ROCKY FLATS SITE REGULATORY CONTACT RECORD 2017-01

Purpose: Original Landfill Temporary Groundwater Intercept System

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Date of Consultation Meetings: October 12, 2016, and January 10, 2017

Consultation Meeting Participants: Scott Surovchak and Jeff Murl, DOE; Carl Spreng and Lindsay Masters, CDPHE; Vera Moritz, EPA; Linda Kaiser, Jeremy Wehner, John Boylan, Clay Carpenter, Michelle Hanson, George Squibb, Jody Nelson, and David Ward, Navarro

Related Contact Records: CR 2016-02 and CR 2016-03

Introduction: Rocky Flats Legacy Management Agreement (RFLMA) Contact Record (CR) 2015-03, dated May 26, 2015, documented that the localized instability of the East Perimeter Channel (EPC), a storm-water management structure of the Original Landfill (OLF), was caused by higher than normal groundwater levels. Movement of the EPC occurred after several weeks of heavy precipitation events in the spring of 2015. This movement disrupted OLF storm-water management structures (EPC and berms), which control surface water run-on and runoff. Immediate maintenance actions were taken in May, June, and July 2015 to reestablish storm-water flow, as required by the OLF Monitoring and Maintenance Plan (DOE 2009), Section 3.6.2, "Maintenance Action Activities." The process to evaluate long-term maintenance actions and address movement caused by high groundwater levels was initiated at that time. In the spring of 2016, the EPC and some of the surrounding area slumped, but not as significantly as in 2015. Repairs began in September 2016 and were completed in October 2016. The slumping in 2016 demonstrates that slope instability requires ongoing maintenance.

As part of the process to evaluate long-term actions, a Geoprobe investigation of the distribution of groundwater upgradient of the OLF was conducted in August and September of 2016 (CR 2016-03, dated July 28, 2016, includes a Soil Disturbance Review Plan [SDRP]). The initial results of the Geoprobe investigation indicated that additional information about groundwater distribution needs to be obtained to better evaluate long-term options.

An observation of the 2015 maintenance action and subsequent evaluation determined that the East Subsurface Drain (ESSD) located in the northeast corner of the EPC was plugged and required maintenance. The maintenance included reconstructing the drain, installing

improvements such as a perforated drain pipe that could be cleaned out as needed, and using a filter geotextile between the native soils and drain rock to reduce the potential for clogging. At the same time, a second solid-wall pipe was installed for potential future use in groundwater management actions. The reconstructed ESSD was installed in January 2017 (CR 2016-04 with a SDRP, dated October 19, 2016).

Two separate geotechnical engineering subcontractors (CD & E and Tetra Tech) confirmed that the instability of the OLF hillside observed over the past several years is due to saturated conditions in the subsurface during periods of extended precipitation as reported in the Original Landfill Path Forward, Rocky Flats Site, Colorado (DOE 2017) (Appendices F and G). This saturation further weakens the inherently weak geologic features such as the underlying organicrich unit and the contact between low-permeability claystone bedrock material and the overlying hillslope colluvium. (As illustrated by visible slump features, this mechanism also drives hillside instability in other areas with similar geologic settings along the Front Range.) Reducing the inflow of groundwater to this hillside, particularly in the less-stable eastern portion of the constructed OLF hillside, is therefore a primary objective. This was the intent of the ESSD reconstruction maintenance action. A network of storm drains associated with the former 400 Area north of the OLF included storm drains that transect the OLF. The Kaiser-Hill Company, LLC closure report Utilities and Infrastructure Closure Report, Sector 8A (440 and 460 Area) (August 2005) documents disruption of these components; however, a large area of saturation and instability generally coincides with what is mapped as the southern extent of the remnant of the drain network. The Geoprobe activities in August and September 2016 targeted components of this network upgradient of the OLF. The results of that work have not confirmed that this drain network routes groundwater into the OLF, but it is likely.

Discussion: The purpose of the proposed project is to install wells to intercept what appear to be preferential groundwater flows into the OLF that follow abandoned storm-drain lines and bedding corridors for these lines from former Buildings 460 and 440/444 (see attached Figure 1). The project will include geophysical surveying to better define the bedrock surface and attempt to better locate the two storm-drain line corridors. The geophysical survey may include inserting rods 18 inches into the ground near the expected lines to obtain subsurface information.

This project is designed and will be constructed as a temporary measure for 2 years of operation during the high groundwater season (spring), to allow for groundwater data collection and to evaluate its potential effectiveness in enhancing hillside stability. The goal is to develop a long-term, sustainable maintenance solution for peak groundwater elevation reduction at the OLF during periods of extended precipitation to enhance hillside stability.

The plan view of the proposed temporary groundwater intercept project is shown on Figure 1. The project consists of two 8-inch-diameter wells, each with a depth of approximately 45 feet below ground surface. Both wells will penetrate the top of the weathered bedrock and each will be equipped with a submersible well pump. The pumps will be powered by a single propane-powered electric generator supplied by a 500-gallon propane tank. Electric power will be distributed to the pumps by conduit buried in an 18-inch-deep trench as shown on Figure 1. The pumps will discharge to a 4-inch-diameter gravity drain pipe staked to the ground with anchors as shown on Figure 1. The gravity drain pipe will be connected to the solid-wall pipe that was installed during the reconstruction of the ESSD and water will flow into the existing riprap downgradient of the ESSD.

Well construction (and abandonment) will comply with the State of Colorado's Division of Water Resources *Guideline 2009-1 Concerning the State Engineer's Permitting Authority Over Wells Located on Hazardous Waste Remediation Sites* and *Rules and Regulations for Water Well Construction, Pump Installation, Cistern Installation, and Monitoring and Observation Hole/Well Construction* (Volume 2 *Code of Colorado Regulations* 402-2), as applicable to the Rocky Flats Site.

The estimated maximum electrical load requirement to operate this groundwater intercept project is approximately 50% of the maximum load of the generator. On the basis of the manufacturer's emission data, the air emissions from the generator will be below the Air Pollutant Emission Notice reporting requirements under the current operating conditions. Air emissions reporting requirements will be reevaluated if operating requirements change.

IC Evaluation: The soil disturbance work is subject to Institutional Controls (ICs) 2, 3, and 6. Table 1 recaps these ICs.

	Excavation, drilling, and other intrusive activities below a depth of three feet are prohibited,
IC 2	without prior regulatory review and approval pursuant to the Soil Disturbance Review Plan in
	RFLMA Attachment 2.
	Objective: Prevent unacceptable exposure to residual subsurface contamination.
	Rationale: Contaminated structures, such as building basements, exist in certain areas of the
	Central Operable Unit, and the Comprehensive Risk Assessment did not evaluate the risks posed
	by exposure to this residual contamination. Thus this restriction eliminates the possibility of
	unacceptable exposures. Additionally, it prevents damage to subsurface engineered components
	of the remedy.
IC 3	No grading, excavation, digging, tilling, or other disturbance of any kind of surface soils is
	permitted, except in accordance with an erosion control plan (including Surface Water
	Protection Plans submitted to EPA under the Clean Water Act) approved by CDPHE or EPA.
	Soil disturbance that will not restore the soil surface to preexisting grade or higher may not be
	performed without prior regulatory review and approval pursuant to the Soil Disturbance
	Review Plan in RFLMA Attachment 2.
	Objective: Prevent migration of residual surface soil contamination to surface water.
	Rationale: Certain surface soil contaminants, notably plutonium-239/240, were identified in the
	fate and transport evaluation in the Remedial Investigation as having complete pathways to
	surface water if disturbed. This restriction minimizes the possibility of such disturbance and
	resultant impacts to surface water. Restoring the soil surface to preexisting grade maintains the
	current depth to subsurface contamination or contaminated structures.
IC 6	Digging, drilling, tilling, grading, excavation, construction of any sort (including construction of
	any structures, paths, trails, or roads), and vehicular traffic are prohibited on the covers of the
	Present Landfill and the Original Landfill, except for authorized response actions.
	Objective: Ensure the continued proper functioning of the landfill covers.
	Rationale: This restriction helps ensure the integrity of the landfill covers.

The required SDRP for IC 2 was approved for this area in CR 2016-03 on July 28, 2016. The proposed soil disturbance is very similar; therefore, a new SDRP is not necessary. The *Erosion Control Plan for Rocky Flats Property Central Operable Unit*, which has been approved by CDPHE and EPA, provides erosion control best-management practices that meet the IC 3 requirements. The gravity drain pipe will be installed across the cover of the OLF, including a portion of the waste footprint, and will be staked in place as indicated on Figure 1. Approval of this CR provides authorization for this response action as required by IC 6.

Resolution: CDPHE, after reviewing information regarding the proposed soil disturbance and excavation, and after consultation with EPA, has approved the proposed activity. CDPHE has determined the proposed activity (1) will not compromise or impair the function of the remedy or (2) will result in an unacceptable release or exposure to residual subsurface contamination. CDPHE has also determined the proposed project meets the rationale and objectives of IC 2. (IC 3 and IC 6 rationale and objectives have been addressed as stated above.)

The work will not start until after CDPHE's approval, and in any case DOE will not begin the approved soil disturbance until 10 calendar days after this CR is posted on the Rocky Flats Site public website and stakeholders are notified of the posting in accordance with the RFLMA Public Involvement Plan.

Progress and completion of the work will be reported by DOE in RFLMA quarterly and annual reports of surveillance and maintenance activities for period(s) in which these activities occur.

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

Contact Record Prepared by: David Ward and Jeremy Wehner, Navarro

Distribution:

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Figure 1. OLF Temporary Groundwater Intercept System Site Plan