

## Comments on December 2003 Reports on the LEHR Site

### Comments on the LEHR Draft DOE Areas Feasibility Study Rev B 12/11/03

Comments Submitted by  
Dr. G. Fred Lee, DSCSOC Technical Advisor

January 8, 2004

#### General Comments

*Unidentified COCs.* Throughout this write-up there is no recognition that there are other, as yet unidentified, constituents of concern that could be found at some time in the future. A key issue will be that DOE recognizes in its writings that this is a potential which may need to be addressed, and that provisions are made to address this problem regardless of when it occurs.

*LEHR Stormwater in UCD Campus Wastewater System.* Another issue that has not been addressed in any of the DOE or UCD documents is that stormwater from part of the LEHR site is carried to the UCD sewerage system and, therefore, becomes mixed with the campus wastewater. This issue was discussed in DSCSOC comments on several occasions in past years. It needs to be resurrected and considered in any evaluation of how pollutants from the LEHR site can enter Putah Creek.

#### Specific Comments

*Preliminary Remedial Action Objectives.* On page 1-1, in the section entitled “The Preliminary Remedial Action Objectives for the DOE Areas Feasibility Study,” the first bullet states,

*“Prevent human incidental ingestion with surface and subsurface soil that pose an excess cumulative cancer risk between  $10^{-4}$  to  $10^{-6}$ , using  $10^{-6}$  as the point of departure or an excess Hazard Index (HI) of greater than 1.”*

First, it appears that the word “with” near the beginning of the sentence should be “of.” Second, as I understand the situation in California, the cancer risk that is “acceptable” in this state is  $10^{-6}$ . This same comment applies to the second bullet, with respect to dermal contact. The same comment is also applicable to the third, fourth and fifth bullets, with respect to the “acceptable” cancer risk in California. This issue needs to be clarified with respect to state ARARs.

With respect to the seventh bullet, which states,

*“Minimize threats to the environment, especially sensitive habitats and critical habitats of species protected under the Endangered Species Act,”*

it is important not to interpret this particular bulleted item as only protecting endangered species. As I understand California regulations, they require protection of all species.

In Figure 1, the “Flowchart for Determining Remedial Alternatives ...,” on the far right column is a diamond with the words, “*Are there threats to sensitive habitats or protected species?*” I believe this should be expanded to include all species of wildlife.

**Comments on Weiss Associates' "Dry Wells Area Hydrogeologic  
Characterization of Well Installation Work Plan," Dated December 12, 2003**

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***Problems with Partition Coefficients.*** On page 1-2, in the last paragraph, Weiss Associates characterizes the literature-derived partition coefficients (Kds) as "conservative." As DSCSOC has commented several times in the past, the Kds from the literature may have little or no applicability to the real situation with respect to transport of constituents in the soils, due to the fact that there is a mixture of chemicals in the water/wastes that are transported along with the constituent of concern, which can interact with the solid surfaces to change the Kd. This can increase or decrease Kd. This issue needs to be pointed out in any discussion of Kds in predicting rates of transport.

***Characterization of Pollutants in HSU-1 to Pollute HSU-2.*** On page 1-3, the last paragraph states,

*"The fine grained deposits in HSU-1 likely provide a confining layer that will **prevent** Dry Wells Area contaminants from migrating downward to HSU-2."* [Empashis added.]

The word "prevent" is inappropriate. There is already substantial evidence that constituents in HSU-1 have migrated to HSU-2.

***Appropriate Location of Monitoring Wells.*** On page 1-4, the first paragraph states,

*"A data gap currently exists because the potential localized ground water impact, if any, is difficult to assess without an HSU-1 well located immediately downgradient of the Dry Wells."*

This same comment applies to essentially all of the waste management units. As DSCSOC has repeatedly pointed out, there is need to install monitoring wells immediately upgradient and appropriately located immediately downgradient of waste management units to detect releases from each waste management unit. The current groundwater monitoring program at the LEHR site is not adequate to determine whether a waste management unit is polluting groundwaters.

***Sampling of Groundwater by Cone Penetrometer.*** On page 3-1, the first paragraph states in the next to last sentence, *"Three borings will penetrate to a maximum depth of 80 ft or cease upon refusal."* If refusal occurs because of the inability of the cone penetrometer, then an alternative approach for sampling the aquifer must be used, since the sample from the aquifer taken near the surface may not be representative of what exists a meter or more below the surface of HSU-2.

***Filtering of Groundwater Samples.*** On page 3-2, the next to last paragraph states, *"Each ground water sample will be filtered with 0.45-micron filter paper to remove solid*

*matter.*” This approach is not technically valid. The total concentration and filtered concentration should be measured on all groundwater samples. What is known is that the concentration in the aquifer is somewhere between the “dissolved” and the total. The solids associated with well development and sampling that are present in a groundwater sample can affect the amount of the dissolved constituents that are present in the aquifer sample.

***Need for DO and TOC Monitoring in Groundwater.*** All of the groundwater monitoring should include electrical conductivity, dissolved oxygen and TOC. Without this information it is not possible to properly interpret the data.

**Comments on “Work Plan; Evaluation of Groundwater Chloroform  
Conditions; LEHR/SCDS Environmental Restoration, Davis, California,”  
Prepared by MWH Americas, Inc., November 2003**

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This Work Plan was requested by the CVRWQCB staff (Susan Timm) to define the lateral extent of the chloroform plume in the region of the IRA pumping. I support Susan Timm’s conclusions with respect to UCD’s proposed plan being adequate to achieve this objective.

***Reliability of Hydropunch Sampling.*** I also wish to indicate that if the hydropunch encounters a situation where refusal of penetration occurs near the top of HSU-2, then regular bore-hole monitoring wells would have to be established to properly sample the aquifer. The hydropunch approach for sampling groundwaters is only reliable if adequate penetration into the aquifer occurs. There are situations where this does not occur, especially at the top of HSU-2, where the concentrations downgradient from the source can be lower than a few meters into HSU-2, due to surface dilution of non-polluted infiltrating groundwater.

***Overall Definition of Groundwater Pollution at LEHR.*** It also should be understood that DSCSOC’s repeated concern about adequate definition of the onsite and offsite groundwater pollution by the various waste management units at LEHR has not been addressed, and still needs to be addressed to properly characterize the extent of groundwater pollution at LEHR.

**Comments on Work Plan; Supplemental Characterization of Chromium in  
HSU-1 Groundwater; LEHR/SCDS Environmental Restoration, Davis,  
California, Prepared by MWH Americas, December 2003**

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As discussed at the last RPM meeting, a far more comprehensive groundwater monitoring program, involving the installation of more monitoring wells than the two wells proposed by UCD, will be needed to properly define whether the high levels of chromium found in groundwater are due to a particular waste management unit.

***Lack of Comprehensive Groundwater Model for LEHR.*** One of the ongoing problems that exists at the LEHR site is that there still is no comprehensive groundwater model for the LEHR site aquifer's hydrogeology, flow paths and groundwater composition. It appears, from the information that is being derived on a piecemeal basis from the existing groundwater monitoring, that the aquifer system, especially in HSU-1 and possibly in HSU-2, is sufficiently complex to require a more intensive monitoring program than has been conducted thus far. The guideline I have used over the years in designing monitoring programs for groundwaters is that of having a sufficient number of monitoring wells sampling at appropriate depths to adequately characterize the groundwaters and the aquifer system so that if another well is constructed what is believed to be downgradient of an existing well, the existing upgradient well data can be used to adequately predict the concentrations of the constituents of concern in the new downgradient well. If this cannot be done, then the aquifer is not adequately characterized.

***Importance of DO and TOC Measurements.*** With respect to measurements made on the groundwater samples collected, DSCSOC again recommends that all groundwater samples include bore-hole DO measurements, EC measurements and TOC measurements. TOC and DO are particularly important for understanding chromium behavior in the aquifer, since they influence the potential for transport of chromium. EC characterizes the water mass being sampled by the well. If the EC along an apparent flow path changes significantly, then different water masses are being sampled along that "flow path," and additional monitoring wells are needed.