

Tri-Valley CAREs

Communities Against a Radioactive Environment

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June 10, 2016

Claire Holtzapple
Federal Project Director
Livermore Environmental Programs
LLNL, PO Box 808, L-574
Livermore, CA 94551

Re: Tri-Valley CAREs Review and Comment on the Draft Work Plan for Characterization of Surface Soil in the Building 851 Firing Table Area at the Lawrence Livermore National Laboratory (LLNL) Site 300 (May 2016)

Dear Claire:

Thank you for this opportunity to review and comment on this draft document.

Background:

Tri-Valley CAREs recently received the May 20, 2016 summary of the Livermore Lab Site 300 Remedial Project Managers' (RPM) meeting held on March 17, 2016, which disclosed that during the summer of 2014, LLNL groundwater samplers, while performing that task, observed visible particles of depleted uranium in surface soils around the currently-operating Building-851 open-air firing table.

Between June and August 2014, LLNL located depleted uranium particles up to 200 feet away from the firing table. Twenty-seven pieces of depleted uranium (Uranium-238) were found exceeding 3-inches in diameter. The total weight of the visible pieces was about 80 pounds. The depleted uranium was associated with open-air experiments at B-851.

In January 2016, DOE/LLNL agreed to present the scope for a Characterization Work Plan for further investigation/characterization of limited surface soils and to receive regulatory agency feedback at the above-noted March 17, 2016 RPM meeting. The proposed schedule included the submittal by DOE/LLNL of a Draft Work Plan at the RPM meeting with formal agency comments due June 14, 2016.

Subsequently, DOE/LLNL agreed to provide Tri-Valley CAREs with a copy of the Draft Work Plan, which the Livermore Field Office provided by email, with a request that the group's comments be submitted by June 10, 2016. Tri-Valley CAREs also requested information regarding - and a map showing - historical "control burn" patterns around B-851. We received an

email with a detailed controlled burn map specified as “latest” from the Livermore Field Office today (June 10, 2016).

Tri-Valley CAREs appreciates the opportunity to review the Draft Work Plan and controlled burn map and offers the following comments and recommendations to guide the further investigation and characterization of Uranium-238 in surface soils around the B-851 firing table.

Tri-Valley CAREs’ Comments and Recommendations:

1. The Draft Work Plan proposes collecting surface soil samples from 40 locations within the immediate firing table area and a 700’ radius around the B-851 firing table. Table 1, page 2, states that the reasons for selecting the 700’ radius were: (1) Depleted uranium was *observed* at distances *at least 400’* from the firing table, and (2) A U.S. Fish and Wildlife Services (USFWS) biological assessment and opinion would be necessary if an area greater than 700’ was selected. Tri-Valley CAREs does not believe that a 700’ radius is sufficient to characterize the uranium in surface soils around the B-851 firing table. We note in particular:

a. Uranium-238 was found in soils in elevated concentrations around the B-812 firing table at much greater distances.

b. According to the Draft Work Plan Table 1, page 6, the difference between Uranium-238 deposition in soil at the B-812 firing table and its likely deposition at B-851 is due to the “steep, uphill topography” at B-812. It is not clear to us that an unobstructed deposition opportunity at B-851 would lead to a lesser radius of deposition of finely divided uranium particles. Offhand, the opposite seems more likely, i.e. that the steep hillside at B-812 might inhibit a greater areal deposition.

c. DOE/LLNL noted more than a year ago that consultation with the USFWS would take about a year. Yet, DOE/LLNL did not undertake such a consultation. It seems illogical to accept the lack of a consultation when the opportunity existed a year ago as a reason *now* to limit soil characterization to 700’. Tri-Valley CAREs recommends that the consultation be undertaken (and would have recommended that a year ago, had we been consulted then).

d. Tri-Valley CAREs notes that avoidance of an agency consultation is not a scientifically valid reason to choose 700’ as a soil investigation radius. Neither is the observance of uranium at least 400’ from the B-851 firing table. And, the B-812 firing table experience suggests a greater radius is needed as well.

Therefore, Tri-Valley CAREs recommends that DOE/LLNL amend the Draft Work Plan to include plans for a greater radial area of investigation around B-851, and include a commensurate increase in the number of soil samples.

2. The Draft Work Plan states in several places (see, for example, pages 13 and 16) that the results of the sampling effort would be presented to regulators at a future RPM meeting and that “the path forward, and any necessary documentation, will be discussed with the regulators at that time” (from page 16). We note in particular:

a. Neither Tri-Valley CAREs nor any other community representatives have historically been present at RPM meetings.

b. The summary notes from the RPM meetings from the LLNL summer 2014 discovery of 80 pounds of depleted uranium in surface soils at B-851 until May 2016 did not disclose the scope and significance of the “find.” Indeed, the prior meetings’ notes merely stated in one or two sentences under “site-wide” or “other” that, for example: “Development of a work plan for an investigation of depleted uranium at the Building 851 Firing Table continues” (from the November 20, 2015 RPM meeting notes). Given that some depleted uranium had been found in soils and groundwater around the B-851 firing table during the Remedial Investigation/Feasibility Study part of the Superfund process prior to 1999, a single sentence on page 11 of otherwise detailed notes made the characterization appear deceptively routine.

Therefore, Tri-Valley CAREs recommends a more formal mechanism for including the results in the Superfund document stream be specified and included in the Work Plan.

3. The Draft Work Plan states that detonations at the B-851 firing table took place from 1962 to present (page 1). It further states that the experiments were conducted most frequently, about two [or] three times a week, from the late 1960s through the late 1970s and that “the majority of the depleted uranium was used during that time.” Page 1 also notes that the most recent uranium shot at B-851 was conducted in 2007. We note:

a. The B-851 firing table and surrounding area was characterized in the 1990s as the Site-Wide Remedial Investigation was done in 1994 and the Remedial Investigation/Feasibility Study was completed in 1999.

b. The 2014 discovery of more than 80 pounds of depleted uranium in “particles” up to 3 inches in diameter was made by LLNL groundwater samplers who were, as we understand it, not specifically looking for uranium in soils. That fact seems at odds with the conclusion that the majority of uranium was used at B-851 prior to the late 1970s. This is important because, if the RI/FS process truly did miss that much uranium lying around visible on the ground in the 1990s, then a much larger investigation of Contaminants of Concern at other Operable Units may be required.

Therefore, Tri-Valley CAREs recommends that a more thorough understanding of how and when the contamination occurred be undertaken. Only then can we know with certainty what follow up to the RI/FS may be needed for contaminants at other OUs.

4. The Draft Work Plan states that natural surface water in the B-851 firing table area is the result of surface runoff from precipitation. It further notes a northwest-southeast trending drainage channel in the area (ephemeral stream).

a. We note the possibility of waterborne carriage of depleted uranium, especially finely divided particles.

b. In this regard, we also note research by the University of Nebraska-Lincoln (study released 8/17/2015) showing that the presence of nitrate in water mobilizes uranium. An oft-used RI/FS map of contaminants at Site 300 shows high levels of nitrates to the north, south and east of the B-851 firing table although not specifically at the firing table.

Therefore, Tri-Valley CAREs recommends that the Work Plan include analysis of the possibility of waterborne spread of uranium. Further, the Work Plan should note any prior investigation of

nitrate in soil at the B-851 firing table so that its presence can be ruled out or properly characterized.

5. The Draft and subsequent Final Work Plan to investigate the areal extent and concentration of depleted uranium in surface soils at the B-851 firing table is also part of a larger question of risk. Controlled burning is capable of distributing finely divided particles of uranium spatially – so it factors into the sampling plan - and it is a contributing factor to the question of risk. We note:

a. Whether the area around B-851 has been subject to controlled burning over the years is relevant to the scope and radius of the investigation needed in the Draft Work Plan – as well as to subsequent determinations of risk to human and ecological receptors.

b. Today Tri-Valley CAREs received the following email and a detailed map (attached):

“Marylia, Per your request, attached is the latest control (prescribed) burn map for the Site 300; the control burn plots in the area around B-851 are: Area ID #15 and Area ID #16. Except for minor changes, the map has not significantly changed in the past several years. Also, the map is just a guide and a plan; for example,

1. The area immediately around B-851 may not be burned (i.e., pavement or dirt); also, there is usually a firebreak at least 50 feet wide (or more) around explosives operating and storage facilities.

2. The control burn is dependent on the seasonal weather conditions; on recent years the grass growth may be so short that there is minimal burning.

3. Finally, for most areas of the control burn, the burn duration of the grass (per square foot) is fairly fast: occurs within seconds or less.

Rick Roses LFO Fire Protection SME, LFO Explosives Safety SME”

c. The map shows that Area ID #15 has 224.9 acres included as part of the controlled burn area in the burn plan, and that Area ID #16 has 644 acres included as part of the controlled burn plan.

d. The pink hatch marks showing the specific areas to be burned cover the B-851 firing table area. Therefore, the minimum zones specified above (not burning asphalt or dirt, which makes sense in any event, and including a firebreak of 50’ or more around explosives operating and storage facilities) appears to be bounding in this case.

e. Controlled burning at Site 300 is a regular event. We recommend that any significant wildfires around B-851 be analyzed as well.

In sum, Tri-Valley CAREs recommends that a more detailed analysis of historical controlled burns in the B-851 area be undertaken, along with any wildfires in the area if they occurred, and that the results be incorporated in and inform the Work Plan.

6. The Draft Work Plan quality assurance and control procedures appear to be dated to 1999 (see, for example, page 10). We recognize that it is possible that best practices may not have changed over the ensuing years, but recommend an examination of this question be undertaken and an update be included if warranted.

7. The Draft Work Plan should include a description of the Reporting Limit (RL) that includes a comparison with the detection limit. That said, in general the Draft Work Plan was clearly laid out and the acronym section was very useful as were the figures and tables.

Please don’t hesitate to contact me if you have any questions or want clarification regarding any of our comments or recommendations.

Tri-Valley CAREs looks forward to DOE/LLNL's response to our comments. Again, thank you for this opportunity.

Sincerely,

Marylia Kelley
Executive Director
Tri-Valley CAREs

Attached:

1. Scan of map of uranium in groundwater at the B-851 firing table circa 1998 (See Tri-Valley CAREs comment #2)
2. Scan of map of contaminants showing areas north, south and east of B-851 with elevated concentrations of nitrates circa 1998 (See Tri-Valley CAREs comment #4)
3. Map of controlled burn areas at Site 300, noted as the "latest" but undated. (See Tri-Valley CAREs comment #5)