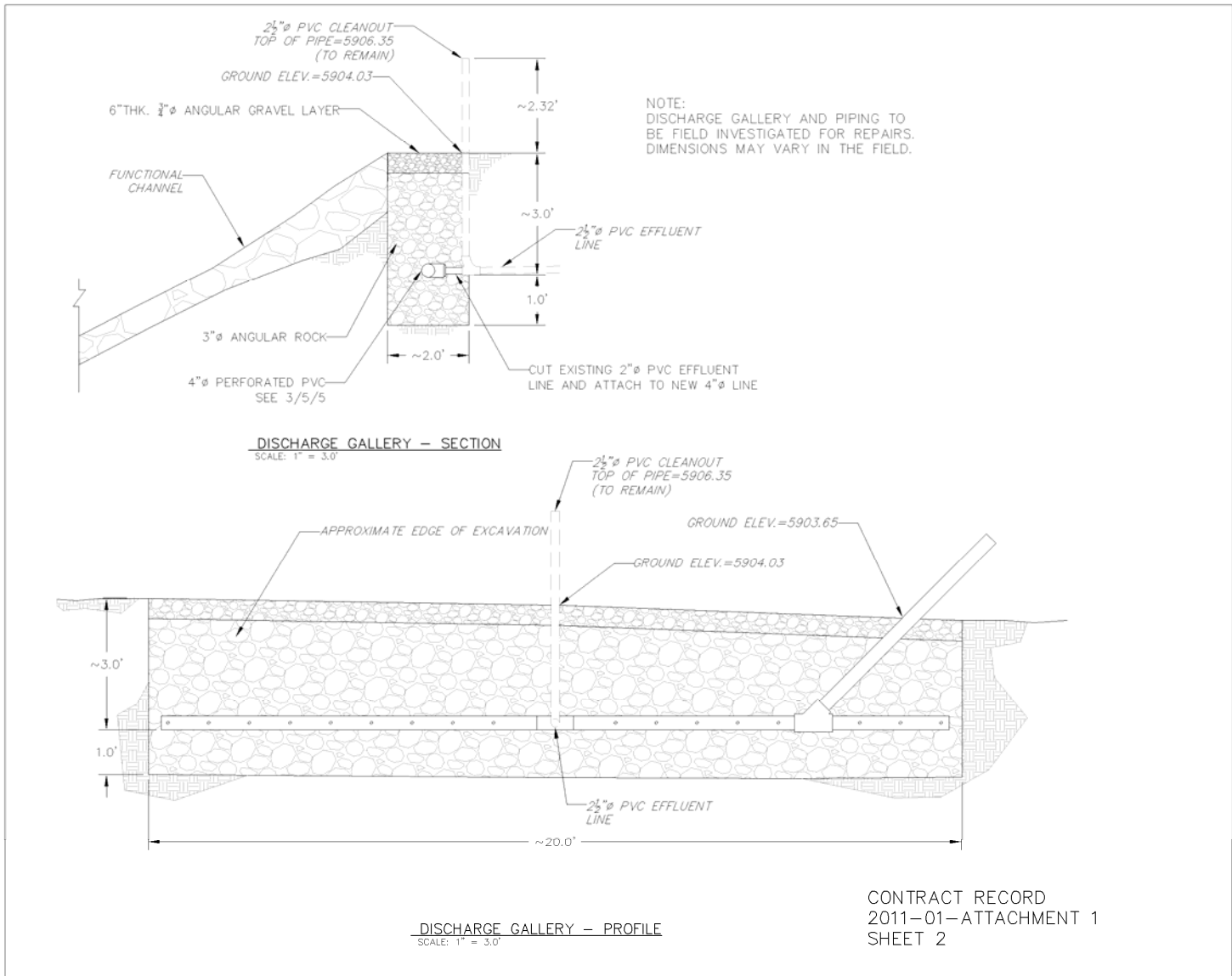
Resolution: Carl Spreng, CDPHE, approved this contact record.

Contact Record Prepared By: John Boylan and Rick DiSalvo

Distribution:

Carl Spreng, CDPHE
Scott Surovchak, DOE
Linda Kaiser, Stoller
Rocky Flats Contact Record
File





ROCKY FLATS SITE REGULATORY CONTACT RECORD

Purpose: Resource Conservation and Recovery Act (RCRA) Well Monitoring Results at Original Landfill (OLF) and Present Landfill (PLF)

Contact Record Approval Date: April 25, 2011

Site Contact(s)/Affiliation(s): Scott Surovchak, U.S. Department of Energy (DOE); John Boylan, S.M. Stoller Corporation (Stoller); Rick DiSalvo, Stoller

Regulatory Contact(s)/Affiliation(s): Carl Spreng, Colorado Department of Public Health and Environment (CDPHE); Vera Moritz, U.S. Environmental Protection Agency (EPA)

Discussion: Groundwater monitoring results were reviewed in accordance with Rocky Flats Legacy Management Agreement (RFLMA) requirements and for the preparation of the 2010 RFLMA Annual Report. The results of statistical evaluations of analytical data from the OLF and PLF RCRA wells required consultation among the RFLMA Parties. This contact record documents the specific results driving the need for consultation. More detailed information will be provided in the 2010 Annual Report.

The RFLMA decision flowchart for RCRA wells at the OLF and PLF is presented in Figure 10 of Attachment 2 to the RFLMA. The following summary describes conditions that require consultation to determine an appropriate response. These conditions were discussed in a consultation meeting on March 31, 2010.

OLF

1. Downgradient groundwater contains statistically significant higher concentrations of a constituent included in RFLMA Table 1 than are present in upgradient groundwater, *OR*
2. Trending calculations indicate a constituent in downgradient groundwater at the OLF is on a statistically significant increasing trend.

PLF

1. Downgradient groundwater contains statistically significant higher concentrations of a constituent included in RFLMA Table 1 than are present in upgradient groundwater, *AND* trending calculations indicate a constituent in downgradient groundwater at the PLF is on a statistically significant increasing trend.

Analytical data from the RCRA wells at each landfill was evaluated using the analysis of variance (ANOVA) approach to determine if downgradient concentrations significantly exceeded upgradient concentrations; and using the Seasonal Kendall trending method to assess whether any constituents are on a statistically significant increasing trend.

OLF

At the OLF, the result of corresponding evaluation condition number 1 above is true for 2010: the groundwater results for all three downgradient wells indicate a statistically significant higher

concentration of boron (B) is present in downgradient than upgradient groundwater. The same applies to uranium (U) in downgradient groundwater monitored at well 80205, the easternmost of the three downgradient wells. The concentration of B is below the RFLMA Table 1 standard and the concentration of U is below the RFLMA groundwater threshold value. Furthermore, the U in this well has been characterized as 100% natural U by Los Alamos National Laboratory using Thermal Ionization Mass Spectrometry analysis.

The result for evaluation condition number 2 is not true for 2010.

The overall 2010 evaluation results for these analytes were no different than the 2009 results, which are summarized in contact record 2010-05 and the 2009 RFLMA Annual Report.

PLF

At the PLF, the result of the corresponding evaluation condition is true for 2010 for B in groundwater monitored at well 73105. The concentration of B is below the RFLMA Table 1 standard.

The overall 2010 evaluation results were no different than the 2009 results, which are summarized in contact record 2010-05 and the 2009 RFLMA Annual Report.

Resolution: The appropriate response is to continue monitoring RCRA wells in accordance with RFLMA.

The RFLMA Parties also agreed that no further contact record documentation for evaluation of these analytes at the PLF or OLF is required, and the evaluation is to be provided in subsequent RFLMA Annual Reports. After review of the RFLMA Annual Reports, the RFLMA Parties may decide that subsequent consultation regarding appropriate response is appropriate. Such consultation will be documented in a contact record.

Closeout of Contact Record: This contact record will be closed when it is posted to the Rocky Flats website.

Resolution: Carl Spreng, CDPHE, approved this contact record.

Contact Record Prepared By: John Boylan and Rick DiSalvo

Distribution:

Carl Spreng, CDPHE
Scott Surovchak, DOE
Linda Kaiser, Stoller
Rocky Flats Contact Record File

ROCKY FLATS SITE REGULATORY CONTACT RECORD

Purpose: Reportable Condition for Uranium at Point of Evaluation GS10

Contact Record Approval Date: July 8, 2011

Site Contact(s)/Affiliation(s): Scott Surovchak, U.S. Department of Energy (DOE); Gwen Hooten, DOE, John Boylan, S.M. Stoller Corporation (Stoller); Rick DiSalvo, Stoller; Linda Kaiser, Stoller; George Squibb, Stoller

Regulatory Contact(s)/Affiliation(s): Carl Spreng, Colorado Department of Public Health and Environment (CDPHE); Vera Moritz, U.S. Environmental Protection Agency (EPA)

Discussion: A reportable condition at surface water Point of Evaluation GS10 was determined based on an evaluation of validated analytical results for uranium from the composite sample collected during the period from 10:50 a.m. on April 11, 2011, to 11:39 a.m. on May 4, 2011.

The evaluation was performed in accordance with *Rocky Flats Legacy Management Agreement* (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 µg/L. This amount exceeds the RFLMA applicable Table 1 standard of 16.8 µg/L. Validated results were received on June 14, 2011, and 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.

Pursuant to RFLMA Attachment 2, Section 6.0, "Action Determinations," for a reportable condition:

- DOE must submit a plan and schedule for an evaluation to address the condition within 30 days of receiving the validated data for the reportable condition.
- DOE will consult with CDPHE and EPA to determine if mitigating actions are necessary.
- The objective of the consultation will be to determine a course of action (if determined necessary) to address the reportable condition and to ensure that the remedy remains protective.
- The results of the consultation will be documented in contact records, in written correspondence, or both.

This Contact Record documents DOE's consultation with CDPHE and EPA on June 16, 2011.

The RFLMA Parties agreed on the evaluation steps described below and agreed that no mitigating actions are necessary while the condition is being evaluated, for the following reasons:

- Downstream monitoring indicates that the remedy remains protective. The current 12-month rolling-average uranium concentration at the Pond B-5 outlet, Point of Compliance GS08, is 7.8 µg/L and includes the sample results through the last Pond B-5 discharge from March 24

to 30, 2011. Uranium results from the non-RFLMA monitoring project location B5INFLOW, which is upstream of GS08, have been reviewed, and concentrations are also below the RFLMA standard. B5INFLOW is also a flow-paced sampling station.

- The groundwater in the GS10 area has high concentrations of naturally occurring uranium as well as lower concentrations of anthropogenic uranium. Measured concentrations of uranium at GS10 include both naturally-occurring as well as anthropogenic uranium. Historically, naturally-occurring uranium has made up a much greater proportion of the concentration at GS10 - generally about 70 percent.
- In recent years, the elevated uranium concentrations at GS10 are a result of proportionally increased groundwater contribution to surface water baseflow due to reduced surface runoff resulting from the removal of impervious surfaces (e.g., pavement, buildings) during site closure. In addition to the general increase in groundwater contribution to the stream, the below-normal precipitation from the late fall of 2010 until mid-May 2011 resulted in a further proportional increase in groundwater contribution.
- The uranium concentrations are expected to vary due to the natural variability in environmental conditions such as the amounts of precipitation over time. Elevated uranium concentrations at GS10 above the RFLMA standard previously occurred for the period from April 30, 2006, to March 31, 2009, with the 12-month rolling averages in the range of 10.2 to 15.8 pCi/L. The RFLMA uranium standard was subsequently revised from an activity-based radionuclide parameter of 10 pCi/L to a concentration based metal parameter of 16.8 µg/L, which equates to approximately 11.3 pCi/L. Thus, the ranges in activity summarized above for 2006 to 2009 equate to approximately 15.2 to 23.5 µg/L. Levels returned to below the RFLMA standard after March 31, 2009, because precipitation levels increased.

However, the RFLMA Parties agreed that further evaluation should be done to help confirm the foregoing conclusions and aid in developing mitigating actions in the future if they become necessary.

Plan and Schedule to Address the Reportable Condition:

The RFLMA Parties agreed that steps described in this Contact Record shall serve as the plan and schedule for the evaluation.

The following preliminary steps are being or have been taken and will inform the evaluation.

- The following samples have been sent to Los Alamos National Laboratory (LANL) for isotopic analysis to determine the percentages of natural and anthropogenic uranium to compare with percentages in pre-closure and post-closure samples previously analyzed by LANL:
 - Flow-paced surface water sample from GS10: Historically, this location has had approximately 70 percent natural uranium.
 - Groundwater sample from upgradient well 99405: Historically, this location has had reported uranium concentrations that typically exceed 100 µg/L and have been 99.9 to 100 percent natural uranium.

- Non-RFLMA sampling and analysis of uranium downstream of GS10 at B5INFLOW will continue. Contact Record 2010-03 describes the non-RFLMA sampling project.

In addition to this sampling, two temporary surface water sample locations upstream of GS10 will be established for biweekly uranium grab sampling. The RFLMA Parties will determine the duration of the grab sampling for these upstream locations, based on an evaluation of the results.

The results of the foregoing sampling and analysis will help to determine if the percentages of natural and anthropogenic uranium differ significantly from previous results or if levels of uranium upstream of GS10 might suggest the need for further investigation or mitigating actions.

DOE will report the results of this monitoring and subsequent evaluation in RFLMA quarterly and annual reports of surveillance and monitoring activities. This plan and schedule may be modified based on the outcome of RFLMA Party consultation related to the evaluation.

To keep the public informed, the outcome of continuing RFLMA Party consultation regarding the evaluation will be reported in RFLMA quarterly and annual reports of surveillance and monitoring activities or in subsequent Contact Records.

Closeout of Contact Record: This Contact Record will be closed when the evaluation is completed.

Resolution: Carl Spreng, CDPHE, approved this Contact Record.

Contact Record Prepared By: John Boylan and Rick DiSalvo

Distribution:

Carl Spreng, CDPHE
Scott Surovchak, DOE
Linda Kaiser, Stoller
Rocky Flats Contact Record File

ROCKY FLATS SITE

REGULATORY CONTACT RECORD

Purpose: Update for Reportable Condition for Uranium at Point of Evaluation GS10

Contact Record Approval Date: October 4, 2011

Site Contact(s)/Affiliation(s): Scott Surovchak, U.S. Department of Energy (DOE); Gwen Hooten, DOE; John Boylan, S.M. Stoller Corporation (Stoller); Rick DiSalvo, Stoller; Linda Kaiser, Stoller; George Squibb, Stoller

Regulatory Contact(s)/Affiliation(s): Carl Spreng, Colorado Department of Public Health and Environment (CDPHE); Vera Moritz, U.S. Environmental Protection Agency (EPA)

Discussion: This Contact Record documents DOE's consultation with CDPHE and EPA on September 12, 2011 regarding the evaluation of the reportable condition at surface water Point of Evaluation GS10. All sampling locations discussed in this Contact Record 2011-05 are shown on Figure 1 at the end of this document.

The reportable condition was determined based on an evaluation of validated analytical results for uranium from the composite sample collected during the period from 10:50 a.m. on April 11, 2011, to 11:39 a.m. on May 4, 2011. The initial consultation regarding the reportable condition is documented in Contact Record 2011-04, approved July 8, 2011. Contact Record 2011-04 describes the **Plan and Schedule to Address the Reportable Condition**.

All of the planned actions described in Contact Record 2011-04 have been implemented, as follows:

- The following samples have been sent to Los Alamos National Laboratory (LANL) for isotopic analysis to determine the percentages of natural and anthropogenic uranium to compare with percentages in pre-closure and post-closure samples previously analyzed by LANL:
 - Flow-paced surface water sample collected June 3 through 13, 2011, from GS10. Historically, samples from this location have contained approximately 70 percent natural uranium.
 - Groundwater sample from upgradient well 99405, which is on the southeast side of former Building 991. Historically, this location has reported uranium concentrations ranging from 98 to 712 µg/L that have been 99.9 to 100 percent natural uranium.
- Non-Rocky Flats Legacy Management Agreement (RFLMA) sampling and analysis of uranium downstream of GS10 at sampling location B5INFLOW is continuing. Contact Record 2010-03 describes the non-RFLMA sampling project that includes B5INFLOW.

- Two temporary surface water sample locations upstream of GS10 were established for biweekly uranium grab sampling. The RFLMA Parties will determine the duration of the grab sampling for these upstream locations, based on an evaluation of the results. These locations are:
 - FC4750 in Functional Channel 4, east of the former location of the 750 Pad.
 - FC4991 in Functional Channel 4, at the east end of the wetland south of former Building 991.

The results of the LANL analysis were informally reported by LANL to Stoller staff while the formal LANL report is being prepared:

- The signature results for GS10 do not match the historical natural uranium percentage of approximately 70 percent. Natural uranium was reported as 49 percent. The uranium concentration was 21.6 µg/L. The previous LANL sample, taken on March 17, 2010, was 24.1 µg/L and 71.7 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.

Results for samples from GS10 and relevant upstream and downstream surface water locations collected in 2011 are provided below in Tables 1 through 3, and a map illustrating these locations is attached as Figure 1. A sample for the analysis of uranium was also collected on December 21, 2010, from the Mound Site Plume Treatment System (MSPTS) effluent, and uranium was not detected at a detection limit of 1 µg/L. The MSPTS effluent discharge gallery is upstream of GS10.

The downstream monitoring results continue to indicate that the remedy remains protective, since uranium results are below the RFLMA surface water standard, 16.8 µg/L.

While the uranium concentration at GS10 appears to be decreasing from the levels that triggered the reportable condition, the 12-month rolling average uranium concentration is still above the RFLMA surface water standard. As stated in Contact Record 2011-04, the plan and schedule to address the reportable condition may be modified based on the outcome of RFLMA Party consultation related to the evaluation.

Table 1. Recent Uranium Grab Sample Results

Locations (upstream → downstream)	FC4750	FC4991	GS10	B3OUTFLOW	B5INFLOW	B5 POND
Sample Date	Result (µg/L)					
1/12/2011	NA	NA	18.0	25.0	14.0	7.2
1/26/2011	NA	NA	20.0	26.0	15.0	7.0
2/10/2011	NA	NA	18.0	20.0	10.0	7.1
2/24/2011	NA	NA	24.0	15.0	11.0	6.1
3/9/2011	NA	NA	22.0	18.0	9.1	7.4
3/23/2011	NA	NA	9.8	17.0	11.0	6.8
4/6/2011	NA	NA	13.0	16.0	9.7	7.9
4/19/2011	NA	NA	18.0	14.0	8.9	8.3
5/4/2011	NA	NA	79.0	14.0	8.2 ^a	8.3
5/18/2011	NA	NA	19.0	17.0	10.0	7.7
6/1/2011	NA	NA	14.0	14.0	7.8	7.3
6/15/2011	NA	NA	12.0	11.0	9.2	8.0
6/30/2011	24.0	6.3	9.6	8.0	7.4	7.5
7/13/2011	14.0	9.7	12.0	6.3	5.5	6.8
7/27/2011	14.0	8.7	8.7	6.2	3.9	6.5
8/10/2011	21.0	4.8	6.6	6.5	No Flow	5.6
8/15/2011 Pre-discharge samples					DOE	5.5
					CDPHE	5.4

Notes: Some results are preliminary and subject to revision.

^a The result returned from the lab for this sample was 72 µg/L. However, it appears that this sample was accidentally switched with the sample collected at location A2EFF. This determination is supported by patterns in both grab and composite samples at GS10, B3OUTFLOW, B5INFLOW, and A2EFF. The table above shows the result that is assumed to be correct.

NA = not sampled

Table 2. Recent Uranium Flow-Paced Composite Sample Results

Locations (upstream → downstream)	GS10		B5INFLOW		GS08	
	Sample Period	Result (µg/L)	Sample Period	Result (µg/L)	Sample Period	Result (µg/L)
	1/3–2/16/2011	21.8	1/18–4/11/2011	13.5		
	2/16–4/11/2011	89.2	4/11–5/4/2011	9.1	3/24 – 3/26/2011	7.9
	4/11–5/4/2011	71.0	5/4–5/13/2011	14.6	3/26 – 3/28/2011	7.5
	5/4–5/13/2011	46.5	5/13–5/18/2011	11.9	3/28 – 3/30/2011	7.9
	5/13–5/20/2011	18.6	5/18–5/19/2011	8.0		
	5/20–6/3/2011	35.8	5/19–5/20/2011	10.3		
	6/3–6/13/2011	20.1	5/20–6/3/2011	10.5		
	6/13–7/1/2011	10.6	6/3–7/1/2011	6.2		
	7/1–7/8/2011	7.8	7/1–7/10/2011	5.3		
	7/8–7/10/2011	4.4	7/10–7/11/2011	4.7		
	7/10–7/11/2011	6.1	7/11–7/14/2011	^a		
	7/11–7/21/2011	^a	7/14–7/21/2011	^a		
	7/21–8/24/2011	^a	7/21–8/24/2011	^a		
	8/24/2011–	^a	8/24/2011–	^b		

Notes: Some results are preliminary and subject to revision.

^a Analysis pending

^b Sample in progress

Table 3. Summary of Recent 12-Month and 30-Day Average Uranium Concentrations (µg/L)

Locations (upstream → downstream)	GS10		B5INFLOW		GS08	
	30-Day	12-Month	30-Day	12-Month	30-Day	12-Month
Date						
1/31/2011	21.4	14.2	9.8	^a	No Flow	9.4
2/28/2011	47.3	14.1	13.5	^a	No Flow	9.4
3/31/2011	89.2	14.1	13.5	^a	No Flow	9.2
4/30/2011	77.1	18.8	10.0	^a	No Flow	8.8
5/31/2011	28.1	21.5	10.9	^a	No Flow	7.8
6/30/2011	17.1	22.8	6.5	9.8	No Flow	7.8
7/31/2011	NA	NA	NA	NA	No Flow	7.8
8/31/2011	NA	NA	NA	NA	No Flow	7.8

Notes: Some values are preliminary and subject to revision.

NA = calculation pending receipt of analytical results

^a B5INFLOW not yet operating for 12 months

No Flow = 30-day averages are not calculated for days with no flow

Based on the LANL results for GS10, the RFLMA Parties agreed the following additional sampling data will help inform the ongoing evaluation.

- The following samples will be collected and sent to LANL for isotopic analysis to determine the percentages of natural and anthropogenic uranium.
 - Flow-paced surface water sample from GS10 to help confirm the previous sample results.

- Grab sample at surface water locations FC4750 and FC4991.
- Flow-paced surface water sample from B5INFLOW. This location does not have a previous LANL sample.
- Grab sample at a surface water location B3OUTFLOW in South Walnut Creek, which is between GS10 and B5INFLOW. One post-closure LANL sample was taken at B3OUTFLOW. The result was a 74.3 percent natural uranium signature.
- Wells 45608, 91203, 91305, and 15699, which are upgradient of GS10, will be sampled for uranium, and a sample from one of these wells will be selected for LANL analysis based on the uranium concentration. Of these, only well 91305 includes uranium as a routine RFLMA analyte.

These data will assist in the possible identification of a source that may have contributed to elevated uranium levels at GS10. Samples from the drainage area will also help determine if and where further evaluation samples may be taken.

- Wells 15699, 45608, and 91203 are not required under RFLMA to be sampled for uranium, but they will be sampled for uranium as a part of this evaluation to determine if the groundwater uranium concentrations are above the concentration at GS10 that triggered the reportable condition.
- The following wells that are required under RFLMA to be sampled for uranium and were most recently sampled before the reportable condition occurred will be sampled again to determine current groundwater uranium concentrations for comparison to historical data: 00203, 79502, and 79605, which are generally south and east of the former Solar Evaporation Ponds. Each of these evaluation wells was last sampled in April 2010. Wells in the former Building 991 area that are typically evaluated for uranium (including sentinel wells 91305, 99305, and 99405) were each sampled in the second half of April 2011, and the reported uranium concentrations were consistent with previous data. However, due to its location with respect to FC4991 and other Mound-area wells described previously, well 91305 again will be sampled for uranium as a part of this evaluation.

To keep the public informed, the outcome of continuing RFLMA Party consultation regarding the evaluation will be reported in RFLMA quarterly and annual reports of surveillance and monitoring activities or in subsequent Contact Records.

Closeout of Contact Record: This Contact Record will be closed when the evaluation is completed.

Resolution: Carl Spreng, CDPHE, approved this Contact Record.

Contact Record Prepared By: John Boylan, George Squibb, and Rick DiSalvo

Distribution:

Carl Spreng, CDPHE
 Scott Surovchak, DOE
 Linda Kaiser, Stoller
 Rocky Flats Contact Record File

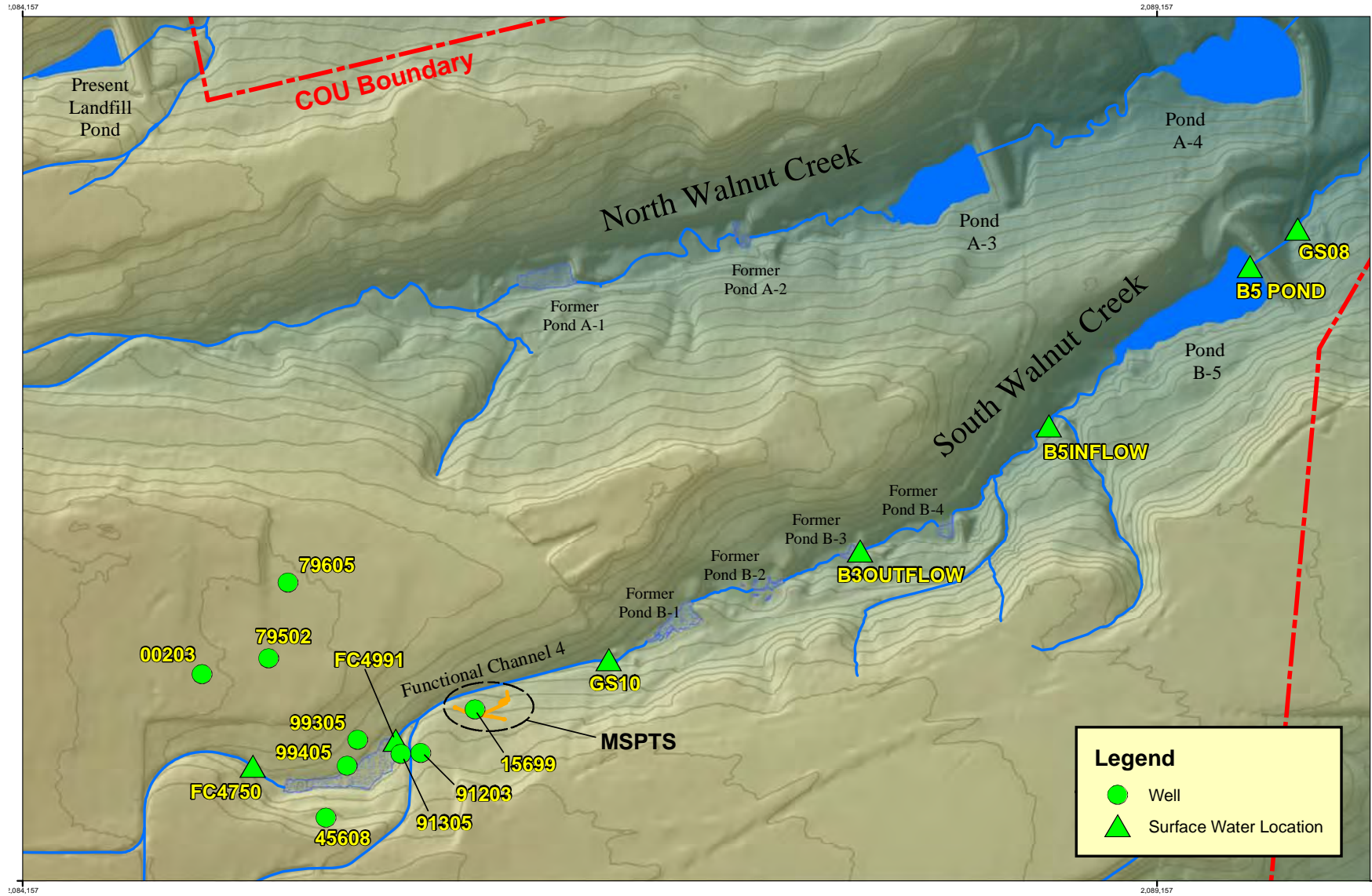


Figure 1. Sampling Location Map

ROCKY FLATS SITE REGULATORY CONTACT RECORD

Purpose: Reportable Condition for Americium-241 (Am) at Rocky Flats Legacy Management Agreement (RFLMA) Point of Evaluation (POE) GS10

Contact Record Approval Date: December 23, 2011

Site Contact(s)/Affiliation(s): Scott Surovchak, U.S. Department of Energy (DOE); Gwen Hooten, DOE; Rick DiSalvo, S.M. Stoller Corporation (Stoller); Linda Kaiser, Stoller

Regulatory Contact(s)/Affiliation(s): Carl Spreng, Colorado Department of Public Health and Environment (CDPHE); Vera Moritz, U.S. Environmental Protection Agency (EPA)

Date of Consultation Meeting: November 21, 2011

Consultation Meeting Participants: Carl Spreng, CDPHE; Vera Moritz, EPA; Scott Surovchak, DOE; Gwen Hooten, DOE; John Boylan, Stoller; Rick DiSalvo, Stoller; Linda Kaiser, Stoller; George Squibb, Stoller

Discussion: This Contact Record documents DOE's consultation with CDPHE and EPA regarding the evaluation of elevated concentrations of Am at POE GS10, which resulted in a reportable condition under RFLMA Attachment 2, "Legacy Management Requirements," Section 6.0, "Action Determinations."

A reportable condition was determined based on an evaluation of recently available validated analytical results for Am from the composite samples collected at GS10 during the period 7/21/11–10/25/11. Following is a synopsis of the data for plutonium-239/240 (Pu) and Am:

- Composite sample 7/21/11–8/24/11 (initial analysis; results validated 11/2/11): Pu = 0.938 pCi/L, Am = 2.97 pCi/L
- Composite sample 7/21/11–8/24/11 (laboratory reanalysis completed 11/15/11; results validated 11/22/11): Pu = 4.07 pCi/L, Am = 4.01 pCi/L
- Composite sample 8/24/11–9/29/11 (results validated 11/30/11): Pu = 0.020 pCi/L, Am = 0.044 pCi/L
- Composite sample 9/29/11–10/25/11 (results validated 11/22/11): Pu = 0.658 pCi/L, Am = 0.877 pCi/L

Under routine data validation protocols, the relative error ratio (RER) is used to evaluate data pairs (i.e., an initial analysis and a duplicate analysis). If the RER for a data pair is >3 and ≤ 5 , then the results are "J-qualified" (estimated). If the RER for a data pair is >5 , then the results are "R-qualified" (unusable result). During validation of the 7/21/11–8/24/11 analytical results, the Am results were determined to be J-qualified, while the Pu results were determined to be R-qualified. Therefore, the arithmetic average of the Am results is used in the calculation of the 12-month rolling average for Am; the Pu results were rejected and not included in the calculation of the 12-month rolling average for Pu.

The evaluation was 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 pCi/L on 8/31/11 and 0.22 pCi/L on 9/30/11. The applicable RFLMA Table 1 standard for Am and Pu is 0.15 pCi/L.

Flow-through operations at Pond B-5 were initiated on 9/12/11 (the previous discharge was in March 2011). Pu and Am results from downstream locations GS08 (Pond B-5 outlet), WALPOC (Walnut Creek at the Central Operable Unit boundary), and GS03 (Walnut Creek at Indiana Street) have been received through 9/26/11; all results were below 0.01 pCi/L. The downstream monitoring results continue to indicate that the remedy remains protective, since Pu and Am results are below the RFLMA surface water standard, 0.15 pCi/L.

While the 12-month rolling average for Pu at GS10 is not reportable, the evaluation of the reportable Am values will also include consideration of the Pu results.

Pursuant to RFLMA Attachment 2, Section 6.0, for a reportable condition:

- DOE must inform the RFLMA regulators and stakeholders identified in RFLMA Attachment 2, Figure 6 within 15 days of receipt of validated data for the reportable condition.
- DOE must submit a plan and schedule for an evaluation to address the condition within 30 days of receiving the validated data for the reportable condition.
- DOE will consult with CDPHE and EPA to determine if mitigating actions are necessary.
- The objective of consultation will be to determine a course of action (if determined necessary) to address the reportable condition and to ensure that the remedy remains protective.
- Results of consultation will be documented in Contact Records, written correspondence, or both.

The RFLMA regulators have been kept informed of the elevated levels since the initial results were received, and a public-information e-mail was sent to the stakeholders on 11/15/11 and 12/5/11. The RFLMA Parties agreed that the date of receipt of the validated results from the reanalysis of the composite sample 7/21/11–8/24/11 would be the trigger date for determination of a reportable condition.

This Contact Record describes the plan and schedule to address the reportable condition. Figure 1 shows the sampling locations related to the evaluation. The plan and schedule for evaluation and the status of actions related to the plan are described below:

- Rocky Flats staff walked down the GS10 drainage on 11/16/11 to see if there were any obvious conditions promoting potential soil erosion. Some thin vegetation spots were noted on the north side of the riprap upstream of GS10.
- On 11/22/11, Stoller staff and the RFLMA Project Coordinators for DOE and EPA examined the drainage more closely, focusing on seeps and former utility corridors, to identify possible seeps and observe areas for additional seeding or erosion controls. Based on the observations:

- Several seep sampling locations (SEEP995, SEEP995A, SEEP995B, and SEEP995C) were also grab sampled on 11/25/11. These samples are being analyzed for Pu and Am on a 2-week turnaround.
- Seeding was done along the north side of the riprap upstream of GS10, and a thinly vegetated area east of the confluence of Functional Channel (FC) 4 and FC 5 was identified for revegetation.
- Several of the sampling locations already designated for the evaluation of the reportable condition for uranium at GS10, as discussed in Contact Records 2011-04 and 2011-05 (FC4991, GS10, and B3OUTFLOW), were grab sampled on 11/25/11. These samples are being analyzed for Pu and Am on a 2-week turnaround.
- An aliquot from each flow-paced composite sample routinely being collected at B5INFLOW (also supporting the GS10 uranium evaluation) will also be obtained and held for Pu and Am analysis if upstream sample results suggest that analysis would inform the evaluation.
- Flow-paced composite samples routinely being collected at WALPOC will continue to be analyzed on a 2-week turnaround. Analyses for flow-paced composite samples routinely being collected at GS10 and GS08 will be accelerated to a 2-week turnaround.
- Historical Pu and Am well data from wells in the drainage have been reviewed. The review gave no indication that any additional well sampling would be informative at this stage.
- The previous GS10 evaluation reports for elevated levels of Pu or Am prior to closure were reviewed for information that may aid this current evaluation. Sampling from surface water locations upstream of GS10 and sediment in GS10 were performed as part of these evaluations. Elevated levels at GS10 were determined to most likely be the result of low-level diffuse soil contamination that intermittently impacted the water quality at GS10 due to erosion. The evaluation being done for this recent reportable condition includes sampling of surface water and seep locations upstream of GS10, but it also includes sampling at B3OUTFLOW and B5INFLOW for Pu and Am between GS10 and Point of Compliance WALPOC.

The RFLMA Parties will review the analytical results of the sampling described above and consult on whether any additional evaluation monitoring or any mitigating actions are needed. This evaluation plan and schedule to address the reportable condition may be modified based on the outcome of RFLMA Party consultation related to the evaluation.

To keep the public informed, the outcome of continuing RFLMA Party consultation regarding the evaluation will be reported in RFLMA quarterly and annual reports of surveillance and monitoring activities or in subsequent Contact Records.

Closeout of Contact Record: This Contact Record will be closed when the evaluation is completed.

Resolution: Carl Spreng, CDPHE, approved this Contact Record.

Contact Record Prepared By: George Squibb and Rick DiSalvo

Distribution:

Carl Spreng, CDPHE

Scott Surovchak, DOE

Linda Kaiser, Stoller

Rocky Flats Contact Record File

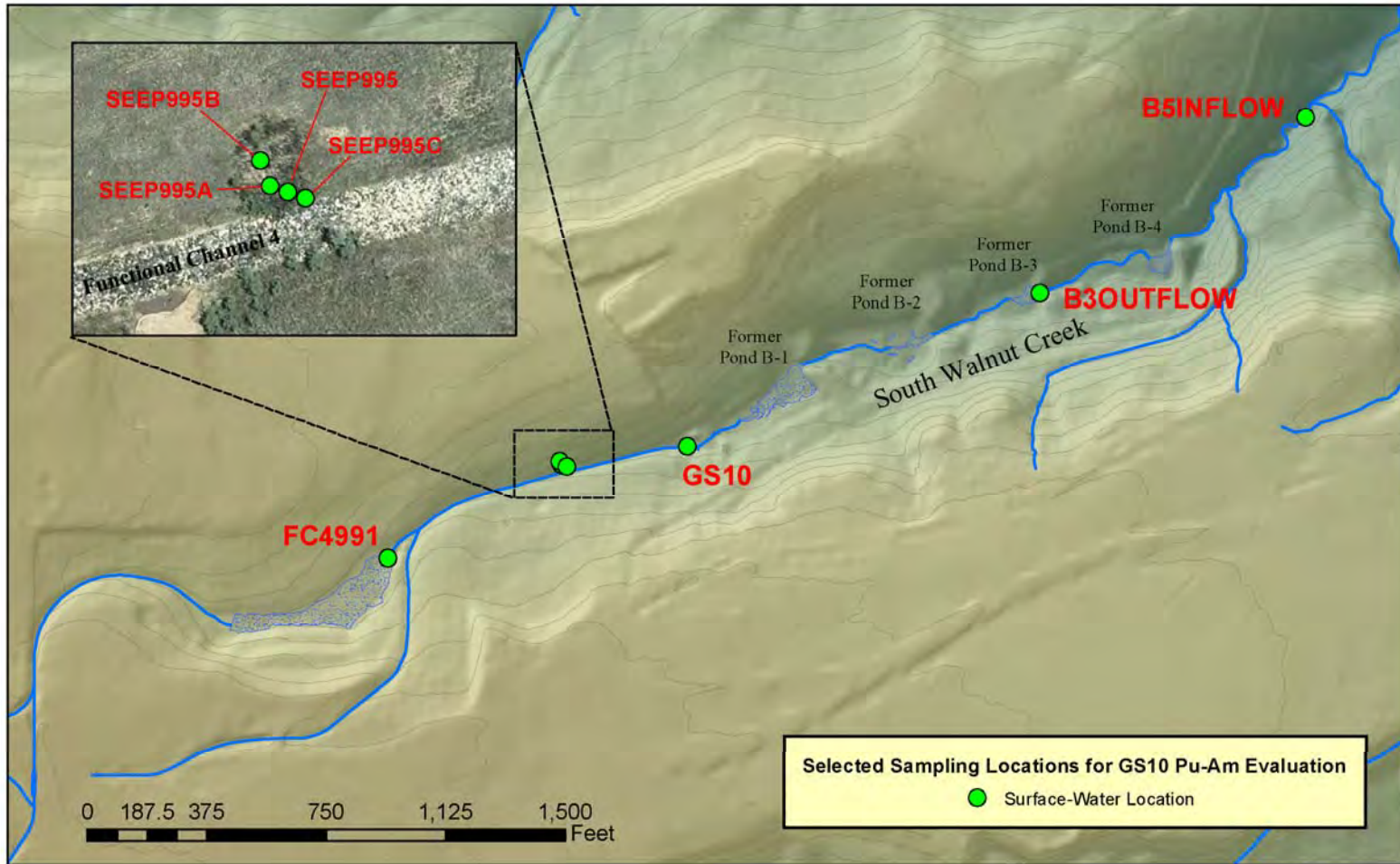


Figure 1. Sampling Location Map

Ward, David (CONTR)

From: DOE Office of Legacy Management
Sent: Monday, July 23, 2012 3:19 PM
To: 'Bob Krugmire'; Bruce Hastings (bruce_hastings@fws.gov); Carl Spreng (carl.spreng@state.co.us); Cathy Shugarts; David Abelson (dabelson@rockyflatssc.org); David Allen; Ed Lanyon (edward.lanyon@cityofthornton.net); Emily Hunt (emily.hunt@cityofthornton.net); Hooten, Gwen; Laura Hubbard (lhubbard@broomfield.org); 'Raymond Reling'; rc-rocky.flats; Rik Getty (rgetty@rockyflatssc.org); Surovchak, Scott; Shelly Stanley (SStanley@northglenn.org); Steve Berendzen (steve_berendzen@fws.gov); Vera Moritz
Subject: Rocky Flats NOTIFICATION OF A REPORTABLE CONDITION

NOTIFICATION OF A REPORTABLE CONDITION UNDER RFLMA ATTACHMENT 2, SECTION 6.0, ACTION DETERMINATIONS

This notification is to inform you of a reportable condition under RFLMA Attachment 2, Section 6.0, Action Determinations, at the RFLMA Point of Evaluation, GS10. RFLMA Attachment 2 Section 6 and Figure 6 require informing regulators and the listed stakeholders within 15 days of receipt of validated data and providing evaluation plan to CDPHE and EPA within 30 days. This e-mail serves as the formal notification.

A reportable condition was determined based on evaluation of recently available validated analytical results for plutonium-239/240 from the composite samples collected during the period 6/1/2011 - 5/31/2012. The evaluation was performed in accordance with RFLMA Attachment 2, Figure 6, Points of Evaluation, which resulted in 12-month rolling average values for Pu of 0.17 pCi/L on 5/31/12. The applicable RFLMA Table 1 Standard for Pu is 0.15 pCi/L.

A reportable condition for americium-241 at GS10 that began in 2011 is described in Contact record 2011-08. The plutonium 239/240 concentration at GS10 was not reportable at the time the americium-241 concentration became reportable, however the evaluation plan for the americium-241 reportable condition also includes evaluation of plutonium 239/240.

The status of the GS10 reportable condition evaluation is discussed in the RFLMA Annual Report of Surveillance and Maintenance Activities, Calendar Year 2011 and in the RFLMA Quarterly Report of Site Surveillance and Maintenance Activities, First Calendar Quarter Calendar Year 2012. These reports as well as Contact Record 2011-08 are posted on the Rocky Flats public website.

If you have any questions, please contact:
Scott Surovchak
DOE Office of Legacy Management
Rocky Flats Site manager
Scott.surovchak@lm.doe.gov

Ward, David (CONTR)

From: Spreng - CDPHE, Carl <carl.spreng@state.co.us>
Sent: Thursday, April 03, 2014 4:26 PM
To: Surovchak, Scott
Cc: Moritz.vera@epa.gov; Ward, David (CONTR); Kaiser, Linda (CONTR)
Subject: Re: FW: e-mail for Carl and Vera to discontinue sampling the 995 hillside seeps

Vera and I are OK with your proposal to discontinue sampling of the seeps on the former Bldg 995 hillside, which is consistent with our recent consultation with you. CR 2011-08 addresses Am-241 since Pu was not reportable at the time. The Pu 12-month rolling average subsequently became reportable, and so this discontinuance of sampling will affect Pu's reportable condition also.

Carl

On Thu, Apr 3, 2014 at 2:46 PM, Surovchak, Scott <Scott.Surovchak@lm.doe.gov> wrote:

Hey Carl and Vera,

The evaluation plan for GS10 Americium-241 reportable condition sampling regimes discussed in CR 2011-08 identified the seeps on the former Building 995 hillside as sample locations of interest. Based on seep water sampling results to date, the concentrations observed do not suggest that continued sampling or any additional investigation actions for this area would further inform the ongoing GS10 evaluation. In accordance with CR 2011-08, we agreed in a recent consultation to discontinue sampling the former Building 995 hillside seeps as part of the evaluation for the GS10 Am-241 reportable condition. We will continue monitor the remaining evaluation locations discussed in CR 2011-08. The results of the seep samples and this evaluation to cease sampling the seeps will be reported in RFLMA quarterly and annual reports.

This good with you? If so, we will proceed with not proceeding on sampling the seeps and focus on the remaining locations and reporting as discussed.

Scott

--
Carl Spreng
Colorado Department of Public Health & Environment

ROCKY FLATS SITE REGULATORY CONTACT RECORD

Purpose: Soil Disturbance Review Plan—Roads maintenance, including grading the road to the former A-3 Pond to convert the road to two-track vehicle use.

Contact Record Approval Date: May 31, 2012

Site Contact(s)/Affiliation(s): Scott Surovchak, U.S. Department of Energy (DOE); Gwen Hooton, DOE; Rick DiSalvo, S.M. Stoller Corporation (Stoller); Kurt Franzen, Stoller; Linda Kaiser, Stoller

Regulatory Contact(s)/Affiliation(s): Carl Spreng, Colorado Department of Public Health and Environment (CDPHE); Vera Moritz, U.S. Environmental Protection Agency (EPA)

Date of Consultation Meeting: May 24, 2012

Consultation Meeting Participants: Carl Spreng, CDPHE; Scott Surovchak, DOE; Rick DiSalvo, Stoller

Discussion: Routine maintenance and minor repairs to portions of the Central Operable Unit (OU) gravel roads are planned for mid-June 2012. As part of the project, the gravel road that leads to the former A-3 Pond will be converted from a truck access road to a two-track vehicle (e.g., an all-terrain vehicle) access road.

The dams for Pond A-3 and the Present Landfill (PLF) were breached as described in Contact Record 2011-07, “Soil Disturbance Review Plan—Pond A-3 and Present Landfill (PLF) Pond Dam Breach Project.” A truck-access gravel road will be maintained for the PLF area for inspection, monitoring, and maintenance of the PLF cover and the Present Landfill Seep Treatment System, but a two-track access road is all that is needed in the former A-3 Pond area for access to North Walnut Creek monitoring locations. That existing gravel road will be converted to a two-track road and will be revegetated and designated for two-track vehicle use. A portion of this road (on the hillside slope leading south to the former A-3 Pond) that was built up to accommodate trucks will be regraded to promote revegetation, to accommodate precipitation runoff, and to minimize the potential for erosion. The regrading will involve excavation deeper than 3 feet below the existing grade, and the surface will not be returned to the preexisting grade.

Two other gravel road sections that have centerline humps will be regraded to remove approximately 6 inches of soil that form the humps. This cut soil will be filled and graded into the road. This regrading will not return the surface of the centerline humps to the preexisting grade or higher.

This work is subject to the *Rocky Flats Legacy Management Agreement (RFLMA)*, Attachment 2, Institutional Controls (ICs) 2 and 3, which are provided in the following table.

IC 2	Excavation, drilling, and other intrusive activities below a depth of three feet are prohibited, without prior regulatory review and approval pursuant to the Soil Disturbance Review Plan in RFLMA Attachment 2.
	<p>Objective: Prevent unacceptable exposure to residual subsurface contamination.</p> <p>Rationale: Contaminated structures, such as building basements, exist in certain areas of the Central OU, and the Comprehensive Risk Assessment did not evaluate the risks posed by exposure to this residual contamination. Thus, this restriction eliminates the possibility of unacceptable exposures. Additionally, it prevents damage to subsurface engineered components of the remedy.</p>
IC 3	No grading, excavation, digging, tilling, or other disturbance of any kind of surface soils is permitted, except in accordance with an erosion control plan (including Surface Water Protection Plans submitted to EPA under the Clean Water Act) approved by CDPHE or EPA. Soil disturbance that will not restore the soil surface to preexisting grade or higher may not be performed without prior regulatory review and approval pursuant to the Soil Disturbance Review Plan in RFLMA Attachment 2.
	<p>Objective: Prevent migration of residual surface soil contamination to surface water.</p> <p>Rationale: Certain surface soil contaminants, notably plutonium-239/240, were identified in the fate and transport evaluation in the Remedial Investigation as having complete pathways to surface water if disturbed. This restriction minimizes the possibility of such disturbance and resultant impacts to surface water. Restoring the soil surface to preexisting grade maintains the current depth to subsurface contamination or contaminated structures.</p>

The required Soil Disturbance Review Plan is in Attachment 1. Figures 1 and 2 show the location of the areas to be graded described above.

CDPHE has reviewed information regarding the proposed soil disturbance and excavation and, after consultation with EPA, CDPHE has approved the proposed activity. CDPHE has determined that the proposed activity will not result in an unacceptable release or exposure to residual subsurface contamination, and will not damage any component of the remedy. CDPHE has also determined that the proposed project meets the rationale and objectives of IC 2 and IC 3.

DOE will not conduct the approved soil disturbance and excavation until 10 calendar days after this contact record is posted on the Rocky Flats website and notification of the posting is made to stakeholders in accordance with the RFLMA Public Involvement Plan.

Closeout of Contact Record: This contact record will be closed when the work is completed, post-construction erosion controls are in place, and seeding for revegetation has been performed.

Resolution: Carl Spreng, CDPHE, approved the soil disturbance and excavation work described in the Soil Disturbance Review Plan (Attachment 1).

Contact Record Prepared by: Rick DiSalvo

Distribution:

Carl Spreng, CDPHE
 Scott Surovchak, DOE
 Linda Kaiser, Stoller
 Rocky Flats Contact Record File

Rocky Flats Legacy Management Agreement (RFLMA) Soil Disturbance Review Plan

Proposed Project: Roads maintenance, including grading the road to the former A-3 Pond to convert the road to two-track vehicle use.

This Soil Disturbance Review Plan provides information required by RFLMA Attachment 2, “Legacy Management Requirements,” Section 4.1, regarding the work proposed by the U.S. Department of Energy (DOE).

For clarity in this Soil Disturbance Review Plan, the areas under discussion are identified on Figure 1 as Locations 1 and 2 (gravel road sections where centerline humps will be removed) and Location 3 (a gravel road that will be regraded and revegetated for two-track vehicle use). The locations are as follows:

- **Location 1:** Gravel road access to the Solar Ponds Plume Treatment System Interceptor Trench System collection sump and related equipment and the SPOUT sampling location.
- **Location 2:** Gravel road access from the east face of Pond A-4 Dam to the WALPOC sampling location.
- **Location 3:** Gravel road access from the south-facing hillside to the former Pond A-3 and Surface Water Configuration Adaptive Management Plan sampling location GS12.

Description of the proposed project, including the purpose, the location, and the lateral and vertical extent of excavation.

The purpose of the project is to perform routine maintenance of gravel roads and to revegetate and regrade a section of existing gravel road to convert it to two-track vehicle use. The work locations are shown in Figures 1 and 2. The maintenance will include removing approximately 6 inches of soil that form the centerline humps in the gravel roads at Locations 1 and 2 that could pose a vehicle safety hazard if not removed, and grading the removed material into the low spots adjacent to the humps. The gravel road in Location 3 was previously graded to accommodate truck use. One portion, on a hillside, has a horizontal “bench” profile that entails precipitation runoff and erosion control maintenance requirements. The removed soils will be placed and graded within the gravel road footprint. Regrading to remove the “bench” profile and revegetation will accommodate two-track vehicle use and improve the runoff characteristics in this area, thus minimizing the erosion potential and the need for erosion controls when the vegetation is established.

The planned location, lateral and vertical extent, and grade upon completion of the work are as described above and shown in Figures 1 and 2.

Information about any remaining subsurface structures in the vicinity of the proposed project.

There are no remaining subsurface structures in the vicinity of Locations 1, 2 or 3.

Information about any former Individual Hazardous Substance Sites (IHSSs), Potential Areas of Concern (PACs), or other known or potential soil or groundwater contamination in the vicinity of the proposed project.

Location 1: This location is not in the vicinity of any former IHSSs or PACs, but it is in the eastern area of the extent of the Solar Pond Plume (SPP), as shown on RFLMA Attachment 2, “Legacy Management Requirements,” Figure 2, “Composite Plume Map.” The SPP contains nitrate and uranium contamination at levels above RFLMA surface water standards, which are based on Colorado drinking water supply standards.

This road maintenance work will not involve any soil disturbance that would result in contact with groundwater that may be associated with the SPP.

Location 2: This location is just east of former IHSS 142.4—Pond A-4, and is not in any former IHSS or PAC.

Location 3: This location is just north of former IHSS 142.3—Pond A-3, and is not in any former IHSS or PAC.

As part of the *RCRA Facility Investigation—Remedial Investigation/Corrective Measures Study—Feasibility Study Report for the Rocky Flats Environmental Technology Site (RI/FS)*, Exposure Units (EUs) were evaluated and documented in Appendix A of the RI/FS, “Comprehensive Risk Assessment” (CRA). Locations 1, 2, and 3 are in the Upper Walnut Drainage EU.

The results of the CRA for the Upper Walnut Drainage EU are in Volume 7 of Appendix A. Benzo(a)pyrene was identified as the only contaminant of concern (COC) for surface soil/surface sediment in this EU. No COCs were identified for subsurface soil. Benzo(a)pyrene was not directly associated with any Rocky Flats site historical source areas but could be associated with vehicle traffic, paving, or pavement degradation prior to closure. The calculated lifetime excess cancer risk for the surface exposure scenario for the wildlife refuge worker for benzo(a)pyrene in the CRA is 1×10^{-6} .

This characterization information is sufficient for DOE to implement appropriate worker health and safety controls for the soil disturbance. Disturbed soils will be regraded in the work area shown in Figure 1 and Figure 2.

The potential for soil migration during and after construction work will be mitigated by implementation of the CDPHE- and EPA-approved *Erosion Control Plan for Rocky Flats Property Central Operable Unit*, DOE-LM/1497-2007, July 2007 (ECP). The ECP includes requirements for stormwater control, best management practices, and revegetation.

The work will not intercept the water table. For Locations 1 and 2, which will remain gravel roads, changes to surface water runoff will be negligible. For Location 3, revegetation and regrading are expected to reduce impacts of runoff.

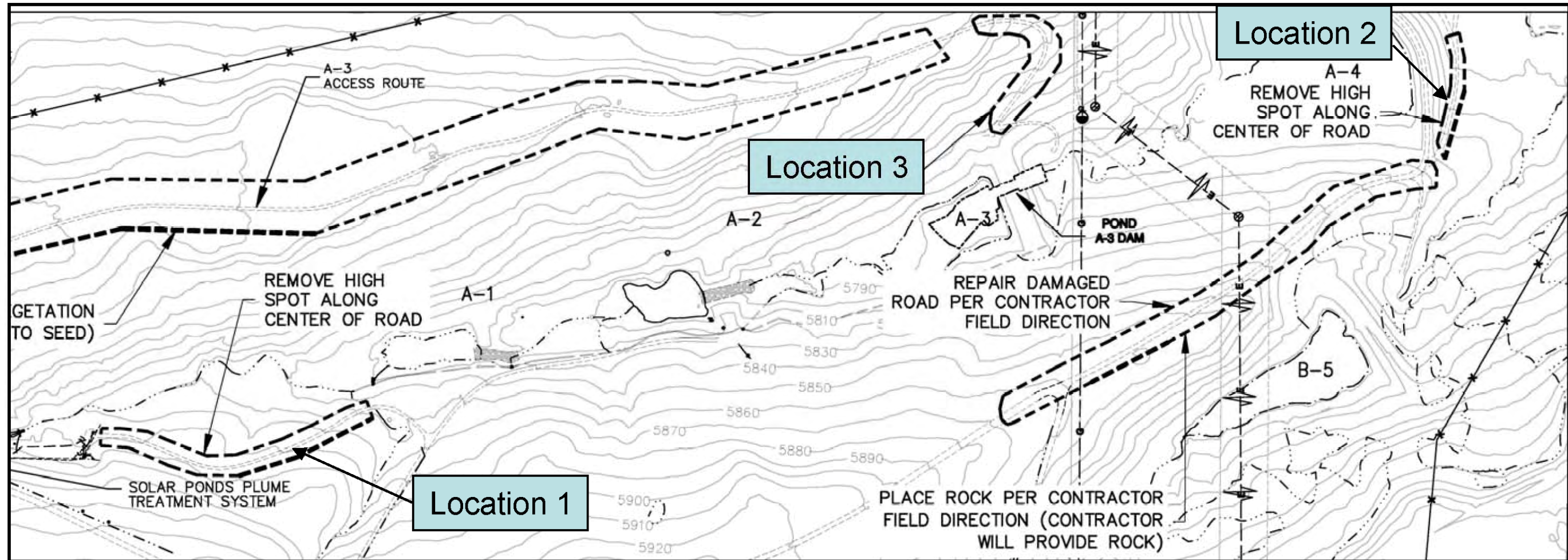
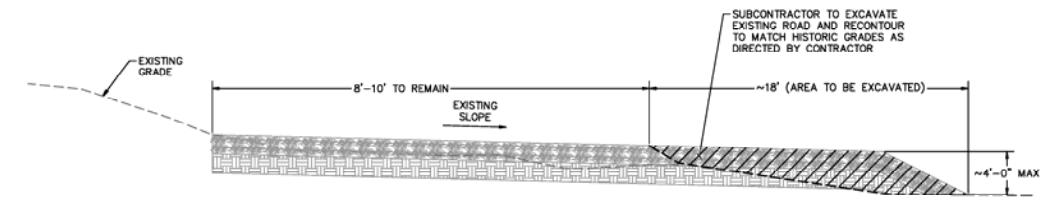
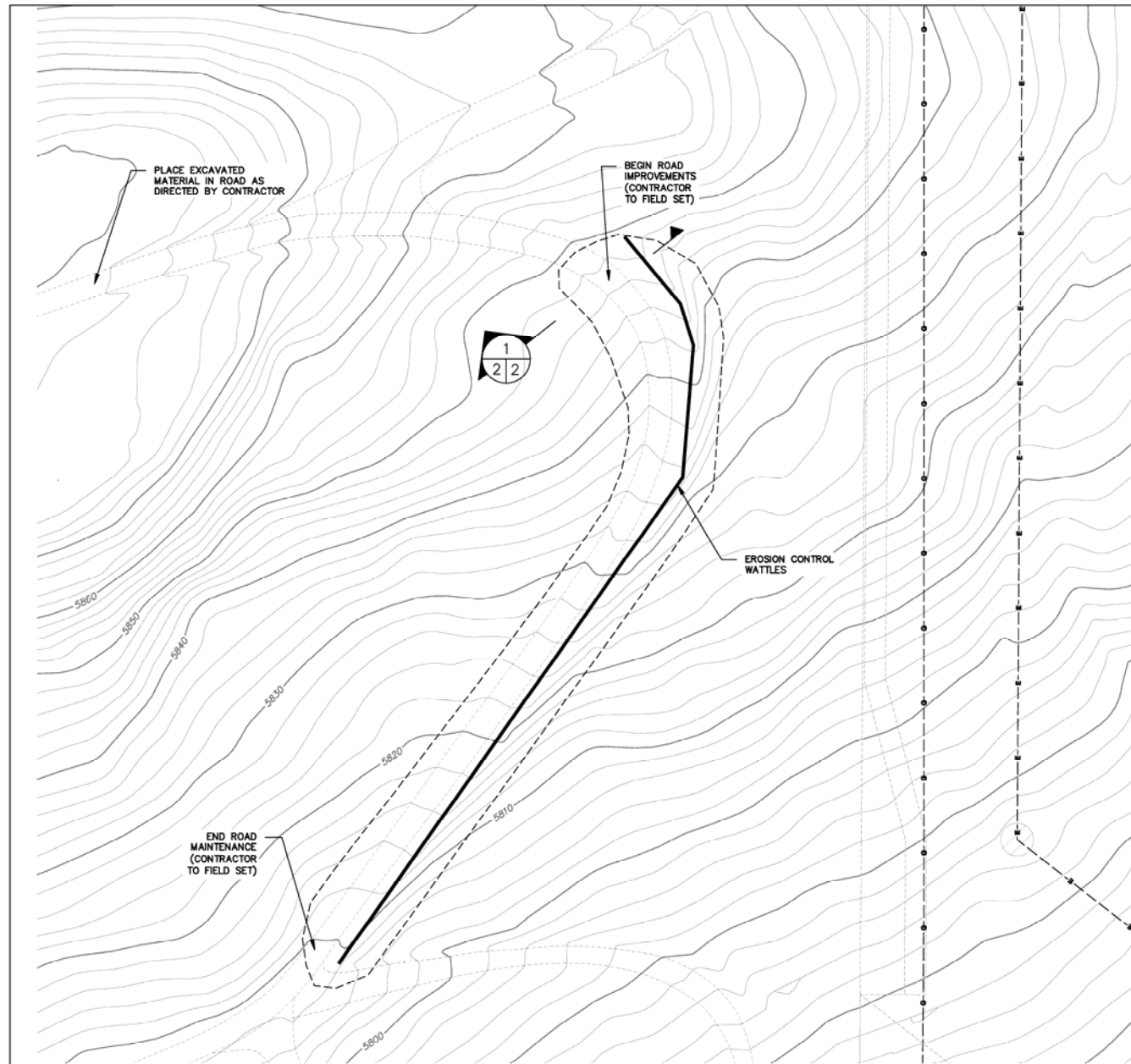
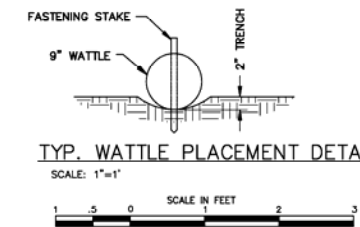


Figure 1. Road Maintenance Locations



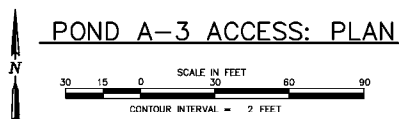
1
2 | 2
A-3 ROAD-SECTION
N.T.S.

NOTE:
EXCAVATE SPOILS TO SUBGRADE AND
SPREAD OVER EXISTING ROAD AS
DIRECTED BY CONTRACTOR



TYP. WATTLE PLACEMENT DETAIL

SCALE: 1"=1'



POND A-3 ACCESS: PLAN

REVISION NO.	DATE	DESCRIPTION	DRAWN BY	CHECKED BY	PROJECT NO.	APPROVAL
		U.S. DEPARTMENT OF ENERGY GRAND JUNCTION, COLORADO		Work Performed by S.M. Stoller Corporation Under GCE Contract No. DE-AM01-07LM00060		
PROJECT LOCATION		ROCKY FLATS SITE GOLDEN, COLORADO		ROAD MAINTENANCE - 2012		
APPROVALS		S. PITTON 5/30/12				
SUPERVISOR		S. PITTON 5/30/12				
PROJECT ENGINEER		S. Pitton 5/19/12				
DRAWING ENGINEER		M. MADRIL 5/30/12				
PROJECT LEAD		G. McLAUGHLIN 5/30/12		PROJECT NO. LTS-111-0056-23-0010		
VTC SUPERVISOR		L. KAISER 5/30/12		DRAWING NO. 508988-R00-C01-D+		
						SHEET 2 OF 2

Figure 2. Road to Former Pond A-3

ROCKY FLATS SITE REGULATORY CONTACT RECORD

Purpose: Improving treatment at the East Trenches Plume Treatment System (ETPTS) by adding an air stripper component

Contact Record Approval Date: October 25, 2012

Site Contact(s)/Affiliation(s): Scott Surovchak, U.S. Department of Energy (DOE); John Boylan, Rick DiSalvo, Linda Kaiser, S.M. Stoller Corporation (Stoller)

Regulatory Contact(s)/Affiliation(s): Carl Spreng, Colorado Department of Public Health and Environment (CDPHE); Vera Moritz, U.S. Environmental Protection Agency (EPA)

Date of Consultation Meeting: October 16, 2012

Consultation Meeting Participants: Carl Spreng, CDPHE; Vera Moritz, EPA; Scott Surovchak, DOE; John Boylan, Rick DiSalvo, Linda Kaiser, George Squibb, Stoller

Introduction: Treatment of contaminated groundwater by the ETPTS results in the removal of the vast majority of the of volatile organic compound (VOC) contamination load from the influent groundwater. But treatment typically does not result in complete removal of VOCs and a few VOCs remain in the ETPTS effluent at levels above Rocky Flats Cleanup Agreement (RFLMA) surface water standards in RFLMA Attachment 2, Legacy Management Requirements, Table 1, Surface Water Standards.

The RFLMA Project Coordinators began consulting in June 2010 regarding possible improvements to the VOC removal capability of the ETPTS and the Mound Site Plume Treatment System (MSPTS), which also had effluent concentrations of a few VOCs above RFLMA surface water standards. RFLMA Contact Records (CRs) 2010-07 and 2011-11 document the outcome of consultation regarding the actions to be taken to reduce VOCs at the MSPTS, which were to install a small solar powered air stripper in the effluent manhole and gather performance data that could be used to optimize its effectiveness.

The MSPTS air stripper consists of a sump pump to pump effluent water through commercially available engineered spray nozzles within the MSPTS effluent manhole allowing the VOCs to volatilize into the air in the manhole headspace.

The MSPTS air stripper was installed in early 2011 and its performance and optimization data are being reported in the RFLMA quarterly and annual reports of site surveillance and maintenance activities. The MSPTS air stripper is performing well and optimization is continuing. Appendix F in the *Annual Report of Site Surveillance and Maintenance Activities at the Rocky Flats Site, Calendar Year 2011* (2011 Annual Report) is a paper by John Boylan presented at the Waste Management 2012 Conference, titled “Solar-Powered Air Stripping at the Rocky Flats Site, Colorado”, which summarizes the features and performance testing of the MSPTS air stripper. The 2011 Annual Report is available on the Rocky Flats public website.

Discussion: Based on the positive results of the MSPTS air stripper performance, DOE will install a solar powered air stripper at the ETPTS similar to the air stripper at the MSPTS, but it will be installed in the ETPTS influent manhole. This will provide a reduction in the influent groundwater VOC concentrations that are subsequently treated by the ETPTS zero valent iron (ZVI) treatment media, which would potentially allow the current volume of ZVI media to provide adequate VOC treatment so that the effluent concentration are below RFLMA standards.

The PV system for the ETPTS air stripper will be a modular design, intended to be placed on (rather than excavated into) the ground surface near the influent manhole, so construction will involve little soil disturbance. At present, it is believed that the PV system installation will not involve any soil disturbance that would require a RFLMA Soil Disturbance Review Plan (SDRP), as provided in RFLMA Attachment 2, section 4.1. If this turns out not to be the case as the PV system is designed, another CR for the SDRP will be prepared.

Based on DOE's evaluation of the ETPTS influent VOC concentration and flow rate the amount and type of VOCs that will be volatilized to the air by the air stripper meets the Colorado Air Quality Control Regulations permitting exemption criteria.

Data will be collected to help optimize the effectiveness of the air stripping. If these efforts lead to the conclusion that this air stripper does not perform satisfactorily as anticipated based on experience with the MSPTS air stripper to date, the RFLMA Parties will consult on the feasibility of other approaches, such as moving the air stripper to the ETPTS effluent manhole to treat effluent water.

Performance and optimization data for the ETPTS air stripper will be reported in RFLMA quarterly and annual reports of site surveillance and maintenance activities.

Closeout of Contact Record: This CR will be closed when the ETPTS air stripper and PV system installation work is completed allowing performance testing and optimization to begin.

Resolution: Carl Spreng, CDPHE, approved this CR.

Contact Record Prepared by: Rick DiSalvo, John Boylan

Distribution:

Carl Spreng, CDPHE
Scott Surovchak, DOE
Linda Kaiser, Stoller
Rocky Flats Contact Record File

**ROCKY FLATS SITE
REGULATORY CONTACT RECORD**

Purpose: Minor Modification of *Rocky Flats Legacy Management Agreement* (RFLMA) Attachment 1, "Site Map," and of RFLMA Attachment 2, "Legacy Management Requirements"

Contact Record Approval Date: December 7, 2012

Site Contact(s)/Affiliation(s): Scott Surovchak, U.S. Department of Energy (DOE); John Boylan, Rick DiSalvo, Linda Kaiser, S.M. Stoller Corporation (Stoller)

Regulatory Contact(s)/Affiliation(s): Carl Spreng, Colorado Department of Public Health and Environment (CDPHE); Vera Moritz, U.S. Environmental Protection Agency (EPA)

Date of Consultation Meeting: October 16, 2012

Consultation Meeting Participants: Carl Spreng, CDPHE; Vera Moritz, EPA; Scott Surovchak, DOE; John Boylan, Rick DiSalvo, Linda Kaiser, George Squibb, Stoller

Introduction: The RFLMA parties agree that RFLMA Attachments 1 and 2 should be modified to reflect changes since the last modifications to these attachments were approved in September 2011. These changes are:

- Completion of breaching the Present Landfill Pond and Pond A-3 dams, resulting in a change to several map figures to show the new surface water configuration as wetlands
- Completion of the installation of the new flumes for surface water monitoring locations WOMPOC and WALPOC and notification to CDPHE and EPA to complete the requirements for these locations to become new Points of Compliance (POCs)
- Completion of the third 5-year review, which necessitates clarifying the scheduling for subsequent reviews
- Deletion of specific vegetation inspections at the landfills as recommended in the third 5-year review
- Recent changes to Regulation #31, "Basic Standards and Methodologies for Surface Water" (5 CCR 1002-31) (Reg. #31) which require updates to RFLMA Attachment 2, Table 1, "Surface Water Standards".

Several items in RFLMA Attachment 2 will also be updated or clarified as part of the modification as editorial changes.

Pursuant to RFLMA paragraph 66, DOE and CDPHE do not consider these items to constitute a significant change from existing requirements of RFLMA, and this contact record provides public notice of the proposed minor modifications. DOE will submit the modifications to CDPHE and EPA for review and approval pursuant to RFLMA paragraph 65.

The specific minor modifications are described in more detail below.

Discussion: The RFLMA Attachment 1 map and several RFLMA Attachment 2 subsections, tables, and figures will be modified. Text to be deleted is shown in single-line strikethrough, and new text is in bold. Modifications to tables and figures are summarized.

RFLMA Attachment 1

RFLMA Attachment 1, “Site Map,” will reflect the Present Landfill Pond and Pond A-3 dam breach by changing the footprint and the map features to indicate areas as “wetland/marsh.” Also, “McCaslin Road” and “Indiana St.” labels will replace “County Highway 5” labels to be consistent with road signs.

RFLMA Attachment 2

1. Section 5.1, “Monitoring Surface Water”

Points of Compliance (POCs): Located in Woman and Walnut Creeks. These locations are used to demonstrate compliance with the surface-water standards in Table 1. ~~POC monitoring locations WALPOC and WOMPOC require construction of a new flume in Walnut Creek and a new flume in Woman Creek at the locations shown on Figure 1 and described in Table 2. After each new flume and associated sampling equipment is installed and tested for proper operation, DOE shall notify CDPHE and EPA that construction is complete. WALPOC and WOMPOC will replace GS08 and GS11 on the date of the DOE notification for that location. WOMPOC will replace GS31 on the date of the DOE notification for that location.~~ **WALPOC, which replaced former POCs GS08 and GS11 on September 28, 2011 and WOMPOC, which replaced former POC GS31 on September 9, 2011,** will also replace GS03 and GS01 respectively upon DOE notification to EPA and CDPHE certifying that WALPOC and WOMPOC have been functioning as POCs for at least two years. EPA or CDPHE may extend the two-year period by requiring DOE to submit a modification to this attachment in accordance with RFLMA paragraph 65 if either determines that such modification is necessary to ensure protection of human health and the environment . . .

Consistent with the above, in Table 2, “Water Monitoring Locations and Sampling Criteria,” the rows for locations GS08, GS11, and GS31 will be deleted. Also, in Figure 1, “Water Monitoring at Rocky Flats: RFLMA,” locations GS08, GS11, and GS31 will be deleted.

2. Section 5.3.7, “Ecological Sampling”

~~The Ecological Risk Assessment determined that residual contamination does not represent a significant risk of adverse ecological effects. The CAD/ROD, however, requires that specific additional sampling be conducted to reduce the uncertainties determined in the Ecological Risk Assessment. Additional ecological sampling listed in Table 5 was completed and approved by CDPHE on April 2, 2008.~~

The subsection header will be deleted, and Table 5, “Ecological Sampling,” will also be deleted because no longer needed.

3. Section 7.3, “CERCLA 5-Year Review”

A statutory 5-year review is required under CERCLA for the Central OU because the selected remedy will result in hazardous substances, pollutants or contaminants remaining above levels that allow for unrestricted use and unlimited exposure. DOE will prepare the 5-year review **report** consistent with EPA-OSWER Directive 9355.7-03B-P (or subsequent EPA directives), as applicable to Rocky Flats. DOE will submit the 5-year review **report** to EPA ~~by August 1, 2007~~ **upon a mutually agreeable schedule determined by the RFLMA Project Coordinators in accordance with the consultative process in RFLMA paragraph 11**, so as to allow for EPA ~~approval by September 17, 2007~~ **concurrency within five years of the preceding 5-year review report** ~~prepare subsequent reviews at five-year intervals from the aforementioned date, until such time as EPA determines that CERCLA periodic reviews are no longer required . . .~~

4. Table 1, “Surface Water Standards,” (RFLMA standards) are remedy performance standards derived from and based on standards promulgated by the Colorado Water Quality Control Commission (WQCC). The WQCC recently approved changes to the standards for some volatile organic compounds in Reg. #31, which are also RFLMA standards. Table 1 will be modified to delete the current standards and replace them with the new Reg. #31 standards, as follows:

Analyte	Current RFLMA standard (mg/L)	New RFLMA Standard (mg/L)
Acrylamide	7.80E-6	2.20E-5
Carbon tetrachloride	2.30E-4	4.30E-4
1,2-dichloroethene (<i>cis</i>)	7.00E-2	1.40E-2 to 7.00E-2
1,4-dioxane	3.20E-3	3.50E-4
Hexachloroethane	4.00E-4	5.00E-4
Nitrobenzene	3.50E-3	1.40E-2
Pentachlorophenol	2.70E-4	8.00E-5
Tetrachloroethene	6.90E-4	5.00E-3

Table 1 footnotes will be modified as follows:

- [c] and [h]: Deleted because the footnotes referenced Temporary Modifications that expired at the end of 2009. Both footnotes will be marked “Reserved.”
- [e]: Revised to clarify that the WQCC-promulgated standard for unionized ammonia applies to Segment 4a only.
- [i]: Clarified that nitrate and nitrite standards are “as nitrogen.”
- [m]: Deleted because the footnote refers to the March 22, 2012, effective date for the current RFLMA standard for 1,4-dioxane (3.20E-3 mg/L). The footnote will be marked as “Reserved.”
- [n]: Added 1,2-dichloroethene (*cis*) to specify that the higher number in the range is to be used as the applicable or corresponding Table 1 standard in the flowcharts shown in RFLMA, Attachment 2, Figures 7 through 11. Arsenic is currently the only Table 1 analyte in footnote [n] based on a Reg. #31 standard that is a range of values.

5. Table 3, “Present and Original Landfill Inspection and Maintenance Requirements,” will be modified to remove landfill-specific vegetation and inspection requirements as recommended in the third 5-year review report. Landfill vegetation meets success criteria, and it will be monitored and managed under the site-wide vegetation and revegetation plans. Table 3 will also be modified

to change the Present Landfill reference from “pond monitoring” to “downstream monitoring” because the Present Landfill Pond dam was breached in 2012.

Minor modifications to the Original Landfill and Present Landfill monitoring and maintenance plans will also be proposed to update the vegetation monitoring requirements. The outcome of RFLMA party consultation regarding the proposed modifications to these plans will be included in separate contact records.

6. Figure 1 will be modified to reflect the Present Landfill Pond and Pond A-3 dam breach by changing the footprint and the map features to indicate areas as “wetland/marsh.” Also, the surface water sampling locations currently marked as Pond A4, Pond B5, and Pond C2 on Figure 1 and currently listed the same way in Table 2 will be changed to match their location codes in the soil/water database, which are “A4 Pond,” “B5 Pond,” and “C2 Pond,” This change is to avoid any confusion in matching the location to the monitoring data in the quarterly and annual reports of surveillance and maintenance activities.
7. Figure 4, “Subsurface Features – Representative Pits and Trenches,” will be modified to reflect the Present Landfill Pond and Pond A-3 dam breach by changing the footprint and the map features to indicate areas as “wetland/marsh.” Also, the Original Landfill and the Present Landfill locations will be added to Figure 4 for clarity because their locations are not currently depicted on any RFLMA maps. The figure title will be changed to “Subsurface Features – Pits, Trenches, and Closed Landfills.”

Closeout of Contact Record: This contact record will be closed when the minor modifications to RFLMA Attachment 1 and RFLMA Attachment 2 are approved.

Resolution: Carl Spreng, CDPHE, approved this contact record.

Contact Record Prepared by: Rick DiSalvo

Distribution:

Carl Spreng, CDPHE
Scott Surovchak, DOE
Linda Kaiser, Stoller
Rocky Flats Contact Record File

ROCKY FLATS SITE REGULATORY CONTACT RECORD

Purpose: GS10 Flume Replacement Project and Soil Disturbance Review Plan

Contact Record Approval Date: May 2, 2013

Site Contact(s)/Affiliation(s): Scott Surovchak, U.S. Department of Energy (DOE); Rick DiSalvo, S.M. Stoller Corporation (Stoller); Linda Kaiser, Stoller; George Squibb, Stoller

Regulatory Contact(s)/Affiliation(s): Carl Spreng, Colorado Department of Public Health and Environment (CDPHE); Vera Moritz, U.S. Environmental Protection Agency (EPA)

Date of Consultation Meeting: March 13, 2013

Consultation Meeting Participants: Carl Spreng, CDPHE; Vera Moritz, EPA; Scott Surovchak, DOE; John Boylan, Rick DiSalvo, Linda Kaiser, George Squibb, Stoller

Introduction: The flume for Rocky Flats Legacy Management Agreement (RFLMA) Point of Evaluation (POE) monitoring location GS10 in South Walnut Creek was originally installed in 1993. DOE considered replacing the GS10 flume in 2000, when it replaced flumes for several other monitoring locations, but it was a low priority in relation to other cleanup and closure work at the time. The new surface water configuration resulting from breaching the dams for former retention ponds B-1, B-2, B-3, and B-4 in 2009 now allows DOE to propose replacing the GS10 flume and to move its location slightly downstream.

The GS10 flume is located just upstream of a massive, deeply anchored, approximately 50-foot-wide concrete diversion structure that blocks the stream channel. The diversion structure has three openings to allow creek water to flow through in corrugated metal pipes (CMPs). The CMP openings are fitted with gate valves, or “headgates.” Water monitored at GS10 flows through the diversion structure, as controlled by the position of the headgates. One headgate controls flow through a 24-inch-diameter CMP into the channel just upstream of the former retention pond B-1. The other two headgates control flow into a concrete distribution box connected to a single 48-inch-diameter CMP that serves as a bypass line around former retention ponds B-1, B-2, and B-3. The concrete distribution box and the CMPs, except the downstream open ends, are buried below the surface on the downstream side of the diversion structure.

The 48-inch-diameter discharge end of the CMP bypass line is downstream and south of former retention pond B-3, so that water flowing through the bypass line goes to former retention pond B-4. The 48-inch-diameter headgates of the CMP bypass line were closed in 2009, and the headgate for the 24-inch-diameter CMP to former retention pond B-1 was opened so that creek water monitored at GS10 now only flows into former retention pond B-1.

The GS10 flume is located at the bottom of fairly steep channel banks, and the bank on the south side has visible localized slumping and sliding toward the creek and GS10. The area just upstream and surrounding GS10 promotes the growth of thick stands of willow saplings, which must be cut periodically to allow access to maintain the flume.

Figure 1 is an aerial photograph of the GS10 flume area, showing the location of the various features described above.

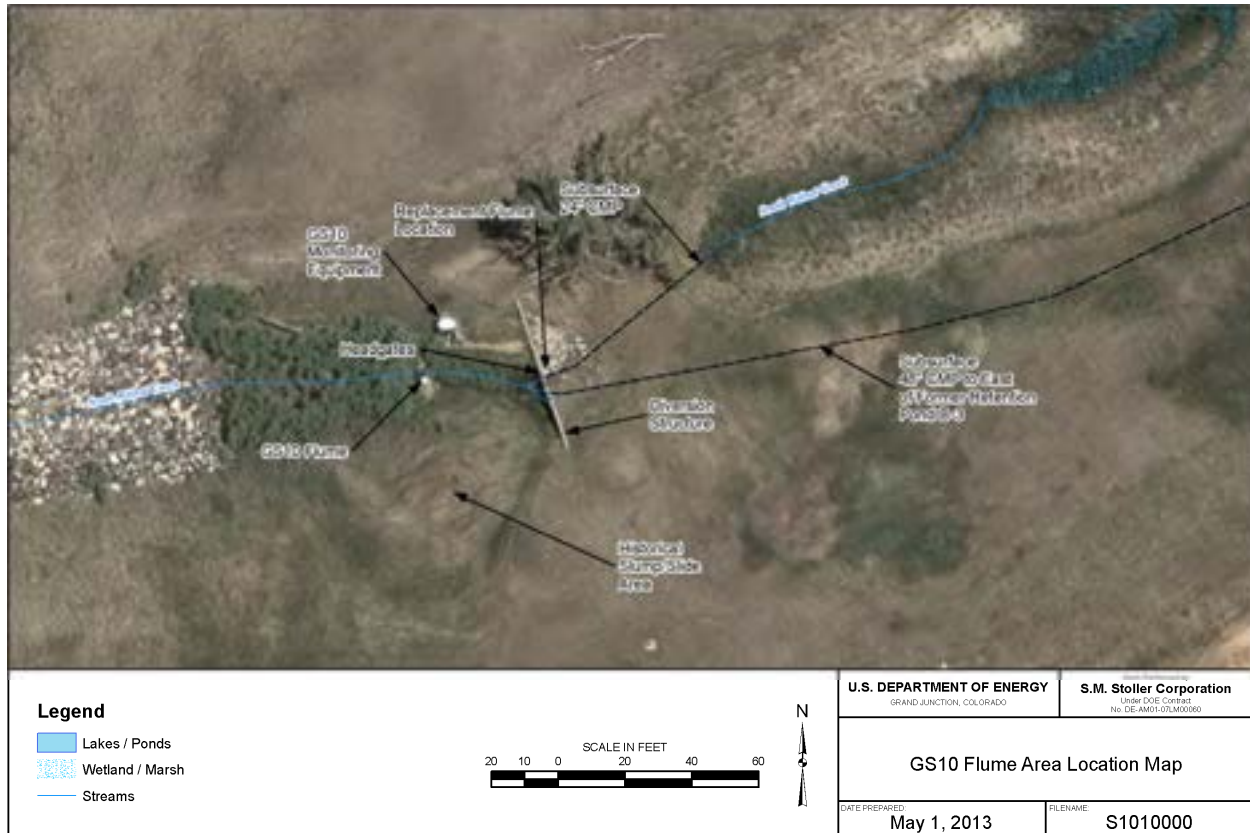


Figure 1. GS10 Flume Area

Discussion: DOE will replace the GS10 flume and move the flume location to the downstream side of the diversion structure, which will, among other things, make flume operation and maintenance easier. The creek channel upstream of the diversion structure will be filled and graded to raise the channel elevation, and the diversion structure will be notched at the top to an elevation slightly above the regraded channel elevation. Creek water will then flow through the diversion structure notch instead of through the diversion structure via the subsurface CMPs.

Although the GS10 metal flume currently is operational, additional structure aging and movement of the south hillside could compromise the quality of data collected in the future. Also, the new flume will be a fiberglass H-flume, better designed to measure the lower postclosure flow rate ranges in this portion of South Walnut Creek. The new fiberglass flume will be physically attached to the downstream side of the diversion structure.

The 48-inch-diameter CMP bypass line is no longer used or needed and the new flume location will eliminate the need for the 24-inch-diameter CMP. The headgates will be removed, and the CMP openings will be plugged and placed in a stable configuration as a good management practice.

As part of the construction work, the depression formed by the localized instability on the south side of the creek will be filled and graded to raise and contour the topography consistent with the regraded channel upstream of the diversion structure. This will serve to stabilize this area.

GS10 Reportable Condition: DOE is currently implementing the evaluation plans for the RFLMA reportable conditions for americium, plutonium, and uranium concentrations at GS10 in accordance with Contact Records 2011-04, 2011-05, and 2012-08. Information regarding the evaluation monitoring is reported in RFLMA quarterly and annual reports. The monitoring results show that water quality downstream of GS10 continuously meets RFLMA standards. This, along with the results of other evaluation monitoring upstream of GS10, does not suggest that actions besides continued evaluation monitoring to gather additional data are needed at this time. DOE will continue to conduct evaluation monitoring upstream and downstream of GS10 in accordance with the evaluation plans, in accordance with RFLMA Attachment 2, "Legacy Management Requirements," Section 6.0, "Action Determinations."

The RFLMA parties agree that conducting the GS10 flume replacement project as described in this Contact Record is not likely to impede the reportable condition evaluation. They also agree that replacement of the GS10 flume complies with RFLMA water monitoring requirements. The new flume will be approximately 40 feet east of its present location.

Because of the proximity of the new flume to the current flume location, this monitoring location will continue to be identified as GS10, and no changes to the tables or figures in RFLMA Attachment 2 that relate to GS10 are needed.

Flume Replacement Scope and Sequence: Figures 2 and 3 show the project area and the main features related to the work sequence.

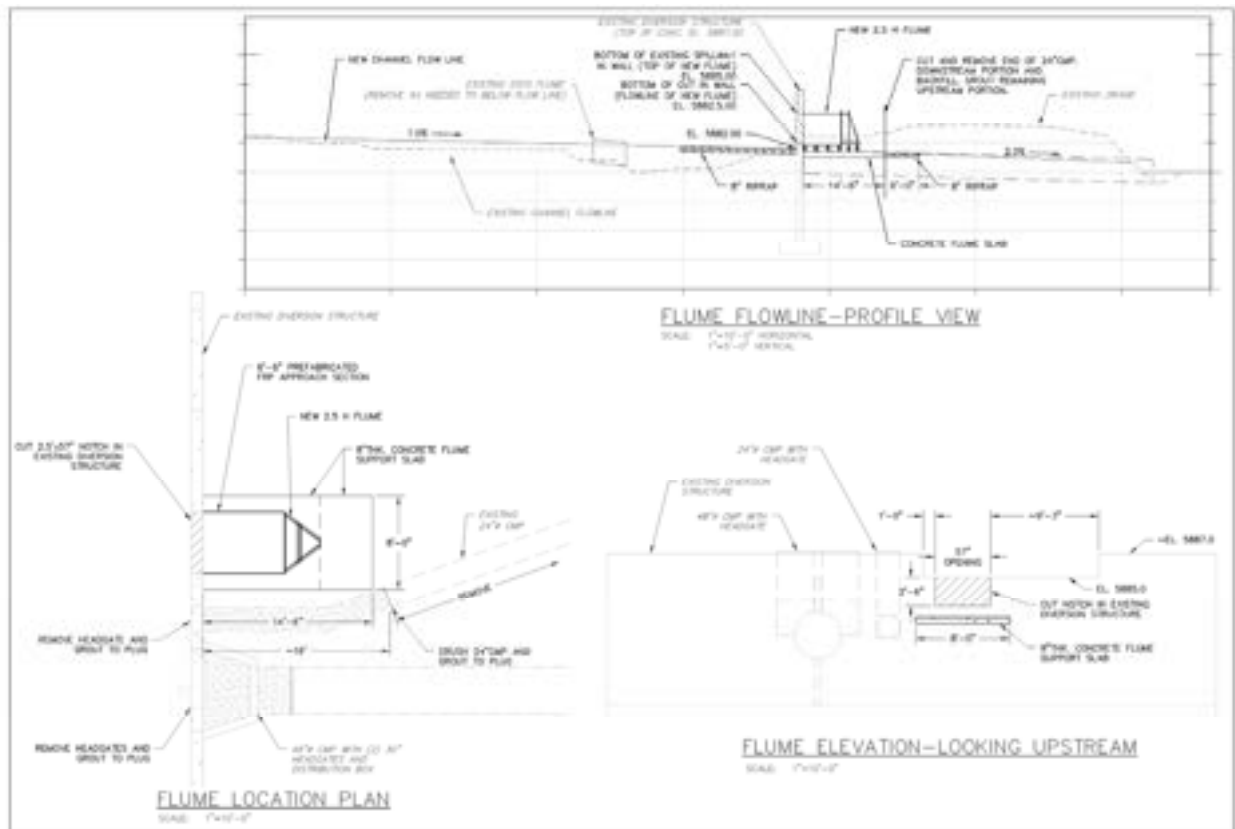


Figure 3. GS10 Flume Replacement Features

The work will be sequenced as follows to provide continual monitoring at GS10 to the extent practicable during the anticipated 2- to 3-week active construction period.

1. Construction perimeter and access points will be marked, and preconstruction erosion controls will be installed.
2. The notch will be cut at the top of the cutoff wall and concrete pads for the new fiberglass flume and the associated monitoring equipment will be installed.
3. At an appropriate time during the grading of the downstream channel, the 24-inch-diameter CMP headgate will be closed, and the downstream end of the CMP will be removed and the area filled to the extent needed to complete grading of the downstream channel.
4. The area downstream of the new flume will be graded and contoured to form a channel to convey the water flowing through the new flume to former retention pond B-1.
5. The new flume and associated monitoring equipment will be installed and made operational on the downstream side of the cutoff wall.
6. A cofferdam will be constructed using imported fill upstream of GS10 to block the flow of creek water.
7. Water that accumulates behind the cofferdam and at the closed headgates will be pumped through the new GS10 flume and sampled in accordance with RFLMA requirements during the rest of the construction.

8. The headgates will be removed and the CMP openings plugged with grout or other suitable material to seal the openings and provide long-term stability to eliminate this potential flow path.
9. The current GS10 flume will be removed to the extent needed for grading the channel, and the monitoring equipment for the current flume location will be removed. The concrete base for the flume and concrete equipment pad will be removed to a depth suitable for backfilling the remnants in place for the final grading.
10. Filling, grading, and contouring of the area upstream of the cutoff wall will be completed.
11. The cofferdam will be removed.
12. Post construction erosion controls and revegetation will be completed.

Excess soil generated by grading the area downstream of the diversion structure and clean imported fill will be used to raise the elevation of the area upstream of the diversion structure. No excavation below the current elevation will be done upstream of the diversion structure. The final fill elevation will be above the current headgate elevation.

Removed pieces of the current GS10 flume, 24-inch-diameter CMP, headgates, and associated hardware and concrete that is removed will be properly managed as waste, or recycled if eligible for recycling.

The 48-inch-diameter CMP bypass line will be left in place, sealed at the upstream end, at the completion of this project. After the upstream end is sealed, there is no present geotechnical reason to remove or fill the remaining bypass line.

Institutional Controls Evaluation: The construction will involve some excavation deeper than 3 feet below existing grade to remove portions of the 24-inch-diameter CMP, to construct the concrete pad and to place riprap, as needed. Subsequent filling and grading to complete construction will result in some portions of the area downstream of the cutoff wall being slightly below the preconstruction elevation. Filling and grading upstream of the cutoff wall will result in elevations higher than the preconstruction elevation.

The soil disturbance work is subject to the *Rocky Flats Legacy Management Agreement*, Attachment 2, Institutional Controls (ICs) 2 and 3. The work also involves an engineered component of the remedy, surface water monitoring location GS10, so it is also subject to IC 7. Table 1 recaps these ICs.

Table 1. Institutional Controls

IC 2	Excavation, drilling, and other intrusive activities below a depth of three feet are prohibited, without prior regulatory review and approval pursuant to the Soil Disturbance Review Plan in RFLMA Attachment 2.
	<p>Objective: Prevent unacceptable exposure to residual subsurface contamination.</p> <p>Rationale: Contaminated structures, such as building basements, exist in certain areas of the Central OU, and the Comprehensive Risk Assessment did not evaluate the risks posed by exposure to this residual contamination. Thus, this restriction eliminates the possibility of unacceptable exposures. Additionally, it prevents damage to subsurface engineered components of the remedy.</p>
IC 3	No grading, excavation, digging, tilling, or other disturbance of any kind of surface soils is permitted, except in accordance with an erosion control plan (including Surface Water Protection Plans submitted to EPA under the Clean Water Act) approved by CDPHE or EPA. Soil disturbance that will not restore the soil surface to preexisting grade or higher may not be performed without prior regulatory review and approval pursuant to the Soil Disturbance Review Plan in RFLMA Attachment 2.
	<p>Objective: Prevent migration of residual surface soil contamination to surface water.</p> <p>Rationale: Certain surface soil contaminants, notably plutonium-239/240, were identified in the fate and transport evaluation in the Remedial Investigation as having complete pathways to surface water if disturbed. This restriction minimizes the possibility of such disturbance and resultant impacts to surface water. Restoring the soil surface to preexisting grade maintains the current depth to subsurface contamination or contaminated structures.</p>
IC 7	Activities that may damage or impair the proper functioning of any engineered component of the response action, including but not limited to any treatment system, monitoring well, landfill cap, or surveyed benchmark, are prohibited. The preceding sentence shall not be construed to prohibit the modification, removal, replacement, or relocation of any engineered component of the response action in accordance with the action determinations in RFLMA Attachment 2.
	<p>Objective: Ensure the continued proper functioning of engineered portions of the remedy.</p> <p>Rationale: This restriction helps ensure the integrity of other engineered components of the remedy, including monitoring and survey points.</p>

The required Soil Disturbance Review Plan is in Attachment 1. The information in the Discussion section demonstrates that the Objective and Rationale of IC 7 will be met.

Resolution: CDPHE has reviewed information regarding the proposed soil disturbance and excavation and, after consultation with EPA, has approved the proposed activity. CDPHE has determined that the proposed activity will not compromise or impair the function of the remedy or result in an unacceptable release or exposure to residual subsurface contamination. CDPHE has also determined that the proposed project meets the rationale and objectives of ICs 2, 3, and 7.

DOE will not conduct the approved soil disturbance and excavation until 10 calendar days after this Contact Record is posted on the Rocky Flats website and stakeholders are notified of the posting in accordance with the RFLMA Public Involvement Plan.

Closeout of Contact Record: This Contact Record will be closed when the work is completed, post construction reseeded has been performed, and post construction erosion controls are in place.

Approval: Carl Spreng, CDPHE, approved this Contact Record.

Contact Record Prepared by: Rick DiSalvo

Distribution:

Carl Spreng, CDPHE

Scott Surovchak, DOE

Linda Kaiser, Stoller

Rocky Flats Contact Record File

Rocky Flats Legacy Management Agreement (RFLMA) Soil Disturbance Review Plan

Proposed Project: Soil Disturbance Review Plan—GS10 Flume Replacement Project

This Soil Disturbance Review Plan provides information required by RFLMA Attachment 2, “Legacy Management Requirements,” Section 4.1, “Soil Disturbance Review Plan,” regarding the work proposed by DOE.

Description of the proposed project, including the purpose, the location, and the lateral and vertical extent of excavation.

The purpose of the project is to replace the flume for RFLMA POE GS10, as described in Contact Record 2013-01.

Contact Record 2013-01 Figures 2 and 3 show the location and the lateral and vertical extent of the excavation. The material excavated from the cut areas, plus an additional approximately 11 cubic yards of clean fill will be placed in the fill areas shown in Figures 2 and 3. The source of the additional clean fill will be from onsite stockpiled soil remaining from construction and maintenance of gravel road rock crossings, from the temporary soil ramp and pad made from imported clean fill used to support the geoprobe unit in sampling of the Solar Ponds Plume Treatment System media and from the regrading of the eastern end of the Original Landfill diversion berm 7. Clean fill material may also be imported from the Bestway, Inc. commercial gravel pit located directly west of the Central Operable Unit. Depending on the availability and pricing of suitable fill material from the Bestway, Inc. pit, an alternative commercial source, such as the Pioneer, Inc. supply yard on Highway 93 just north of Golden, CO will be used. When completed, the new surface elevations will be tapered into the north and south side of the creek as shown in Figure 2, and the creek flowline will be consistent with the profile view shown in Figure 3.

Information about any remaining subsurface structures in the vicinity of the proposed project.

Remaining subsurface structures in the vicinity of the proposed project include the diversion structure and buried CMP and the concrete base for the current GS10 flume components. A downstream portion of the 24-inch-diameter CMP will be removed, and the concrete base for the current GS10 flume will be removed to an appropriate depth below the planned finished grade. The headgates and associated components on the upstream side of the diversion structure will be removed, and the CMP openings sealed. The portion of the 24-inch-diameter CMP not removed and all of the 48-inch-diameter CMP will remain in the subsurface. The upstream side of the diversion structure will be filled and graded so that the sealed CMP openings and former headgates will be in the subsurface.

Process knowledge (i.e., familiarity based on past experience at the site) regarding the characteristics for each removed item will be confirmed by visual inspection. If process knowledge cannot be confirmed by visual inspection, additional characterization will be performed to determine proper disposal. Based on process knowledge, it is expected that removed items will be disposed of offsite as solid waste or recycled, as appropriate. However, routine radiological field screening of these waste items which will be accessible when they are removed will also be performed to determine if offsite

disposal under DOE directives and policy as radioactive waste is required. Items removed for disposal will be staged in a manner to prevent run-on and runoff of precipitation pending offsite disposition.

Information about any former Individual Hazardous Substance Sites (IHSSs), Potential Areas of Concern (PACs), or other known or potential soil or groundwater contamination in the vicinity of the proposed project.

The project area is located in former IHSS 190, Caustic Leak (also referred to as Central Avenue Ditch). Approximately 1,000 to 1,500 gallons of 2.5 Normal sodium hydroxide was released from a tank in 1978 into the Central Avenue Ditch and was diverted into South Walnut Creek. A 1- to 3-gallon spill of concentrated sodium hydroxide also occurred from the same tank in 1989. The 1978 release was neutralized with alum. Based on the steps taken to neutralize the caustic solution, the large volume of water conveyed in the creek since the spill, and results of characterization soil sampling, the IHSS was approved for No Further Action in 2004. The summary for this IHSS is in Appendix B, "Historical Release Report," in the June 2006 *RCRA Facility Investigation – Remedial Investigation/Corrective Measures Study – Feasibility Study Report for the Rocky Flats Environmental Technology Site (RI/FS)*.

The project area is in the Upper Walnut Drainage Area Exposure Unit (EU) evaluated in the Comprehensive Risk Assessment, in Appendix A of the RI/FS. The only contaminant of concern (COC) identified for this EU is benzo(a)pyrene in surface soil/surface sediment, resulting in an estimated total excess lifetime cancer risk of 2×10^{-6} based on the wildlife refuge worker exposure scenario. There were no COCs identified for subsurface soil or subsurface sediment in this EU.

Concentrations of americium, plutonium, and uranium have been measured above their respective RFLMA standards at GS10, which constitutes an RFLMA reportable condition, as described in Contact Records 2011-04, 2011-05, and 2012-08. DOE is currently implementing an evaluation plan consisting of additional monitoring at locations upstream and downstream of GS10 and expedited analysis of samples collected at GS10. Information regarding the evaluation monitoring is reported in RFLMA quarterly and annual reports.

The RFLMA standards for americium, plutonium, and uranium are based on Colorado health-based standards for a drinking water exposure scenario. Incidental contact with contaminated surface water was determined to be a complete, but insignificant, exposure pathway for the Comprehensive Risk Assessment exposure scenario. There is no actual drinking water use onsite, and incidental exposure resulting from the work to complete this project will be minimized by DOE hazard control procedures (no eating, drinking, or smoking in the construction area), construction worker personal protective equipment (gloves, eye protection, and work boots) use, and good hygiene practices (hand washing before eating or drinking).

Upstream from the GS10 project area is the Mound Site Plume Treatment System (MSPTS). The MSPTS intercepts volatile organic compound (VOC)-contaminated groundwater to remove VOC loading from South Walnut Creek from the groundwater to surface water pathway. The MSPTS discharges treated water to a subsurface discharge gallery located upgradient of GS10, and GS10 serves as the RFLMA surface water performance monitoring location for the MSPTS. Groundwater

treated by the MSPTS meets RFLMA standards at the effluent monitoring location and water at GS10 meets RFLMA standards for VOCs.

To the south of the GS10 project area is the western end of the groundwater intercept barrier for the East Trenches Plume Treatment System (ETPTS). Like the MSPTS, the ETPTS intercepts VOC-contaminated groundwater to remove VOC loading from South Walnut Creek from the groundwater to surface water pathway. The ETPTS subsurface discharge gallery is located to the south of former retention pond B-4. The project will not impact the ETPTS intercept barrier.

ROCKY FLATS SITE REGULATORY CONTACT RECORD

Purpose: Reportable Condition at the Original Landfill (OLF)

Contact Record Approval Date: October 21, 2013

Site Contact(s)/Affiliation(s): Scott Surovchak, U.S. Department of Energy (DOE); Rick DiSalvo, S.M. Stoller Corporation (Stoller); Linda Kaiser, Stoller; Jeremiah McLaughlin, Stoller

Regulatory Contact(s)/Affiliation(s): Carl Spreng, Colorado Department of Public Health and Environment (CDPHE); Vera Moritz, U.S. Environmental Protection Agency (EPA)

Date of Consultation Meeting: September 18, 2013

Consultation Meeting Participants: Carl Spreng, CDPHE; Vera Moritz, EPA; Scott Surovchak, DOE; John Boylan Stoller; Rick DiSalvo, Stoller; Linda Kaiser, Stoller

Introduction: A rainfall event from September 9 through September 16, 2013, caused catastrophic flooding in northeastern Colorado. Based on preliminary data, the amount of rainfall received at the Rocky Flats Site during this event was at least 8 inches.

Because the event produced more than 1 inch of rainfall within a 24-hour period, the OLF cover and storm water management system were inspected after this storm event in accordance with the Rocky Flats Legacy Management Agreement (RFLMA) Attachment 2, Table 3, "Present and Original Landfill Inspection and Maintenance Requirements."

Localized surface cracking and differential settlement in the northeastern portion of the cover were noted during the inspection on September 16, 2013. In accordance with RFLMA Attachment 2, Section 6.0, "Action Determinations," DOE determined this was a reportable condition affecting the effectiveness of the OLF cover. Section 6.0 provides:

When reportable conditions occur (except in the case of evidence of violation of institutional controls as described below), DOE will inform CDPHE and EPA within 15 days of receiving the inspection reports or validated data. Within 30 days of receiving inspection reports or validated analytical data documenting a reportable condition, DOE will submit a plan and a schedule for an evaluation to address the condition. DOE will consult as described in RFLMA Paragraph 11 to determine if mitigating actions are necessary. Final plans and schedules for mitigating actions, if any, will be approved by CDPHE in consultation with EPA. DOE is not, however, precluded from undertaking timely mitigation once a reportable condition has been identified.

Cracks with vertical displacement of up to approximately 2 feet and cracks up to approximately 0.5 feet wide were observed during the inspection. The cracking and settling extended through portions of Diversion Berms 4 and 5, and a minor depression was formed in the Diversion Berm 4 channel between the cracks. Figure 1 shows the general location of the observed cracks based on handheld GPS measurements.

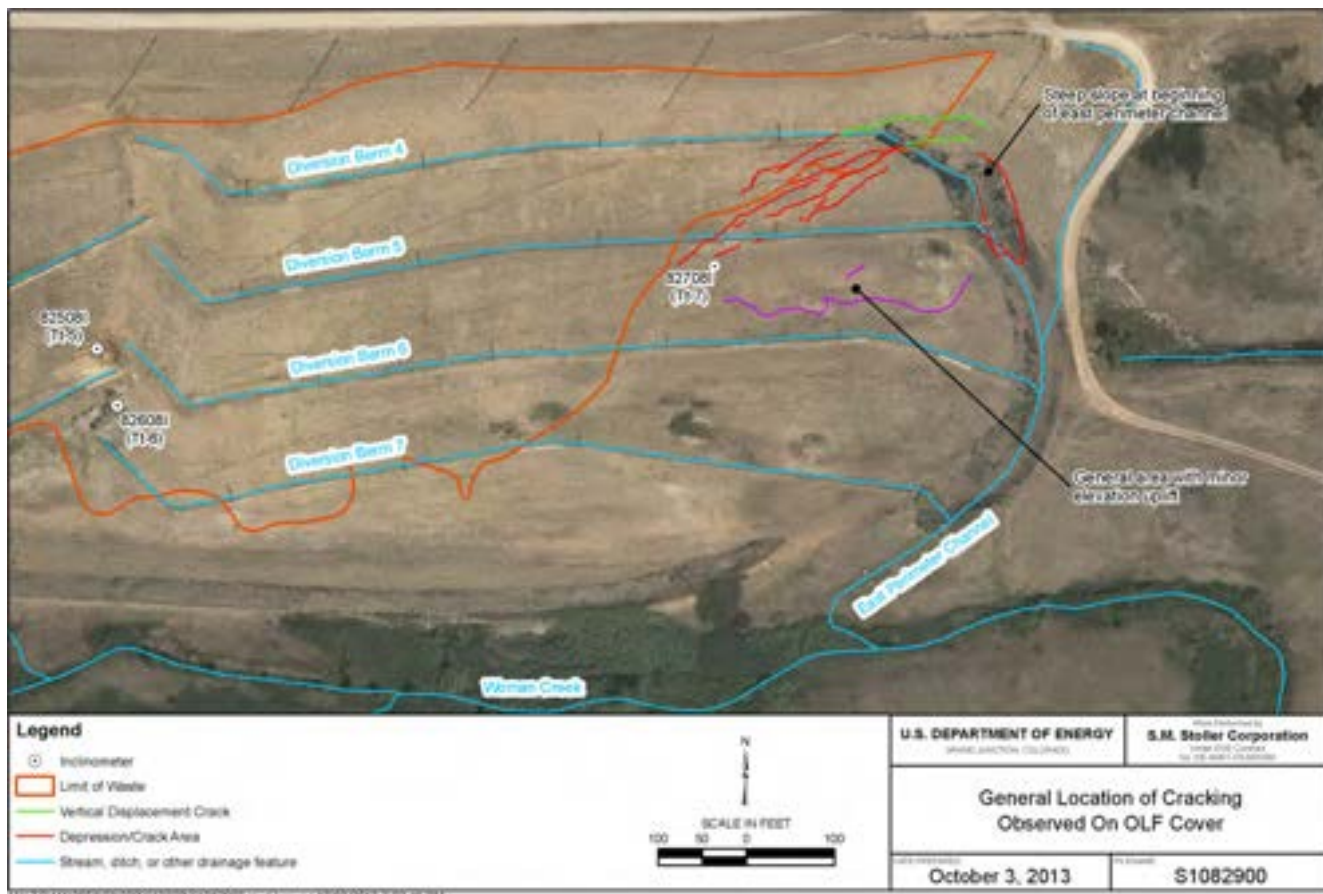


Figure 1. General Location of Cracking Observed on OLF Cover

DOE informed CDPHE and EPA of the cracking on the northeast side of the OLF on September 17, 2013. DOE, CDPHE, and EPA personnel toured the area on September 18 to start the consultative process to develop a proposed course of action.

Background: Minor surface cracking north of the beginning of the East Perimeter Channel (EPC) was noted in August 2010. A qualified geotechnical engineer evaluated the observed cracking in August 2010 and in September 2011. The evaluations concluded that, based on the proximity and shape of the cracks, they appeared to be related to the abrupt slope change at the beginning of the EPC. The geotechnical engineer recommended in 2010 that the cracks be monitored for expansion and be filled and tamped to prevent infiltration of precipitation as part of routine maintenance. This routine maintenance has been performed since that time. The condition of the observed cracking has also been noted on the OLF monthly inspection reports.

This repair methodology is (1) consistent with the conclusions and recommendations in the June 2008 geotechnical investigation report, which is discussed in Contact Record 2008-07, and (2) related to localized instability cracking on the northwest side of the OLF observed in 2007. The new cracking on the northeast side of the OLF appears similar to the cracking that was previously observed and repaired on the northwest side.

The geotechnical engineer's recommendation was reiterated after observation of the area in 2011, and no significant expansion of the cracking was observed until the September 16, 2013, inspection. The 2008 geotechnical investigation concluded for the northwest side OLF instability that a weak clay layer containing organic materials at or near the bedrock contact appeared to be a weak interface area. Modeling predicted small-scale instability due to percolating moisture that lubricates this weak interval. It is likely that the northeast side OLF instability is also associated with the effects of moisture from this precipitation event.

The localized instability observed in 2008 in the northwest side of the OLF was addressed by adding fill to reduce the depth of the West Perimeter Channel (WPC), regrading the relatively steep side slopes of portions on the WPC, and adding additional drainage features to reduce potential water infiltration. This work, done in 2008, along with routine maintenance to address minor surface cracking by smoothing and tamping cracks to fill any openings, appears to be successful.

Discussion: The "Maintenance Action Activities" subsections in Section 3.2, "Subsidence and Consolidation"; Section 3.3, "Slope Stability"; Section 3.4, "Soil Cover"; and Section 3.6, "Stormwater Management Systems," of the *Original Landfill Monitoring and Maintenance Plan* (OLF M&M Plan) are relevant to development of a plan and schedule to address the new reportable condition.

The goals of the maintenance actions that are or may be required after further evaluation by a qualified geotechnical engineer are as follows:

- To eliminate the potential for ponding and to correct the slope of the surface
- To address any potential slope failure that would likely compromise the remedy
- To maintain the minimum soil cover thickness and diversion-berm design heights
- To remove and relocate eroded soils (if necessary)
- To remove blockages in diversion berm channels, repair any channel disturbances, and replace temporary erosion control mats

In general, the new maintenance actions may include, but are not limited to, regrading affected areas, filling areas, maintaining positive drainage of surface water, constructing seep drains, and regrading steep EPC slopes to achieve side slopes grade of no greater than 4 horizontal:1 vertical. If soil is needed, Rocky Flats Alluvium (RFA) is to be used.

Prior to the September 2013 precipitation event, diversion berm height maintenance had been planned to begin on September 23, 2013. This work involves adding RFA to the tops of those portions of the diversion berms that, due to minor settling of the berms over time, do not meet the minimum height

requirements. Generally, measurements show that most portions needing adjustment are low by an inch or two, but the planned maintenance approach is to add RFA to the berm tops in 6-inch lifts, compact the lifts, seed the added RFA, and cover the added RFA with erosion matting.

The minimum diversion berm heights were calculated (based on modeling) to be sufficient to convey the runoff from a 100-year/24-hour storm event to the perimeter channels, with additional height (freeboard) based on a projected 1,000-year/24-hour storm event. Inspections of the OLF during and after the precipitation event demonstrated that the diversion berms were more than adequate to convey the runoff without causing significant water level elevations in the berm channels. It appeared that runoff collected and conveyed by the diversion berms was approximately 6 to 10 inches deep in the berm channels. The fast moving water did cause some erosion and gulying at the ends of several diversion berms where they joined the perimeter channels. However, there was no evidence of any significant erosion of the OLF cover or the perimeter channels or loss of existing vegetation from run on and runoff.

Based on these observations, it appears that, except for the northeast side of the OLF, the storm water management systems performed very well and that these features are robust. The RFLMA parties agreed that the planned berm-height maintenance can be delayed until DOE can compare performance of the diversion berms in relation to this event and then evaluate a possible modification to the minimum berm-height criteria.

Previous instances of localized instability and cracking have been successfully addressed by (1) regrading and filling cracks to maintain the integrity of the cover and (2) adding drainage features to minimize infiltration of precipitation. Since such repair activities involve the use of construction machinery, any needed berm-height maintenance can be performed at the same time as the repair activities.

Initial Response: Initial mitigation steps were undertaken by DOE to minimize the potential for infiltration of precipitation. Initial steps included (1) regrading the differential displacement cracks to seal the openings using the RFA from the adjacent area and (2) filling minor cracks by smoothing and tamping the surrounding surface. Erosion mats were placed over the regraded area. This work was completed on September 20, 2013. This area will be inspected weekly and any continuation of the cracking will be filled by smoothing out and tamping the surface as needed.

A qualified geotechnical engineer and Stoller engineering staff visited the OLF on September 24, 2013, to view the affected area, to provide recommendations for additional near term repairs, and to assist in developing a plan and schedule to address the conditions.

EPA and CDPHE concurred with the initial mitigation steps outlined above and with the need for additional work to maintain positive drainage in the Diversion Berm 4 channel.

The cracks with vertical displacement running through Diversion Berm 4 created a slight depression about 50 feet long in the berm channel. The depression prevents positive storm water drainage. This was temporarily corrected by installing perforated drain pipe and drain rock in the channel to convey runoff and to prevent ponding in this channel.

The work is subject to the *Rocky Flats Legacy Management Agreement*, Attachment 2, Section 4.0, “Institutional Controls” (ICs). The work involves an authorized response action on the OLF cover, which is subject to IC 6, shown in Table 1.

Table 1. Institutional Controls

IC 6	Digging, drilling, tilling, grading, excavation, construction of any sort (including construction of any structures, paths, trails or roads), and vehicular traffic are prohibited on the covers of the Present Landfill and the Original Landfill, except for authorized response actions.
	<p>Objective: Ensure the continued proper functioning of the landfill covers.</p> <p>Rationale: This restriction helps ensure the integrity of the landfill covers.</p>

The initial response information in this contact record demonstrates that the objective and rationale of IC 6 will be met.

Evaluation Plan and Schedule: The evaluation of localized instability and recommendations by a qualified geotechnical engineer is included in Attachment 1.

Drawings of the proposed grading and additional drainage features and an estimate of the time needed to complete the repairs to the OLF cover will be submitted by November 25, 2013, for CDPHE review and approval, as required under RFLMA. The schedule for completing the repairs will be dependent upon CDPHE’s review and any changes that are required for DOE to obtain CDPHE approval of the final design.

In accordance with RFLMA, DOE is not prohibited from taking any mitigating actions it deems necessary while the evaluation and design is being completed. The RFLMA Parties shall use the consultative process to discuss DOE’s mitigating actions as necessary. DOE will document mitigating actions in e-mail or other written correspondence, and will provide summaries of the actions taken in RFLMA quarterly or annual reports of site surveillance and maintenance activities.

Resolution: CDPHE concurs with DOE’s conduct of the initial response work described above. The work meets the objective and rationale of IC 6.

CDPHE, after consultation with EPA, approves the plan and schedule for evaluation.

DOE will provide information regarding the outcome of further consultation related to this reportable condition and the progress of the evaluation in RFLMA quarterly and annual reports.

Closeout of Contact Record: This contact record will be closed when the construction is completed, post-construction reseeding has been performed, and post-construction erosion controls are in place.

Approval: Carl Spreng, CDPHE, approved this contact record.

Contact Record Prepared By: Rick DiSalvo

Distribution:

Carl Spreng, CDPHE

Scott Surovchak, DOE

Linda Kaiser, Stoller

Rocky Flats Contact Record File

Attachment 1

Geotechnical Engineer Technical Memorandum



Technical Memorandum

Mr. Rick DiSalvo
Mr. Melvin Madril, PE
To: Mr. Stephen Pitton From: Thomas A. Chapel, CPG, PE
Company: S.M. Stoller Corporation Date: October 10, 2013
Rocky Flats OLF Berm 4 Grading
and Drainage Project No.: 114-181750

This memorandum summarizes Tetra Tech's observations, opinions, and recommendations regarding recent soil movement near Berm 4 at the Original Land Fill (OLF) area within the Rocky Flats Environmental Technology Site (RFETS). Minor cracking and localized slope distress have been observed occasionally in the area of Berm 4 since approximately 2010 (see Tetra Tech's 2010 memorandum). Cracks were also noted during a walk down in September 2011. Similar movements have been observed elsewhere on and adjacent to the OLF.

Such cracking and associated movement were evaluated as part of a geotechnical engineering investigation conducted by Tetra Tech for S. M. Stoller in 2008. Results of that investigation were published in a report titled Rocky Flats Original Landfill Geotechnical Investigation Report, dated June 4, 2008. The investigation included site visits and "walk downs", geophysical seismic and resistivity surveys, test excavations, exploratory borings, laboratory testing, slope stability modeling, and engineering analyses. The report concluded that the distress generally includes small-scale, localized slump features that typically originate in a comparatively weak, native clay layer that underlies the OLF. During extreme precipitation events or prolonged periods of wet weather, surface water penetrates the cover and shallow soil deposits, reducing the stability of the shallow subsurface. Computer modeling indicated that large scale, global failure of the OLF slopes is unlikely.

Recommendations in the geotechnical report included a range of possible measures that could be implemented to mitigate the localized distress. In accordance with approved procedures, S.M. Stoller selected a method of hand tamping soil in and adjacent to cracks to reduce water infiltration in distressed areas. This measure seems to have been successful, because little movement has been noted by S.M. Stoller during periods of typical precipitation that occurred between 2010 and the recent heavy and prolonged precipitation event.

RECENT EVENTS

During the period September 11 through September 13, 2013, rainfall of historic proportions fell in the vicinity of the OLF. Shortly after that event S.M. Stoller conducted a walk down of the OLF and observed several curvilinear cracks near the eastern terminus of Berm 4. The most significant of these cracks was located upslope from the area where Berm 4 outfalls into the East Perimeter Channel (EPC), and was on the order of 200 feet long with up to approximately two feet of downward displacement on the downhill side of the crack. Informal measurements of the crack depth indicated it progressed more than 18 inches below the ground surface and had a width of two to three inches. S.M. Stoller mapped the cracks, then filled them in by hand and using lightweight construction equipment to prevent additional surface water and precipitation from entering the cracks.

On September 24, S.M. Stoller and Tetra Tech met and walked the OLF to examine the ground, specifically the eastern portion of Berm 4 and nearby areas. At the time of our visit, no new movement was visible after the crack described above had been repaired. Traces of minor additional cracks were visible and had a similar alignment to the larger crack described above.

As a result of the crack and displacement described above, a segment of Berm 4 is now lower than adjacent segments of Berm 4, which may impact the ability of Berm 4 to convey the needed surface water volume in the event of future precipitation events similar in magnitude to those that occurred in September 2013. Further, the lower segment of channel will hold water and cause increased surface water infiltration in the distressed area.

Any condition that results in an increase in water in the shallow subsurface will contribute to instability of the slope. Localized failures can be expected under these conditions. We do not believe that a broad-scale, global failure of the OLF slope is more likely at this time than was predicted during the previous study. Recommendations to mitigate the localized instability of the eastern portion of the OLF are described below.

RECOMMENDATIONS

We recommended a phased approach to repair, monitor, and mitigate the localized instability observed in the vicinity of Berm 4. Items 1 and 2 are considered immediate and short-term measures; items 3 and 4 are longer-term engineering remedies. In order of implementation, we suggest the following:

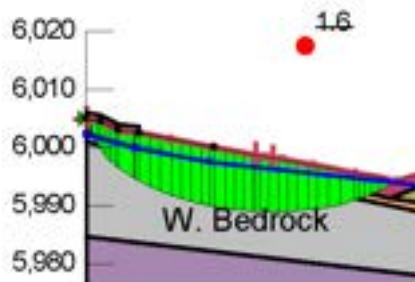
1. **Monitor the distress.** Frequency of observations of the OLF should be increased to approximately weekly in the short term to look for evidence of additional movement of the existing cracks or development of new distress. If or as distress is observed, cracks should continue to be filled in accordance with existing procedures. New cracks should be mapped if or as they occur. This process has been used successfully in other parts of the OLF. The repair methodology is consistent with the conclusions and recommendations in Tetra Tech's geotechnical investigation report dated June 4, 2008, and with the recommendations described in our Technical Memorandum dated August 10, 2010.
2. **Evaluate and repair Berm 4.** In its current condition, Berm 4 will hold water in the distressed area should additional precipitation and runoff occur. Ponding water in this area will exacerbate the instability and could result in additional or accelerated movement of localized, marginally stable zones. This condition should be repaired as soon as practical to reduce the risk of additional movement.

We have considered two alternative, short-term methods for reducing the occurrence of standing water in this area. Fill could be placed on the berm and in the channel invert to raise the lower portion so that positive drainage will occur across the zone. This alternative adds additional weight to the cracked area which tends to decrease the stability. Using previous slope stability models that we constructed as part of our geotechnical engineering evaluation, Tetra Tech simulated a wet condition and placement of additional fill by increasing the water level in the model and adding a surcharge to the ground surface at the failure plane. The surcharge applied approximates a two-foot layer of Rocky Flats Alluvium placed at the upper portion of the failure zone. Figure 1 (below) illustrates these conditions. Figure 1(a) shows the slope and localized failure with no surcharge, but with an elevated water level. The model calculated a minimum factor of safety (FoS) of 1.6, with failure occurring in the upper portion of the weathered claystone bedrock. Figure 1(b) shows the effect of adding a two-foot layer of fill as a surcharge. The calculated minimum FoS dropped

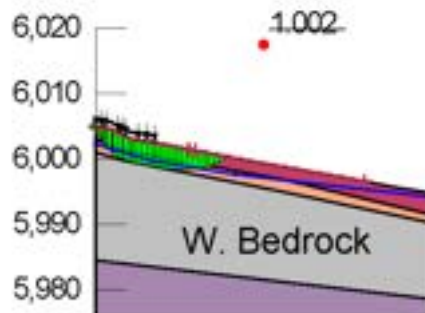
to 1.002 and the failure is predicted to occur in the organic layer at the surface of the weathered bedrock. These results indicate that the slope is marginally stable and on the verge of failure following the addition of two feet of fill. Because a localized, minor failure did actually occur when the water level increased, but without an additional surcharge, the model results may actually under-predict the potential risk of additional failures if surcharge is added.

Figure 1. Slope Stability Model Results

(a) Elevated water table, no surcharge.



(b) Elevated water table and a surcharge approximating a two foot fill in the upper portion of the failure zone.



Another alternative that would appear to have a lower risk for decreasing stability of the area is the construction of a temporary drain in the invert of Berm 4 to convey water from the low segment eastward to the outfall. This could be a trench and flexible drain pipe constructed such that the upper end of the drain is at the downstream end of the low segment and the drain outfall is at the eastern end of Berm 4 or in the EPC. This drain could be removed when longer term remedies have been designed and constructed (see below).

3. **Trench Drains and EPC Grading.** To improve drainage within the channels of Berms 4 through 7, thus decreasing the risk of future localized failures, a shallow trench drain could

be designed and constructed in the invert of each of the berms. Details would need to be designed, but the concept involves a trench excavated approximately one foot wide by one foot deep from a location upstream of the distressed area to the channel outfall in the EPC. This concept was used on some channels on the west side of the OLF, and it appears to have been successful in reducing the cracking and localized slope failures in that area.

The upstream terminus of the EPC includes a steep "headwall" that is adjacent to berm 4 at its east end. The steep slopes of this headwall may contribute to slope instability of the areas upslope from the EPC. The EPC should be re-graded to reduce the slopes to 3H:1V or shallower. This should be possible by placing approximately 5 feet of fill at the toe of the existing headwall and by "laying back" the existing slope at the upper end, generally on the north and east over a small area. The capacity of the EPC must be maintained and should be verified as part of the hydraulic analysis described below.

4. **Hydraulic Modeling and Design Review.** Because of the recent record setting precipitation and flood events, there is an opportunity to evaluate rainfall intensity and other hydrologic data at the OLF to evaluate the berm height in order to protect the area from damage due to future events. The analysis would require an engineer to obtain and review the daily precipitation records from Rocky Flats. A statistical analysis would be performed on the data to compare the rainfall event that occurred the week of September 11, 2013 to the projected period of record. This could be evaluated against previous recommendations for berm height along the drainage channels at the OLF to determine the actual level of protection that exists for the berms.