Appendix G: RFLMA Contact Records

RFLMA contact records issued during 2010 are included in this appendix.

This page intentionally left blank

ROCKY FLATS SITE
REGULATORY CONTACT RECORD

Purpose: 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's) August 2008 Policy, *End of Post-Closure Care*.

Contact Record Approval Date: January 20, 2010

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

Regulatory Contact(s) / Affiliation(s): Carl Spreng, CDPHE

Discussion: The OLF was closed in accordance with the March 10, 2005, *Final Interim Measure/Interim Remedial Action for the Original Landfill* (OLF IM/IRA). While the OLF was not a hazardous waste landfill, the OLF IM/IRA identified certain Colorado Hazardous Waste Act (CHWA) hazardous waste landfill closure regulatory requirements as Comprehensive Environmental Response, Compensation, and Liability Act's (CERCLA) Applicable or Relevant and Appropriate Requirements. Under CHWA regulatory requirements, the generally applicable post-closure care period is 30 years, but this period may be shortened or extended.

Under the OLF IM/IRA, a 2-foot-thick soil cover was selected for closure. To enhance slope stability, the existing slopes and hummocky features were regraded before the soil cover was placed, and a buttress consisting of fill with a subsurface rock/geotextile drain was installed at the OLF toe. Subsurface rock/geotextile drains were also installed to minimize the expression of historical seeps on the cover surface. East and west OLF perimeter drainage channels and diversion berms on the cover were also constructed to control surface water run-on and runoff around the OLF cover. One upgradient and three downgradient wells were installed for groundwater monitoring. (Surface water quality is monitored upstream and downstream of the OLF in Woman Creek.)

The OLF Monitoring and Maintenance Plan (M&M Plan) describes the procedures to be used to maintain the integrity and effectiveness of the final cover, including conducting inspections and evaluations and making repairs as necessary. The OLF M&M Plan is incorporated by reference as an enforceable requirement of the Rocky Flats Legacy Management Agreement (RFLMA) (see RFLMA Attachment 2, "Legacy Management Requirements," Section 5.3.1). RFLMA Attachment 2 also requires that OLF groundwater well and surface water is monitored and evaluated.

CDPHE's *End of Post-Closure Care* policy discusses criteria to be evaluated to determine when post-closure care of hazardous waste landfills is no longer necessary, based on a demonstration that the closed unit does not significantly threaten human health or the environment. The CDPHE criteria include whether a closed unit may meet "clean closure" standards, or whether a performance-based evaluation shows that the closed unit does not pose a threat for which post-closure care is needed. The "clean closure" standards are based on CDPHE-specified residential- and unrestricted-use soil-screening levels.

Note that under the CDPHE policy, ending post-closure care would not necessarily mean that post-closure controls for the OLF would end. However, certain monitoring and maintenance requirements may be reduced, given that the Rocky Flats Site will remain subject to land use restrictions under an existing Environmental Covenant.

On December 14, 2009, DOE, CDPHE, and S.M. Stoller staff discussed sampling, to determine OLF residual soil contamination, because the data can indicate whether the CDPHE clean closure standards (based on screening levels) might be achieved and can address some of the CDPHE policy performance-based criteria.

DOE proposes to develop a targeted Sampling and Analysis Plan (SAP) based on a review of the pre-closure OLF residual soil contamination data. The pre-closure residual soil contamination data are between 15 and 19 years old. Natural attenuation and the impacts of regrading the surface of the OLF for closure are believed to have reduced the residual contamination levels. Also, removing small areas of radionuclide contaminated surface soil at the OLF (called “hot spots”), just before the soil cover was installed, reduced radionuclide contamination levels.

Analytical results can provide data to characterize any reduction in contaminant levels over time. The data can help establish a baseline for current conditions and make it easier to surmise when certain OLF post-closure maintenance requirements might be phased out. DOE will consult with CDPHE on the development of the SAP and the proposed sampling locations. The SAP will also address the disposal of investigation-derived materials (IDM) (drill cuttings, excess soil, equipment decontamination waste, and personal protective equipment) in designated locations within the OLF. The 2-foot-thick soil cover material will be removed before the soils under the cover are drilled, and will be replaced after the drilling to keep the cover material free from possible subsurface contamination.

The sampling work involves drilling activities prohibited by the institutional controls (ICs) incorporated into RFLMA. Drilling below the 3-foot-depth limit specified by ICs (RFLMA Attachment 2, Table 4, IC 2), and drilling and vehicular traffic on the cover of the OLF are prohibited, except for remedy-related purposes (RFLMA Attachment 2, Table 4, IC 6) and in accordance with approved procedures. The sampling will involve the presence of vehicular traffic (a drill rig and support vehicles) on the OLF cover and drilling into soil below a depth of 3 feet on the OLF cover.

DOE will submit the SAP to CDPHE for approval to conduct the drilling work.

The objective of IC 2, regarding excavations with a depth that exceeds 3 feet, is to maintain the current depth between ground surface and any subsurface contamination or contaminated structures. This IC also results 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 objective and risk management policy goal.

The objective of IC 6 is to ensure the proper functioning of the landfill cover. The soil sampling data will provide information to evaluate the post-closure care period and are consistent with this objective. RFLMA ICs prohibit these activities unless CDPHE approves them.

CDPHE has requested that the following information be included in Contact Records that involve soil excavation:

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

There are no remaining subsurface structures in the vicinity, so minimum cover assumptions will not be violated. An Xcel Energy natural gas line is buried north of the OLF. Utilities will be located, and the location of the gas line will be marked before vehicular traffic and drilling work commence.

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

This OLF is former IHSS 115. The drilling will take place in the OLF waste footprint. The OLF is not a hazardous waste unit because it was not used for waste disposal after the effective dates of the various hazardous waste regulations. However, the OLF's historical use is typical of solid waste dumps of the time, and the wastes disposed of were plant trash and construction debris that, based on sampling, likely contained some chemicals that subsequently were regulated as CERCLA hazardous substances. The OLF IM/IRA describes the history of the OLF and the types of wastes disposed of.

The OLF was not a radioactive contaminated waste disposal area. However, there is a documented instance of placing a smoldering depleted uranium (DU) slab in the OLF to allow it to "burn out." When the burned slab was recovered, not all of the DU mass was recovered. Surface soil monitoring at the OLF also located several hot spots. Before the soil cover was placed on the OLF, the hot spots were removed (see OLF IM/IRA Appendix E.)

Use of the OLF for dumping trash and debris ended in 1968, and an unknown amount of soil was used to cover the waste. The OLF IM/IRA states that soil was used to cover the waste dumped in the OLF area during its use, and that the waste and soil are fairly well commingled.

The OLF IM/IRA contains environmental media analytical results, including results from 57 surface soil locations and 22 subsurface soil (to bedrock) borehole locations. A review of the OLF IM/IRA residual soil contamination data shows that concentrations of all analytes are below the Wildlife Refuge Worker subsurface soil Preliminary Remediation Goals, which are based on $1x10^{-6}$ risk from activities involving occasional exposure to subsurface soils, such as drilling.

Pre-closure groundwater samples from within the OLF footprint indicated localized contamination consistent with the presence of contaminated soils, but the soil sampling is not expected to result in direct contact with, or the removal of, groundwater. Post-closure groundwater sampling at the downgradient sampling wells does not indicate any anthropogenic contamination above RFLMA surface water standards.

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).

The final ground contours will approximate the contours that existed prior to the drilling activities.

Closeout of Contact Record: This Contact Record will be closed out when the soil sampling work, including IDM disposal, is completed.

Resolution: The proposed drilling work to obtain soil samples at the OLF is approved as described in this Contact Record, and may commence upon CDPHE's approval of the SAP.

Contact Record Prepared by: Rick DiSalvo

Distribution:
Carl Spreng, CDPHE
Scott Surovchak, DOE
Linda Kaiser, S.M. Stoller
Rocky Flats Contact Record
File

ROCKY FLATS SITE
REGULATORY CONTACT RECORD

Purpose: Approval of Excavation Greater Than 3 Feet Below Grade to Breach Dams A-3, A-4, B-5, C-2 and the Present Landfill Dam.

Contact Record Approval Date: April 15, 2010

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

Regulatory Contact(s)/Affiliation(s): Carl Spreng, Colorado Department of Public Health and Environment (CDPHE)

Introduction: Breaching of Dams A-1 and A-2 (located in North Walnut Creek) and Dams B-1, B-2, B-3, and B-4 (located in South Walnut Creek) was completed in 2009. This action was the preferred alternative in the DOE October 2004 *Pond and Land Reconfiguration Environmental Assessment, Comment Response and Finding of No Significant Impact* (DOE/EA-1492). The dam breach work included soil excavation more than 3 feet below the surface and removal of sentinel well TH046992 at Dam B-3 that required approval under the Rocky Flats Legacy Management Agreement (RFLMA), because these actions are otherwise prohibited by certain RFLMA institutional controls (ICs). The approval for the soil excavation and removal of the monitoring well location is documented in Contact Records 2008-02 and 2008-09.

The five remaining Rocky Flats Site dams, Dams A-3 and A-4 (in North Walnut Creek), Dam B-5 (in South Walnut Creek), Dam C-2 (at the end of the South Interceptor Ditch north of Woman Creek), and the Present Landfill (PLF) Dam (in No Name Gulch) retain surface water in retention ponds that are not necessary to site operations. DOE proposes to breach these remaining dams. This action would reduce or eliminate the out-of-priority retention of surface water and return the Rocky Flats surface water flow approximately to the original conditions. Returning flows to a more natural condition will provide ecological benefits by improving riparian habitat and promoting wetlands. In addition, this will reduce or eliminate the inspection and reporting costs associated with meeting dam safety requirements, operating and maintaining the dams, and determining out-of-priority storage and evaporative depletions.

DOE is preparing the *Rocky Flats Surface Water Configuration Environmental Assessment* (EA) to evaluate impacts related to breaching the remaining dams. DOE intends to release the draft EA for public review and comment in spring 2010 and issue the final EA in summer 2010. Figures 1 and 2 show the locations of the remaining ponds and dams and the approximate footprints of the construction areas where excavations would occur based on the preliminary design being prepared for the EA. Final design and construction work will be performed after DOE issues the final EA.

A portion of each dam embankment will be removed to form a channel in the dam and create a flow-through configuration. The designs for the previous dam breach construction included stop log structures in the notch to retain a shallow pool level upstream of the stop logs. The shallow pool level can be adjusted by adjusting the height of the stop logs (by removing or adding stop logs) in the structure. The preliminary design for the breach of the remaining dams does not include stop log

structures; channel invert and grading elevations are designed to result in no retained water. The final design will be informed by the hydrological modeling being conducted as part of the EA.

The proposed excavation work will exceed the 3-foot depth limit prohibited by ICs (RFLMA, Attachment 2, Table 4, Control 2) and thus requires pre-approved procedures. On January 18, 2010, DOE and CDPHE staff consulted regarding the soil excavation.

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. This IC also results 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} excess lifetime cancer risk. As discussed below, the proposed work achieves the risk management policy goal.

The excavated soils will be used as fill in accordance with the engineering design to raise the level of a portion of the pond bottoms, partially fill the spillways adjacent to each dam, and reclaim disturbed areas. It is not anticipated that any imported fill will be needed for these purposes. Some excavated soils from within the notched area could also be used to provide materials for reclaiming roads adjacent to the dams and for revegetation and minor recontouring in the Central Operable Unit (COU) to maintain and improve erosion control.

Erosion controls for the excavation, construction, and fill activities will be employed in accordance with the *Erosion Control Plan for Rocky Flats Property Central Operable Unit*, DOE-LM/1497-2007, July 2007.

CDPHE has requested that the following information be included in Contact Records for soil excavation related to IC 2 that will not return soil to the preexisting grade:

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).*

There are no subsurface building or tunnel structures near the dams. However, outlet works, pipes, valves, drop structures, spillways, and miscellaneous components are integral to the dam structures. Unneeded surface components or structures will be removed to appropriate depth below the finished grade, and openings in pipes, manholes, and drop structures that are not removed will be stabilized in accordance with the engineering design to meet the Colorado State Engineer's requirements for the breached dam structures. 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. It is expected that removed items will be disposed of off site as solid waste or recycled, as appropriate. However, routine radiological field screening of these waste items will also be performed to determine if off-site 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 and surface water pending off-site disposal.

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

The dams are associated with the following former IHSSs/PACs:

IHSS 142.3 - Pond A-3

IHSS 142.4 - Pond A-4

IHSS 142.9 - Pond B-5

IHSS 142.11- Pond C-2

IHSS 114 - PLF Pond

More detailed information on these IHSSs/PACs and the disposition of these areas is available in the *RCRA Facility Investigation—Remedial Investigation/Corrective Measures Study—Feasibility Study Report for the Rocky Flats Environmental Technology Site (RI/FS),* Appendix B, "FY2005 Final Historical Release Report."

A Rocky Flats Cleanup Agreement (RFCA) accelerated action resulted in removal of sediment from the PLF Pond as part of the PLF closure in 2005. The removed sediment was placed in the PLF prior to construction of the PLF closure cover. Confirmation sampling after the sediment removal demonstrated that the objectives of the removal were met, and the remaining residual contamination levels were well below the RFCA wildlife refuge worker soil action levels. This accelerated action and the confirmation sampling results are documented in the September 2005 *Final Closeout Report for IHSS Group 000-5 Present landfill (IHSS–114).*

Characterization results for the investigation of ponds A-3, A-4, B-5, and C-2 are presented in the October 2005 *Data Summary Report for IHSS Group NE-1* (DSR).

Based on the DSR characterization information for the ponds in question, all surface and subsurface constituent concentrations or activities were less than the RFCA wildlife refuge worker soil action levels, and no RFCA accelerated action was required.

As part of the RI/FS, Exposure Units (EUs) were evaluated and documented in the RI/FS Appendix A, "Comprehensive Risk Assessment" (CRA). Ponds A-3, A-4, and B-5 are located in the Upper Walnut Drainage EU. Pond C-2 is located in the Lower Woman Drainage EU. The PLF pond is located in the No Name Gulch 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 risk to the wildlife refuge worker for the surface and subsurface exposure scenario for benzo(a)pyrene in the CRA is 1×10^{-6}.

The results of the CRA for the No Name Gulch Drainage EU are in Volume 6 of Appendix A. Vanadium was identified as the only COC for surface soil in this EU. The noncancer hazard index (HI) estimate is less than 1, indicating that adverse noncancer health effects are unlikely for the wildlife refuge worker exposure scenario.

The results of the CRA for the Lower Woman Drainage EU are in Volume 11 of Appendix A. No COCs were identified for this EU. Thus, risks are expected to be similar to those associated with background conditions.

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 new surface elevations will be consistent with the final design drawings for the regrading work for the dams and the new POCs. Final elevations will be surveyed, and the resulting data will be used to update the COU topographic maps.

Closeout of the Contact Record: This Contact Record will be closed out when the as-built drawings are completed for the construction work, and the COU topographic maps have been updated with the final elevations.

Resolution: Carl Spreng, CDPHE, approved the soil excavation for the proposed dam breach work.

Contact Record Prepared by: Rick DiSalvo

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

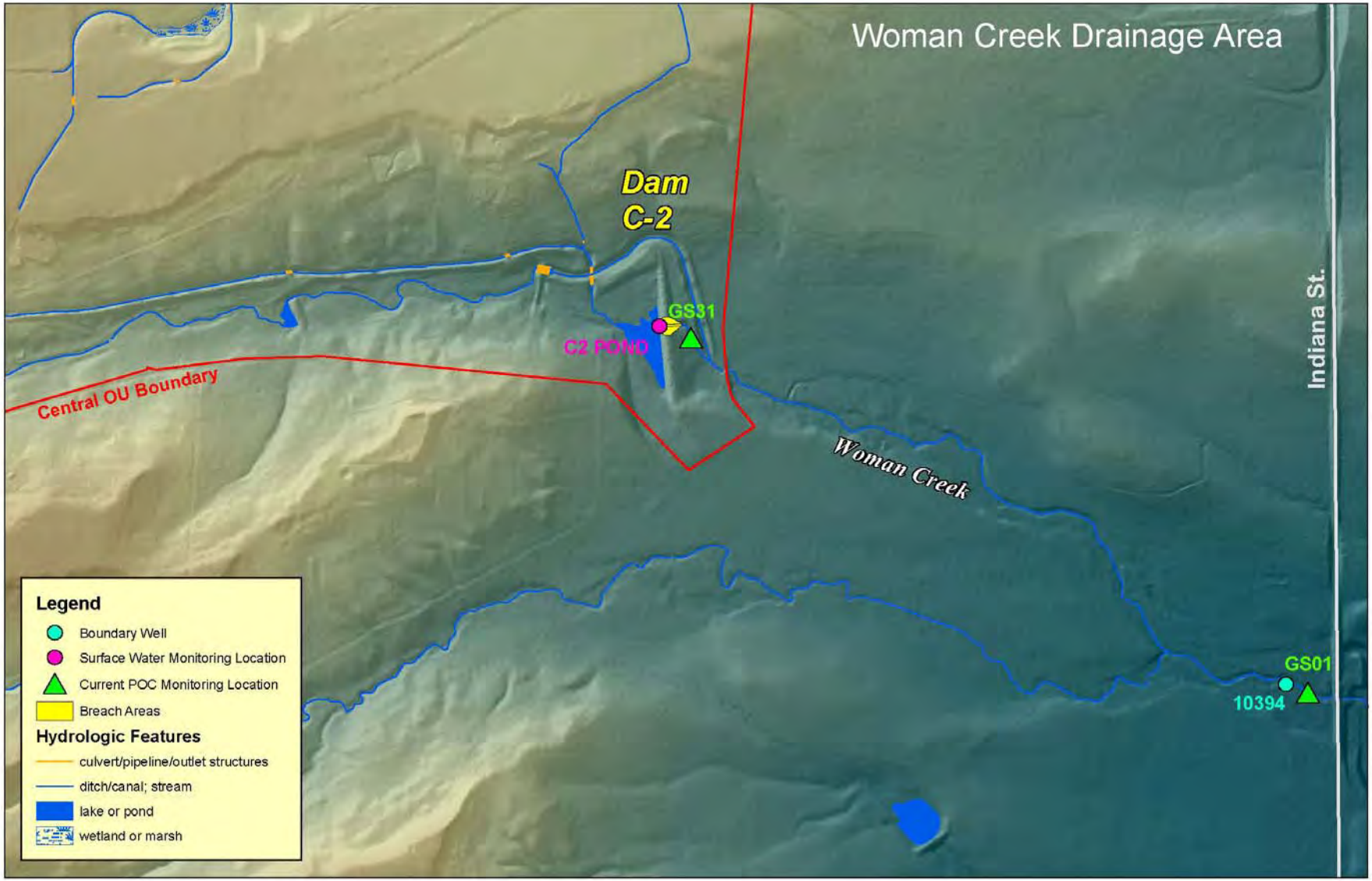


Figure 1. Monitoring and Dam Breach Locations—Woman Creek Drainage Area

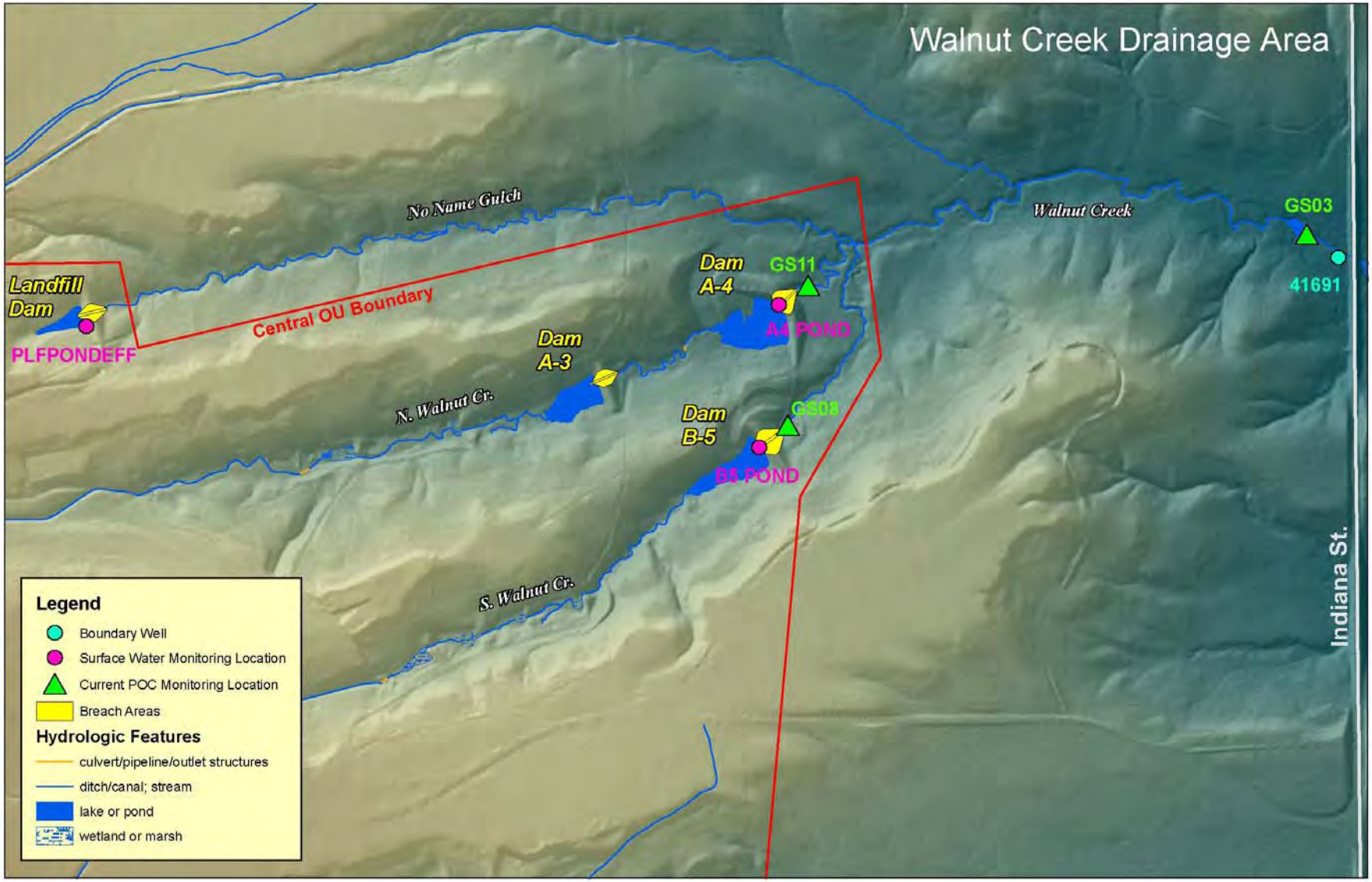


Figure 2. Monitoring and Dam Breach Location—Walnut Creek Drainage Area

ROCKY FLATS SITE
REGULATORY CONTACT RECORD

Purpose: Non–Rocky Flats Legacy Management Agreement (RFLMA) Surface Water Monitoring Project for North and South Walnut Creeks

---

Contact Record Approval Date: 3/15/10

Site Contacts/Affiliations: Scott Surovchak/U.S. Department of Energy (DOE); Linda Kaiser/Stoller; Rick DiSalvo/Stoller; John Boylan/Stoller; George Squibb/Stoller

Regulatory Contact/Affiliation: Carl Spreng/Colorado Department of Public Health and Environment (CDPHE)

Discussion: On January 18, 2010, DOE and CDPHE staff consulted regarding planned non-RFLMA surface water monitoring at various locations and the rationale for performing this monitoring. It was agreed that this monitoring does not require approval under RFLMA and that a Contact Record would be prepared to outline the monitoring project. The parties verbally concurred that the monitoring could proceed.

The non-RFLMA monitoring is intended to provide temporal and spatial water quality data that pertain to several postclosure aspects of Rocky Flats site operations and surveillance, which are outlined below.

- Closure of Rocky Flats resulted in the removal of buildings, roads, and parking lots and the elimination of imported water, which greatly reduced the runoff and eliminated sewage treatment plant effluent contributions to surface water. Groundwater, which contains varying levels of natural uranium, now makes up a higher proportion of surface water base flow compared to preclosure conditions. Periodic comparison of preclosure and postclosure natural uranium levels in surface water adds to the understanding of hydrologic conditions.
- The postclosure vegetation management and revegetation work is resulting in well-established vegetation in the Rocky Flats drainage areas. This is intended to mitigate erosion from runoff during precipitation events. Data will help characterize the water quality impacts from precipitation events.
- Breaching of Dams A-1 and A-2 (located in North Walnut Creek) and Dams B-1, B-2, B-3 and B-4 (located in South Walnut Creek) was completed in 2009. This action was the preferred alternative in the DOE October 2004 *Pond and Land Reconfiguration Environmental Assessment, Comment Response and Finding of No Significant Impact (DOE/EA-1492)*. The purpose of the action was to eliminate the cost of dam inspections and maintenance and enhance the ecological conditions by returning to a more natural flow-through condition approximating pre-Rocky Flats Plant operations. Water quality levels upstream and downstream of some of the breached dams can help quantify the effects of restored flow-through conditions.
- DOE is currently pilot-testing treatment media and component configurations, known as the Phase II/III upgrades to the Solar Ponds Plume Treatment System (SPPTS) in the North Walnut Creek drainage to gather information for design of a subsequent full-scale SPPTS Phase IV upgrade.

This work was necessitated in part because of the successful implementation of the SPPTS Phase I upgrade to collect additional nitrate- and uranium-contaminated groundwater. The increased contaminant loads and water flow rates to the SPPTS, as expected, cannot be adequately treated by the original SPPTS treatment cells. The approved SPPTS Phase I, II, and III upgrades are documented in Contact Records 2008-08 and 2009-01. Information on natural attenuation of nitrate levels and changes in uranium levels from possible groundwater baseflow to surface water downstream of the SPPTS will help inform the alternatives evaluation of the Phase IV upgrades.

The following discussion provides background and objectives information for the non-RFLMA monitoring project.

Ambient water quality levels of uranium—RFLMA Attachment 2, *Legacy Management Requirements*, Table 1, Surface Water Standards, are based on the tables in Colorado Water Quality Control Commission (WQCC) Regulation No. 31: Basic Standards and Methodologies for Surface Water (5 CCR 1002-31) and on the site-specific standards in the WQCC Regulation No. 38 (5 CCR 1002-38).

The initial RFLMA uranium standard for Walnut Creek was 10 picocuries per liter (pCi/L), which is equivalent to approximately 14.6 micrograms per liter (µg/L) of uranium. This standard was based on an ambient uranium level that was determined during plant operations, which is no longer representative of site conditions. Post closure surface water runoff has decreased, and the relative contribution of uranium from groundwater containing predominantly natural uranium has therefore increased. DOE petitioned the WQCC in August 2007 to revise the uranium standard to the WQCC table value standard, which is the maximum contaminant level (MCL) of 30 µg/L.

DOE's impetus for the rulemaking in 2007 was that uranium levels at RFLMA Point of Evaluation GS10 in South Walnut Creek exceeded the RFLMA standard due to the increased groundwater contribution to surface water, and the predominantly natural uranium in groundwater. Concentrations of natural uranium in groundwater from wells near GS10 have been as high as 10 to 15 times the MCL, so with groundwater now comprising a higher proportion of surface water flows, applying an unusually low uranium standard may be inappropriate.

Following a January 2009 hearing, the WQCC revised the uranium standard to the Colorado health-based uranium metal standard of 16.8 µg/L, which is equivalent to approximately 11.3 pCi/L of uranium. The WQCC decided that human health-based criteria were more appropriate than the table value standard, a new ambient-based standard, or maintaining the current standards at that time, but would consider future revisions based on additional data if requested.

Since the late 1990s, samples from a number of surface water and groundwater locations have been collected for analysis at Los Alamos National Laboratory (LANL) to determine the relative presence of natural and anthropogenic uranium species; recently, these samples have provided data for the WQCC hearing. Non-RFLMA samples will again be collected for LANL analysis to update this information.

SPPTS upgrade and ambient nitrate and uranium—The SPPTS Phase II/III work was necessitated in part because of the successful implementation of the SPPTS Phase I upgrade to collect additional nitrate- and uranium-contaminated groundwater, which increased the contaminant loading and water flow rates to the SPPTS. Those flows could not be adequately treated by the original SPPTS. The approved SPPTS Phase I, II, and III upgrades are documented in Contact Records 2008-08 and 2009-01.

Following completion of the Phase I upgrades that increased nitrate loading and water flow rates to the SPPTS, the RFMLA nitrate standard, which was a temporary modification that adopted an agricultural-based standard of 100 mg/L, expired on December 31, 2009. The current nitrate standard is now based on the water supply standard of 10 mg/L. DOE will be evaluating the Phase II and III results to determine the practicability of a subsequent Phase IV system to cost effectively minimize in-stream levels. Monitoring will provide data for ambient water quality levels resulting from bioreduction of nitrate and the contribution of natural uranium in groundwater baseflow.

Spatial variation during precipitation runoff events—In-stream radionuclide and total suspended solids (TSS) concentrations during the rising and falling water levels due to precipitation events (synoptic sampling) will provide data for evaluating the effects of soil erosion on water quality.

The non-RFLMA monitoring project involves four sampling activities, described below. The sampling locations and analytes are shown in Figure 1.

- Grab samples will be collected at eight locations in North Walnut Creek and analyzed for nitrate+nitrate as N concentrations. The samples will initially be collected biweekly; sampling frequency may be adjusted as data become available. Analytical results will be evaluated both spatially and temporally to further define nitrate concentration and variation in North Walnut Creek.
- Grab samples will be collected at 12 locations in both North and South Walnut Creeks and analyzed for total uranium concentrations. The samples will initially be collected at a biweekly frequency; sampling frequency may be adjusted as data become available. Analytical results will be evaluated both spatially and temporally to further define uranium concentration and variation in North and South Walnut Creeks.
- Grab samples will be collected at 12 locations in both North and South Walnut Creeks and analyzed at LANL for isotopic uranium signatures using high-resolution instruments. The samples will be collected as a single sampling event in March 2010; additional LANL sampling may be conducted at later dates. Analytical results will be evaluated spatially to further define the ratios of anthropogenic to natural uranium in North and South Walnut Creeks.
- Automated storm-event composite samples will be collected at six locations in both North and South Walnut Creeks for plutonium, americium, and TSS. Automated water sampling equipment will be temporarily installed next to the stream or stoplog structure (at the ponds). The equipment will be attached to a half-pallet (approximately 2 feet by 4 feet, or approximately 8 square feet) that is staked to the ground. A small vinyl tube will be run to the stream or the pond stoplog structure and attached to either a piece of rebar in the stream or the face of the stoplog structure at the ponds. The samplers will be programmed to trigger on rising water levels and then automatically collect samples during the rising limb of a runoff event (the rising limb of a runoff event is the period with the highest suspended solids concentration). The intent is to synoptically collect a sample at each location from the same runoff event during the same portion of the hydrograph. This sampling is intended to occur for six runoff events; additional events may be sampled based on the data evaluation. Analytical results will primarily be evaluated spatially to look for variation along the stream reaches.

At present, it is estimated that the sampling project will be conducted over a 3 to 4 month period. However, some of the sampling may be conducted for a shorter or longer period. DOE will keep CDPHE informed through consultation regarding any additional sampling locations or changes to the sampling project.

Closeout of Contact Record: This contact record will be closed after completion of the non-RFLMA sampling project described herein. After this Contact Record is closed out, additional non-RFLMA sampling activities may be performed, and CDPHE will be kept apprised of the additional sampling through the consultative process.

Resolution: Carl Spreng, CDPHE, approved the summary of the consultation regarding the non-RFLMA sampling project.

Contact Record Prepared by: Rick DiSalvo

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

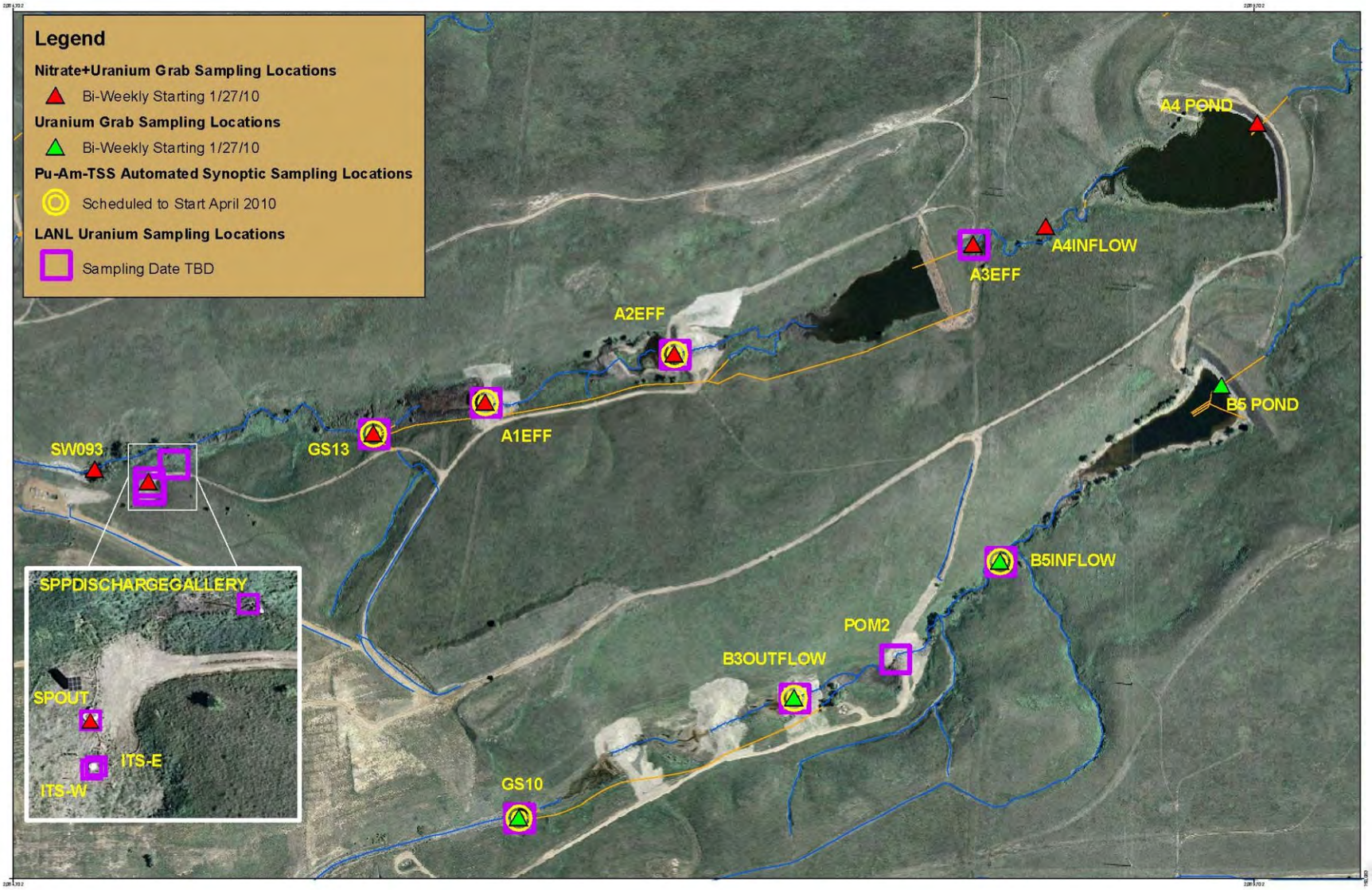


Figure 1. Sampling Locations and Analytes for the Non-RFLMA Monitoring Project

This page intentionally left blank

ROCKY FLATS SITE
REGULATORY CONTACT RECORD

Purpose: Rocky Flats Legacy Management Agreement Attachment 2: Modification to Revise Monitoring Points

Contact Record Approval Date: July 15, 2010

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

Regulatory Contact(s)/Affiliation(s): Carl Spreng, Colorado Department of Public Health and Environment (CDPHE)

Introduction: This Contact Record documents the Rocky Flats Legacy Management Agreement (RFLMA) parties' consultation regarding proposed changes to RFLMA required monitoring points. The RFLMA monitoring points are incorporated in RFLMA Attachment 2, *Legacy Management Requirements,* and DOE proposes to eliminate certain monitoring points and establish new monitoring points as discussed in the Contact Record.

This Contact Record does not constitute approval of the proposed changes to RFLMA monitoring points discussed herein. The proposed changes to RFLMA Attachment 2 are subject to regulatory approval under RFLMA paragraph 65. The parties agreed that in accordance with RFLMA paragraph 66, the proposed changes to monitoring points will be subject to public review and comment, as discussed below.

The proposed changes are prompted for two main reasons. First, the U.S. Environmental Protection Agency (EPA), with CDPHE concurrence, deleted the Peripheral Operable Unit (POU) from the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) National Priority List (NPL) on May 25, 2007, and no further response action is required for the POU. DOE subsequently transferred jurisdiction and control of most of the land in the POU to the U.S. Fish and Wildlife Service for the establishment of the Rocky Flats National Wildlife Refuge. Thus, monitoring and compliance points in the POU are no longer on the NPL site.

Second, RFLMA anticipates moving the surface water points of compliance (POCs) if the terminal ponds are breached or other changes to site configuration force their relocation. DOE is preparing the *Rocky Flats Surface Water Configuration Environmental Assessment* (EA) to evaluate environmental impacts related to breaching the remaining dams. DOE released a draft EA for public review and comment from April 26, 2010, through June 1, 2010. RFLMA Contact Record 2010-02 also provides information related to the proposed dam breach work.

The remaining dams are Dams A-3 and A-4 (located in North Walnut Creek), Dam B-5 (located in South Walnut Creek), Dam C-2 (located at the end of the South Interceptor Ditch north of Woman Creek), and the Present Landfill (PLF) Dam (located in No Name Gulch) that retain surface water in retention ponds that are not necessary to site operations and are not a requirement of the remedy. RFLMA Attachment 2 provides that if the terminal ponds (Ponds A-4, B-4, and C-2) dams are breached, new monitoring and compliance points will be established.

In addition, DOE has historically operated the terminal ponds in a batch and release mode. Though not required by the remedy, RFMLA Attachment 2, section 5.4, "Operational Monitoring," requires DOE to sample and evaluate terminal pond water quality prior to batch release (unless an emergency release is warranted). In the EA, DOE evaluates operating the terminal ponds in flow-through mode for the next several years prior to actually breaching the dams.

Thus, as required by RFLMA, the proposed changes to monitoring points address where new monitoring and compliance points will be located considering DOE's proposed action to breach the terminal ponds. Also, the proposed changes to monitoring locations include elimination of pre-discharge sampling in the terminal ponds.

Figures 1 and 2 in this Contact Record also show the current required monitoring locations, the monitoring locations that DOE proposes to eliminate, and DOE's proposed new monitoring locations. The relevant monitoring locations are listed in Table 1 as well. Figures 1 and 2 also show the locations of the remaining ponds and dams and the approximate footprints of the construction areas for the proposed dam breach based on the preliminary design used in preparing the EA.

In addition to the main reasons for the proposed monitoring locations discussed above, the following items are also pertinent to the proposed changes:

- The proposed locations maintain the ability to evaluate the quality of surface water leaving the site in order to determine whether the remedy remains adequately protective of human health and the environment.
- The decision frameworks in the RFLMA Attachment 2 monitoring point evaluation flowcharts will be followed for reporting and consultation to implement response actions as appropriate when specified compliance values are exceeded.
- Compliance values are based on the surface water standards in RFLMA Attachment 2, Table 1.
- Boundary wells, which are located in the POU where no further response action is required, are remote from groundwater sources of contamination and are not used for POC monitoring.
- Having fewer routine sampling locations increases efficiency and reduces the need to enter the Refuge for monitoring and maintenance work.
- The monitoring locations within the Refuge are also in the possible route of the proposed Jefferson Parkway (see, www.jppha.org), so changes to locations need to be considered to accommodate the proposed Parkway routing.
- The Colorado Water Quality Control Commission moved the eastern end of Big Dry Creek Segment 5 (which includes Walnut Creek) to the eastern Central Operable Unit boundary as part of the 2009 triennial review of the Classifications and Numeric Standards for South Platte River Basin—Regulation 38 (5 CCR 1002-38), and the proposed Walnut Creek monitoring location will remain in Segment 5.

.

On January 18, March 29, and April 27, 2010, DOE and CDPHE staff consulted regarding DOE's proposed changes to monitoring points. DOE and CDPHE have also continued to discuss the proposed changes during the public review and comment period for the draft EA.

The RFLMA parties agreed that the proposed RFLMA Attachment 2 modification will be released for a 30-day public review and comment period. The parties also agreed that a public information meeting regarding the proposed modification will also be scheduled to occur during the public comment period.

The RFLMA parties also agreed that the dates upon which the specific changes to monitoring locations become effective would be included in any approval decision by CDPHE and EPA regarding DOE's proposed modification.

Discussion: Some of the monitoring locations subject to the proposed modification are identified in the Corrective Action Decision/Record of Decision (CAD/ROD) and are incorporated into RFLMA Attachment 2. Other monitoring locations are only identified in RFLMA Attachment 2. The proposed monitoring point changes will therefore require EPA and CDPHE approval.

The following excerpts are relevant to the proposed monitoring point changes:

Pursuant to the CAD/ROD Section 17, "Selected Remedy/Corrective Action for the Central OU":

> [Points of Compliance (POCs)] … are currently established in Walnut and Woman Creeks at Indiana Street and at the outfalls of the terminal ponds (Ponds A-4, B-5, and C-2). POCs will remain at these points unless changes in site configuration (such as removal of the terminal ponds or the construction of a new highway along Indiana Street) force their relocation.

While the example of the removal of the terminal ponds is used to illustrate a change in site configuration, the deletion of the POU from the NPL site and determination that no further response action is required in the POU is also a site configuration change.

RFLMA Attachment 2, Section 5.1, "Monitoring Surface Water," provides the following direction:

> Compliance with the surface-water standards in Table 1 will be measured at the Points of Compliance (POCs) downstream of the terminal ponds in Woman and Walnut Creeks. If the terminal ponds are removed, new monitoring and compliance points will be designated and will consider groundwater in alluvium.

In addition to the changes to monitoring locations, the installation of flumes at the proposed new monitoring locations will involve excavations deeper than 3 feet below the surface, which is prohibited by RFLMA institutional controls (ICs) unless approved by CDPHE. This Contact Record provides information requested by CDPHE for approval of excavations deeper than 3 feet below the surface.

Table 1. RFLMA Monitoring Locations Proposed for Changes

ID	Location	Identified in CAD/ROD	Required by RFLMA	Proposed Change
GS01	Surface water Point of Compliance (POC)—Woman Creek at Indiana St.	Yes	Yes	Remove—not part of NPL site. POC is upstream in Woman Creek at the Central Operable Unit (COU) boundary. GS01 is in the Northwest Parkway proposed route.
GS03	Surface water POC—Walnut Creek at Indiana St.	Yes	Yes	Remove—not part of NPL site. POC is upstream in Woman Creek at COU boundary. GS03 is in the Northwest Parkway proposed route.
GS08	Surface water POC—South Walnut Creek at outfall of Pond B-5	Yes	Yes	Replace with new POC near COU boundary at confluence of North and South Walnut Creeks. Compliance value remains based on 12-month rolling average, but DOE will use 30-day rolling average to trigger consultation with CDPHE on whether mitigating actions are required.
GS11	Surface water POC—North Walnut Creek at outfall of Pond A-4	Yes	Yes	Replace with new POC near COU boundary at confluence of North and South Walnut Creeks. Compliance value remains based on 12-month rolling average, but DOE will use 30-day rolling average to trigger consultation with CDPHE on whether mitigating actions are required.
GS31	Surface water POC—At outfall of Pond C-2 upstream of Woman Creek	Yes	Yes	Replace with new POC in Woman Creek near COU boundary. Compliance value remains based on 12-month rolling average, but DOE will use 30-day rolling average to trigger consultation with CDPHE on whether mitigating actions are required.
PLFPONDEFF	Surface water grab sample location to determine water quality downstream of Present Landfill Treatment System if treatment system effluent exceeds RFLMA standards	No	Yes	A new sampling point ID will be assigned. Grab sample location will be in No Name Gulch near the proposed PLF dam notch after notching. This is the approximate downstream location of the current PLFPONDEFF location.
Pond A-4	Operational monitoring surface water grab sample location for pre-discharge sampling	No	Yes	Remove—operational monitoring not needed; pre-discharge sampling no longer relevant once surface water flow-through condition is restored.
Pond B-5	Operational monitoring surface water grab sample location for pre-discharge sampling	No	Yes	Remove—operational monitoring not needed; pre-discharge sampling no longer relevant once surface water flow-through condition is restored.
Pond C-2	Operational monitoring surface water grab sample location for pre-discharge sampling	No	Yes	Remove—operational monitoring not needed; pre-discharge sampling no longer relevant once surface water flow-through condition is restored.
Well 10394	Operational monitoring Boundary well near POC GS01	No	Yes	Abandon—not part of NPL site. Area of Concern wells inside COU meet groundwater point of

ID	Location	Identified in CAD/ROD	Required by RFLMA	Proposed Change
				compliance regulatory standard. Well is in the Northwest Parkway proposed route.
Well 41691	Operational monitoring Boundary well near POC GS03	No	Yes	Abandon—not part of NPL site. Area of Concern wells inside COU meet groundwater POC regulatory standard. Well is in the Northwest Parkway proposed route.

DOE intends to install monitoring equipment at the proposed new POC locations to have these locations operational before work begins on the surface water configuration project. Current monitoring locations will be sampled as required by RFLMA until the time monitoring at current locations is to be discontinued in accordance with any approved RFLMA Attachment 2 modifications.

Proposed RFLMA Attachment 2 Modifications: The following information provides more detail for the proposed changes outlined in Table 1.

Surface Water POCs—As outlined above, adjusting the location of the POCs to the edge of the COU is a consequence of deleting the POU from the NPL, establishing the Wildlife Refuge, and moving the boundary of the DOE-managed property. State and federal guidance for POCs (for groundwater, but the concepts and principles are the same for surface water) require locating them at or as close as possible to the "waste management area" boundary. CERCLA requires that remedial actions at CERCLA sites at least attain legally applicable or relevant and appropriate federal and state requirements, standards, criteria, and limitations, which are collectively referred to as ARARs. ARARs are in the Rocky Flats CAD/ROD, Table 21, and include the Colorado Water Quality Control Commission (WQCC) statewide basic standards in Regulation No. 31 (5 CCR 1002-31), site-specific standards in WQCC Regulation No. 38 (5 CCR 1002-38), and groundwater standards in Regulation No. 41 (5 CCR 1002-41).

The Area of Concern (AOC) wells satisfy the ARAR in Regulation No. 41 for groundwater POCs. However, surface water POCs are not identified in Regulation No. 31 or No. 38, or in the Rocky Flats CAD/ROD ARARs, but are established in accordance with the remedial action, implemented under RFLMA. Under CERCLA guidance, compliance with surface water ARARs is measured at an appropriate point considering groundwater impacts to surface water within the NPL site boundary.

RFLMA Attachment 2 Section 5.1 states that new POCs will consider groundwater in alluvium. The draft EA describes that the proposed dam breach design is to notch, rather than completely remove the dams. The remaining structures will continue to effectively capture alluvial groundwater and direct it towards the surface water flowing through the notches so that it will be measured at the POCs. The proposed new POCs, like the current POCs, are downgradient of the AOC wells. They are also proposed to be located downstream of the notches proposed to breach the dams. Thus, the proposed new POCs are positioned to evaluate contaminated groundwater in the alluvium reaching the stream. No change to Section 5.1 is warranted and none is proposed.

Boundary Wells—Because the boundary wells are located outside the COU, DOE proposes to abandon them. RFLMA Attachment 2 Section 5.4.1 and the evaluation criteria for boundary well sampling results presented in Figure 7 are proposed to be deleted; Figure 7 will be revised to only address AOC wells and SW018 sampling results evaluation criteria. RFLMA Attachment 2 Section 5.4.1 explains

that the boundary wells are used to demonstrate that contaminants are not migrating off site in groundwater. However, contaminated groundwater migrates by discharging to surface water. The AOC wells, which are downgradient of contaminant plumes, adjacent to surface water features, together with the proposed surface water POCs downgradient of the AOC wells provide adequate monitoring information to determine if contamination in groundwater is migrating off site. The AOC wells inside the COU are much closer than the boundary wells to source areas, and the AOC wells therefore allow earlier detection of contaminant migration.

Pre-discharge Sampling for Terminal Ponds—The procedure and terminology in RFLMA Attachment 2 Section 5.4.2 refers to terminal pond pre-discharge sampling and providing notification to allow CDPHE and EPA to collect split or duplicate samples. While the pre-discharge sampling would be obviated by breaching the dams, the RFLMA Attachment 2 Section 5.4.2 text will be revised to provide for CDPHE and EPA to collect split or duplicate samples at the POCs. RFLMA Attachment 2 Figure 13, which contains the evaluation criteria for pre-discharge pond sampling results, is proposed to be deleted.

Determining Exceedances at POCs —In accordance with Note 1 of Figure 5 in RFLMA Attachment 2, plutonium, americium, and uranium concentrations in samples taken at GS01 and GS03 (and nitrate, when required at GS03) are measured by calculating the 30-day rolling average of the flow-paced sampling (and grab sampling for nitrate) results. For samples taken at GS08, GS11, and GS31 (and nitrate at GS08 and GS11) plutonium, americium, and uranium concentrations are measured by calculating the 12-month rolling average of the flow-paced sampling (and grab sampling for nitrate) results. For the proposed new POCs, the 30-day and 12-month averages will still be calculated and an exceedance of applicable remedy performance standards by either of these calculated values will constitute a reportable condition under RFLMA Attachment 2, Section 6.0. Exceedance of the 30-day rolling averages would trigger timely implementation of the RFLMA party consultation process in accordance with RFLMA paragraph 11 to determine the actions or direction to be taken. The 12-month rolling averages will be used to determine compliance with the remedy performance standards for surface water (RFLMA Attachment 2, Table 1). The criteria for determining exceedances in Figure 5 are proposed to be revised accordingly.

PLF Treatment System Evaluation—The protocols in RFLMA Attachment 2 Figure 11, which contains the evaluation criteria for treatment system sampling results, include collecting a grab sample from the PLF Pond (designated PLFPONDEFF) if three consecutive monthly samples of PLF Treatment System effluent indicate an exceedance for a monitored analyte. Once the PLF Dam is notched, the pond will be eliminated and a new sampling location established just upstream of the notch in the dam, at approximately the same place as the current location.

The proposed modification to RFLMA Attachment 2 released for public review and comment will contain other changes made for internal consistency. For example, the map (RFLMA Attachment 2, Figure 1) and table of water monitoring locations (RFLMA Attachment 2, Table 2) will be revised to reflect the monitoring location changes.

Excavation Work: Excavation to install the flumes in the stream channels for the proposed new POC locations is discussed below, and CDPHE agreed that the flume installation in these locations could proceed. However, the effective date for these locations to become POCs will be included in any approval decision by CDPHE and EPA regarding DOE's proposed modification. As a practical matter, the planning and design work will take time to complete, but DOE intends to plan for this work during

the upcoming construction season. However, these locations are not approved as the new POCs until RFLMA Attachment 2 modification designating them as POCs is approved.

The proposed excavation work will exceed the 3-foot depth limit established by ICs (RFLMA Attachment 2, Table 4, Control 2) and thus requires pre-approved procedures. 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. This IC also results 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} excess lifetime cancer risk. As discussed below, the proposed work achieves the risk management policy goal.

The flume construction will include excavation to install concrete footers for the flume. The soils removed for footer construction will be used for backfill, and any excess soil will be used in the construction area for recontouring and revegetation. Any excess soil could also be used for revegetation and minor recontouring in the COU to maintain and improve erosion controls.

The fill placement will be in conformance with the ICs, and the final elevations of areas receiving fill, after fill placement and reseeding, are expected to be above the existing elevations. Erosion controls for the excavation, construction, and fill activities will be employed in accordance with the *Erosion Control Plan for Rocky Flats Property Central Operable Unit*, DOE-LM/1497-2007, July 2007.

CDPHE has requested that the following information be included in Contact Records for soil excavation related to IC 2 that will not return soil to the preexisting grade:

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).*

There are no subsurface building or tunnel structures near the flume locations. The soil surface will be returned to approximately pre-existing grades.

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

The locations are not in any former IHSSs/PACs. The proposed new Walnut Creek POC is located in the Upper Walnut Drainage Exposure Unit (EU). The proposed new Woman Creek POC is located in the Lower Woman Drainage EU. The EUs were evaluated as part of the Remedial Investigation/Feasibility Study (RI/FS) and documented in the RI/FS Appendix A, “Comprehensive Risk Assessment” (CRA).

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 traffic, paving, or pavement degradation prior to closure. The calculated risk to the wildlife refuge worker for the surface and subsurface exposure scenario for benzo(a)pyrene in the CRA is 1×10^{-6}.

The results of the CRA for the Lower Woman Drainage EU are in Volume 11 of Appendix A. No COCs were identified for this EU. Thus, risks are expected to be similar to those associated with background conditions.

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 new surface elevations are not expected to be significantly different from current elevations. The flume elevations will be consistent with the final design drawings for the new flumes. Final elevations will be surveyed, and the resulting data will be used to update the COU topographic maps.

Closeout of the Contact Record: This Contact Record will be closed out when the RFLMA modification is completed and the as-built drawings are completed for the flume construction work.

Resolution: Carl Spreng, CDPHE, approved the summary of the consultation provided by this Contact Record documenting the approach for the proposed modification of monitoring locations. The soil excavation for the new flumes may also be conducted as described in the Contact Record.

Contact Record Prepared by: Rick DiSalvo

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

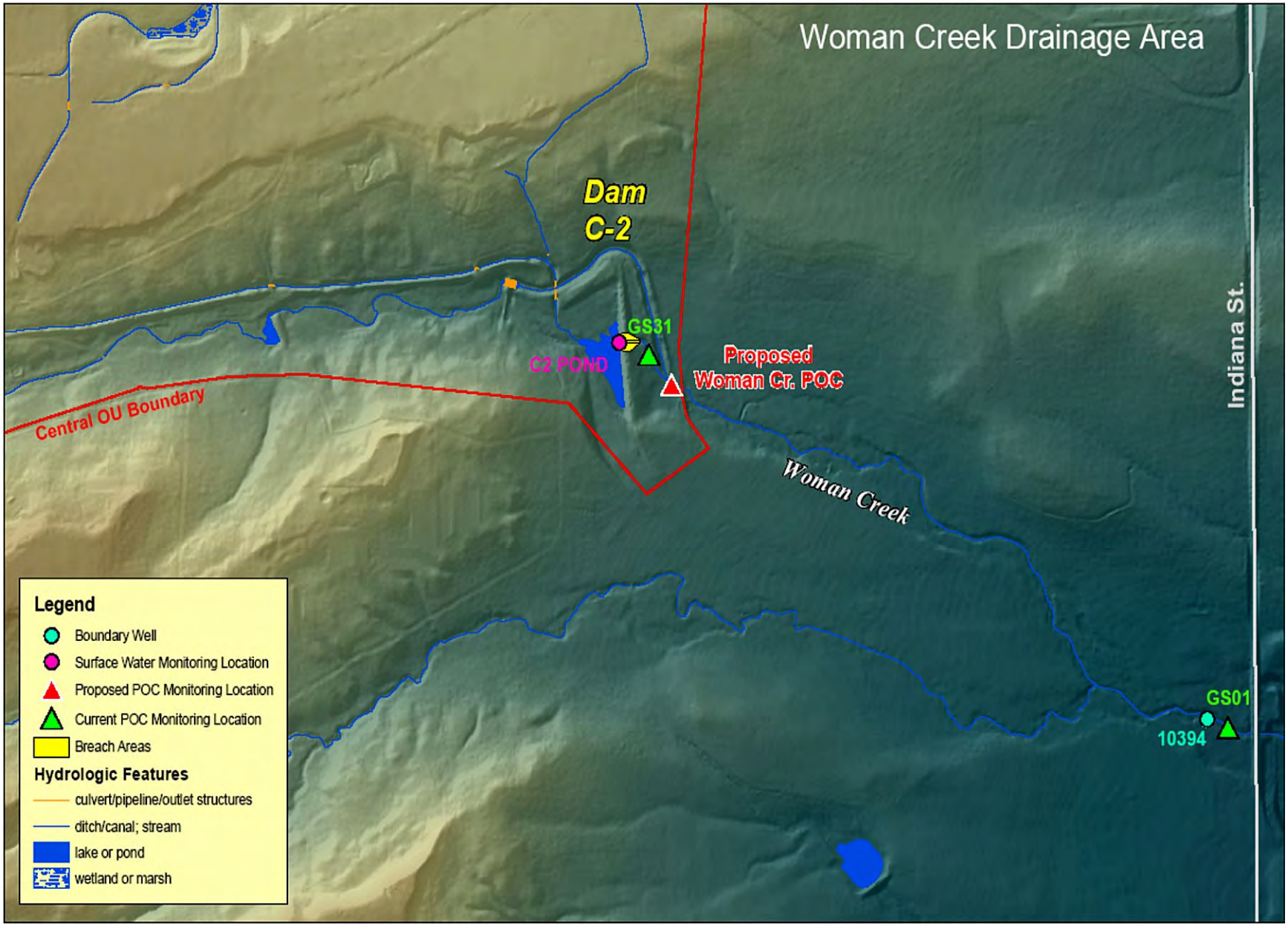


Figure 1. Monitoring and Dam Breach Locations—Woman Creek Drainage Area

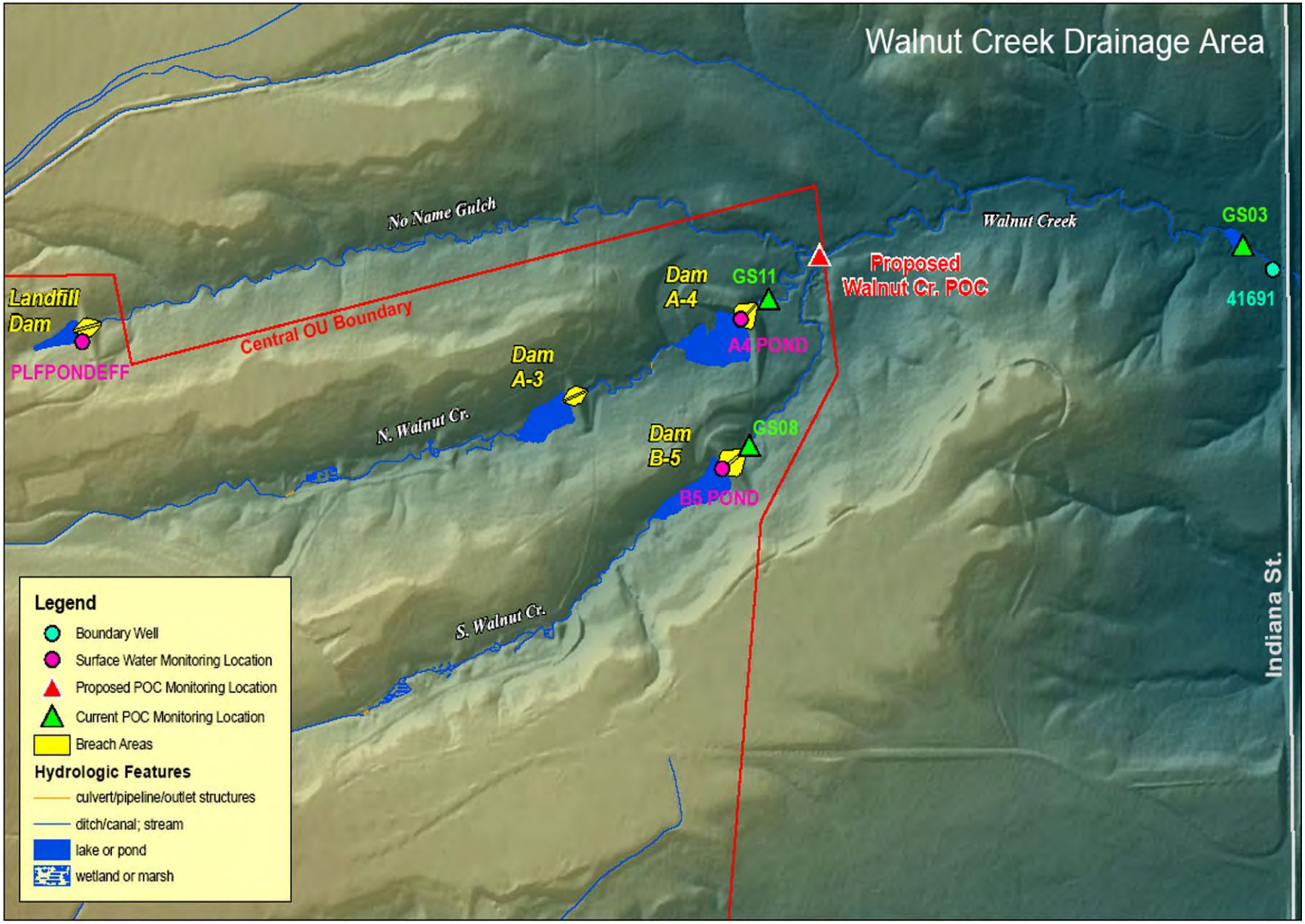


Figure 2. Monitoring and Dam Breach Location—Walnut Creek Drainage Area

ROCKY FLATS SITE
REGULATORY CONTACT RECORD

Purpose: Statistically Higher Concentrations of Analytes in Groundwater Downgradient of the Original Landfill (OLF) and Present Landfill (PLF)

Contact Record Approval Date: May 10, 2010

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

Regulatory Contact(s)/Affiliation(s): Carl Spreng, Colorado Department of Public Health and Environment (CDPHE)

Introduction: This Contact Record documents the results of the evaluation of groundwater samples at the PLF and OLF in accordance with the *Rocky Flats Legacy Management Agreement* (RFLMA) Attachment 2, "Legacy Management Requirements."

Groundwater at the PLF is monitored quarterly in three upgradient and three downgradient Resource Conservation and Recovery Act (RCRA) wells. Groundwater at the OLF is monitored quarterly in one upgradient and three downgradient RCRA wells. RCRA well water quality is evaluated in accordance with the decision flowchart presented in RFLMA Attachment 2, Figure 10, "RCRA Wells."

Concentrations in downgradient wells are evaluated to determine if the concentrations are significantly higher than those in the upgradient wells. Concentrations in downgradient wells are also evaluated to determine if there is a statistically significant increasing trend. If concentrations are statistically higher in downgradient wells than in upgradient wells, or if downgradient wells show statistically significant increasing concentration trends, consultation regarding the appropriate response is required.

Significantly higher downgradient concentrations and increasing trends were observed for some analytes. These conditions were discussed in a consultation meeting on March 29, 2010.

PLF

Statistical evaluations of groundwater data from PLF RCRA wells were performed as part of the 2009 RFLMA Annual Report preparation. These evaluations indicated that several constituents are present at statistically higher concentrations in downgradient groundwater than in upgradient groundwater, as determined by the analysis of variance (ANOVA) statistical method. These statistical results, which are identical to those reported in the RFLMA 2008 Annual Report, are summarized in Table 1.

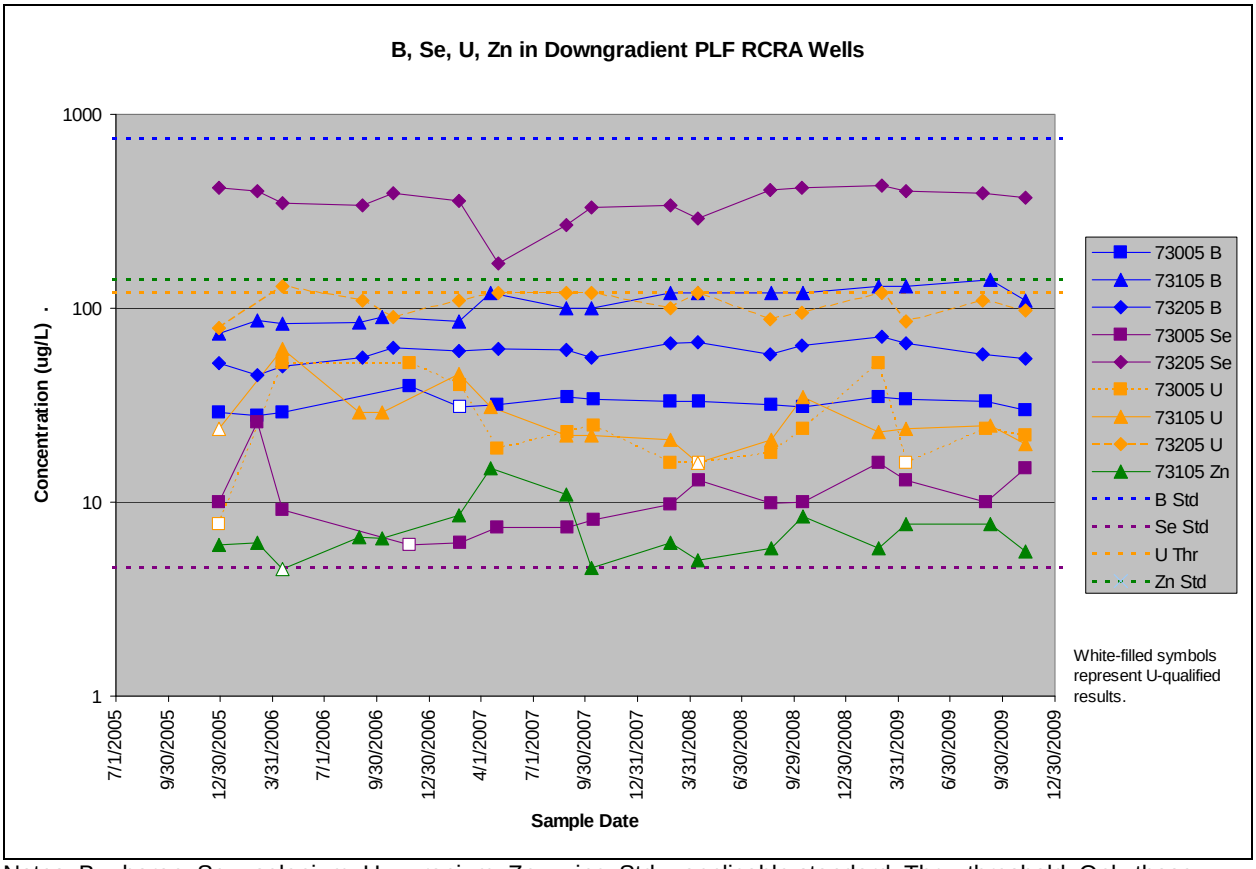
Table 1. Results of Groundwater ANOVA Evaluation for 2009 at the PLF

Analyte	73005	73105	73205
B	x	x	x
Se	x		x
U	x	x	x
Zn		x	

Note: x = analyte is present in groundwater at a statistically significant higher concentration in the indicated downgradient well compared to upgradient wells.

Prior to the 2009 samples, data from downgradient PLF RCRA wells were insufficient to support statistical trending. With the groundwater data collected in 2009, adequate data are now available. Results of trending calculations using the Seasonal Kendall method indicate that groundwater samples from downgradient well 73105 have a statistically significant (at the 95 percent level of confidence) increasing trend in boron concentrations. Concentrations of boron remain well under the RFLMA Attachment 2, Table 1 standard of 750 micrograms per liter (µg/L). The highest concentration observed in 2009 was 140 µg/L. Other constituents identified as having greater concentrations downgradient than upgradient (Table 1) are not represented by increasing trends of the same statistical significance.

Constituents identified as having greater concentrations downgradient than upgradient are illustrated on the time-series plots of data presented in Figure 1. The lack of any clear increasing trends other than boron in well 73105 is visually apparent in these plots.



Notes: B = boron, Se = selenium, U = uranium, Zn = zinc; Std = applicable standard, Thr = threshold. Only those analyte-well combinations identified in the ANOVA evaluation of PLF groundwater data as having statistically significant higher concentrations in downgradient RCRA wells (Table 1) are shown. Uranium data are compared to the uranium groundwater threshold value. In addition to the nondetects ("U"-qualified results), numerous other results were qualified ("B," "J"), but are not shown differently for the sake of simplicity. Note logarithmic concentration scale.

Figure 1. Concentrations of Constituents Identified in 2009 ANOVA Evaluations of Groundwater Data from Downgradient PLF RCRA Wells

OLF

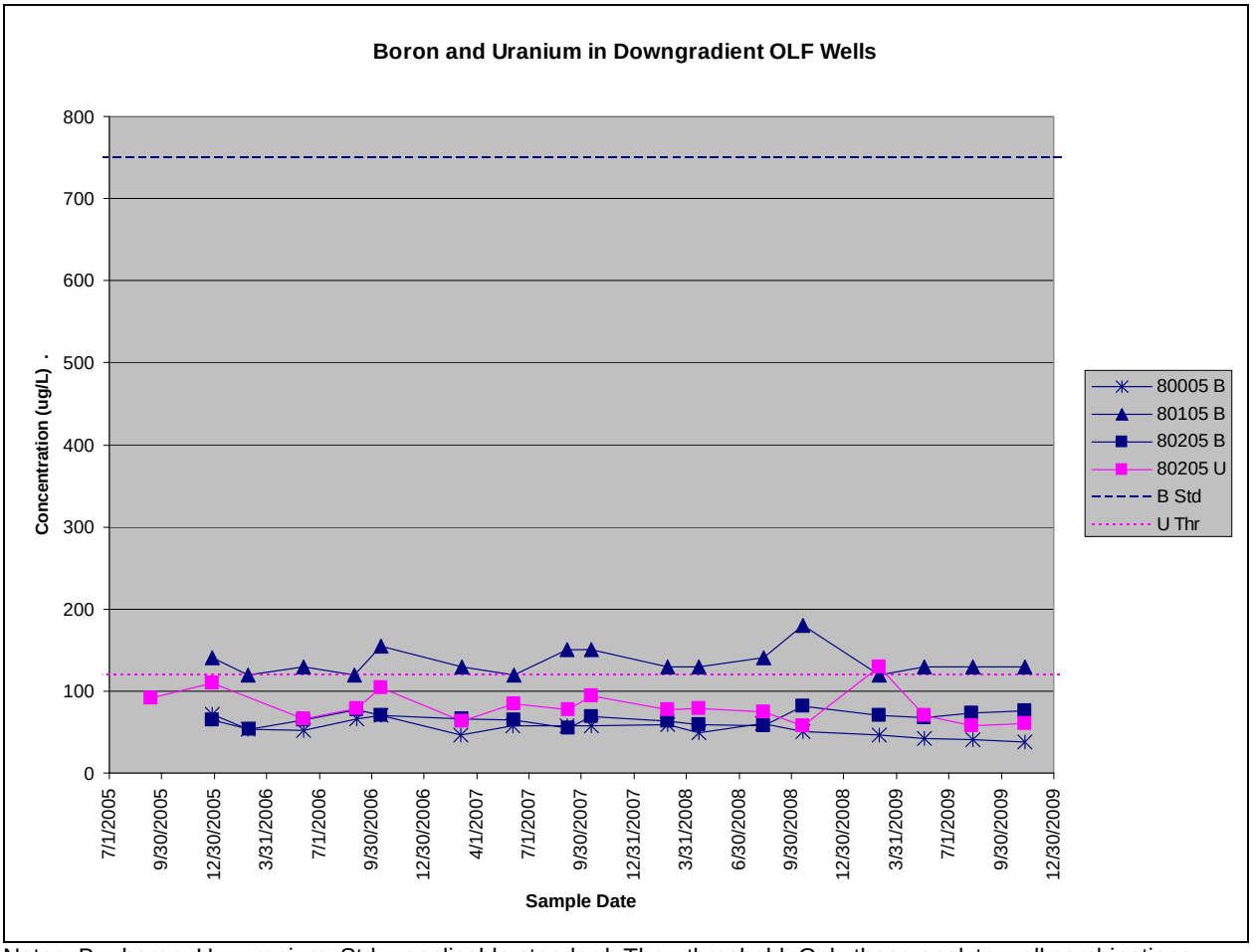
Statistical evaluations of groundwater data from OLF RCRA wells were performed as part of the RFLMA 2009 Annual Report preparation. These evaluations indicated two constituents are present at statistically higher concentrations in downgradient groundwater than in upgradient groundwater, as determined by the ANOVA statistical method. These results, which are identical to those reported in the RFLMA 2007 and 2008 Annual Reports, are summarized below in Table 2. Consultation regarding the 2007 and 2008 evaluations is documented in Contact Record 2008-05.

Constituents identified as having greater concentrations downgradient than upgradient are illustrated on the time-series plots of data presented in Figure 2.

Table 2. Results of Groundwater ANOVA Evaluation for 2009 at the OLF

Analyte	80005	80105	80205
B	x	x	x
U			x

Note: x = analyte is present in groundwater at a statistically significant higher concentration in the indicated downgradient well compared to upgradient wells.



Notes: B = boron, U = uranium; Std = applicable standard, Thr = threshold. Only those analyte-well combinations identified in the ANOVA evaluation of OLF groundwater data as having statistically significant higher concentrations in downgradient RCRA wells are shown. Uranium data are compared to the U groundwater threshold value. Several results were qualified ("B," "J"), but are not shown differently for the sake of simplicity.

Figure 2. Concentrations of Constituents Identified in 2009 ANOVA Evaluations of Groundwater Data from Downgradient OLF RCRA Wells

Previously, groundwater data from downgradient OLF RCRA wells have been insufficient to support statistical trending. With the groundwater data collected in 2009, adequate data are now available. Results of trending calculations using the Seasonal Kendall method indicate a statistically significant (95 percent confidence level) decreasing trend in boron concentrations in samples from downgradient well 80005. In addition, groundwater samples from downgradient well 80205 have a statistically significant (at the 95 percent confidence level) increasing trend in

selenium concentrations. However, every result for selenium in samples from this well is qualified, either with a U (nondetect) or a J (estimated) or B (the constituent was detected in the blank). Not a single result represents an unqualified detection. Therefore, the validity of this trend is suspect. For the same reason, the 85th percentile concentration of selenium in this well, which is calculated as 9.125 μg/L (above the standard of 4.6 μg/L), may not be representative.

Surface water downgradient of the OLF, as monitored at location GS59, shows no adverse impact due to elevated concentrations of B, Se, or U in groundwater at the OLF.

Resolution: Statistical evaluations of groundwater quality at the PLF and OLF identified a few constituents that are present at higher concentrations in downgradient wells than in upgradient wells and identified fewer constituents that displayed increasing concentration trends. These constituents were below RFLMA Attachment 2 Table 1 standards, or for uranium below the groundwater threshold value. The parties agreed that the appropriate response is to continue monitoring RCRA wells in accordance with RFLMA. Carl Spreng approved this summary of the March 29, 2010, consultation.

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

Contact Record Prepared by: John Boylan

Distribution:
Carl Spreng, CDPHE
Scott Surovchak, DOE
Linda Kaiser, Stoller

This page intentionally left blank

ROCKY FLATS SITE
REGULATORY CONTACT RECORD

Purpose: Monitoring Results at Surface Water Point of Evaluation (POE) SW027.

Contact Record Approval Date: July 27, 2010

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

Introduction: Surface water location SW027 is the Rocky Flats Legacy Management Agreement (RFLMA) POE at the eastern (downstream) end of the South Interceptor Ditch (SID), upstream of Pond C-2. In accordance with RFLMA Attachment 2, Legacy Management Requirements, continuous flow-paced composite samples for total plutonium (Pu), total americium (Am), total uranium (U), dissolved cadmium, dissolved silver, total beryllium, and total chromium are collected at SW027. The sampling results are evaluated in accordance with RFLMA Attachment 2, Figure 6, Points of Evaluation.

Per Figure 6, the 12-month rolling averages for the last day of the particular month for Pu, Am, and U are calculated and compared to the applicable values in RFLMA Attachment 2, Table 1, Surface Water Standards. These values represent a volume-weighted average for a period covering the previous 12 months.

The last continuous flow-paced composite sample collected at SW027 was retrieved from the field on April 27, 2010. The subsequent composite sampling begun on April 27, 2010, does not yet include a quantity of water sufficient for analysis. The SID flows intermittently when there is enough runoff, which was the case during March and April 2010, but the SID has been predominantly dry or not flowing since then. It is not known when additional sample volume will be collected at SW027 to complete the composite sampling begun on April 27, 2010. The analytical results for this sample must be received in order to calculate the April 2010 month-end 12-month rolling average.

However, based on the results for continuous flow-paced samples collected through April 27, 2010, when the April 30, 2010, Pu compliance value is calculated (including the analytical result for the composite sample currently being collected), it is anticipated that the 12-month rolling average value will exceed the Table 1 standard for Pu (0.15 picocuries per liter [pCi/L]). This is because even if the continuous flow-paced sample currently being collected has no detectable Pu, the volume-weighted 12-month rolling average for the end of April 2010 would be approximately 0.16 pCi/L, which is slightly above the Table 1 standard.

So far this calendar year (2010), four composite samples have been collected at SW027, as shown in the following table:

Date - Time start	Date - Time end	Pu result
1/13/10 - 11:11	3/29/10 - 11:55	0.122
3/29/10 - 11:55	4/23/10 - 11:11	0.300
4/23/10 - 11:11	4/23/10 - 19:12	0.294
4/23/10 - 19:12	4/27/10 - 12:07	0.029
4/27/10 - 12:07	continuing	N/A

The site received approximately 2.8 inches of rain from April 21 to 25, 2010. Most of the runoff was on April 23, 2010, as illustrated by the short period it took to collect the composite flow-paced sample started at 11:11 a.m. on that date.

Discussion: The 12-month rolling average for April, 2010 for Pu at SW027 cannot be formally calculated until the sample currently being collected is analyzed. If the calculated result exceeds the Table 1 standard, a reportable condition under RFLMA Attachment 2, Section 6.0, Action Determinations, is triggered. A reportable condition requires informing CDPHE and EPA within 15 days of receiving the validated data. Validation of the results through the April 27, 2010, sampling was completed on June 4, 2010. However, the SW027 composite sample currently being collected will not be validated until after the sample has been collected and analyzed; thus, the reportable condition will not be formally identified until that time.

Scott Surovchak informed Carl Spreng of the data evaluation based on the unvalidated sample results as of June 2, 2010, which included samples through the April 27, 2010, continuous flow-paced sampling. George Squibb summarized this data evaluation at the June 7, 2010, Rocky Flats Stewardship Council meeting, which Vera Moritz, Carl Spreng, and the Rocky Flats Stewardship Council representatives of the local communities attended.

On June 22, 2010, John Boylan and Rick DiSalvo met with Carl Spreng to provide the status of the steps taken to date and to discuss and next steps, as summarized below. Rick DiSalvo and Vera Moritz also toured the SW027 location on June 22, 2010, to view the conditions in the area and discuss the status of the sampling and evaluation. No flow was observed on that date.

The heavy runoff in late April 2010 likely mobilized low levels of residual contamination and impacted the surface water measured at SW027. The SW027 drainage includes the former 903 Pad/Lip area, which was remediated prior to closure. The 903 Pad area was revegetated in 2004, with the addition of several inches of soil followed by reseeding. Low levels of residual surface soil Pu contamination remains south of the former 903 Pad/Lip area and generally north of the eastern reach of the SID and in the SID sediment.

The fate and transport of residual contamination is evaluated 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 RI/FS concluded that while erosional

transport of soil and sediment will continue to impact surface water in this area, the remedial actions, land configuration, and revegetation in the area will reduce runoff volumes, peak discharge rates, and soil transport, thereby resulting in an overall improvement in water quality. Furthermore, erosion of surface soils with residual contamination below the 50 pCi/g soil action level for Pu can result in exceedances of the 0.15 pCi/L RFLMA Table 1 surface water standard.

Reduced volumes of runoff predicted for the SID after closure has been confirmed through continuous flow measurement. No flow paced samples were collected at SW027 for calendar years 2006 and 2008 since no flow occurred. Also, post-closure erosion controls and revegetation have reduced soil transport, and in calendar years 2007 and 2009, when there was flow at SW027, the 12-month rolling averages for Pu during both years were below the RFMLA standard.

Steps taken and next steps: On June 7 and 8, 2010, Rocky Flats personnel walked the SID drainage area to look for physical indications that a source other than the expected soil erosion process may be affecting water quality. The personnel identified several areas of ground surface where additional revegetation could improve soil cover. Steps to improve vegetation cover would take time to be effective but will be implemented this summer.

Site personnel also noted several areas where additional localized erosion-control best management practices, such as installing erosion matting and wattles, could help minimize erosion and promote vegetation cover. Site personnel are evaluating approaches to installing such erosion controls if they would prove worthwhile.

The SID channel is covered with rip rap, dense vegetation, and/or vegetation debris, limiting movement of sediment within the SID. Site personnel are evaluating where additional erosion controls, such as permanent erosion matting, might be used for localized areas in the SID, and the approach to installing these items if recommended.

Carl Spreng suggested that grab samples might be collected at locations in the SID when precipitation causes flow there. The samples could show if a localized source of soil contamination was impacting the SID. However, collecting samples under such conditions would present a number of logistical problems. Rocky Flats personnel would have to collect the grab samples in the hazardous terrain around and in the SID when conditions are wet and slippery. If the precipitation event were associated with a thunderstorm (likely during the normally dry summer months), the window of opportunity would be limited, as site outdoor activities are prohibited until 30 minutes after lightning is no longer in the vicinity. It was agreed that this suggestion would not be implemented.

Gaging station GS51 has continued to be operated since closure in a small ditch that is a tributary to the SID, approximately 2,300 feet upstream of SW027. The drainage basin for GS51 is about 16 acres, and the drainage basin for SW027 (which includes the GS51 drainage basin) is about 178 acres. As at SW027, flows are present at GS51 intermittently when there is heavy precipitation or snowmelt. This location contributes about 10 to 12 percent of volume at SW027 when flowing. GS51 is equipped with a flow-paced sampler, and the samples are analyzed for total Pu and Am (and total suspended solids when the composite sample is collected within holding times for total suspended solid analysis). Site personnel are reviewing the results from GS51 to evaluate whether this location indicates a source of Pu residual contamination that could significantly impact water quality at SW027.

If the flow-paced sample currently being collected at SW027 is not large enough for Pu and Am analyses by the end of September 2010 (which is near the end of the 6-month holding time for these analytes), the RFLMA parties will consider whether to perform the analyses from the then-existing partial volume or to extend the sample collection period beyond the formal hold time.

Pre-discharge sampling of Pond C-2 is planned for early July 2010.

Report: DOE will submit to CDPHE a report of completion of the steps presented above by August 31, 2010. (This will allow time for the Pond C-2 analysis results to be received.) DOE will include any recommendations and a schedule for additional actions beyond the revegetation and erosion controls already discussed and planned. Although the elevated Pu level at SW027 is not yet a reportable condition, pursuant to RFLMA Attachment 2, Section 6.0, CDPHE will consult with EPA regarding final mitigating actions for reportable conditions, if any.

Closeout of the Contact Record: This Contact Record will be closed out when the completion report is submitted to CDPHE.

Resolution: Carl Spreng, CDPHE, approved the summary of the consultation provided by this Contact Record and the steps for the evaluation.

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: Monitoring Results and Water Treatment at the MSPTS and ETPTS

Contact Record Approval Date: November 2, 2010

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

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

Introduction: Treatment of contaminated groundwater by the MSPTS and ETPTS results in removal of the vast majority of contamination load from influent groundwater. Treatment does not result in complete removal of all groundwater contaminants, however, and low concentrations of a few volatile organic compounds (VOCs) remain in system effluent at levels that are above RFLMA Attachment 2, Table 1 standards. This has been recognized previously – for example, treatment system reports issued prior to Site closure documented ETPTS conditions, and quarterly and annual RFLMA reports issued since closure have documented conditions at both of these systems. Discussions among Site and CDPHE personnel have taken place in the past on these issues, both prior to and since site closure.

Groundwater treatment system monitoring results are evaluated in accordance with RFLMA Attachment 2, Figure 11. If the 85th percentile of the results for a Table 1 analyte in the system effluent or the performance monitoring location is above the corresponding RFLMA standard, then the consultative process is used to determine if actions should be implemented.

This Contact Record serves to document consultation regarding the evaluation of VOC levels that exceed the criteria in RFLMA Attachment 2, Figure 11 in system effluent. The RFLMA Parties consulted in June and July, 2010, following the most recent routine RFLMA required monitoring of designated sampling locations for these systems to evaluate whether any mitigating actions may be required. While mitigating actions beyond the scheduled change out of the media and minor system upgrades for the MSPTS are not deemed necessary due to the low VOC concentrations in the effluent, this Contact Record describes the follow-up actions that are underway; and next steps.

Discussion: The MSPTS was designed to treat groundwater contaminated with VOCs from the Mound source area to the south, and was installed in 1998. As a part of site closure, after the nearby Oil Burn Pit #2 (OBP#2) was remediated via source removal in 2005, contaminated groundwater from that area was routed to the MSPTS intercept trench to be treated by this system. This caused influent flow rates and contaminant loads to increase substantially. Higher flow rates result in a lower residence time within the treatment media, which can reduce treatment effectiveness. The contaminants from OBP#2 include metabolic byproducts such as cis-1,2-DCE and vinyl chloride, both of which are most effectively treated via increased residence times. The net result is reduced treatment effectiveness, with residual contaminants present in system effluent at concentrations that have exceeded RFLMA Attachment 2, Table 1 values. These conditions were first recognized in 2006,

roughly one year after the OBP#2 source removal. Replacement of the treatment media in the MSPTS in late-summer 2006 did not fully resolve these conditions.

The ETPTS was designed to treat groundwater contaminated with VOCs from the East Trenches source area to the south, and was installed in 1999. Since installation, effluent from this system has often included one or more constituents at concentrations exceeding RFLMA Attachment 2, Table 1 values. Multiple media replacements over the years since its installation have not fully resolved these conditions.

Routine RFLMA samples are collected from these systems (influent, effluent, and surface water performance locations) semiannually, in the second and fourth calendar quarters. (The analytical results for these samples are reported in the corresponding RFLMA quarterly reports.) Results for samples collected in the second calendar quarter of 2010, during wet spring (higher-flow) conditions, indicated reduced treatment effectiveness at both systems. Table 1 below presents a summary of these second-quarter results, and focuses on constituents that are present in the effluent.

Table 1: Constituents detected in system effluent in second quarter 2010 samples, and corresponding concentrations in system influent and surface water performance locations

MSPTS	**1,2-DCA**	**c12-DCE**	**MCl**	**TCE**	**VC**
Influent	ND	**1900**	ND	**79**	**79**
Effluent	**1.3**	**360**	0.82 (J)	**3.5**	**150**
GS10	ND	12	ND	0.49 (J)	ND
ETPTS	**CF**	**c12-DCE**	**MCl**	**PCE**	**TCE**
Influent	**62**	30	ND	**260**	**2500**
Effluent	**63**	57	**8.2 (B)**	**10**	**23**
POM2	0.22 (J)	0.32 (J)	ND	ND	0.38 (J)

NOTES: Constituents and RFLMA Attachment 2, Table 1 standards: 1,2-DCA = 1,2-dichloroethane, 1 ug/L; c12-DCE = cis-1,2-DCE, 70 ug/L; MCl = methylene chloride, 4.6 ug/L; TCE = trichloroethene, 2.5 ug/L; VC = vinyl chloride, 0.2 ug/L; CF = chloroform, 3.4 ug/L; PCE = tetrachloroethene, 1 ug/L.
Bold, shaded data exceed RFLMA Attachment 2, Table 1 standards. All concentrations are presented in ug/L.
Qualifiers: ND = not detected; J = estimated concentration; B = constituent detected in blank.

Although concentrations of many of the contaminants in system influent are not shown, the summary data provided above confirm that both systems remove the majority of contamination from influent groundwater. For example, in the June samples from the MSPTS, over 81% of the cis-1,2-DCE and more than 95% of the TCE were removed; and at the ETPTS, over 96% of the PCE and more than 99% of the TCE were removed. Since the current media was installed in these two systems, they have each removed approximately 95% of the VOCs in system influent. However, effluent conditions for certain listed constituents in Table 1 do not meet all RFLMA Attachment 2, Table 1 values.

Steps taken and next steps: Conditions in treatment system effluent were discussed with CDPHE on June 8, 22, and July 27, 2010. The elevated flow rates, and correspondingly reduced residence times, were noted. The RFLMA required semi-annual sampling frequency was also discussed. It was decided per the RFLMA consultation process to increase the sampling frequency for this evaluation.

A path forward was agreed upon whereby extended sampling of these treatment systems would be performed. For the subsequent three months (June, July, and August 2010), the RFLMA locations – influent, effluent, and surface water performance – would be sampled, together with two additional points per system between the effluent and surface water performance locations. These two locations would target system effluent as it moves into the receiving drainage and toward the surface water performance location.

On June 17, 2010, potential sampling locations at the MSPTS and ETPTS were identified. At the MSPTS, the two locations represent water within Functional Channel (FC)-4; one is closer to the effluent discharge gallery and is identified as MSPTSCHAN1. On June 17, this location held what appeared to be standing water (i.e., active flow was not apparent). The second location at the MSPTS, MSPTSCHAN2, is a short distance down FC-4 from the previous location and represents what appeared on June 17 to be the farthest upstream location at which samples of visibly turbulent, flowing water could be easily collected. The two locations at the ETPTS include ETPTSDGOVER, which is at the discharge gallery; and ETPTSB4, which is where discharge gallery water joins former Pond B-4. Figure 1 below illustrates the general locations of these additional sampling points.

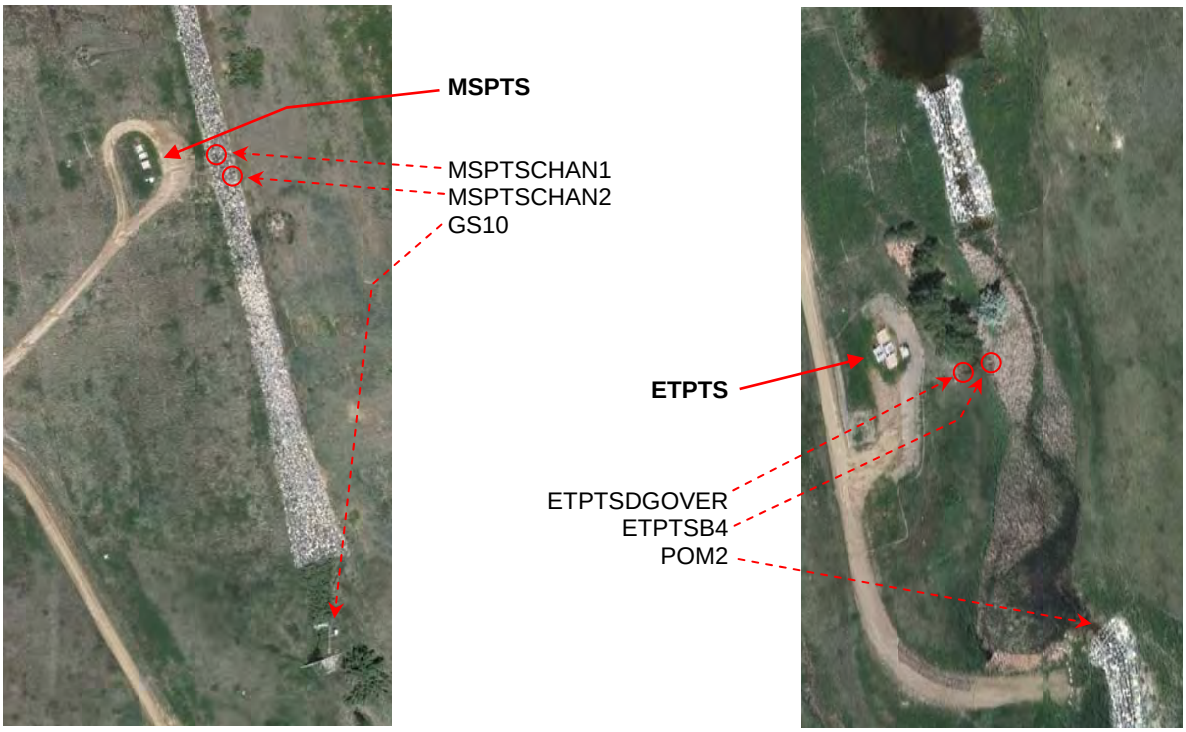


Figure 1. MSPTS (left photo), ETPTS (right photo), and approximate locations of extra sampling points with respect to treatment systems and surface water performance locations. Source photos are from 2010.

On June 22, each of the selected locations, as well as the routine RFLMA locations, were sampled. Sampling was repeated on July 28, and again on August 26. In each of these three events, the same locations were visited for sampling. Flow conditions in July at the FC-4 locations sampled in support of the MSPTS were noticeably reduced compared to the June sampling date; both held what appeared

to be standing water. In August, both of these locations were dry, preventing sample collection from the two FC-4 locations on that third visit.

Analytical results for these samples are summarized below in Table 2, which also includes both the routine second quarter results (summarized above in Table 1) as well as estimated residence times and corresponding flow rates that apply to the sampling events. The correlation among residence times/flow rates and concentrations of VOCs in system effluent are obvious: a lower flow rate, which corresponds to a higher residence time, allows for improved water treatment relative to conditions of higher flow rates and the resultant lower residence times. This correlation is more evident at the MSPTS than the ETPTS. This is because the MSPTS is more strongly impacted by variations in precipitation as a result of the local hydrology, in particular the former utility corridor that crosses the OBP#1 and empties into the MSPTS collection trench. On an annual basis, however, flow rates at the MSPTS have been generally decreasing since site closure. A second factor may be that the treatment media at the MSPTS is older and more clogged than at the ETPTS. The mineral precipitates responsible for this clogging limit the contact between the water and ZVI, and thereby reduce the treatment effectiveness.

The sample results at the performance monitoring points were evaluated in accordance with RFLMA Attachment 2, Figure 11. The concentrations do not exceed the 85th percentile of the results for the corresponding RFLMA standards in Attachment 2, Table 1. The results at GS10 for the 6/22/10 sample were slightly above RFLMA standards for TCE and VC (though the result for VC was qualified).

It should be noted that the RFLMA standard for VC, 0.023 ug/L, is based on the lowest promulgated Colorado Water Quality Control Commission (WQCC) statewide standard, which is a “water+fish” (W+F) standard. The W+F standard is based on an exposure scenario that includes human water consumption and fish consumption. The WQCC “water supply” (WS) standard is a range of 0.023 to 2 ug/L with 2 ug/L corresponding to the EPA maximum contaminant level (MCL) for drinking water supplies. There is no WQCC statewide “aquatic life based” (AL) standard for VC. The surface water at Rocky Flats is not fishable, and is not used for water supply. Based on this, and the fact that the VC levels were non-detect on the subsequent sample, the VC concentration measured on 6/22/10 does not pose any significant risk to human health and the environment.

Similarly, the TCE concentration measured on 6/22/10 does not pose any significant risk. The RFLMA standard for this constituent is also based on the WQCC W+F standard for TCE. The WQCC WS standard for TCE is 5 ug/L, and the AL standard is 45,000 ug/L for acute exposure and 21,900 ug/L for chronic exposure.

These results demonstrate that residual VOCs in system effluent dissipate very quickly, and would not represent a threat to surface water quality at surface water Points of Compliance. However, DOE is evaluating optimization of the MSPTS to provide additional VOC removal. This optimization is currently conceived as a passive air stripping component. The parties will continue to consult to finalize optimization of system performance to encourage additional VOC removal.

Table 3 summarizes calculated 85th percentile concentrations for those constituents presented in Table 1 above. The results in Table 3 incorporate data collected from January 2000 through June 2010. Note that media replacement activities are not reflected or accounted for in these calculations.

Table 2. Constituents detected in system effluent in second quarter 2010 samples and follow-up sampling events, with corresponding flow information and concentrations in system influent and at surface water performance locations

CONSTITUENT (RFLMA standard)	MONTH (2010)	MSPTS							ETPTS						
		R1-O (influent)	R2-E (effluent)	MSPTSCHAN1	MSPTSCHAN2	GS10	Average Flow (gpm)	HRT Days	ET INFLUENT	ET EFFLUENT	ETPTSDGOVER	ETPTSB4	POM2	Average Flow (gpm)	HRT Days
Chloroform (3.4)	June	0.46 (J)	**9.9**	1	0.54 (J)	0.49 (J)	**2.27**	**1.70**	**70**	**64**	**60**	**10**	0.3 (J)	**3.92**	**1.50**
	July	**22**	3.3 (J)	0.87 (J)	0.19 (J)	0.18 (J)	**1.08**	**3.50**	**95**	**57**	**57**	**6.9**	0.3 (J)	**4.22**	**1.40**
	August	**15**	**3.5**	NF	NF	ND	**1.23**	**3.10**	**78**	**39**	**39**	1.1	ND	**3.96**	**1.50**
Cis-1,2-DCE (70)	June	**110**	**1800**	**160**	**84**	70	**2.27**	**1.70**	34	55	49	7.6	0.3 (J)	**3.92**	**1.50**
	July	**2800**	**790**	**200**	36	42	**1.08**	**3.50**	43	55	54	7.9	0.24 (J)	**4.22**	**1.40**
	August	**1700**	**960**	NF	NF	25	**1.23**	**3.10**	37	56	57	5.6	ND	**3.96**	**1.50**
PCE (1 - PQL)	June	**8.7**	**29**	**2.4**	**1.2**	0.93 (J)	**2.27**	**1.70**	**260**	**14**	**12**	**1.3**	ND	**3.92**	**1.50**
	July	**74**	**11**	**3.4**	0.57 (J)	0.62 (J)	**1.08**	**3.50**	**320**	**20**	**16**	**1.4**	ND	**4.22**	**1.40**
	August	**44**	**20**	NF	NF	0.34 (J)	**1.23**	**3.10**	**280**	**18**	**18**	0.94 (J)	ND	**3.96**	**1.50**
TCE (2.5)	June	**9.3**	**77**	**7.3**	**3.8**	**2.8**	**2.27**	**1.70**	**2100**	**13**	**11**	1.3	ND	**3.92**	**1.50**
	July	**230**	**40**	**12**	2.2	2.2	**1.08**	**3.50**	**2600**	**16**	**14**	1.5	ND	**4.22**	**1.40**
	August	**160**	**84**	NF	NF	1.8	**1.23**	**3.10**	**2600**	**19**	**19**	1.3	ND	**3.96**	**1.50**
Meth. Chloride (4.6)	June	0.39 (JB)	**5.6 (JB)**	0.62 (JB)	0.49 (JB)	0.49 (JB)	**2.27**	**1.70**	2.1 (JB)	**8.4 (B)**	**7.7 (B)**	1.6 (B)	ND	**3.92**	**1.50**
	July	**7.7 (J)**	**6.4**	0.83 (J)	0.36 (J)	0.36 (J)	**1.08**	**3.50**	3.7 (J)	**15**	**15**	2.8	ND	**4.22**	**1.40**
	August	3.1 (JB)	4.3 (B)	NF	NF	ND	**1.23**	**3.10**	**5.8 (JB)**	**19 (B)**	**19 (B)**	1.8 (B)	ND	**3.96**	**1.50**
VC (0.2 - PQL)	June	ND	**270**	**7.7**	**2.6**	**0.69 (J)**	**2.27**	**1.70**	ND	ND	ND	ND	ND	**3.92**	**1.50**
	July	**70**	**40**	**13**	**0.6 (J)**	ND	**1.08**	**3.50**	**0.76 (J)**	ND	**0.52 (J)**	ND	ND	**4.22**	**1.40**
	August	ND	**160**	NF	NF	ND	**1.23**	**3.10**	ND	ND	ND	ND	ND	**3.96**	**1.50**
1,1-DCE (7)	June	2.2	**24**	1.9	0.91 (J)	0.58 (J)	**2.27**	**1.70**	0.93 (J)	3.7 (J)	0.69 (J)	ND	ND	**3.92**	**1.50**
	July	**42**	**8.5**	2.1	0.33 (J)	0.24 (J)	**1.08**	**3.50**	0.75 (J)	5.9 (J)	0.53 (J)	ND	ND	**4.22**	**1.40**
	August	**22**	**12**	NF	NF	ND	**1.23**	**3.10**	5.3 (J)	0.52 (J)	0.51 (J)	ND	ND	**3.96**	**1.50**
1,2 DCA (1 - PQL)	June	ND	ND	ND	ND	ND	**2.27**	**1.70**	ND	ND	ND	ND	ND	**3.92**	**1.50**
	July	ND	ND	ND	ND	ND	**1.08**	**3.50**	ND	ND	ND	ND	ND	**4.22**	**1.40**
	August	ND	**1.8 (J)**	NF	NF	ND	**1.23**	**3.10**	ND	ND	ND	ND	ND	**3.96**	**1.50**

NOTES: HRT = estimated hydraulic residence time; assumes uniform packing of media and no precipitates (i.e., no media clogging), which is known to be inaccurate particularly at the MSPTS. Flow rate is estimated average over the corresponding HRT prior to effluent sample collection.
All concentrations are in ug/L. RFLMA standards are from Attachment 2, Table 1, and correspond to the applicable water quality standard or practical quantitation limit (PQL), as appropriate. cis-1,2-DCE = cis-1,2-dichloroethene; meth.chloride = methylene chloride; VC = vinyl chloride; 1,1-DCE = 1,1-dichloroethene; 1,2-DCA = 1,2-dichloroethane.
Bold, shaded values exceed corresponding RFLMA Att. 2, Table 1 value. ND = not detected; NF = location not flowing (no water available for sampling); J = estimated value; B = constituent also detected in blank.
Locations MSPTSCHAN1, MSPTSCHAN2, ETPTSDGOVER, and ETPTSB4 are not RFLMA monitoring locations, but were established specifically for this evaluation.
The reported higher concentration of some constituents (such as PCE and TCE) in MSPTS effluent vs. influent in the June samples may be a result of several factors or mechanisms. Perhaps most importantly, for example, the samples are collected at approximately the same time, and therefore do not represent the exact same volume of water as it moves through the media.

Table 3. Calculated 85th-percentile concentrations

MSPTS	**1,2-DCA**	**c12-DCE**	**MCl**	**TCE**	**VC**
Influent	1	**5670**	3.9	**140**	**126.2**
Effluent	**2.11**	**328**	**4.64**	1.87	**35.8**
GS10	0.00845	40.35	0.001	0.471	0.001
ETPTS	**CF**	**c12-DCE**	**MCl**	**PCE**	**TCE**
Influent	**97.23**	40	**11.995**	**371.5**	**3204.5**
Effluent	**15.7**	39.94	**19**	**13.4**	**20**
POM2	0.07765	0.307	0.001	0.001	0.2435

NOTES: Constituents and RFLMA Attachment 2, Table 1 standards: 1,2-DCA = 1,2-dichloroethane, 1 ug/L; c12-DCE = cis-1,2-DCE, 70 ug/L; MCl = methylene chloride, 4.6 ug/L; TCE = trichloroethene, 2.5 ug/L; VC = vinyl chloride, 0.2 ug/L; CF = chloroform, 3.4 ug/L; PCE = tetrachloroethene, 1 ug/L.
Bold, shaded data exceed RFLMA Attachment 2, Table 1 standards. All concentrations are presented in ug/L. Calculations include all analytical data collected from January 2000 (consistent with the RI/FS and Integrated Monitoring Plans data base) through end of June 2010 and do not recognize or otherwise take into account media replacement activities.

While the treatment media in the ETPTS is fresh, having been replaced in October-November 2009, that in the MSPTS is due for replacement. The scope of this activity has been reconsidered, and the work will be postponed beyond the original schedule of late 2010 into early 2011.

As noted above, the MSPTS was not designed to treat high concentrations of metabolic byproducts such as cis-1,2-DCE and vinyl chloride such as have been present in system influent since site closure. Following the media replacement in this system, it is anticipated that treatment effectiveness will be improved significantly and impacts to surface water reported at performance location GS10 during higher flow conditions (such as June 2010) will be eliminated. Additional measures will be incorporated as part of the media replacement activity to further reduce concentrations in system effluent. This work will be discussed in a separate Contact Record.

At the ETPTS, data from samples collected at performance location POM2 show the applicable RFLMA standards are being met consistently. As the objective of these treatment systems is to protect surface water quality, this is seen as an indication that the ETPTS is performing adequately. However, as at the MSPTS, it is important to replace the media promptly when it becomes clogged and treatment effectiveness is reduced.

The events and data summarized in this Contact Record will be discussed and presented in the RFLMA Annual Report for 2010 and subsequent RFLMA Quarterly Reports as needed.

Closeout of the Contact Record: This Contact Record will be closed out when the media at the MSPTS has been replaced.

Resolution: Carl Spreng, CDPHE, approved the summary of the consultation provided by 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