



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

**REGION 4
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June 21, 2010

NAVFAC Atlantic
Attn: David Cleland
NAVFAC Midlant Environmental RPM, Camp Lejeune
Marine Corps North Carolina IPT
6506 Hampton Blvd
Norfolk, VA 23508-1273

SUBJ: MCB Camp Lejeune
Draft Five –Year Review

Dear Mr. Cleland:

The Environmental Protection Agency (EPA) has partially completed its review of the above subject document, dated February 2010. Initial comments are enclosed. Once the comments have been addressed and corrections made, the document will be submitted to EPA Headquarters (HQs) for final review. In preparation for EPA HQs review, please submit the corrected version in an electronic format. Once all of the comments have been received and addressed, the document can then be prepared in its final form.

If there are any questions, I can be reached at (404) 562-8538.

Sincerely,
Gena
Townsend
Gena D. Townsend
Senior Project Manager

Digitally signed by Gena Townsend
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Reason: I have reviewed this document
Date: 2010.06.21 15:00:36 -0400

Enclosure

cc: Randy McElven, NCDENR
Robert Lowder, MCB Camp Lejeune

General Comments

- 1. Change in Cleanup Standards** – As discussed in Section 4.2.1 of the EPA Comprehensive Five-Year Review Guidance, cleanup levels that are based upon chemical-specific ARARs such as Safe Drinking Water Act Maximum Contaminant Levels (MCLs) or State groundwater standards should be evaluated to determine if the standards have changed in light of making a remedy protectiveness determination. At several of the Camp Lejeune sites [e.g., #78, #41, #74, #2) with groundwater contamination where restoration to drinking water levels is one of the remedial action objectives, the cleanup level for arsenic listed on tables is based upon the old MCL of 50ug/L. The MCL for arsenic was revised by EPA to a concentration of 10ug/L in January 2001 to better address potential unacceptable risks to drinking water users. Based upon new human health risk information, the 50ug/L concentration is considered to be outside of EPA generally acceptable carcinogenic risk range of 10^{-4} and 10^{-6} used for CERCLA response actions. Consequently, any response actions that have met the 50 ug/L, or have not reached the cleanup level, should be further evaluated to determine if the selected response action can meet the new MCL of 10ug/L. This evaluation may require additional groundwater monitoring (such as part of site long-term monitoring program) for sites that have achieved the cleanup objectives in the ROD. Alternatively, the Navy may be able to demonstrate based upon background data or other information that the arsenic is naturally occurring and is not a site-related contaminant.

As a result of this regulatory change, the Navy should revise several sections of the Five- Year Review Report to better reflect whether the remedy remains protective or additional actions are necessary such as increased monitoring, or possibly a change to the remedy. [See Comment #2 below] Also, an ESD or ROD Amendment to modify cleanup level for arsenic to 10ug/L may be necessary. In particular, the language provided in the Technical Assessment Section on the question of “*Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?*” should be revised since it is not accurate with respect to arsenic. The old cleanup level for arsenic is not valid and arguably not protective of human health related to consumptive uses of groundwater. Also, the tables listing cleanup levels for each site should include a footnote for the arsenic (or any other contaminant) which was based upon MCL (or other promulgated standard) that has changed to be more stringent since the ROD was issued. The Recommendations Section should, in light of the new MCL, indicate that additional groundwater monitoring to determine arsenic concentrations will be conducted, or alternatively that additional studies are underway to determine if the arsenic is naturally occurring and not site-related.

- 2. Remedy Protectiveness** – As discussed in General Comment #1 above, any groundwater remedy which listed a cleanup level for arsenic of 50ug/L is arguably not protective since that concentration is considered to be outside the risk range typically used by EPA for CERCLA response actions. The 10 ug/L

3 Draft Five Year Review – Camp Lejeune 2010
US EPA Comments

concentration equates to an estimated carcinogenic risk of 10^{-4} .¹ Although LUCs as part of the remedy may be preventing unacceptable exposures to the contaminated groundwater in the short-term, restoration to a beneficial use of a drinking water supply would require that the new MCL be met. The Navy should revise the Statement of Protectiveness Section of the Report to better reflect whether the remedy remains protective or whether additional actions are necessary such as increased monitoring, or change in remedial treatment technology, etc.. [See EPA Comprehensive Five-Year Review Guidance Exhibit 4-5: Examples of Protectiveness Determinations (see specific comment #7 for portion of exhibit)] Additionally, the Navy should indicate that an ESD or ROD Amendment will be necessary to update the remedy with new cleanup level for arsenic based upon the revised MCL of 10ug/L. Depending on the existing remedial action for the groundwater, it is possible that a change in the remedy may be necessary to address the arsenic contamination. The Navy may want to review EPA guidance documents *Monitored Natural Attenuation for Inorganics in Ground Water – Volumes I and II* (EPA/600/R-07/139 and 140, October 2007) to determine whether MNA is a viable remedial approach for the arsenic contamination in groundwater.

3. **Land Use Controls** – Throughout the Report there are statements that LUCs were implemented and monitored but there is not a listing or description of the actual LUCs. A description of the remedy should include a description of what LUCs are being used such as fences, signs, groundwater use restrictions in base master plan, no dig permit, recordation of notice of contamination, etc. Also, if the LUCs were not identified in the ROD as a part of the remedy but later determined to be necessary by the Navy (OUs 8 & 13), it should be clearly stated that the LUCs are being implemented for land use planning purposes only and are not a requirement of a CERCLA action. However, after further review of the specific RODs in question, the No Further Action Remedy included implementing land use controls. Although there were no risk identified for human health and the environment under the current land use scenarios; there were limited risk identified for the future residential scenarios. These are known waste disposal areas and are deemed not suitable for non-industrial or groundwater usage which signifies a potential unknown human health risk. This also holds true for OU 11-Site 80, the removal action was completed to the industrial use standards. Accordingly, the remedy description should be updated to include the list of specific LUCs utilized at the particular site. The EPA expects that an ESD is required for those Sites that have LUCs but that are not officially included as a component of the remedy. A recommendation should be included in the five year review that states an ESD will be initiated to include the LUCs as part of the remedies (see specific comments 14, 16 & 19).

Specific Comments

1. Five Year Review Summary Form – Remove check from “Remediation Status: – Complete” or only include the OUs where the remediation goals have been achieved and have been officially closed as per CERCLA. Completed remedial

¹ See 66 Federal Register 6976 at p. 7008, January 22, 2001.

4 Draft Five Year Review – Camp Lejeune 2010
US EPA Comments

actions are those actions where construction is complete and **cleanup levels** have been achieved.

2. Section 2 Process, Table 2-1 – “Summary of ARARs and TBCs” - Remove table from document. The five-year review, should evaluate the effects of **significant changes** in standards and assumptions that were used at the time of remedy selection. The change in a promulgated standard or “to be considered” (TBC) that will impact the protectiveness of the remedy should only be discussed as it applies to a particular operable unit.
3. Section 3, OU-1, page 3-6, 1st paragraph – Add and reference data trend figures from the 2008 Long Term Monitoring Report for Site 78 (B-20 to B-22). Although the figures are depicting 78 North, it can be also stated that similar trends are occurring in the 78 South area.
4. Section 3, OU-1, “3.7 Statement of Protectiveness”, page 3-8 – Change protectiveness statement to read: “The remedies for **soil** at OU1 are protective of human health and the environment because exposure pathways that could result in unacceptable risk are being controlled and LUCs preventing exposure are in place. The remedies for **groundwater** at OU1 are protective of human health and the environment in the short term because LUCs are in place and therefore there is no current or potential exposure. However, in order for the remedy to be protective in the long term the treatment plants and systems should be optimized to increase their efficiencies in removing contaminated mass.”
5. Section 4, OU-2, 4.4.3 Progress since Last Five-Year Review, page 4-5 – Add and reference data trend figures for the 2008 LTM report, figures B-34 to B-37.
6. Section 4, OU-2, “4.7 Statement of Protectiveness”, page 4-7 - Change protectiveness statement to read: “The remedies for **soil** at OU2 are protective of human health and the environment because exposure pathways that could result in unacceptable risk are being controlled and LUCs preventing exposure are in place. The remedies for **groundwater** at OU2 are protective of human health and the environment in the short term because LUCs are in place and therefore there is no current or potential exposure. However, in order for the remedy to be protective in the long term, supplemental site investigations should be completed that will identify the potential additional source areas that are contributing to the groundwater contamination. This information will then be used to optimize the treatment plants and systems to increase their efficiencies in removing contaminated mass.”
7. Section 4, OU-2, Table 4-1, Cleanup Levels for OU2 – Verify that the COCs identified as cleanup levels achieved remain protective of human health and the environment based on the newly revised promulgated standards and TBCs. See inserted table from EPA’s 2001 Five Year Review Guidance. The Recommendations Section should, in light of the new MCL, indicate that additional groundwater monitoring to determine arsenic concentrations will be conducted, or alternatively that additional studies are underway to determine if the arsenic is naturally occurring and not site-related.

Exhibit 4-5: Examples of Protectiveness Determinations

If the remedy involves...	and you observe in your five-year review that...	then your answers to questions A, B and C should be...	and...
groundwater pump-and-treat for 20 years; ICs restricting well drilling; RAO: groundwater restoration to drinking water standards	<ul style="list-style-type: none"> • ICs are in place; • new Federal standard for one of the COCs; • the standard (ARAR) in the original ROD is still protective, within EPA's risk range; • no current or potential exposure to groundwater; and • existing remedy can remediate groundwater to the new standard, 	<p>A - Yes B - No C - No</p>	<p>the remedy is considered protective because cleanup levels are still within the risk range and there is no current or potential exposure. However, if the new MCL is not met, the groundwater will not meet the RAO of restoration to drinking water standards. Recommend consideration of follow-up actions to address the new standard and the issue of not achieving the RAO. However, in this case, the remedy can meet the new standard, and therefore, another option is to recommend that the new standard be adopted as the new cleanup level, which would then allow you to achieve the original RAOs. Adopting a new cleanup level would have to be done through the remedy decision process with a ROD Amendment or Explanation of Significant Differences (ESD).</p>

Question A – Is the remedy functioning as intended by the decision documents?

Question B – Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

Question C – Has any other information come to light that could call into question the protectiveness of the remedy?

8. Section 5, OU-4, “Table 5-1, Cleanup Levels for OU4” – see comment #7. However, if the revised standards are within EPA’s risk range and/or the actual concentrations detected were below the revised standards, then the following statement can be used: *“the remedy is considered protective because the cleanup levels are still within EPA’s risk range and/or the detected concentrations were below the revised standards and there is no current or potential exposure”*. It could also be mentioned that a specific contaminant was not site related and is naturally occurring.
9. Section 6, OU-5, “6.2 – Site Chronology”, page 6-1 – include in the chronology the “non-significant change memo” dated July 1997.
10. Section 6, OU-5, “6.4 – Remedial Actions”, page 6-2 – include a paragraph explaining the “non-significant change memo” dated July 1997.
11. Section 6, OU-5, “6.6 Issues, Recommendations and Follow-up Actions” - Include a recommendation to add a correction to the “Remedial Action Close Out Report” to include and explain the “non-significant change memo” dated July 1997.
12. Section 6, OU-5, “Table 6-1 – Cleanup Levels for OU 5 (Site 2)” – Add a footnote that corrects the COC list as per the “non-significant change memo” dated July 1997.
13. Section 8, OU-7, (Site 28) – The description of the use restrictions is useful but the actual LUCs that are being utilized as part of the remedy must be provided

since there is recommendation to revise the use restrictions. [See General Comment #3 above]

14. Section 9, OU - 8, (Site 16) – The application of LUCs for an old dump area to restrict intrusive activities is a responsible approach to land management at the base which EPA supports. If the LUCs were not selected in the ROD but later determined to be necessary by the Navy, it should be clearly stated that the LUCs are being implemented for land use planning purposes only and are not a requirement of a CERCLA action. However, as stated in General Comment #3, the No Further Action determination included implementing land use controls to prohibit the use of groundwater and prohibit non-industrial land use. Therefore, EPA expects that an ESD be initiated to include and describe the LUCs as part of the remedy that are necessary to prevent unacceptable exposures. Also, EPA is requesting that the description of the remedial actions be updated to be clear that ICs were contemplated as part of the NFA decision.
15. Section 10, OU-10, “10.7 Statement of Protectiveness”, page 10-5 – change “will be protective” to “is expected to be protected”.
16. Section 11, OU - 11, (Site 80) – The application of LUCs after the NFA decision in the ROD requires that the remedy be amended through issuance of an ESD or ROD Amendment. Updating a Five-Year Review Report based upon recommendations is not sufficient and the Administrative Record File should include agency decisions that affect the remedy. Update the write-up throughout this Section to accurately reflect the status of the site and include EPA recommendation to issue an ESD to select LUCs necessary to prevent unacceptable exposures.
17. Section 12, OU-12, “12.4.3 Progress since Last Five-Year Review” page 12-3 – this section should include a summary of the information as it is presented in the “2008 Annual Long Term Monitoring Report”. It appears, from the data that this site is very close to meeting the remediation goals. Add information to this section that discusses the nearness of achieving the remediation goals and include figures and/or tables from the above report to support the discussion.
18. Section 12, OU-12, 12.7 Statement of Protectiveness – Add this statement to the beginning of this section: “*The remedy at OU 12 is expected to be protective upon completion of human health and the environment, and in the interim, exposure pathways that could result in unacceptable risks are being controlled.*”
19. Section 13, OU-13, 13.7 Statement of Protectiveness, page 13-3 – The Selected Remedy for OU13, as per the ROD signed May 1997, is “No Further Action with Institutional Controls”. By today’s standards, the Selected Remedy would be titled “Institutional Controls”. As stated in General Comment #3, EPA expects that an ESD be initiated to rename the selected remedy as a Land Use Control Remedy and include a description of what LUCs are being used to prevent unacceptable exposures. The protectiveness statement should read “the remedy is considered protective in the short-term, because there is no evidence that there is current exposure. However, in order for the remedy to remain protective in the

long-term, ICs restricting should be implemented. Also, EPA is requesting that the description of the remedial actions be updated to be clear that ICs were contemplated as part of the NFA decision.

20. Section 13, OU-13, Table 13-1, Cleanup Levels for OU16 (Site 93) – The information presented in this table does not agree with the text. It is apparent that this table has been inserted in this section by error. Remove this table from this section.
21. Section 14, OU-14, 14.4 Description of Remedial Actions, third dash, page 14-3 – The text states: “Prohibit non-industrial land use within the extent of the former soil removal” should this be former dump area? The information that is presented does not identify a soil removal action. Verify and correct as appropriate.
22. Section 14, OU-14, Statement of Protectiveness, page 14-5 – Insert the following statement: *“The remedy at OU 14 is protective of human health and the environment, because exposure pathways that could result in unacceptable risks are being controlled.”*
23. Section 15, OU-15, Table 15-1, Cleanup Levels for OU21 (Site 73) - Table has been inserted in this section by error. A Record of Decision has not been signed for OU-15; therefore there are no COCs for this site. Remove the table from this section.
24. Section 16, OU-16, 16.3 Site Characterization, third dash – Typo - remove the word chlorinated from this sentence.
25. Section 16, OU-16, 16.6 Issues, Recommendation and Follow-up Actions, last sentence, page 16-7 – The NTCRA has been completed for Site 89. Correct the text to present the current status. Same also applies to fourth bullet in “16.7”.
26. Section 16, OU-16, 16.7 Statement of Protectiveness, Site 93, third sentence, page 16-9 - Change sentence to read “...Site 93 are protective of human health and the environment in the short term because ...” However, the remedy will be protective in the long term once the remediation goals have been achieved by the natural attenuation process.
27. Section 17, OU-19, 17.4.3 Remedy Operation and Maintenance, second sentence, Page 17-3 - confusing sentence, verify and correct.
28. Section 17, OU-19, figure 17-1 – Site boundary is incorrect on this figure. Verify and correct as appropriate.
29. Section 18, OU-21, 18.7 Statement of Protectiveness, page 18-5 - change “will be protective” to “is expected to be protected upon completion”.
30. Appendix C, Community Interview Questionnaires – Include the completed questionnaires.

31. Table ES-1 Five Year Review Summary Table – correct the protectiveness statements as per the above comments. Also, include tables that list the issues, recommendations and follow-up actions along with the date of anticipated completion. See examples tables below:

Exhibit 4-3: Example Table for Listing Issues

Issues	Affects Protectiveness (Y/N)	
	Current	Future

Exhibit 4-4: Example Table for Listing Recommendations and Follow-up Actions

Recommendations/ Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Follow-up Actions: Affects Protectiveness (Y/N)	
				Current	Future