

May 24, 2007

Phil Wong
U.S. Department of Energy
Livermore Environmental Programs
Lawrence Livermore National Laboratory
P.O. Box 808,
Livermore, California 94551

Lindee Berg
Livermore Site Project Leader
Environmental Restoration Division
Lawrence Livermore National Laboratory
Livermore, CA 94551

By email and postal mail

Subject: Comments on the Draft Third Five-Year Review for Lawrence Livermore National Laboratory Main Site Superfund Cleanup

Dear Phil and Lindee:

Attached are the comments on of Tri-Valley CAREs (TVC) that address the Draft Third Five-Year Review that was prepared in January 2007 for the Lawrence Livermore National Laboratory (LLNL) Main Site Superfund cleanup. These comments are divided into General and Specific Comments.

Sincerely,

Marylia Kelley,
Tri-Valley CAREs

Peter Strauss,
PM Strauss and Assoc.

cc:

Kathy Setian US EPA
Jacinto Soto, DTSC
Agnes Farres, RWQCB
Claire Holtzapple, DOE
Scott Wilson, LLNL

General Comments of Tri-Valley CAREs on the Draft 5-Year Review for the Lawrence Livermore National Laboratory Main Site Superfund Cleanup

1. In 1997 we wrote the following comment:
"... [I]t is important to acknowledge that the cleanup of the groundwater contamination has by all counts proceeded at a quicker pace than was expected when the Record of Decision (ROD) for the Lawrence Livermore National Laboratory (LLNL) was signed in 1992. Tri-Valley CAREs wants to take this opportunity to congratulate LLNL on the work that it has accomplished in the field."

Tri-Valley CAREs wishes to repeat this comment. We want to express our concern, however, that the Department of Energy's (DOE) National Nuclear Security Administration (NNSA) may have other priorities. The transfer of authority for cleanup from DOE Office of Environmental Management (EM) to NNSA may limit the ability of Livermore Lab to keep up the pace of cleanup in the coming years.

2. Notwithstanding our comment #1 regarding the pace of cleanup so far, a major issue that has been overlooked in the Draft Five-Year Review is the potential for vapor intrusion of volatile organic compounds (VOCs) into buildings. We recommend that LLNL undertake a study to assess the potential for vapor intrusion. This should be done before the Five-Year Review is finalized. We provide some detail below as part of our Comment #2.

The US EPA, the California State Dept. of Toxic Substances Control (DTSC) and numerous other agencies have drafted guidance on vapor intrusion assessments. Essentially, both EPA and DTSC adhere to a common criterion for determining whether the potential for vapor intrusion occurs in a building. That is, if the distance from the groundwater plume is 100 feet laterally. ("For existing or future buildings not to be considered a candidate for vapor intrusion, the buildings must be greater than 100 feet away laterally from subsurface contamination -- USEPA, 2002a").

At LLNL, hundreds of buildings are built over and around the contaminant plume(s) with VOCs. Moreover, the depth to groundwater ranges between 40 feet and 120 feet, so by any reasonable standard, the potential for vapor intrusion into multiple buildings exists.

This potential is exacerbated at LLNL by the network of utility lines, pipelines, sewer lines, and roadways, which can all serve as preferential pathways for vapors to enter buildings. DTSC Interim Guidance states that "Buildings with preferential pathways should be evaluated for vapor intrusion even if they are further than 100 feet from the contamination".

DTSC also makes a point that if the contamination has been in the subsurface for a long time, 100 feet from the plume may have to be adjusted so that it takes account of the increased likelihood that vapors have diffused beyond 100 feet. At LLNL, some of the VOCs have been in soil and groundwater for up to 5 decades or longer.

We note that a first step in a vapor intrusion study is to develop a conceptual site model (CSM). The purpose of a CSM is to provide a conceptual understanding of the potential for exposure to hazardous contaminants at a site based on the sources of contamination, the release mechanisms, the transport media, the exposure pathways, and the potential receptors.

DTSC recommends that the following items be included in a CSM for the vapor intrusion pathway:

- Primary Sources of Contamination.
- Primary Release Mechanism.
- Secondary Sources of Contamination.
- Contaminant Transport Mechanisms.
- Environmental Exposure Media and Exposure Routes, including preferential contaminant migration pathways associated with the buildings, such as foundation crack, voids, utility ports, pipes, elevator shafts, sumps, and drain holes.
- Potential Receptors. List all the current and future receptors that could potentially contact contaminated indoor air.

The CSM should be followed up by soil gas analysis and indoor air testing.

It is important for DOE and LLNL to understand that the state of the art for addressing vapor intrusion has changed since the LLNL Main Site Superfund Baseline Public Health Assessment was developed (mentioned in Section 4.6 of the Draft Five-Year Review). And, therefore, the statement in the Draft Five-Year Review's Section 6 that there "have been no changes in location-, chemical- or action-specific requirements; exposure pathways, toxicity, ... or changes in the risk assessment methodologies that would invalidate the remedy selection" is not entirely correct. In fact, it is out of date. Vapor intrusion was not fully analyzed or considered at that time. It must be done now.

It is Tri-Valley CAREs' recommendation that inhalation pathways of VOCs, including TCE, have to be given far greater attention, and deserve analysis (vapor intrusion) before the Five-Year Review is finalized and a final protectiveness statement is "signed off" on by the regulatory authorities.

3. The greatest uncertainty with toxicological changes for the Site is associated with TCE. This should be addressed in Section 6 of the Five-Year Review.

In August 2001, U.S. EPA's Office of Research and Development (ORD) released the draft TCE Health Risk Assessment. We note that EPA has made a similar comment in its comment on this Five-Year Review. We would add that the draft TCE Health Risk Assessment indicated that TCE could pose a higher risk through both inhalation and ingestion than previously considered. Moreover, in July 2006, the National Academy of Sciences completed additional review of this issue and confirmed the principle conclusions in the 2001 Study.

In addition, LLNL should note that the allowable drinking water standard for TCE may be made more stringent in the future (e.g., we have heard presentations that suggest that the new drinking water standard for TCE will be 1 ppb).

We recommend that this not only be addressed in this and the next Five-Year Review, but that LLNL begin to plan for the application of a new and stricter standard for TCE. This is in keeping with the "Precautionary Principle," which Tri-Valley CAREs supports -- and which (for example) the community has embraced as part of the "community acceptance criteria" for the LLNL Site 300 Superfund cleanup.

4. Tri-Valley CAREs remains concerned that the budget for environmental restoration may effect the progress on cleanup. While the Draft Five-Year Review Table 5 indicates that funding has been relatively constant over the last five years (not including adjustments for inflation), there is no analysis in the document regarding the effects of limited funding on environmental restoration. We recommend that there be a statement in the Final Five-Year Review concerning how the budget has affected cleanup, and how future decreases in the budget may affect cleanup. We also recommend that this new section include an analysis of how increased future funding may accelerate or enhance cleanup, given the current state of knowledge.

5. In a related comment, Tri-Valley CAREs finds that the recommendations in the summary of the draft Five-Year Review, including an evaluation of source area clean-up technologies, while well thought out, do not currently have a commitment to fund them. We note that the fourth recommendation from the previous Five-year Review (Continue to characterize the source areas and further evaluate source area remediation technologies) is repeated in this Five-Year Review. While we clearly support characterizing and investigating contaminants and remediation technologies, it is not clear to us how much of that recommendation was funded and supported by DOE over the past five years. This should be clarified in the final document.

6. We also recommend that a Remediation Process Optimization Study be added to the list. The study may incorporate some of the actions already listed in the draft Five-Year Review, as well as information developed from Tri-Valley CAREs' Comment #4, above. Additionally, a recent survey of the Livermore remediation project by an EPA contractor found that techniques such as six-phase soil heating have not been evaluated for use in the LLNL Main Site Superfund cleanup. The EPA contractor recommendations could similarly be included in an optimization study. Finally, the draft optimization study should be subject to regulator and public comment before its inclusion in the Final Five-Year Review.

7. Tri-Valley CAREs thinks that the document presents a good snapshot of the status of cleanup, and partial details on how the remedial strategy has evolved. However, we see little detailed examination of the future rate of cleanup. Tri-Valley CAREs has commented on this omission in past Five-Year Reviews.

This essential information -- which would allow the community to judge the performance of LLNL cleanup as it unfolds -- continues to be missing. We recommend the Final Five-Year Review contain a description of what LLNL expects to achieve during the next 5-year period, as well long-term expectations about the cleanup (e.g., length of time for cleanup, mass reduction). We request that LLNL include this information, as summarized below:

Performance milestones (e.g., given x-funding level, using xyz model, this site will have decreased contaminant concentration by y-parts per billion, and decreased mass by z kilograms) must be keyed into the regular five-year cleanup reviews.

When we first made this comment in 1992, LLNL's position at that time was that only a level of detail commensurate with broad assumptions was required. Tri-Valley CAREs repeated this comment during the first and second Five-Year Review, with the caveat that these performance milestones be stated as goals. We said that we would not view these as legal commitments, but as LLNL's best projection of what it expects to accomplish in the future.

We again comment that this information should be included. We note that Section 5.3.1 make an effort to historically show how much mass was removed during the last five years and explains differences in the projections of total mass from the prior five year review period. Performance milestones that project from the present into the future are a way that these "backward glances" can be put into perspective and judged.

Specific Comments of Tri-Valley CAREs on the Draft 5-Year Review for the Lawrence Livermore National Laboratory Main Site Superfund Cleanup

1. Regarding Section 4.2, please provide more detail and explanation regarding the Preliminary Close Out Report. It is not clear to stakeholders what this entails and what significance it has.
2. Regarding Section 5.3.1., while we understand that significant progress has been made in removing mass, it appears that total mass estimation was made for groundwater, not for the VOC mass absorbed to sediments. We recommend that LLNL estimate mass absorbed to sediments and include it in this section.
3. Regarding Section 5.3.2.1, Hydrostratigraphic Unit (HSU) 1B, please explain in more detail increasing concentration trends at the TFC Hotspot area and the 10-fold increase in TCE concentrations at piezometer SIP-191-002. Explanations are needed to ensure that the remedy is protective -- and that it is as aggressive as possible. Are the increased concentrations due to rebound, unknown sources, or some other reason?
4. In a similar comment, regarding Section 5.3.2.1, HSU 2, please explain increases in concentrations of TCE along the western margin in more detail. (Has the capture network failed; what is going to be done to correct the situation?)
5. In a related comment, regarding Section 5.3.2.2, HSU 3B, please explain the appearance of VOCs in Well-618. The statement, as it reads, suggests that capture network of TFE-W is not adequate. A similar explanation is also needed for the TFE area (HSU 4) where TCE concentrations have increased to the west.

6. Also regarding Section 5.3.2.2, HSU 5, the increase in groundwater elevations that may have activated source areas in the vadose zone needs further explanation. Has there been a general trend in increased groundwater elevations throughout all HSUs or only HSU 5? If it is true for other HSUs, what can be done to correct this situation? (See also General Comment #6 on the optimization study). The suggestion that this phenomenon may have activated previously sorbed contaminants in the vadose zone supports our recommendation for additional estimation of mass sorbed to sediments.

7. With regard to the Draft Third Five-Year Review Section 7 (Status of recommendations from the Second Five-Year Review), please be more specific about the Explanation of Significant Difference that is being proposed. Tri-Valley CAREs is opposed to the decision to discharge untreated water from the stagnation zone to the sanitary sewer for “final treatment” by another party, without a full description of the capability of the Livermore Water Reclamation Plant to appropriately treat the contaminated water. Furthermore, if the “treatability study” is merely pumping contaminated groundwater and diluting and dumping it, we are also opposed and believe that it is a violation of the ROD and the NPDES conditions incorporated therein, as well as general environmental principles concerning treatment of contaminated water. We are concerned that the City of Livermore cannot treat this discharged water adequately, particularly given recent concerns about increased toxicity of some VOCs. We are aware that this one-year treatability study began in January 2007, but are unfamiliar with the details. We request a briefing on the "treatability study" at our scheduled meeting on May 31, 2007 -- and we may then have additional comments and recommendations.

8. Figure 7 seems to indicate that HSU 2 is expanding and not being fully captured. It indicates that some areas that were previously without VOCs are now contaminated. Please provide an explanation and propose actions taken to correct this situation.

9. We recommend inserting a Table after Table 6 that shows the annual and cumulative mass removal.

10. As we requested in 2002, is it possible to correlate the estimated mass of VOCs by HSU and by area of influence of the Treatment Facilities? If so, please provide this information. This would help determining priorities by treatment unit.

Again, we thank you for this opportunity to comment on the Draft Five-Year Review.