

North Carolina
Department of Environment and Natural Resources

Division of Waste Management

Michael F. Easley, Governor
William G. Ross Jr., Secretary
Dexter R. Matthews, Director



June 23, 2003

Commander, Atlantic Division
Naval Facilities Engineering Command
1510 Gilbert Street (Building N-26)
Norfolk, Virginia 23511-2699

Attention: Mr. Kirk Stevens, PE
Navy Technical Representative
Code EV23KS

RE: Comments on Operable Unit 16, Site 93 Draft Final Technical Evaluation
Soil and Groundwater
Camp Lejeune, NC6170022580
Jacksonville, Onslow County, North Carolina

Dear Mr. Stevens:

The NC Superfund Section has received and reviewed the Draft Final Technology Evaluation for Operable Unit (OU) #16 Site 93 for the Camp Lejeune, MCB Superfund Site. The following comments are provided for your consideration.

General Comments

1. The Site 93 Technical Evaluation seems to provide sufficient detail about the Site Geology, Hydrogeology, and plume data to complete a reasonable evaluation of various technologies that could be effective at treating the chlorinated solvent plume at the Site.

Specific Comments

2. Hydrogen Sparging is identified as being delivered into the aquifer using horizontal wells in item one on page E-1 and is associated with horizontal wells in other areas of the Evaluation. However, the cost estimate and other sections of the Evaluation provide cost and data for vertical wells. Please clarify or make appropriate changes as required throughout the Evaluation for Hydrogen Sparging.
3. Sodium lactate is priced at \$0.78 per pound. What is the price for other lactates such as ethyl lactate?

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4. The fourth sentence on page E-2 should read “. . . pneumatic fracturing would be used for the injection at the four points around 93-MW08.” Rather than 93-MW06.
5. The second sentence of the 3rd paragraph on page 2-3 states that “Overall, elevations are higher in the northern portion of the site, . . .” This should state that overall elevation are higher in the western portion of the site . . .”
6. The first paragraph on page 2-4 discusses background levels of metals being consistently high. As noted in previous comment letters from the NC Superfund Section, metals will require continued evaluation at least on a 5-Year-Review basis until they meet the required 2 standard deviations of the mean background concentration for all areas or sites of the Camp Lejeune, MCB. The State would prefer that this documentation be provided in the future for each site rather than making vague generalized statements about background metals concentrations. The data should be available for comparison with the background study. This is the simplest resolution to this problem.
7. The Third paragraph on page 2-4 states that the “Following compounds exceeded 2L Standards:” Vinyl Chloride (VC) should be included in this list.
8. The State agrees with the recommended approach to evaluate the injection and pneumatic fracturing for determining the most effective delivery system for the substrate as discussed on page 4-7. I would recommend follow-up treatments using ethyl lactate or sodium lactate at 93-MW02, 93-MW05 and IS24 at the west side of the plume. Both injection and pneumatic fracturing should be used in this application as well. In this manner we will effectively hit all the hot spots of the plume and reduce the plume to low levels that can be monitored until they meet the standards. This will minimize migration of the solvents vertically into the Castle Hayne aquifer and horizontally to Edwards Creek as shown by the BIOCHLOR model.

In terms of using vegetable oil rather than lactates I would disagree with the logic in this evaluation. The last sentence on page 4-7 and throughout this evaluation, it is emphasized that vegetable oil only requires one injection since it is less dispersive and stays in the aquifer longer. If the purpose of the work was to develop a cutoff wall for the solvents then I might agree. However, the purpose is to actually treat and eliminate the hot spots of the plume. As the Ferone and Palmer study shows (see farone@appliedpowerconcepts.com or search the internet for ‘Comparison of Reducing Agents’) and many experts will affirm, the 2 substrates can accomplish the same goal but at different rates.

The lactates as you signify in this TE will quickly disperse in the aquifer and reduce the contaminant mass to a lower level. The vegetable oils will disperse more slowly and will require longer monitoring to achieve the same low levels achieved by the lactates. It is likely that the level attained by the lactates in a few months may or may not be achieved

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by the vegetable oil in a longer period of time and it is likely that if one substrate requires a second application that the other will also. If possible I think it would be worth the effort to evaluate both vegetable oils and lactates at the site 93 area to evaluate which one achieves the best results. The lactates are slightly more expensive but if it achieves the same levels (or better) as the vegetable oils in less time, there may be a savings from lactates due to reduction in monitoring costs. Lactates may actually have a greater radius of influence that would require less injection points to treat a specific area of concern.

If you have any questions or comments, please contact me, at (919) 733-2801, extension 341 or email randy.mcelveen@ncmail.net

Sincerely,



Randy McElveen
Environmental Engineer
NC Superfund Section

Cc: Dave Lown, NC Superfund Section
Rick Raines, EMD/IR
Gena Townsend, USEPA