

**Comments on  
Draft 2005 Comprehensive Annual Water Monitoring Report  
LEHR/SCDS Environmental Restoration**

**Prepared by Brown and Caldwell, May 2006**

Comments Submitted by

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Julie,

Presented herein are my comments on the University of California, Davis (UCD), draft 2005 LEHR Superfund site Annual Water Monitoring Report.

**Overall**

This report, like all of the previous annual water monitoring reports, is significantly deficient in adequately and reliably presenting the results of the monitoring program that has been conducted at the UCD LEHR Superfund site.

Since 1995, when DSCSOC first became involved, DSCSOC has submitted detailed comments on the significant deficiencies in the LEHR site water quality monitoring program. UCD has been allowed to continue a water quality monitoring program that is grossly inadequate to reliably define some aspects of the potential impacts of UCD's waste disposal practices at the LEHR site. Of particular concern to DSCSOC is the continued failure of UCD to install monitoring wells that would adequately and reliably define the role of each waste management unit on pollution of the groundwaters at the site. On several occasions RPMs (specifically, Susan Timm of the Central Valley Regional Water Quality Control Board – CVRWQCB) have indicated that this deficiency needs to be corrected. However, the 2005 Annual Water Monitoring Report shows that UCD has continued to fail to follow normal practices for hazardous chemical site investigation of adequately and reliably defining the actual impact of a waste management unit's contribution to groundwater pollution just downstream of the location where the waste management unit-derived pollutants would be impacting groundwater quality.

The monitoring well array that was established at the LEHR Superfund site was not designed to define the impact of each waste management unit on groundwater quality. There is need to install monitoring wells just downstream of each waste management unit, which are screened to proper depths to intercept the maximum concentrations of pollutants that are derived from the waste management unit. Until this is done, it will not be possible to reliably define past, current and future pollution of groundwaters by each waste management unit. Monitoring wells that are screened over a substantial part of the depth of the aquifer can readily yield unreliably low data on the concentrations of pollutants being added to the aquifer by a waste management unit. Properly sampling the waters that are being polluted by each waste management unit at the location in the aquifer where the greatest concentrations are expected – i.e., in the upper part of

the water table just down groundwater gradient of the waste management unit – is essential, in order to be able to determine whether the waste management unit is now polluting the groundwater and – for those constituents that, according to DOE’s unreliable vadose zone transport modeling, have not yet polluted groundwaters but are expected to do so at some time in the future – when they start to pollute groundwaters. This information is essential so that further remediation of the contaminated soils and wastes can be implemented to stop the additional pollution that can occur.

With respect to the quality of UCD’s Annual Water Monitoring Reports, of all the reports that I have reviewed over the past 45+ years, UCD’s annual monitoring reports rank among the poorest quality that I have seen in terms of properly presenting – and, most importantly, discussing – the data. The 2005 Annual Water Monitoring Report is no exception with respect to its poor quality. A credible water quality monitoring report must, at the least, present the water quality objective (CTR criterion) for pollutants of potential concern and specifically discuss water quality objective exceedances. Again this year, as has occurred now for over 11 years, obvious water quality problems in terms of excessive concentrations of pollutants occur in the data, yet the Annual Water Monitoring Report does not mention them. This report should be resoundingly rejected as a non-credible presentation of information, and returned to UCD to start over.

The issue of ongoing greatest concern is the failure of UCD to adequately and reliably collect and then properly present information on UCD LEHR site’s contribution of mercury in stormwater runoff from the site. Again this year (2005), as has been occurring routinely now for many years, UCD/DOE has been using analytical methods for mercury in stormwater runoff, such as presented in Appendix F, page 34, with a listed analytical method detection limit of 200 ng/L. The California Toxics Rule (CTR) criterion for mercury is 50 ng/L. What does the CRDL mean with respect to the detection limit for mercury, if the allowed analytical method used has a detection limit that is four times the current water quality objective? Is the CRDL listed in the table a bureaucratic number and not the real detection limit for the analytical method used? This kind of situation should have been discussed in a credible water quality monitoring report.

Examination of the mercury data in the table presented in Appendix F, page 34 shows that on January 11, 2005, and December 28, 2005, the mercury concentrations in the samples collected at LF-01 were 224 and 249 ng/L, respectively. As discussed below, UCD in this 2005 Annual Water Monitoring Report does not mention the fact that the monitoring of two different stormwater runoff events in 2005 had total mercury in the runoff at over four times the CTR criterion. This situation provides additional confirmation that UCD should be put under strict orders by the Regional Water Quality Control Board to control mercury in stormwater runoff so that at no time does the concentration exceed the water quality objective for Putah Creek – i.e., 50 ng/L.

As DSCSOC has repeatedly discussed, the 50 ng/L CTR criterion will eventually be reduced to a few ng/L for total mercury, as part of the development of site-specific objectives associated with controlling the excessive bioaccumulation of mercury from all sources in Putah Creek fish. This will evolve from the CVRWQCB’s efforts to implement a TMDL for mercury in the Delta’s watershed.

Another issue that UCD has continued to ignore is the requirement established by the CVRWQCB to use low-level detection limits for mercury in stormwater runoff from the LEHR site in order to determine when the concentrations exceed those that are known to result in excessive bioaccumulation of mercury in fish. As previously discussed, UCD should also be required to monitor for methylmercury in stormwater runoff from the LEHR site, since this is the form of mercury that is most readily available for bioaccumulation.

There has been a chronic problem of inadequate monitoring of stormwater runoff from the LEHR site. As DSCSOC has previously pointed out, the inadequate sampling of stormwater runoff events has led to a situation where both Julie Roth and I have started documenting when runoff events occur that should have been sampled. There have been a number of situations where major runoff events have occurred (such as first flush in the fall of 2005), and UCD did not monitor these events. First flush runoff events for the first major storm of the fall could readily show much higher concentrations of pollutants in the runoff than is being reported by UCD. By avoiding sampling these events, UCD is biasing the data on the characteristics of stormwater runoff from the LEHR site.

The table presented in Appendix F, page 34 also shows that on two occasions in 2005 the total concentrations of chromium in the stormwater runoff from the LEHR site exceeded the CTR criterion. A similar situation occurred for nickel. A credible water quality monitoring report would have presented and discussed these issues. It is important to note that this is not the first time that DSCSOC has raised these issues. They have been discussed in year after year's comments on UCD's Annual Water Monitoring Reports. These comments are available on the DSCSOC website (<http://www.members.aol.com/dscsoc>).

Overall, UCD has failed to develop, implement and reliably report on the characteristics of stormwater runoff from the LEHR site relative to regulatory requirements. This has led to the unreliable ecological risk assessment that BBL has presented on stormwater runoff impact issues.

### **Specific Comments**

Except for some glaring examples (discussed below), I have not reviewed the draft report for the chronic problems that have existed in UCD's reports of failing to properly edit the report and reference materials included in the report. Following are comments on specific sections of this report.

With reference to the Executive Summary, page 0-3, first paragraph under section 0.5 Assessment of Water Monitoring Programs and Recommendations, as discussed above and in previous RPM meetings, there is need for UCD and DOE to construct additional monitoring wells just downgradient from each waste management unit which sample the upper part of the water table that is most likely polluted by chemicals derived from the waste management unit.

Page 0-5, under LTPS, which states "... *UC Davis recommends that no additional soil monitoring on the LTPS is needed and there is sufficient data to evaluate the technology in the FS,*" UCD should not be allowed to terminate soil monitoring at the LTPS, since there could be accumulation of chemicals in the soil column derived from the wastewaters deposited there that

has not yet been detected by the limited-scope monitoring that UCD has been conducting. The water column, soils and vegetation at the LTPS site will need to be monitored for at least several years beyond when UCD stops disposing of some of the LEHR site wastewaters at this site.

With reference to page 0-6, a properly developed water quality monitoring report for the LEHR site would have included a reference to the website for the Davis South Campus Superfund Oversight Committee (<http://www.members.aol.com/dscsoc>) as a source of information on the deficiencies in the water quality monitoring program that UCD and DOE have been conducting at the LEHR site, such as inadequate analytical method detection limits, inadequate monitoring of stormwater runoff and its impacts on Putah Creek, inadequate sampling of groundwaters to determine the current pollution by each waste management unit, etc.

Page 1-3, mid-page, a new bulleted item should be added to the list:

- Determine the specific pollution of the aquifer by each waste management unit at this time and in the future.

Page 2-3, under Site Hydrogeology, information should be provided at some location in this report on the zones that are screened in each monitoring well, to determine if the monitoring well can properly sample groundwaters that are polluted just upstream of the location of the well. Fully screened monitoring wells can readily present an unreliable assessment of the characteristics of the aquifer near a source.

Section 3, page 3-1, second paragraph, last line uses the term “bioassay samples.” This is inappropriate terminology. All of the toxicity testing samples should be labeled as “toxicity test samples,” not “bioassays.”

Last paragraph of page 3-1 mentions the changes in the monitoring program that have occurred with the approval of the US EPA and the RPMs. As pointed out in previous comments, UCD, DOE and the RPMs have held special meetings where they reviewed and approved changes in the monitoring program, of which DSCSOC was not informed and in which it was not allowed to participate. This has occurred twice at the LEHR site.

Page 3-2, second paragraph, line 4, and at many other locations in the document, uses the term “nitrate as nitrogen.” At other locations in the report, it is listed as “nitrate.” As DSCSOC has pointed out previously, it is inappropriate to include the words “nitrate as nitrogen” in the text, unless it is referring to a specific concentration of nitrate. Simply referring to nitrate as “nitrate as nitrogen” reflects a lack of understanding on the part of the authors on how to properly discuss chemicals. “Nitrate as nitrogen,” unless it is tied to a specific concentration situation, should be changed throughout the report to “nitrate.” Another deficiency in the discussion of nitrate data (and, for that matter, data for several other parameters) is the use of excessive numbers of significant figures. A properly developed report will round off the concentration data to reflect their potential analytical reliability.

Page 3-4, as discussed above, the stormwater monitoring from the LEHR site has during 2005 continued to be grossly inadequate compared to what is needed to properly sample and characterize the pollutant load from the LEHR site to Putah Creek.

Page 3-4, last paragraph, as discussed above, again this year UCD failed to sample the first flush runoff from the first major storm of the fall 2005. There was substantial runoff from the LEHR site at LF-3 during this event.

Page 3-5, in section 3.2.3 Surface Water Monitoring, second paragraph, the program that UCD has been allowed to carry out for sampling of the impacts of LEHR site stormwater runoff on Putah Creek, where single grab samples have been taken upstream and downstream of the site during sampling events, is obviously significantly deficient in properly characterizing Putah Creek water quality upstream of the site and downstream of the site. Much more comprehensive upstream, stormwater runoff and downstream monitoring programs are needed to discern if stormwater runoff from the LEHR site is impacting Putah Creek water quality. It is naïve to attempt to characterize water quality in a waterbody like Putah Creek by grabbing a single sample at one time. Multiple samples over time and at various locations are needed to begin to properly characterize water quality impacts of LEHR site stormwater runoff. Further, for several parameters there is need to significantly expand the monitoring parameter list and to improve analytical detection limits. All of these issues have been discussed on repeated occasions over the years in connection with DSCSOC's review of the Annual Water Monitoring Reports.

DSCSOC has pointed out over the years that, unless the stormwater monitoring program was significantly expanded, it would not be possible, as part of conducting a site risk assessment, to make any definitive statements about the impact of LEHR stormwater runoff on Putah Creek water quality. The kinds of statements that BBL has made in its most recent ERA, that there is no evidence of impacts of LEHR stormwater runoff on Putah Creek, simply reflects the gross inadequacies of the stormwater monitoring program that UCD has been allowed to conduct at this site.

Page 3-6, under IRA Monitoring, where UCD mentions the unsuccessful attempts to rehabilitate the injection well, as DSCSOC has pointed out since prior to the time that the IRA proposed approach was first mentioned, that approach would obviously lead to well plugging due to UCD's failing to recarbonate the waters that are being injected into the aquifer. This is a problem that has been well known for over 30 years. It was pointed out to UCD by DSCSOC when they first planned the IRA. UCD was allowed to proceed with what was obviously a technically invalid approach that would result in a significant waste of public funds with their proposed IRA treated wastewater reinjection system.

Page 3-6, under 3.3.2 LTPS Monitoring, the monitoring program that UCD has been allowed to conduct at the LTPS site is inadequate to determine if pollutants in the air-stripped wastewaters are causing or could cause pollution of the groundwaters below where these wastewaters are discharged to land. As DSCSOC has pointed out on several occasions, attempting to use monitoring wells (which may be screened for considerable distances in the aquifer) to characterize the pollution by wastewater disposal is unreliable. There is need to establish

unsaturated vadose zone monitoring of the wastewaters as they percolate through the soil column, to determine if these wastewaters contain constituents that can pollute the aquifer.

Page 4-3, under 4.1.2 Field Quality Control Samples, in 2005 as in all previous years, there have been chronic problems with sample contamination by laboratory solvents. (For example, on page 4-9 mention is made of acetone and MEK being present in the samples, which was likely due to laboratory contaminants.) Those collecting the samples and the laboratories conducting the analyses should have been required years ago to clean up their act so that this type of contamination does not occur. Basically, UCD and its analytical contractor have been allowed to conduct a sloppy sampling and monitoring program.

Page 4-5, with respect to Holding Time Violations, mentions that “743 anions and VOC results were qualified as estimated, due to exceeded holding times.” This is another example of a sloppy analytical program. UCD needs to set up an arrangement with an analytical laboratory so that samples can be processed within the required holding times.

Page 4-14, second paragraph, fifth line states, “...suggests that HSU-2 and HSU-4 are not hydraulically connected.” Such statements are largely without technical merit. Unless UCD conducts a comprehensive monitoring program of HSU-4 (which it has not done thus far), it is inappropriate to assert that the two are not connected. It is indeed rare that there is not some transport between aquifers such as those underlying the LEHR site.

Examination of page 34 of Appendix F, “Volatile Organic Compounds – Groundwater, Stormwater, and Surface Water,” shows that LF-01 was sampled on 01/11/05 and 12/28/05. As discussed above, excessive concentrations of mercury, nickel and chromium were found in those samples. Examination of page 4-19 Stormwater Monitoring Results shows that this section makes no mention of these data. This is another example of a grossly inadequate water quality monitoring report. A credible water quality monitoring report must present and critically discuss all data which show potential water quality problems.

Page 5-3, under section 5.2.2 Stormwater Monitoring, either the stormwater monitoring program should be significantly expanded so that it becomes a credible monitoring program or it should be terminated, since it is wasting public funds.

Section 6, page 6-1, under Recommendations, the last bulleted item (eliminate soil monitoring at the LTPS) should not be approved. If anything, the monitoring at this site should be expanded to include vadose zone transport monitoring as well as monitoring wells appropriately located just downgradient of the area that are screened to detect the maximum concentrations of pollutants derived from UCD’s waste disposal at this site, when they first reach the water table.

A recommendation should be made that the stormwater runoff water quality monitoring program and the Putah Creek water quality monitoring program should either become credible, or be terminated. This fallacy of grabbing a couple of samples a couple of times per year as a credible “monitoring program,” and then claiming that there is no evidence for impacts, should be terminated as a waste of public funds.