

# Comments on Draft LEHR/SCDS Site-Wide Ecological Risk Assessment Prepared by BBL, Dated February 2006

Comments Submitted by  
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## Historical Perspective

Montgomery Watson Harza in 2004 presented a draft Ecological Risk Estimate for the LEHR Superfund site, which DSCSOC found to be technically incompetent and needing to be redone. After about a year's delay, the US EPA concluded that there is need to redo the Montgomery Watson Harza ecological risk assessment by a new contractor for UCD. The comments presented below focus on the revised Ecological Risk Assessment (ERA) prepared by BBL, although, as noted below, it appears that the BBL staff did not review the DSCSOC comments on ecological risk assessment issues that need to be considered to properly characterize the impact of the LEHR site on Putah Creek. The focus of these comments will be on off-site impacts associated with stormwater runoff from the LEHR site.

## Specific Comments

Page 3, under "SWERA Conclusions for On-Site Areas," states as the last two sentences in the last paragraph,

*"An engineered landfill cap for the three landfills is currently being evaluated as a presumptive remedy. This would remove any potential risks at the landfills and any co-located areas as future exposure would be expected to be de minimus."*

While I understand this is US EPA policy, so-called "engineered landfill caps" are not necessarily protective of the environment for as long as the wastes in the landfills represent a threat. A credible ecological risk assessment for the LEHR site must evaluate the potential for the wastes in these landfills to be exposed to the surface conditions over the very long period of time that the wastes in the landfills will be a threat to pollute the environment. As discussed at the recent LEHR site meeting where the draft ERA was summarized, there are significant questions about the adequacy of the waste characterization in the UCD landfills at the LEHR site. Basically, some soil samples were taken from the landfills, which were analyzed. There seems to be no understanding by the participants at this meeting as to whether the wastes were sampled and where the soil that was sampled was derived from. The area of the potential ecological hazards of the landfills is an issue of significant deficiency in how the LEHR site investigations have been conducted.

Page 4, under "SWERA Conclusions for Off-Site Areas," second paragraph states,

*"When all the measurement endpoints were evaluated in the risk characterization, it was concluded that there is no indication that the LEHR/SCDS Site has significantly impacted the sediment or the benthic community adjacent or downstream to the Site."*

That statement is unreliable. It is based on very limited-scope studies conducted over the past two years and does not include the total period of time that the LEHR site has been discharging stormwater to Putah Creek. Further, as discussed, the LEHR site is currently at times discharging mercury in stormwater runoff at 10 times the California Toxics Rule (CTR) criterion. This is contributing to the overall mercury burden that exists in Putah Creek, the Delta and San Francisco Bay, which is adverse to human health and wildlife. It appears that the BBL staff who prepared this statement have not reviewed the extensive discussions of these issues by DSCSOC, which are available on their website at <http://members.aol.com/dscsoc/doc.htm>. References to several of these reports are listed below. These sections of this draft ERA need to be redone if it is to present a credible discussion of this issue.

Another issue that has not been adequately addressed for the LEHR site stormwater runoff impacts is the presence of chlordane in stormwater runoff at concentrations that could readily be accumulating to excessive levels in Putah Creek aquatic life. Again, these issues have been discussed in detail by DSCSOC in comments on previous LEHR site ecological risk assessments and other documents. As discussed, there has not been a reliable assessment of the potential impacts of chlordane and other “legacy” pesticides associated with the LEHR site on Putah Creek water quality.

Page 2-2, fourth paragraph states,

*“However, due to slope, the water actually ends up percolating into the soil at a low spot in the ditch (URS, 2002).”*

While that statement may have been made by URS, it is unreliable. There is stormwater runoff from the western part of the LEHR site to Putah Creek during periods of intense rainfall.

Page 2-8, section 2.1.5.4 (Putah Creek COPECs), states that,

*“Those constituents not detected in Putah Creek (using adequately sensitive reporting limits) were not advanced to the Tier 2 assessment based on the premise that they had not been transported off-Site.”*

This is potentially in error, due to the fact that, for example, chlordane, which is a constituent of concern in Putah Creek that has at times been found in stormwater runoff at measurable concentrations, can be present in LEHR site stormwater runoff at concentrations that can contribute to excessive bioaccumulation of chlordane in Putah Creek at concentrations below the analytical method detection limits that have been used to measure chlordane in stormwater runoff and in Putah Creek. DSCSOC has repeatedly urged the RPMs to require that a proper evaluation of chlorinated hydrocarbon “legacy” pesticides in Putah Creek fish be made. ATSDR, working with the US EPA, attempted to do this on two occasions; however, both times the US EPA laboratories responsible for these studies failed to properly handle the samples, with the result that there is still no reliable information on whether Putah Creek fish contain excessive concentrations of legacy pesticides, and whether LEHR site stormwater runoff contributes to this excessive concentration, if it does exist. These issues have been discussed in detail in previous DSCSOC comments that have been provided to the RPMs and are on the DSCSOC website.

At several locations in this draft ERA, mention is made of the use of  $K_d$  values, such as on page 2-25. Literature values, apparently the same as those in the original draft ERA, were used. As DSCSOC has discussed and as is well known by those who understand aquatic chemistry,  $K_d$  values based on pure solution situations, such as those that have been used in this draft ERA, may have little or no relevance to the real  $K_d$  values for distributions between solid surfaces and water or organism tissue. The basic problem is that the character of the solid surfaces can influence the  $K_d$  value, and a simple partitioning between total organic carbon and water is not necessarily reliable for estimating the partitioning that can occur. These issues have been discussed in previous DSCSOC comments on the LEHR site investigations.

Page 2-25, second paragraph has a brief discussion about mercury, where the last sentence of that paragraph states,

*“The site specific value for mercury is considered to be highly conservative since it is independent of oxidation state or chemical species and, under typical conditions, mercury is unlikely to partition from soil to water (Anderson, 1979).”*

That statement is incorrect with respect to methylmercury. Methylmercury does partition between soil and water. Further, methylmercury can be formed in ponded water situations.

Table 2-8 lists what are called the “NOAEL-Based Toxicity Reference Values or Equivalents.” One of the columns is for “Sediment Biota,” where references are provided to the values used. The references include Long and Morgan (1991), MacDonald, et al. (2000), and Long and Morgan (1995). As discussed in DSCSOC comments on the original draft ecological risk assessment (see references listed below), the use of the Long and Morgan and MacDonald co-occurrence (coincidence) values in an ecological risk assessment is a technically invalid approach for assessing whether a chemical in sediments can lead to toxicity to aquatic life. This issue has been reviewed in detail by DSCSOC. While US EPA Region 9 staff claim that this is a valid approach, their claims are not supported by those who have expertise in aquatic chemistry and aquatic toxicology.

The State of California Water Resources Control Board, over the past two years in a two and a half million dollar effort, has been developing sediment quality objectives for the state, where they have examined the relationship between total concentrations of chemicals in sediments and aquatic life toxicity. They have found, as was found in the 1970s, that there is no relationship between total concentrations of a particular chemical, and toxicity. Total concentration of a chemical is a highly unreliable predictor of toxicity. The State Water Resources Control Board (SWRCB) has an international advisory panel, including a member from the US EPA Region 9, which supports these conclusions. Questions about these sediment quality objective development efforts can be directed to Chris Beegan ([cbeegan@waterboards.ca.gov](mailto:cbeegan@waterboards.ca.gov)) at the SWRCB. Basically, as was found in the 1970s, if there is interest in assessing whether a sediment is toxic, toxicity tests must be used. If there is interest in assessing whether a particular chemical in sediments is responsible for the toxicity, a toxicity investigation evaluation procedure must be used to determine the cause of toxicity.

The basic issue of concern for an ecological risk assessment is whether the use of the co-occurrence (coincidence)-based values of Long and Morgan and MacDonald will affect the conclusions from this ecological risk assessment. It appears that they would not, since apparently none of the chemicals evaluated at the LEHR site using the coincidence approach exceeded the threshold value, although this may need further evaluation. As discussed in our writings (see references below), it is dangerous to assume that, since none of the so-called “thresholds” are exceeded, there are no toxicity problems associated with the sediments or soil, since there are a large number of chemicals that can be present in a sediment or soil that are not considered in the coincidence approach for evaluating toxicity (see previous discussions on Unrecognized Pollutants, referenced below). Also, that approach fails to consider additive and synergistic effects of chemicals. An evaluation of whether a sediment or soil is toxic can only be reliably done through toxicity testing.

Page 19-2, paragraph 6, the statement is made that,

*“During sustained rainfall events (e.g., > 1 inch/24 hours) storm water discharges may reach Putah Creek.”*

It is not a question of “may.” They do reach Putah Creek. Both Julie Roth and I have documented on a number of occasions when the flow from the LEHR site through Old Davis Road ditch reaches Putah Creek.

Page 19-3, third paragraph states,

*“At the UC Davis sites (LF-1 and LF-3), between 1-3 samples from each storm water monitoring location exceeded the CTR for freshwater aquatic life criteria for either hexavalent chromium, copper, mercury or zinc (Geomatrix, 2004). However, some of these samples were not filtered prior to analysis resulting in dissolution of suspended materials and anomalously high concentrations of some metals.”*

That statement reflects a lack of understanding of how the CTR criteria are applied to mercury. The criteria are based on total recoverable mercury, not dissolved mercury. Also, particulate metals and organics can accumulate in sediments and therefore be adverse to aquatic life.

Page 19-4, fourth paragraph states, *“The study determined that the site does not have a major effect on mercury dynamics in the creek.”* This paragraph should be expanded to include the fact that the Central Valley Regional Water Quality Control Board has examined the data on mercury bioaccumulation in Putah Creek and the amount of mercury discharged from the LEHR site in stormwater runoff and concluded that UCD must implement best management practices to control the mercury runoff from the LEHR site. This reflects that LEHR is contributing to the excessive mercury bioaccumulation in Putah Creek and downstream. DSCSOC has discussed the mercury situation in Putah Creek in several reports on the DSCSOC website, including those listed below.

Page 19-7, fifth paragraph states, *“The Putah Creek Study area is considered a unique habitat, formed initially by dredging and the WWTP effluent.”* The WWTP effluent did not form Putah

Creek. Putah Creek in the vicinity of the LEHR site was formed by dredging and the flow from upstream sources. The wastewater effluent was the primary source of water only in late summer and during periods of drought. Most of the time the water in Putah Creek is derived from upstream sources in the Putah Creek watershed.

Page 19-9, near the bottom of the page in the third bullet, indicates that, "*Storm water discharge from LF-3 has not been observed since 2001.*" I observed stormwater runoff from the LF-3 area in November 2005.

Section 21 presents the references used in this draft ERA. No reference is given to the numerous comments that have been provided by DSCSOC since 1995 on the unreliability and inadequacy of the LEHR site investigations as they relate to human health protection and environmental issues. This is a significant deficiency in this draft ERA, since it does not provide the public with an opportunity to learn of the unreliable information that has been provided in a number of the LEHR site contractors' and agencies' studies on the site's impact on public health and the environment.

#### **References** (Available at <http://members.aol.com/dscsoc/doc.htm>)

##### Mercury

- Lee, G. F., "[Regulating Mercury in LEHR Site Stormwater Runoff](#)," Comments submitted to DSCSOC by G. Fred Lee, G. Fred Lee & Associates, El Macero, CA, October 16 (2005). [39 kb]
- Lee, G. F., "[UCD Report on Low Level Mercury Analysis of LEHR Superfund Site Stormwater Runoff](#)," Comments submitted to DSCSOC by G. Fred Lee & Associates, El Macero, CA, May (2004).
- Lee, G. F., "[Listing of Lower Putah Creek as CWA 303\(d\) Impaired due to Mercury](#)," Report to DSCSOC by G. Fred Lee & Associates, El Macero, CA, August (2003).

##### Landfill issues

- Lee, G. F., "[Comments on 'Draft Site-Wide Risk Assessment, Volume I - Human Health Risk Assessment \(Part C – Risk Characterization for UC Davis Landfill Units\)' Prepared by Brown and Caldwell, August 12, 2005](#)," Comments submitted to DSCSOC by G. Fred Lee, G. Fred Lee & Associates, El Macero, CA, September 8 (2005). [16 kb]

##### Unrecognized pollutants

- Lee, G. F., "[Comments on 'Draft Site-Wide Risk Assessment, Volume I: Human Health Risk Assessment \(Part B-Risk Characterization for DOE Areas\)' Draft E, dated August 20, 2005](#)," Comments submitted to DSCSOC by G. Fred Lee, G. Fred Lee & Associates, El Macero, CA, September 7 (2005). [60 kb]

## Unreliability of co-occurrence based sediment quality guidelines

- Lee, G. F., "[Comments on US EPA Region 9's Response to DSCSOC's Request for Technical Review of the Reliability of Using Co-Occurrence-Based SQGs in a LEHR Site Ecological Risk Assessment](#)," Report submitted to DSCSOC by G. Fred Lee, G. Fred Lee & Associates, El Macero, CA, February 3 (2005). [47 kb]
- Lee, G. F., "[Use of Cooccurrence Based “SQGs” in UCD LEHR Ecological Risk Assessment](#)," Comments submitted to DSCSOC by G. Fred Lee & Associates, El Macero, CA, November 7 (2004). [14 kb]