

**Comments on the
Draft Data Summary and Data Gaps Report
Remedial Investigation/Feasibility Study Work Plan Addendum
for the SCDS/LEHR Environmental Restoration
Prepared by the University of California, Davis, April 2002**

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Presented herein are comments on selected aspects of the Draft Data Summary and Data Gaps Report Remedial Investigation/Feasibility Study Work Plan Addendum for the SCDS/LEHR Environmental Restoration.

Page 2, Section 1.3.1 UC Davis Areas states,

“The Old Waste Water Treatment Plant is included in the UC Davis OU because of its proximity to the UC Davis areas (Figure 1-2). The investigation of this facility is complete and will be documented in the RI report, but will otherwise not be included in the scope of this effort.”

The statement that the investigation is complete of the Old Waste Water Treatment Plant’s potential to pollute groundwaters is incorrect. As I recall, there were concrete-lined sludge drying beds, which almost certainly had cracks in them which would allow sludge and any leachate associated with the sludge to percolate into the groundwater system underlying the concrete area. I would be surprised if there has not been (and maybe still is continuing) pollution of the groundwaters in that area. Until there is a proper investigation of groundwater quality immediately downgradient from the Old Waste Water Treatment Plant, it will not be possible to know whether that facility polluted groundwaters in the area.

The statement is made on page 3, sixth paragraph, on Surface Water, Storm Water, that,

“Monitoring data collected upstream and downstream of LEHR along Putah Creek do not suggest that the Site is impacting Putah Creek, although monitoring and investigations in Putah Creek are continuing, and will be described in greater detail in Section 3.0.”

The monitoring program for stormwater impacts at the LEHR site since its inception has been grossly deficient and has not properly investigated the potential impact of LEHR site runoff on Putah Creek water quality.

Page 5, first paragraph under Western and Eastern Dog Pens, the last sentence contains a phrase about the excreta containing nitrate from urination. Usually, urination results in ammonia discharges, which are then converted in the environment to nitrate.

Page 5, under Domestic Septic Systems, line 6, the Dames and Moore reference needs to specify either a, b or c.

Page 5, last paragraph, third line, the PNNL reference needs to specify either a or b. Since this is now becoming a chronic problem with respect to proper listing of references, I will stop making notes of these problems. Someone associated with UCD should have taken the time, before this was submitted for review, and now must take the time, to properly prepare the document by carefully checking to see that all references listed in the text are properly listed in the reference list, and vice versa. This is a chronic problem with UCD and its consultants' reports on their LEHR site work.

Page 6, second paragraph under Groundwater IRA System, UCD is again misrepresenting the purpose of the IRA system as a removal system. It was a pilot system to investigate the potential to use pump and treat, not a removal system. It was never contemplated as a final removal system. It has been recognized from the beginning that the IRA that UCD proposed was inadequate for removal, and in fact, would be spreading pollution to areas where it is not now located. The recent monthly IRA reports show that the system is not working very well.

This system has been plagued with problems, some of which were predicted because of poor design. In addition to only removing a small amount of chloroform, it is only recapturing a small part of the pollutants reintroduced back into the groundwater. It is now spreading the pollution at the site to a much greater extent than originally projected.

Page 6, under Groundwater IRA System, second paragraph, the statement is made that the land treatment pilot study system was designed to treat groundwater for removal of TDS. That system will not be effective in removing TDS. All that is being done is to dilute the TDS. There is no removal. It will only be partially effective, depending on operation, in removal of nitrate, and may not be very effective in removing hexavalent chromium.

Page 10, under Conceptual Site Model, paragraph 2, states, mid-paragraph, *“For example, based on historical data, the surface soil covering the UC Davis areas is not impacted.”* That statement is not in accord with what has been found. There is inadequate monitoring of the soil and the stormwater runoff to be able to make that statement.

Page 11, the end of the first paragraph states, *“The land use would also restrict development of groundwater resources on site, until groundwater treatment is complete.”* This statement is misleading. It is virtually certain that groundwater pollution will always exist at the LEHR site so long as there are any wastes left at the site. The capping of landfills at best will restrict the migration of contaminants from the landfilled wastes to groundwater for a short period of time compared to the time that the wastes in the landfill are a threat to cause groundwater pollution. Even if it were possible to completely clean up the aquifer (which cannot occur) from the wide variety of known as well as unknown hazardous chemicals that exist at the site, within a few years after capping and so-called “groundwater cleanup,” the groundwaters would become polluted again. Wastes that are left at the site will be a threat to groundwater quality forever.

Page 13, section 2.4.1 Primary Inter-Media Transfer ignores the translocation of pollutants in soil through vegetation out to the environment from the leaves and flowers. This error in the UCD and its consultants' approach to addressing this issue has been repeatedly pointed out to them. They continue to ignore it. They must now include it in their evaluation of the potential for transport of pollutants from below the soil surface to the surface and atmosphere.

Page 13, section 2.4.2 provides a highly misleading statement,

"If chemicals reach HSU-2 groundwater and are not captured by the groundwater IRA, they could potentially migrate to a supply well, be used for irrigation and taken up by plants (groundwater to biota). However, off-site migration in groundwater has been addressed by the IRA; therefore, this pathway is considered incomplete."

That statement is a gross misrepresentation of the ability of the IRA, which at best was a pilot, experimental study, not an effective, reliable groundwater remediation approach. UCD, since it first initiated the IRA, has been trying to portray it as a reliable approach for remediation of groundwater. It has been repeatedly shown that this approach is not reliable. It has had severe problems throughout its operation. It fails to capture some of the pollutants that are not removed by air-stripping that are pumped back into the groundwater as part of the IRA. It is statements like this that cause the DSCSOC and the public to justifiably not trust UCD and its consultants to reliably present information pertinent to evaluation of the potential hazards of the LEHR site and the effectiveness of control programs that are being implemented.

Page 16, fourth bulleted item states, "... UC Davis supplies water to all on-site residents from wells approximately 1,500 ft bgs." On page 15, the third line states, "The UC Davis water supply is drawn from deep groundwater campus wells (300-700 ft bgs) ..." Are these the same wells?

Pages 16 and 17, for the off-site farm resident, there is a potential to use the groundwater from HSU-2 and HSU-4 for garden irrigation, which could result in contamination of food crops, which could potentially add to the exposure to hazardous chemicals.

Page 17, under section 2.5.6 The Off-site Farm Resident (South), states, "Groundwater was not considered an exposure medium for this receptor because groundwater does not flow south." That statement is true under the existing conditions. However there are no restrictions on a property owner to the south putting a high production well near the property line which would change the groundwater flow direction, so that groundwaters under the site would be diverted to the south.

Page 17, section 2.6.1, last bullet, states again that, "Surface soil at the Site is not known to be contaminated." That is not necessarily true. Constituents have been measured in stormwater runoff, which had to come from surface soils, which are in excess of water quality standards. It is unclear as to the origin of these, except that at least some of them are from LEHR site operations.

Page 17, last line, the word "absorbed" should be "adsorbed."

Page 18, second bulleted item, states, “*Sub-surface soil (see caveat above).*” The so-called “caveat” is not defined. There certainly is an opportunity for terrestrial plants to take up pollutants from the sub-surface soils through the roots and transport them to the surface.

Page 18, the fourth bulleted item considers only the higher macrophytes. Primary producers include algae, which can take up chemicals directly from the surface water.

Page 18, last bulleted item at the top of the page, the direct uptake of chemicals from sediments can take place by animals as well as plants. The statement at the end of that section, “*Groundwater was not included because the groundwater IRA limits the off-site migration of site constituents.*” This is an inappropriate statement. The IRA that is in place now is a pilot study and is not a reliable mechanism for preventing offsite migration. Further, there is substantial offsite migration that has occurred in the past, which has to be included as part of the evaluation.

Pages 17 and 18 are confusing, because it appears that UCD has mixed together aquatic exposure and terrestrial exposure. These should be separated and discussed as separate exposure routes, where there is clear definition as to which is being addressed.

Page 18, the final statement in 2.6.2, “*Groundwater was not included because the groundwater IRA limits the off-site migration of site constituents,*” is another propaganda statement that is not factual. There is substantial offsite pollution of groundwaters which must be considered and addressed. Second this so-called “pilot-study IRA” is not effective in controlling pollution of offsite groundwaters, since only part of the reinjected groundwater is recaptured.

Page 19, last sentence is again unreliable with respect to groundwater. Certainly tertiary consumers could be exposed to groundwater-associated pollutants through pumping of the groundwaters to the surface. Also, it is not clear in the Secondary Consumers and Tertiary Consumers sections that adequate attention has been given to translocation of sub-surface pollutants through vegetation, which would bring them to the surface, making them available for secondary and tertiary consumers.

Overall, UCD’s description of routes of potential exposure to contaminants at the LEHR site is inadequate and needs to be reworked.

Page 20, section 3.1.1, second paragraph states,

“While the 1994 background data for organochlorine pesticides and general chemical parameters were adequate, ...”

Because of the significant problems that have existed, where UCD and its consultants have failed to recognize the importance of adequate detection limits on organochlorine pesticides and other constituents such as mercury, it is essential that the organochlorine pesticide data be reviewed by someone who understands these issues, to be sure that the statement made is technically correct.

Page 21, mid-page, under “Data Gaps - Background Soil,” I am not convinced that the statements regarding adequate characterization of the background soil are accurate. This needs to be reviewed by the RPMs to be certain that UCD and its consultants have reliably portrayed the existing information.

Page 22, fifth paragraph, last sentence states, “*Although the analytical results indicate elevated concentrations of select parameters, the results are typical for analysis of landfill waste material.*” That statement has no meaning unless it is put in the context of what the authors interpret as “typical” of landfill waste material. Typical landfilled waste consists in part of organics which produce landfill gas. There should be appreciable organics in the waste. The impression is given from this paragraph that there are no organics in the waste. Is this correct? In my opinion, there is inadequate characterization of the wastes in all three of the UCD landfills.

We do not know what was deposited there, and the potential threats that this material represents to public health and the environment. In order to properly characterize whether the existing landfills represent a threat to groundwater, it will be necessary to conduct slant drilling under the landfills, to measure the concentrations of various potential pollutants in the migrating water in the vadose zone. Also, the characteristics of the upper two feet of the water table in HSU-2 at several locations just downgradient from each of the landfills must be evaluated. This will require installation of a number of new monitoring wells that are specifically designed to sample groundwaters just downgradient from the landfill. Further, since there is inadequate characterization of the upgradient groundwater quality, several monitoring wells just upgradient of each landfill should be constructed and operated for several years to characterize the groundwaters that pass under the landfill.

Page 23, third paragraph states what DOE concluded with respect to the potential for the landfills to pollute groundwaters, and cites a reference to Weiss. It is presumed that this is the Weiss’ fundamentally-flawed unsaturated modeling that has been done. UCD consultants previously have been critical of the unreliable unsaturated transport modeling that Weiss Associates (on behalf of DOE) have been trying to foist on the RPMs and the public.

Page 24, in the third paragraph under Data Gaps - Landfill Unit No. 2, the statement that, “*The waste materials and transport pathways in Landfill Unit No. 2 have been characterized except that surface soil samples are limited in the area north of the Eastern Dog Pen,*” is unreliable. There is inadequate characterization of the waste and its potential effects on groundwater. A major data gap is the need for sampling of the vadose zone and underlying groundwaters described above for Landfill Unit No. 1.

Page 25, under Data Gaps - Landfill Unit No. 3, states that, “*Samples of waste material have been characterized for both total and leachable constituents.*” The characterization of waste and its potential effect on the groundwater has not been properly done for Landfill Unit No. 3. The statement is made in that same paragraph that, “*Based on the work completed and the results received from Landfill Unit No. 3, no data gaps are recognized.*” That statement is not accurate. There are significant data gaps with respect to Landfill Unit No. 3 that need to be addressed to

properly characterize the potential threat that leaving that landfill intact represents to public health and the environment.

Page 26, fourth paragraph states,

“Application of the Designated Level Methodology (Marshak, 1989) suggested that WBH area soils will not contribute tritium to groundwater above the Maximum Contaminant Level ...”

Rather than trying to speculate about what has occurred through the use of the Designated Level Methodology, actual measurements should be made. It is possible to sample the vadose zone groundwaters under the waste burial holes to determine what the concentrations are in this water and in the upper level of groundwater in HSU-2 just downgradient from the waste burial hole.

Page 26, last paragraph, the statement is made that,

“The subsurface transport pathway to groundwater was evaluated after the IRA and the analysis showed that the residual concentrations of tritium would not leach to HSU-1 or HSU-2 groundwater above the MCL.”

This needs to be thoroughly evaluated to be sure it is a reliable characterization of the situation.

Page 34, with respect to the discussions on the Landfill Units and the adequacy of monitoring, this section needs to be critically reviewed to be sure that the statements made about the adequate monitoring are, in fact, supported by the information available. At this point, this issue has not been adequately reviewed.

Page 35, in the section HSU-4 Aquifer, the statement is made in the last sentence that, *“The HSU-4 monitoring network is considered adequate to monitor Site impacts.”* This needs to be evaluated with respect to comprehensive review. It is my recollection that it was previously concluded that a number of additional wells were needed to characterize the downgradient impact. As far as I know, these have not been installed.

As discussed above, with respect to the Data Gaps - Groundwater Monitoring Well Network, there is inadequate characterization of the impacts of the landfills and other waste management units on groundwater quality. There is need for immediately upgradient and downgradient wells. Many of the wells that were cited in these sections as being appropriate for describing the impacts of the landfill, are inadequate for this purpose. It is important to recognize that the input of waste from a landfill to the groundwaters can be localized, generating relatively narrow plumes of waste. In 1995, I suggested that these issues needed to be evaluated in terms of determining the adequacy of monitoring. This evaluation has still not been done, with the result that we do not know how reliably the monitoring has been done and how many additional wells will be needed to have a high probability of properly characterizing the pollution of groundwaters by the landfills and other waste management units.

UCD, in developing this section, is practicing more of the inappropriate approach that has become chronic with respect to evaluating the impacts of the waste management units at the LEHR site, where the staff and consultants will make statements about adequate definition of these issues to see if they will get by the RPMs. This approach has caused UCD and its consultants to have no credibility in reliably describing these issues, since they have been repeatedly found to distort the information available on issues.

Page 36, under Cone Penetrometer Testing, there is no discussion of the fact that the Hydropunch and the CPT could readily miss polluted groundwaters, based on the fact that they cannot properly sample the aquifer to any depth within HSU-2. The upper part of the groundwater column can have the concentrations diluted by infiltrating surface waters. Further, landfill leachate typically has a higher salt content, and would tend to sink upon reaching HSU-2, and thereby could readily pass under the sampling points for the Hydropunch.

Page 37, mid-page, under Groundwater Flow Modeling, claims that a groundwater model was developed in connection with the groundwater IRA. While this is the case, it appears from what I understand of the situation that the model was not very reliable. Further, there is no site-wide groundwater model available for the site and the offsite pollution that has occurred. This has been repeatedly requested of UCD over the past half a dozen years, and thus far UCD has not provided it.

Page 38, in the section on Data Gaps - Background Groundwater, there is need for additional wells that sample at specific locations upgradient of the site to determine whether the existing wells and UCD's approach is adequate for characterizing the upgradient groundwater from the site. Further, there is need to install wells upgradient of each of the landfills to properly characterize the groundwaters passing immediately under the landfill that can be polluted by materials derived from it.

Page 41, third paragraph under Nitrate, the last sentence states, "*These concentrations are within the range of concentrations observed in supply wells in the vicinity of Davis (Dames & Moore, 1999b).*" That issue is not relevant, and is more of the smokescreen that UCD presents with respect to the pollution of groundwaters by the LEHR site waste management units. The issue is not what pollution is occurring elsewhere, but whether a specific waste management unit at the LEHR site pollutes groundwater. The issue is whether the nitrate concentrations increase as the HSU-2 groundwater moves under and across the waste management unit.

Page 42, first paragraph, last sentence is another of the smokescreen sentences, where UCD states, "... *but average TDS concentration in HSU-2 wells are similar to [those] observed for drinking water in the City of Davis (Dames & Moore, 1999b).*" Again, this is not relevant. The issue is whether the concentrations of TDS increase because of discharges from a waste management unit at LEHR. If they do, then the groundwater has to be cleaned up, and the waste management unit must be managed to stop pollution of the groundwater forever.

Pages 43 and 44 fail to adequately address the issue that has been repeatedly raised by DSCSOC on the unregulated constituents in soils and groundwater at the LEHR site. The issue that should be discussed is whether there is an indication of potentially hazardous chemicals from among the tens of thousands of chemicals that were in use every day at the time when the LEHR site landfills were developed and used by UCD. There are total organic carbon and dissolved organic carbon concentrations which could readily contain a variety of hazardous chemicals. The point of this matter is to recognize and prepare for the likelihood that the current list of constituents of concern at the LEHR site is a small part of the vast arena of hazardous and/or deleterious chemicals that exist at the site that are a threat to public health, the environment and groundwater resources. While it is not possible with the limited funds made available to regulatory agencies at the federal and state levels to conduct the kinds of studies that should have been conducted years ago, to more aggressively pursue identifying hazardous and deleterious chemicals in complex mixtures of wastes such as those that were deposited at the LEHR site, it is possible to recognize significant deficiencies that exist in the current approach toward investigating and remediating hazardous chemical sites such as the LEHR site, and to take the necessary steps to ensure to the maximum extent practicable, that public health and the environment are protected. The UCD LEHR approach of doing the minimum to just get by the regulatory requirements is strongly contrary to the public's and environmental interests for site investigation and remediation.

On pages 45 and 46, a series of bullets are presented with respect to UCD's conclusions on groundwater quality issues. Many of these are presented as though they had been properly investigated, where a detailed report had been made available, and then opportunity had been given to the RPMs, the public and others to critically review this report to see if the conclusions presented by UCD and its consultants were backed up by the data. Many of these issues that are summarized in the bullets are the same as those that UCD adopted without data years ago. They still have not developed the critical evaluation needed to support the conclusions. For example, the last bullet on page 45 with regard to chromium, the RPMs have made it clear that there is need for additional investigation. UCD has not carried out this investigation, but attempts to convince everyone through its propaganda, such as in the last bullet on page 45, that there is no need for additional work on the chromium issue. There is need for additional work on chromium, and it will have to be done, as part of site investigation.

With respect to the first bullet on page 46 on data gaps for HSU-4, there is need for a comprehensive report showing what is known, how well it is known, and what needs to be done to further define the data gaps that exist.

Page 46, second bullet states, "... *unregulated compounds have also been evaluated and are considered adequate.*" That is not true. They may have been evaluated by UCD, but they have not been evaluated by others, and UCD has still failed to properly address this issue.

Page 46, third bullet discusses the monitoring well network. UCD still has not installed monitoring wells upgradient and downgradient from each of the waste management units to determine whether the waste management unit is in fact polluting the groundwater.

Page 46, section 3.3 Storm Water Monitoring Program, tries to give the impression in the first paragraph that an adequate stormwater monitoring program has been carried out in the past and is in existence today at LEHR. This is not true. The program for stormwater monitoring at LEHR has been and continues to be significantly deficient.

Page 46, section 3.3.1 states in the last sentence of the first paragraph that, “*Storm water monitoring was initiated to establish the presence of Site constituents in storm water runoff in 1994.*” That is not true. The program was initiated to prove that there were no constituents in stormwater runoff that could be pollutants. Analytical methods which were obviously inadequate were used for key constituents. DSCSOC became involved in the LEHR site in the summer of 1995. One of the first things that became apparent was that those responsible for stormwater monitoring at the LEHR site did not even know how the stormwater was leaving the LEHR site. There was no monitoring of Landfill No. 3 runoff. Further, it was believed by the site manager that runoff from the Landfill No. 3 area did not reach Putah Creek. Similarly, runoff from Landfill No. 2 was not even known to the site manager at the time. This was found by DSCSOC and the RPMs in 1995 and 1996.

Page 49, the discussion of Storm Water Data Gaps should be expanded to include the parameters for which inadequately sensitive analytical methods have been used by UCD and DOE to monitor stormwater, so that this issue is clearly defined as a data gap and not just glossed over as is done in this paragraph.

Page 49, section 3.3.3, second paragraph again attempts to address what UCD calls “Site-related chemical stressors.” The LEHR site has been found to contain elevated mercury. This is not even mentioned in this discussion of stormwater runoff. The analytical methods for mercury and several other constituents throughout the program have been deficient. This was pointed out in 1995 when DSCSOC first became involved. It has taken six years to convince UCD that they should use adequate analytical methods. Whether the mercury came from LEHR waste is not an issue. In accord with the Clean Water Act, if there are concentrations of mercury leaving the LEHR site in stormwater runoff above the California Toxics Rule criterion, then UCD is obligated to control that runoff of mercury, independent of the origin of the mercury.

Page 50, mid-page, under Pesticides and PCBs, mention should be made that the analytical methods that have been used for DDT, chlordane, etc., in monitoring Putah Creek, have been inadequate to detect these constituents at critical concentrations. Therefore, it is not known whether this is a problem associated with Putah Creek or associated with LEHR.

UCD has failed to mention some of the early work on attempting to characterize the sediments in Putah Creek with respect to accumulation of pollutants from the LEHR site. This early work was done incorrectly, because the consultants involved did not understand how to do the studies properly. It is still an issue that needs to be discussed.

Page 51, under Other Constituents, second paragraph, there are two ATSDR reports. Only one of them is mentioned.

Pages 51 and 52 fail to address an important data gap with respect to surface water issues. This is one that has been mentioned repeatedly by DSCSOC, where it is known that the LEHR site soils contain a variety of organochlorine pesticides, such as DDT and its transformation products, chlordane, etc. ATSDR attempted, based on DSCSOC's recommendations, to assess whether excessive concentrations of organochlorine pesticides and PCBs were present in fish taken from Putah Creek in the vicinity of the LEHR site. Both studies by ATSDR and the US EPA had significant problems which prevented assessing the situation. Therefore, at this time, it is not known whether chlordane is present in Putah Creek fish at or above hazardous levels, and whether chlordane from the LEHR site is contributing to this situation. This is a significant data gap that must be addressed.

Another data gap that has not been addressed is the translocation of hazardous chemicals from the soils into plant material at the site. While the occurrence of tritium at elevated concentrations in a tree is acknowledged early in the report, not mentioning it as a significant data gap with respect to other vegetation and the variety of potential pollutants that could be translocated is a significant failure of this data gap review.

Another data gap that should be discussed in a credible report on existing data gaps is the fact that LEHR site materials and waste have been transported to other locations. While the UCD L. Vanderhoef administration staff do not wish to acknowledge this, there can be little doubt that there are LEHR site wastes deposited at UCD's Landfill No. 4. It also appears that waste sludges from UCD's LEHR operations were transported to other locations in the state. This issue has never been properly addressed.

Page 54, in the discussion of the FS Process, does not reliably cover the 1995 discussions that were held on alternatives for LEHR site remediation. It is implied that there was an in-depth discussion of potential remediation approaches for the LEHR site. This characterization of the discussions that took place at that time is significantly in error. Pacific Northwest Laboratory staff presented a matrix of possible remediation approaches. These were never discussed among the RPMs and the public. I recall providing some initial comments on some aspects of this, such as the PNNL suggestion that the landfills could be closed with a "less than RCRA" cap. When I asked what was meant, I never got an answer, and this issue was never brought up again.

Basically, with respect to remediation of the site, we are now beginning to discuss these issues. Nothing on the table is to be taken for granted with respect to previous discussions outlining how the site should be addressed. Certainly, there was never discussion of groundwater treatment for the VOCs only. In fact, there have been repeated discussions by Susan Timm and DSCSOC that there will be need to remediate all pollution of groundwaters by TDS, nitrate, TOC, DOC, etc. This is yet another example of the unreliable information that UCD provides on issues in an attempt to gain concurrence for UCD's position, without proper review.

With respect to the RCRA cap for the landfills, as I have pointed out in detail previously, a RCRA cap is not a satisfactory approach for closing a landfill if the closure is to comply with State of

California Title 27 requirements for protecting groundwaters from pollution by landfill leachate for as long as the wastes in the landfill will be a threat.

The statement in the last paragraph on page 54 that, “Typically, landfill wastes cannot be treated because of their heterogeneous composition,” is not factual. Landfill wastes can be treated to reduce the mobility of the hazardous or deleterious constituents. While typically this is not done, it is certainly technically feasible to carry it out.

Page 55, second paragraph under 4.2.2 states, “If required, UC Davis will enter into agreements with state or federal officials to ensure land use is restricted from residential development.” The UCD past and current administrations have a poor record of protecting the public from its waste management activities. Any agreement signed by UCD to restrict use of the LEHR site after remediation should carry with it an independent, third-party review, funded by UCD, to ensure that the public and UCD’s students and staff’s interests are protected from members of the administration who are notorious for shortcutting proper public health and environmental protection procedures.

Page 56, under Alternative S-1 No Action/Land Use Restriction, states in the last sentence, “A supplement to existing warning signs, no-trespassing signs, identifying the CERCLA status of the Site would be necessary.” This is another hypocritical statement by UCD. Thus far, UCD has refused to even acknowledge via a sign to warn the public that this is a Superfund site. After the site is closed is it going to start putting up signs to say that this is a partially remediated Superfund site?

Page 56, under Alternative S-1,

“Key information needs include:

- *How UC Davis would enforce land use restrictions”*

should include how the public, UCD students and faculty would ensure that UCD administration would enforce land use restrictions and how the UCD students, staff and the public will be protected..

Page 56, under Alternative S-2 Capping, as discussed in previous DSCSOC discussions, any proposed capping of existing waste management units at LEHR must include a virtually failsafe inspection and maintenance of the cap for as long as the wastes in the landfill represent a threat to groundwater quality. The typical RCRA cap is well-recognized, if properly installed, to be a temporary barrier to significant infiltration of moisture into the wastes. In time, however, the low-permeability component of the cap will deteriorate, and the moisture will again generate leachate within the landfill, which will lead to groundwater pollution. This issue must be addressed as part of the remediation in order for the public to support capping of LEHR waste management units as a proper remediation technique.

Page 57, top of the page, third bulleted item mentions using materials from Landfill No. 3 as a foundation for Landfill No. 2/Eastern Trenches cap. Landfill No. 3 was found, after UCD dug a

trench to the top of the wastes to drain its stormwater, to contain highly hazardous chemicals, including PCBs. Is this what UCD wishes to use as a foundation for materials for Landfill No. 2's cap?

Page 57, the sentence after the last bulleted item at the top of the page must include long-term remediation and independent inspection of the closed landfill area.

Page 57, the set of bullets near the bottom of the page, in the sixth bullet, states, "*The existing groundwater monitoring network will probably be sufficient ...*" That statement is not true for any landfilled wastes. The existing groundwater monitoring network is significantly deficient to define the pollution that is occurring now. It will not be accepted as adequate for long-term pollution control from remediated sites.

Page 58, Alternative S-4, with respect to data gaps, one that is not mentioned is the long-term liability that California would incur in disposal of LEHR site wastes offsite. As discussed previously, just because the US EPA and other states will allow certain waste management practices does not mean that these practices are adequate or protective from long-term liability.

Page 58, section 4.2.5 states in the first sentence, "*Soil treatment alternatives are not currently available for the municipal landfill waste and laboratory debris present at the UC Davis areas.*" This statement is not true. They are available and could be used. In the long run they may be cheaper than the expensive, *ad infinitum* monitoring and maintenance of landfill systems' soil areas that eventually will lead to further groundwater pollution.

Page 58, under 4.2.5 Data/Information Gaps - Soil Remedial Alternatives, indicates that there will be need for remediation of soils; yet in other parts of this report there have been claims that at least the surface soils at the site are clean.

Page 58, in this same section, this section needs to be "beefed up" with respect to what soils are of concern, where they are located, constituents of concern, etc.

Page 59, the first paragraph states in the last sentence, "*An interim action to prevent off-site migration of Site constituents was initiated by UC Davis in 1997.*" Again, UCD is presenting distorted information. The IRA was a pilot study. It only addressed some of the constituents of concern. Further, it allowed for pollution to spread into areas that were not polluted before. It has been clear from the beginning that UCD would have to clean up these areas.

In the second paragraph on page 59, mention is made that the focus of the groundwater treatment options report would consider the existing treatment programs. The RPMs and DSCSOC have made it clear from the beginning that there is need to clean up the offsite groundwater that has been polluted by UCD. Thus far UCD has refused to address this issue. They will have to address it before the site can be declared to be under proper remediation.

On page 59, section 4.3.1, the second paragraph refers to, “... *reported detections do not form a consistent pattern.*” As discussed at RPM meetings, this lack of consistent pattern can readily be the result of the inadequate monitoring program design and the groundwater hydrology of the site.

Page 62, under Alternative GW-3 Enhance Current IRA with Land Treatment, UCD has continued its propaganda with respect to the second sentence, “*Treatment for other constituents, particularly TDS and nitrate, was not considered feasible when the original IRA system was implemented (Dames & Moore 1997a).*” It was considered feasible. It was just that UCD refused to undertake the necessary studies. These will have to be done, which will delay the remediation of the groundwaters at the LEHR site.

Page 62, in the second paragraph of Alternative GW-3, the statement in the latter part of this paragraph about ion exchange and reverse osmosis not being feasible, “... *because concentrated waste streams were generated ...*” is, again, propaganda. UCD administration should have considered this when they opted to manage campus wastes at cheaper than real cost. The proper cleanup of the groundwaters at the LEHR site, including removal of TDS, nitrate, etc., will now require extensive, fairly expensive treatment technology. This is all feasible, and is part of proper remediation of the LEHR site. These concentrated waste streams can be hauled off and sent to an offsite treatment unit.

Page 62, under Land Treatment, fourth paragraph, the statement that the irrigation water will convert many of the dissolved salts such as calcium, magnesium, sulfate, etc., into plant material is somewhat of a distortion. The amount of removal of these bulk constituents by conversion into plant material will be minimal compared to their concentrations.

Page 63, under Specific information needed, there is need to evaluate whether there is uptake of pollutants by plants, which can lead to adverse effects on soil biota, organisms and wildlife. This issue has not been adequately addressed thus far in planning the monitoring of the land treatment system.

Page 67, section 5.2 Soil, “> 3 ft bgs” for ecological issues is inadequate to address the translocation of constituents at depths greater than three feet through roots to leaves, flowers, etc.

Page 69, under Landfill Unit No. 3 Soil, while UCD claims that, “*The number of soil samples at all depth intervals is considered to be adequate for both the human health and ecological RAs,*” this statement is not accurate. Considerable additional sampling is needed to properly characterize the site and its threat to public health and the environment.

For all of the statements in this section where UCD claims that the current numbers of samples, sampling locations and concentrations found are adequate to characterize the area, UCD must generate a report, that can be reviewed for its reliability, in support of this claim.

Throughout this section, mention is made of ORNL PRGs for ecological endpoints. Some ORNL PRGs are not technically valid, and will not be acceptable for use at the LEHR site. UCD needs to

specify the ORNL PRGs that it proposes to use in order to avoid wasting a lot of time using inappropriate PRGs.

Page 71, under 5.2.4 DOE Areas, states in the second paragraph that compared to “... *US EPA Region 9 PRGs for human health, all reporting limits were generally found to be acceptable for non-detects.*” That is not true for constituents in surface soils that can be transported to Putah Creek in stormwater runoff, where the concern is the potential for bioaccumulation. PRG values do not consider this pathway. This is one of the significant deficiencies in the US EPA PRG values in protecting human health.

On page 75, there is inadequate information provided to judge the adequacy of the proposed approach for addressing chemical constituents in Putah Creek sediments.

Page 76, with respect to Data Gaps - Groundwater, UCD continues to ignore the fact that it has never defined the full extent of offsite groundwater pollution. This has been an issue that has been discussed a number of times. Each time the RPMs have indicated that this needs to be done. It still needs to be done.

Page 76, section 6.1.3 Data Gaps - Storm Water/Surface Water, there are significant data gaps on surface water and, especially, stormwater runoff that have not been addressed. These have been repeatedly discussed at RPM meetings and in notes provided by DSCSOC. UCD continues to ignore them, hoping that the RPMs will forget about them.

Page 77, section 6.1.5 Modeling, states in the first paragraph that computer simulation and modeling can fill data gaps. Great caution should be exercised with this approach. Mathematical games can be played with any data set to achieve a “simulation.” However, the simulation can readily have no predictive capability and be of little or no value in describing the system. All models have to be properly verified. In the case of the threat that constituents in the soil column represent to groundwater, the verification is through actual monitoring of the groundwater at the point where the soil column materials should reach the groundwater.

Page 77, third paragraph states that, “... *modeled concentrations and model results will be calibrated by measured data.*” This is a tuning process, where, if there are enough equations in the model, the model can be made to fit almost any data set. Great caution will need to be exercised in relying on modeling of environmental transport fate as a means of predicting concentrations that represent an assessment of the hazard that chemicals from a certain location represent to public health and the environment.

Pages 82 and 83 on groundwater evaluation, there is need for additional monitoring of groundwater pollution offsite to define the total extent of the pollution plume offsite from LEHR. There is also need for additional groundwater monitoring upgradient and downgradient from the various waste management units to determine the extent of pollution by the waste management units.

Page 84, last paragraph states, “*If site-related constituents are being transported to Putah Creek ...*” That is not an issue. Chlordane is a site-related constituent, and it has been transported to Putah Creek in stormwater runoff from the LEHR site. Chlordane transported from the LEHR site can potentially bioaccumulate in aquatic life within Putah Creek.

Page 85, first paragraph, second and third lines, it should be “California Toxics Rule (CTR),” not Toxic Criteria. Further, there are no criteria for the NPDES system.

Page 85, under section 6.4.3 Benthic Invertebrate Sampling, sampling of benthic invertebrates next to the LEHR site may not be (in fact, will not likely be) a proper measure of whether LEHR site constituents are bioaccumulating. An understanding of the hydrology of Putah Creek is necessary to determine the most likely location for accumulation in sediments of constituents derived from the LEHR site and, therefore, their potential for bioaccumulation.

Page 85, last paragraph, the discussion of how these data are going to be used is too superficial to make an evaluation of its reliability. There is concern based on past experience that this approach will be of little or no value in properly defining the impacts of LEHR site constituents on the beneficial uses of Putah Creek.

Page 86, fourth paragraph, the statement that, “... *bioavailable is affected by body lipid content,*” is not true. Bioavailability applies to the source. That is not dependent on lipid content. Lipid content is important with respect to bioaccumulation (not bioavailability) of certain types of constituents such as the chlorinated pesticides. It is not important for mercury or heavy metals.

UCD continues to have a problem with its developing of contours of constituents in groundwater. As RPMs have pointed out previously, there is often insufficient data to properly contour concentrations. The reliability of the contours needs to be independently evaluated to be sure they are representative of the information available, with particular reference to developing additional data to fill in gaps where contouring cannot be done reliably.