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February 17, 2015

David Stensby, LEHR Remedial Project Manager
75 Hawthorne Street
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San Francisco, CA 94105

Stensby.David@epa.gov

Dear Mr. Stensby:

Attached please find our comments on the US EPA Region 9 “Proposed Plan Summary and Public Meeting Announcement for the UC, Davis Areas, Volume 1: Soil/Solid Waste and Soil Vapor at the Laboratory for Energy-Related Health Research/Old Campus Landfill Superfund Site,” and the presentations at the Public Meeting held on February 10, 2015.

Attached also is the first page of my summary resume.

If you have any questions about these comments, or my 15 years’ involvement as the TAG technical advisor to DSCSOC on the LEHR site, please contact me.

copy to:

Lane.Jackie@epa.gov (Jackie Lane, Community Involvement Coordinator, US EPA Region 9)

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Comments on
US EPA Region 9 “Proposed Plan Summary and
Public Meeting Announcement for the UC, Davis Areas
Volume 1: Soil/Solid Waste and Soil Vapor at the Laboratory for
Energy-Related Health Research/Old Campus Landfill Superfund Site”¹

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On February 10, 2015 the US EPA Region 9 held a Public Meeting to review the US EPA Region 9’s Proposed Plan Summary for the UC, Davis Areas Volume 1: Soil/Solid Waste and Soil Vapor at the Laboratory for Energy-Related Health Research [LEHR]/Old Campus Landfill Superfund Site. Prior to that meeting the US EPA had distributed a Fact Sheet dated January 2015 on its preferred cleanup alternative for the Proposed Plan. At public meeting the US EPA made available a hard copy of a set of PowerPoint slides titled, “Welcome to the Proposed Plan Public Meeting for the Laboratory for Energy-Related Health Research (LEHR)/Old Campus Landfill (OCL),’ UC Davis, February 10 (2015)” which David Stensby, the US EPA RPM for the LEHR site, read to the audience.

Mr. Stensby stated that the US EPA’s Preferred Remedy for the LEHR landfills is the US EPA “Presumptive Remedy,” i.e., capping the landfills. His PowerPoint slides described the Presumptive Remedy for the landfills as follows:

USEPA Presumptive Remedy for Landfills

- *Risk assessments for landfills may underestimate actual risk, since contaminants and the extent of contamination may not have been fully defined so a presumptive remedy approach was developed by USEPA*
- *The presumptive (assumed) remedy is containment (e.g., a landfill cap)*
- *Landfills do not need to be fully characterized to implement the presumptive remedy*
- *Capping will permanently isolate wastes from human and animal contact*
- *Land Use Controls include deed notices and fences to limit human access and protect the landfill caps*
- *Annual inspections and Five-Year Reviews are required*

¹ [http://yosemite.epa.gov/r9/sfund/r9sfdocw.nsf/3dc283e6c5d6056f88257426007417a2/efced908ea6f070388257dd6006075e6/\\$FILE/51408552.pdf/LEHR%201_15.pdf](http://yosemite.epa.gov/r9/sfund/r9sfdocw.nsf/3dc283e6c5d6056f88257426007417a2/efced908ea6f070388257dd6006075e6/$FILE/51408552.pdf/LEHR%201_15.pdf)

The US EPA Fact Sheet cited above and the PowerPoint slides provided the following information on the “EPA’s Preferred Alternative” for LEHR landfill remediation as follows:

EPA’s Preferred Alternative

- SW-6 – “Volatile Organic Compound (VOC) Hot Spot” Removal, Three On-Site Landfills with Multi-Layer Caps, Institutional Controls, Drainage Controls, and Groundwater Monitoring

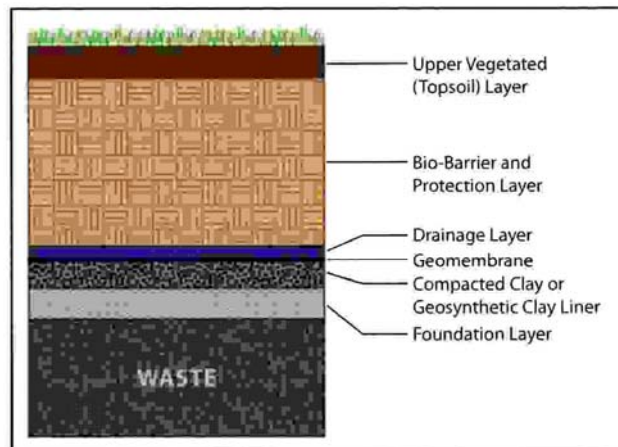


Figure 4: Cross-Sectional View of Typical Multiple-Layer Cap for a CAMU

This “preferred alternative” is basically a US EPA RCRA Subtitle D Landfill Cap, which relies on a plastic-sheeting geomembrane layer to keep water that enters the landfill cover from entering wastes. While the US EPA material claims, “*Capping will permanently isolate wastes from human and animal contact,*” it is well-known that capping cannot be relied upon to “permanently isolate” wastes from human and animal contact. As discussed in our writings on impacts of municipal solid wastes landfills (see the *Landfill Impacts* section website, www.gfredlee.com) the integrity and properties of a plastic sheeting layer in a landfill cap will deteriorate over time; over time their ability to prevent water that enters the top layers of the cap from passing through the plastic sheeting and entering the wastes in the landfill diminishes. If, as water enters the landfilled wastes, the wastes can still generate leachate when contacted by water, the leachate formed will leave the landfill through the bottom and cause groundwater pollution. Therefore, as long as the buried wastes can generate leachate **the US EPA “Preferred Alternative” for the LEHR landfills will only postpone – not prevent – the occurrence of additional groundwater pollution.** These issues are discussed with references to the professional literature in:

Lee, G. F. and Jones-Lee, A., “Flawed Technology of Subtitle D Landfilling of Municipal Solid Waste,” Report of G. Fred Lee & Associates, El Macero, CA, December (2004). Last updated January (2015) www.gfredlee.com/Landfills/SubtitleDFlawedTechnPap.pdf

As I (G. Fred Lee) commented at the LEHR public meeting, the US EPA does not have needed technical information concerning the current leachability of the wastes, active pollution of the groundwater, or ensured long-term reliability of its proposal, to justify causing the tax payers of California (the University of California, Davis (UCD) to spend about \$17 million to cap the LEHR Old Campus Landfills with the proposed Presumptive Remedy cap. As I discussed at the meeting, it has yet to be determined whether or not the existing 40-year-old landfills are still producing leachate that is polluting the LEHR area groundwater. Placement of a reliable cap at this point would only delay further pollution from the landfills if they were still actively generating leachate that could contribute to groundwater pollution. However, if the landfills are no longer generating leachate that could contribute to groundwater pollution, a cap would not serve to delay, much less prevent, further groundwater pollution from the landfills.

I asked if there was recent information that shows that the existing 40-year-old landfills are in fact producing leachate that is polluting groundwaters. Mr. Stensby referred the question to Karla Brasaemle of the TechLaw firm, a technical consultant to the US EPA on the LEHR investigation. Ms Brasaemle did not answer my question; instead she presented an historical review of the landfill pollution of the LEHR site landfills area. While, as I discussed, there is no question that the LEHR landfills have, in the past, polluted LEHR-area groundwater, the key issue to developing technically valid remediation of the landfills is whether the existing landfills are still polluting the area groundwater. As I repeatedly discussed at the LEHR RPM meetings over five years ago while I was the TAG technical advisor to DSCSOC, information is needed on the current pollution, and that the existing groundwater monitoring has not adequately defined the existing pollution by the landfill. Based on the response of Ms Brasaemle and others at the February 10 meeting, there still have been no studies conducted to establish whether, or to what extent, the landfills are still producing significant amounts of leachate that are polluting groundwater.

In her response to my question on the existing groundwater pollution by the landfills Ms Brasaemle also stated that additional groundwater monitoring studies are being conducted that would provide additional information on groundwater pollution at LEHR. Although she did not describe the nature of the monitoring studies additional information is clearly needed on the extent and nature of the existing landfill pollution, in addition to defining the current contribution of the landfills to the groundwater pollution. It is not clear that the additional groundwater pollution studies will provide the needed information to define the role of the existing landfills in contributing to additional groundwater pollution at LEHR.

Additional Deficiencies in the US EPA Presumptive Remedy of Old LEHR Landfills with Subtitle D Landfill Caps and Unreliable Claims

“Capping will permanently isolate wastes from human and animal contact.”

It has been well-known for more than two decades that nationally, the US EPA has failed to correct a number of major deficiencies in the “Presumptive Remedy” for former landfills. Many of those deficiencies are discussed in our “Flawed Technology” review, including the inadequate provisions for proper funding of post-remedy monitoring and maintenance to detect incipient failures of the landfill cap to keep the wastes dry and to repair deteriorated low-permeability plastic-sheeting layers in landfill caps. Also deficient is the recognition of, provision for, the

large amount of money that will be needed to undertake groundwater cleanup caused by additional pollution when the landfill cap no longer keeps the wastes dry. These funding deficiencies are imbedded in Subtitle D that requires only 30 years of postclosure monitoring and cap maintenance. A properly installed landfill cap with plastic sheeting layer can be expected to prevent entrance of water into the wastes only as long as the initial integrity of the cap is maintained. As discussed by Lee and Jones-Lee (2015), there are inescapable difficulties with achieving ideal cap installation. Once installed, even the ideally installed cap will be buried beneath cover materials – top soil and drainage soil layer – and not amenable to thorough visual inspection; the components of the cap that are relied upon for prevention of moisture passage deteriorate with time and with intrusion of outside breaches such as roots, animal burrows, erosion, etc. Since areas of breach and weakness cannot be reliably detected when they first appear, the first evidence of cover breach will be evidence of leachate development and passage through the system. By that time, more widespread deterioration of the cover can be expected to have occurred. In addition, since the cover is not amenable to careful visual inspection, once a breach is detected by leachate generation the source of the breach will not be known. The evidence of cover failure may not appear before the 30 years of mandated postclosure monitoring and maintenance; if the materials buried in the LEHR landfills are in fact still hazardous/deleterious and subject to leaching, the passage of 30 years does not render the materials nonhazardous or non-deleterious. If groundwater quality protection in the LEHR site landfills area is dependent upon the Presumptive Remedy landfill cover, it is to be expected that there will be need in the future for ongoing groundwater monitoring, additional groundwater remediation, and periodic installation of a new cap. While it is not possible to predict when the cover would lose integrity, it could be several decades to a hundred or more years. It has not, however, been determined whether the buried materials still contribute to groundwater pollution, much less that the Presumptive Remedy would be capable of protecting groundwater from further pollution if they do. The public should be informed of this situation at the time that the Presumptive Remedy is proposed rather than be provided highly misleading information and false assurances of the type that the US EPA provided of claiming, as it did at the meeting, *“Capping will permanently isolate wastes from human and animal contact.”*

Recently we were asked to prepare a paper on long-term postclosure issues for municipal solid waste landfills, which was published as,

Jones-Lee, A., and Lee, G. F., “Landfill Post-Closure and Post-Post-Closure Care Funding - Overview of Issues,” *WasteAdvantage Magazine* 5(12):24-26 December (2014).

http://www.gfredlee.com/Landfills/Funding_Issues_WasteAdvantage.pdf

That review discusses the large amounts of long-term funding that is needed to properly maintain a closed landfill so that it does not cause further groundwater pollution.

“Land Use Controls”

Mr. Stensby noted in his PowerPoint slides that part of the proposed plan is: *“Land Use Controls include deed notices and fences to limit human access and protect the landfill caps.”* He did not discuss the significant problems associated with properly implementing adequate “land use controls” to, in fact, adequately and reliably *“limit human access and protect the landfill caps.”* There is legitimate concern about the ability of organization or entities such as a university, governmental agency, or others to properly implement land-use controls at a closed landfills for

the decades to hundreds of years during which the wastes in a Presumptive-Remedy-closed landfill can still generate leachate when contacted by water. The adoption of the Presumptive Remedy proposed by the US EPA must include provisions that will ensure that the land-use control will be effectively carried out for as long as the wastes in the LEHR will be a threat to generate leachate when contact by water, effectively forever.

“Annual inspections and Five-Year Reviews”

One of the statements made by Mr Stensby in his PowerPoint presentation was, *“Annual inspections and Five-Year Reviews are required.”* That statement misleads the public concerning the ability of the LEHR site landfill cap inspections and reviews to identify incipient deficiencies in the cap and preclude the failure of the cap to keep the wastes dry and thereby prevent groundwater pollution. As discussed above, the integrity of the plastic-sheeting liner, a key element in a cap to preventing passage of moisture, is unavailable to inspection since it is buried below a top soil and drainage soil layer and cannot be visually inspected to determine if and where it has deteriorated. As discussed in our writings on landfills, those landfills with landfill leachate collection systems can reveal when plastic sheeting in covers has deteriorated and is no longer effective in preventing water from passing through the liner and generating leachate. However, since the LEHR site landfills do not have leachate collection systems, the failure of the landfill’s plastic sheeting-based cover proposed by the US EPA as the Preferred Alternative will be found by additional groundwater pollution.

An important issue that needs to be considered is that the UCD LEHR landfills are not typical municipal solid waste landfills even though they received some campus solid wastes and other campus wastes. While conventional municipal solid wastes landfill can generate leachate for many decades or longer it is not clear that this applies to the LEHR old landfills. As discussed herein, there is need for current studies to determine whether the existing landfills are still significantly polluting the LEHR site groundwater.

Background and Experience of Dr. Lee

Landfill Impacts on Public Health & Water Quality

Dr. G. Fred Lee earned his bachelor’s degree from San Jose State College in sanitary science/public health in 1955, his Master of Science in Public Health degree from the University of North Carolina in 1957, and his PhD degree in environmental engineering from Harvard University in 1960. For 30 years he served on the graduate civil and environmental engineering/science faculty of several major US universities where he taught and conducted about \$5 million in water quality research, mentored the Masters and PhD degree work of 90 students, published about 500 reports and papers in professional journals, and actively undertook public service activities for regulatory, professional, and lay communities.

In 1989 Dr. Lee retired from his academic career and moved, with his wife, Dr. Anne Jones-Lee, to focus on private consulting and public service; he continues to serve as owner and principal of G. Fred Lee & Associates. Areas of his professional emphasis include domestic water supply water quality focusing on how land use in a water supply watershed impacts water supply water quality; investigation and management of surface and groundwater quality, stormwater runoff, contaminated sediments, land surface activities that impact groundwater quality, and use of reclaimed wastewater; and investigation and management of impacts of solid and hazardous

waste, and hazardous chemicals including MSW and hazardous waste landfills, and Superfund and other hazardous chemical sites. Since entering full-time consulting, Drs. Lee and Jones-Lee have developed another 600 papers and reports on their professional consulting activities. Many of their papers and reports are available as downloadable files from their website, www.gfredlee.com.

Dr. Lee became active in reviewing environmental impacts of landfills in his undergraduate course work in public health at San Jose State College in 1954. Since then he has been involved in the evaluation of public health and water quality impacts of about 80 landfills located throughout the US, several areas of Canada and other countries. This work has included, among other things, aspects of efficacy of engineered containment systems, groundwater monitoring, nature of leachate and impacts on groundwater quality, movement of leachate through saturated and unsaturated aquifers, reclamation of landfill areas, remediation of polluted groundwater, and regulatory aspects of solid and hazardous waste management. He has developed more than 90 professional papers/reports on his landfill investigations, which are available in the *Landfill Impacts* section of their website www.gfredlee.com.

In the 1980s, with research support of the US EPA Groundwater Research Laboratory, Dr. Lee began to investigate the properties of various types of landfill liners, including clay and plastic sheeting liners. He has continued to closely follow the professional literature on factors impacting the long-term integrity of landfill liners. A summary of current information on this issue is included in his “Flawed Technology” review cited above. As discussed in that review, among other aspects that limit efficacy, it is well-recognized that plastic sheeting (HDPE and LDPE and similar materials) undergoes free-radical attack that leads to polymer chain scission and the deterioration of the liner’s ability to prevent water from passing through the liner. This is especially of concern in landfill caps where factors that lead to deterioration of the plastic sheeting are more severe.

The US EPA Presumptive Remedy landfill cap proposed could include a Geosynthetic Clay Liner rather than a Compacted Clay layer. As discussed in our Flawed Technology review (Lee and Jones-Lee, 2015) while Geosynthetic Clay Liners are being allowed to substitute for compacted clay liners it is well-known that the long-term integrity of such layers is less reliable than compacted clay layers.

Activities of DSCSOC and Dr. Lee at LEHR

For 15 years beginning in 1995, Dr. Lee served as technical consultant to the Davis South Campus Oversight Committee (DSCSOC) organized by Julie Roth and supported by a US EPA Technical Assistance Grant (TAG). As technical advisor to DSCSOC, Dr. Lee participated in the LEHR site RPM meetings and frequently made technical contributions to the discussions. He also prepared written comments for the public on the technical aspects, reliability, and adequacy of what was being done and found at the site, etc. As part of the public outreach aspect of his work, Drs. Lee and Jones-Lee developed and maintained the LEHR DSCSOC website [<http://www.gfredlee.com/DSCSOC/dcsoc.htm>] to provide the public with access to the papers and reports that they developed on LEHR site investigations/remediation. (Drs. Lee and Jones-Lee continue to maintain the DSCSOC website even though they have had no support and, until February 10, 2015, have had no contact with anyone associated with the LEHR site for the past

five years.)

For 15 years, Julie Roth, Executive Director for DSCSOC, and Dr. Lee had a good working relationship with the US EPA Community Involvement Coordinators and the DSCSOC TAG was renewed with no difficulty. However, when D. Cooper became the US EPA Community Involvement Coordinator for the LEHR site he created conditions for renewing the TAG that were completely inappropriate and would have been impossible to meet. Despite attempts to overcome these difficulties, it became clear in the spring of 2010 that D. Cooper had no appreciation of how a TAG could and should be active in addressing the public's legitimate interest in reviewing the adequacy of the US EPA LEHR site investigation and remediation, and was creating unnecessary barriers to the renewal of the TAG, Julie was forced to terminate the DSCSOC participation in LEHR site activities; Dr. Lee's involvement in the LEHR site activities ceased. (As discussed on our website [www.gfredlee.com] Dr. Lee has been active as a technical adviser to the public on the adequacy of site investigation/remediation at a number of NPL sites, state hazardous chemical sites, and brownfield sites. Information on those activities, is available at <http://www.gfredlee.com/Tag-Advisor-Work.html>, illustrates our extensive experience and understanding of how to help the public participate in site investigation/remediation.)

Attached is a statement that J. Roth and Dr. Lee prepared in May 2010 explaining the circumstances of the termination of their activities at LEHR. It also includes a list of issues known in May 2010 that will need to be address in further investigation/remediation of the LEHR landfills, including the need to define the current pollution of LEHR groundwaters by the existing landfills. The unfortunate aspect of this situation is that owing to the termination of the TAG, the public in the Davis area has had no representation on the LEHR site investigation/remediation for nearly five years.

Developing Protective Landfills

Most of our more recent work on landfill impacts has been devoted to reviewing the impacts of improperly sited, developed, and/or closed landfills on behalf of governmental agencies, industry/commerce, and public citizen groups, and reviewing the adequacy of landfill regulations for protecting public health and environmental quality for as long as wastes represent a threat. As part of testifying at an Alberta Canada Appeal Board I was ask by a Board member how to develop protective landfills. Out of our experience, we developed guidance on aspects of landfill development that are critical to improving the protection of public health, groundwater and surface water resources, and the interests of those in the sphere of impact of a landfill for as long as the wastes in the landfill are a threat. This guidance is available as,

Lee, G. F., "Developing Protective Landfills," Report of G. Fred Lee & Associates, El Macero, CA, January 19 (2013).

http://www.gfredlee.com/Landfills/Sum_Developing_Protective_Landfills.pdf

As discussed therein, it is possible to develop landfills and to close existing landfills and provide protection of public health, the environment, and those in the vicinity of the landfill. That guidance addresses many of the issues that need to be considered in developing closure of an existing old landfill that is still polluting groundwater. If the LEHR old landfills are no longer producing leachate that is significantly polluting groundwater, then a considerably less-expensive approach to the closure of those landfills, such as the approach that UCD proposed at the LEHR meeting, may well be justified. It is clear, however, that if those landfills are still

contributing to groundwater pollution, the US EPA's Preferred Remedy as presented cannot be relied upon to provide long-term protection of groundwater from further pollution.

If there are questions on these comments please contact G. Fred Lee at gfredlee33@gmail.com.

These comments are unsponsored and were developed as part of our ongoing interest in supporting the public in developing technically valid, cost-effective remediation of the LEHR Superfund site.

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Termination of DSCSOC Activities at the UCD/DOE LEHR Superfund Site  
Prepared by  
Julie Roth, Former Executive Director of DSCSOC and  
G. Fred Lee, PhD, BCEE, F.ASCE, Former TAG Technical Advisor to DSCSOC  
May 14, 2010

In March 2010 Davis South Campus Superfund Oversight Committee (DSCSOC) terminated its representation of the public's interests through the Technical Assistance Grant (TAG) program in the matter of the University of California Davis (UCD) US Department of Energy (DOE) LEHR national Superfund site on the UCD campus. For the past 15 years, DSCSOC served as an active, diligent, and reasoned advocate for the public in its review of the adequacy of the investigation and remediation being undertaken at the LEHR site. During those 15 years, DSCSOC enjoyed a cooperative and supportive relationship with the US EPA sponsors of the TAG. However, in the winter/ spring of 2010, the US EPA Region 9 Community Involvement staff (D. Cooper) imposed conditions on renewal of the Technical Assistance Grant (TAG) that made it impossible for DSCSOC to apply for renewal of support to continue its activities.

As the last TAG contract period funds became exhausted, DSCSOC proposed to the US EPA that the US EPA provide a three-year extension of the contract to cover DSCSOC's continued participation in the LEHR site investigation/remediation process through the signing of the Record of Decision (ROD) for the LEHR site remediation. That requested extension, for \$44,000 over 33 months, was less than that allowed under TAG support, but would have been sufficient to enable DSCSOC to continue to be an active participant in LEHR site Remediation Program Managers' (RPM) meetings, provide comments on issues of concern for providing public health and environmental protection in LEHR site investigation and remediation, review draft and final UCD and DOE reports, and participate in public meetings on site activities. It also would have enabled the continued posting of the results of DSCSOC's activities, and maintenance of, the DSCSOC website [<http://www.gfredlee.com/DSCSOC/DSCSOC.htm>].

With the same level of reasonable estimation of anticipated activities to be conducted under the TAG contract as it had provided with previous proposals for its TAG extension and renewal, and with record of 15 years of performance as a TAG recipient, DSCSOC submitted its proposed approach for a three-year contract renewal proposal in which we proposed to follow the

approach approved by the US EPA in the spring 2009 for renewal of the previous TAG. The US EPA Region 9 Community Involvement officer for the LEHR site responded by rejecting the DSCSOC proposed approach for renewal of the TAG as inadequate, and required that a complete detailed proposal be submitted imposing impossible conditions for the TAG renewal that DSCSOC identify the specific future activities that would be covered under the contract and delineate the amounts of time that would be spent of each of the tentatively scheduled UCD/US EPA/RPM activities. It was clear that such specificity could not be reliably provided since the future RPM activities had not yet been defined in the detail needed for DSCSOC to incorporate this information into its renewal application. Not only was it not possible to reliably provide the detail being newly required by the US EPA, but also incorporating such speculative detail of tasks, scopes of work, and time expenditures in the contract would not have been good-faith representation of the public interests. It could commit DSCSOC to undertake specific activities that could subsequently be revealed to not be cost-effective in representing the public's interests, and also could constrain and prevent DSCSOC from undertaking presently unforeseen work that should be conducted in the interest of the public.

Given the obstruction to what should have been routine contract extension placed by the US EPA Region 9 Community Involvement staff in its specious demands for speculative detail, in the winter of 2010 DSCSOC found that it had no choice but to terminate its activities at LEHR; it was impossible, and indeed would have been irresponsible, to provide the required "details" of the specific future DSCSOC activities.

DSCSOC's decision to terminate its activities at the LEHR Superfund site was also influenced by the significant delays, obstruction, and inattentiveness to the timely processing of the renewal of the previous TAG by the US EPA Region 9 Community Involvement officer. For more than six months the US EPA Region 9 Community Involvement officer for the LEHR site failed to act on repeated requests submitted by DSCSOC for renewal TAG information. During that period DSCSOC was repeatedly informed by the US EPA Community Involvement officer for the LEHR site that the TAG would be renewed but that he had not had time to process the application. While with that assurance DSCSOC continued its efforts in anticipation of forthcoming budget to cover them, after six months of being disregarded by the US EPA Community Involvement officer, DSCSOC notified the US EPA and the RPMs that under those conditions – of having no TAG renewal support and those responsible "not having time" to act on the matter – DSCSOC was terminating its activities at the LEHR Superfund site. Shortly thereafter DSCSOC received notice that the renewal of the TAG support had been awarded. However, the conditions of the renewal required that a considerable part of the renewal funds had to be used to pay for time that DSCSOC had devoted to LEHR activities during the six months that the US EPA Community Involvement officer indicated that the TAG would be renewed but did not act on the renewal. The DSCSOC activities during that period were at the same level as they had been during the previous 14 years of the contract.

As documented in reports on the DSCSOC website, there remain important issues in the development of the remainder of the site investigation, and especially of the remediation, approaches that are to be developed, into which the public should have input. First and

foremost among these issues is the fact that the current US EPA Superfund and state of California hazardous chemical site remediation regulations do not ensure full protection of public health and environmental quality. The current regulations are based on legislation that is often a compromise among competing interests including full protection, cost for investigation and remediation, and political considerations. Discussion of these issues is presented in some of the papers listed below. These issues are not widely discussed by the regulatory community or those being regulated, as they make the expedient “remediation” of sites more cumbersome. DCSOC has brought these issues to the public’s understanding, and could have continued to do so with continued TAG support. Other issues in which the public potentially affected by the LEHR site should have the opportunity to be involved with sound technical review and input include:

- reviewing the ongoing site characterization program with particular reference to identifying and monitoring for unknown/unrecognized pollutants at the LEHR site,
- reviewing the development of a groundwater remediation plan and its implementation for chloroform-polluted groundwater,
- reviewing the development of a groundwater remediation plan and its implementation for chromium-polluted groundwater,
- reviewing the development of a remediation plan for contaminated soil to ensure that soils and site remediation do not lead to increased stormwater pollution of Putah Creek by LEHR site stormwater runoff,
- reviewing the development of an investigation plan for characterization of the UCD landfills as a source of pollution,
- reviewing the development of a remediation plan for the three UCD landfills to provide a high degree of reliability for stopping current groundwater pollution and for maintaining the integrity of the landfill containment system for as long as the wastes in the landfills are a threat,
- reviewing the development of a stormwater runoff control plan to control mercury derived from CERCLA areas of the site with particular emphasis on developing fully functional BMPs to control mercury in the stormwater runoff to meet CVRWQCB water quality standards/objectives in the stormwater discharge to Putah Creek,
- reviewing and reporting on the adequacy of groundwater and surface water monitoring programs and reports including providing recommendations on how the monitoring should be conducted to more adequately define the pollution of the LEHR site groundwater and surface water.

Based on the experience of the past 15 years, there are issues within each of the areas named, as well as others that come to light, in which it is important for the public to have access to independent, high-quality technical input on their behalf – input of the level and type that DCSOC has been providing – as the development of the UCD ROD for the site progresses. Further, there will be need for this level of public input after the signing of the ROD, during the ROD implementation phase, to ensure to the extent possible with the level of TAG support provided that public health and environmental protection is achieved at the LEHR site. Without this level of independent review, the problems of the type that DCSOC has detected and worked to remedy at the LEHR site could continue to occur at the UCD/DOE LEHR national

Superfund site on the UCD campus. Some of the DSCSOC contributions to improving LEHR site investigation and remediation include:

- causing ATSDR/US EPA to develop a program to investigate the impact of LEHR site stormwater runoff on Putah Creek fish, and the public health implications of the consumption of fish from impacted areas of Putah Creek,
- causing the Central Valley Regional Water Quality Control Board to list Putah Creek as a Clean Water Act Section 303(d) “impaired” waterbody due to excessive mercury concentrations in some Putah Creek fish,
- highlighting and discussing repeated failures of the RPM to require that UCD contractors use adequate analytical methods for determination of mercury in LEHR site stormwater runoff that violates the NPDES permit for mercury discharges to Putah Creek,
- discussing the need for, and failure of, those who manage lands next to Putah Creek, such as UCD and the city of Davis Department of Parks, to post signs along Putah Creek as suggested by ATSDR, CA Department of Health and OEHHA to warn those who eat some types of fish from the creek that the concentrations of mercury in the fish can be a threat to human health,
- discussing inadequacies in the monitoring of Putah Creek to evaluate the impact of pollutants derived from the LEHR site in the UCD Campus wastewater discharges to the creek that violate the CVRWQCB discharge permit for the wastewater discharges to the creek,
- defining the role of LEHR site stormwater runoff mercury in excessive bioaccumulation of mercury of Putah Creek fish that causes a human health threat to those who use Putah Creek fish as a source of food,
- better defining the constituents of concern (CEC) in the LEHR site groundwater,
- discussing problems caused by developing a stormwater runoff channel through the top of LEHR site landfill number 3 that exposed PCBs and other UCD wastes to stormwater runoff in the channel that is discharged to Putah Creek,
- discussing inadequacies in stormwater runoff monitoring from LEHR and recommending a modified monitoring approach based on US EPA guidance to more reliably assess the impact of LEHR site stormwater runoff-associated polluted on Putah Creek water quality,
- discussing the error made by the RPMs in developing a LEHR site assessment for ecological impacts through the use of co-occurrence-based sediment quality criteria,
- discussing errors made by ATSDR in conducting a LEHR site public health assessment,
- discussing errors made year after year in UCD contractors’ annual monitoring reports, and the failure of the RPMs to require correction of those errors prior to acceptance of the reports by the RPMs and the placement of these reports in public libraries for public review,
- discussing the unreliable reporting of the efficacy of the UCD and DOE BMPs installed at the LEHR site in preventing discharges of mercury above the CVRWQCB discharge limit and deficiencies in the BMPs installed by UCD to control mercury in stormwater runoff from the LEHR site,
- discussing inadequacies in groundwater monitoring and modeling at the LEHR site,
- discussing the failure of UCD to develop a LEHR site landfill groundwater monitoring

program that will adequately define the pollution of groundwaters by each of the UCD landfills,

- discussing inadequacies in the design and operation of the UCD groundwater extraction and treatment system that led to the failure of this system that caused it to have to be abandoned due to plugging of the aquifer near the recharge well,
- causing the investigation of the old UCD wastewater treatment plant pollution of groundwater,
- discussing ramifications of the approach followed by the UCD administration for managing campus wastes by burial in shallow pits (called landfills) that were known since the 1950s to led to groundwater pollution. While that approach saved UCD some waste disposal costs at the time of disposal, it is now costing the CA taxpayers many tens of millions of dollars in LEHR site remediation,
- discussing that the UCD administration has in the past and continues today to approach campus waste management by doing the least amount that the regulatory agency staff will allow, rather taking a proactive approach to protect public health and the environment in management of UCD campus wastes,
- developing professional papers that have been published in national journals on inadequate superfund site investigations and remediation that were based in part on the situation at the LEHR site,
- making presentations at US EPA national TAG meetings on improving the reliability of Superfund site investigations,
- developing and maintaining the DSCSOC website.

The mishandling of the DSCSOC TAG renewal by the US EPA Region 9 Community Involvement staff should be reviewed by US EPA management in Region 9 and Washington, D.C. headquarters so policies and procedures can be developed to prevent these types of problems from occurring in the future at other Superfund sites. This mismanagement has cost the people affected by and concerned about the investigation and remediation of the LEHR Superfund site their voice in the process. Unless these problems are remedied, the public will stand to be denied the informed independent technical review and voice in the Superfund process that the TAG was established to provide.

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