

UCD/DOE LEHR Stormwater Runoff Water Quality Monitoring Issues
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As US EPA-supported Technical Assistance Grant (TAG) advisors to the Davis South Campus Superfund Oversight Committee (DSCSOC), we have the responsibility to review the adequacy of the University of California/Department of Energy (UCD/DOE) Laboratory for Energy and Health Research (LEHR) NPL Superfund site investigation and remediation. The results of our reviews of documents and issues are brought to the attention of the public through reports to DSCSOC. When we became involved in this project in 1995, we worked with DSCSOC to develop, and we continue to maintain, the DSCSOC website [<http://www.gfredlee.com/DSCSOC/DSCSOC.htm>] to provide information about the Committee and its mission, and to make available reports of the TAG Advisors and other pertinent technical information [direct url to reports: <http://www.gfredlee.com/dscsoc/doc.htm>]. Additional information on the issues briefly discussed in this report is available in other reports on the DSCSOC website.

This write-up reviews significant deficiencies in the LEHR Superfund site stormwater runoff water quality monitoring program, and discusses the need to update that monitoring program to enable it to more reliably monitor the stormwater runoff during the time that extensive remediation of the LEHR site occurs as part of implementation of the ROD for the UCD and DOE areas of the LEHR site.

Examples of Past and Current Problems with Stormwater Runoff Water Quality Monitoring

Historically there has been a series of chronic problems with the stormwater runoff water quality monitoring program at the LEHR Superfund site. For example, as part of a site tour that was conducted in the summer of 1995 by LEHR Superfund site staff, J. Roth and Dr. Lee observed significant inadequacies in the monitoring of stormwater runoff from the site. The stormwater runoff sampling program that was initially established at LEHR failed to include sampling of stormwater runoff that occurred in a ditch that UCD had cut to enable stormwater from a part of the UCD campus to drain to Putah Creek. That ditch had been cut through the top of Landfill 3, causing the exposure of landfilled waste to stormwater runoff. When we asked the LEHR staff about this situation, we were told that stormwater that accumulated in the ditch did not discharge to Putah Creek. However, it was obvious from the discharge structures at the end of the ditch and on the Putah Creek side of the ditch, that that assessment was not accurate. Furthermore, during the first rainfall/runoff event the following winter, we documented by visual inspection, that water in that ditch, with its associated pollutants that had leached from the exposed Landfill 3 wastes, was, in fact, being discharged to Putah Creek.

Another major deficiency in the stormwater runoff monitoring program that had been established at LEHR was that the LEHR staff was not aware of the stormwater discharge structure that existed near the entrance to the Raptor Center. That structure, with a discharge pipe through the levee, drained stormwater runoff from the Landfill 1 area. DSCSOC was able to cause the LEHR site governmental agency Remediation Program Managers (RPMs) to expand the stormwater runoff monitoring program to include the sampling of the discharges from Landfills 1 and 3. They also were able to get the Central Valley Regional Water Quality Control Board (CVRWQCB) to require UCD to take steps to eliminate contact of stormwater runoff from the LEHR site and from part of the campus with exposed waste in Landfill 3 by placing a gunnite layer over the wastes in the ditch.

Another major deficiency in the LEHR site investigation that we observed during the summer of 1995 was that there was no monitoring of the fish in Putah Creek for excessive bioaccumulation of hazardous chemicals that could be derived from LEHR site stormwater runoff. Through DSCSOC we convinced the Centers for Disease Control (CDC) Agency for Toxic Substances and Disease Registry (ATSDR) representative that, as part of evaluating the potential human health impacts of the LEHR site, fish in Putah Creek should be monitored for bioaccumulatable hazardous chemicals. ATSDR then convinced the US EPA Region 9 to conduct sampling and analysis of fish from Putah Creek near the LEHR site. It was found that the edible tissues of some of the fish taken from the creek near LEHR contained excessive concentrations of mercury. Follow-on studies conducted by ATSDR/USEPA and UCD (D. Slotten) showed that some of the fish in that region of Putah Creek contained sufficient mercury to pose a health threat to pregnant women (fetuses) and young children.

Also through DSCSOC, we convinced the CVRWQCB that Putah Creek should be listed as Clean Water Act Water Quality Limited waterbody because of the excessive mercury in some of the fish taken from the creek. Such a listing means that the NPDES-permitted discharges of wastewater and stormwater to the Creek must not cause violation of the California Toxic Rule (CTR) criterion for total recoverable mercury of 50 ng/L.

In the fall of 2008 we reviewed issues of mercury in stormwater runoff from the LEHR site and published our findings in a report and professional paper:

Lee, G. F., and Jones-Lee, A., "LEHR Superfund Stormwater Runoff and Putah Creek Mercury Issues," *Journal Remediation*, 19(2):123-134, Spring (2009).
<http://www.gfredlee.com/SJR-Delta/LEHRrunoffHgRemediation.pdf>

Lee, G. F., and Jones-Lee, A., "Summary of Slides – Putah Creek Mercury Water Quality Issues," Report of G. Fred Lee & Associates, El Macero, CA, Presented to Delta Tributaries Mercury Council, December 2 (2008).
<http://www.gfredlee.com/SJR-Delta/PutahHgMineSummary.pdf>

Lee, G. F., and Jones-Lee, A., "Runoff of Mercury from UCD/DOE LEHR Superfund Site – Putah Creek Mercury Issues," PowerPoint Slides for Presentation to Delta Mercury Tributaries Council, Sacramento River Watershed Program

[<http://www.sacriver.org/issues/mercury/dtmc/>], December 2 (2008).
<http://www.gfredlee.com/SJR-Delta/PutahHgMinesli.pdf>

Over the past 14 years that we have been advisors to DSCSOC on the LEHR site investigation, we have repeatedly found and reported inadequacies in the stormwater runoff monitoring that precluded the proper evaluation of the potential impacts of LEHR site runoff on water quality in Putah Creek. US EPA had developed guidance in 1992 for the monitoring of stormwater runoff from areas that are subject to NPDES permit limitations, which would include areas like the UCD campus and the LEHR site [available at the following site:]

US EPA, “NPDES Stormwater Sampling Guidance Document (EPA/833/B-92/001)” for implementing the Agency NPDES stormwater management program. (<http://yosemite.epa.gov/R10/WATER.NSF/NPDES+Permits/SW+guidance+&+fact+sheets+-+Region+10/>).

Review of that guidance shows that the regulatory agencies (CVRWQCB and the US EPA) responsible for establishing the LEHR site stormwater runoff program disregarded that US EPA guidance applicable for industrial facilities where there is a significant potential for hazardous chemicals to be present in the runoff waters in favor of one of the type allowed for municipal NPDES-permitted stormwater runoff. The allowed prescribed monitoring program for the LEHR Superfund site of collecting a single grab sample of stormwater runoff at sometime during two runoff events each year is grossly deficient compared to the US EPA guidance for this type of facility. The US EPA guidance for stormwater runoff monitoring cited above is explicit in requiring first-flush and on-going monitoring of a sufficient number of storms and during the stormwater runoff events to properly characterize the presence of hazardous chemicals in the runoff waters and to evaluate the impact of the loads of those chemicals to the receiving waters.

In addition to an inadequate sampling regimen, analytical methods employed in the stormwater monitoring program for the LEHR site have been inadequate. Analytical methods used for the analysis must be sufficiently sensitive to detect potentially hazardous situations in the runoff/receiving waters. However, as has been repeatedly discussed in our reports to DSCSOC, copies of which were forwarded to the LEHR site RPMs/PRPs, the analytical methods that UCD/DOE has used over the years for mercury in stormwater runoff have lower detection limits that are four times higher than the CTR criterion. This means that concentrations reported as “non-detectable” could readily be high enough to cause excessive bioaccumulation of mercury in fish in Putah Creek. After years of inadequate stormwater monitoring for mercury in LEHR site runoff the CVRWQCB is finally requiring that sufficiently sensitive analytical methods be used to detect mercury at concentrations appropriate for assessing compliance with the CTR criterion.

Recommended Approach for Establishing a Credible Stormwater Runoff Monitoring Program

The initiation of remediation for several of the waste management units at the LEHR site will likely change the runoff characteristics for potential pollutants from the site. The LEHR site stormwater runoff monitoring program should be revised to conform to the US EPA 1992 guidance. Of particular importance will be proper consideration of the mercury in stormwater

runoff from the waste management areas that exceeds the CTR criterion, and its control to meet that criterion level. This control should be part of the CERCLA required remediation of the site and mercury in runoff from the waste management units should be listed as a Constituent of Concern at the LEHR site.

It is recommended that LEHR Superfund site RPMs and the CVRWQCB review the adequacy of the stormwater runoff monitoring from the LEHR site and adopt the approach specified in the US EPA guidance for stormwater runoff from industrial sites where there could be hazardous chemicals in the runoff.