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LETTER AND U S EPA REGION V CORRECTED COMMENTS ON FIVE YEAR REVIEW
NIROP FRIDLEY MN (PUBLIC DOCUMENT)
7/10/2008
U S EPA REGION V

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

Rec'd
7/18/08

REPLY TO THE ATTENTION OF: SR-6J

July 10, 2008

Howard Hickey
201 Decatur Ave.
Building 1A
Great Lakes, IL 60088-2801

Subject: Corrected Comments on the Five-Year Review for the Naval Industrial Reserve Ordnance Plant (NIROP), Fridley, Minnesota.

Dear Mr. Hickey:

Enclosed is a hard copy of a Corrected Comments on the Five Year Review for NIROP. An electronic copy was sent our initially with a hard copy following. An error was made as there was a difference between the copies, that being the Protectiveness Statement. An e-mail was sent out to correct the situation, but to ensure that there is no confusion, the correct Protectiveness Statement reads:

> **Section 10.0, Protectiveness Statement, Page 10-1:** The Protectiveness Statement will have to be revised after the concerns raised by the EPA are adequately addressed. This statement, as it stands, doesn't reflect the concerns we have commented on in this Five-Year Review.

I apologize for any misunderstanding this may have caused. If you have any questions, please feel free to contact me at 312 886-6540 or e-mail me at smith.thomasl@epa.gov.

Sincerely,

Thomas L. Smith

Thomas L. Smith, PG
Remedial Project Manager

cc: David N. Douglas, MPCA
Mark Sladic, Tetra Tech NUS, Inc
Laura Pugh, Techlaw
Richard Kuhlthau. Techlaw
Hans Neve, MPCA

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REVIEW OF THE THIRD FIVE-YEAR REVIEW REPORT
DATED APRIL 2008

NAVAL INDUSTRIAL RESERVE ORDNANCE PLANT
FRIDLEY, MINNESOTA

GENERAL COMMENTS

1. The Five-Year Review Guidance suggests that an Executive Summery (page E-15) as well as the Five-Year Review Summery Form (E-17) should be in the report. These would be placed ahead of Section 1, the Introduction.

2. The Five-Year Review Guidance suggests the use of a Five-Year Review Checklist (Page D-3). This checklist may be completed and attached to the Five-Year Review Report. The checklist can be modified to the needs of NIROP. The complete checklist is found in Appendix D.

3. This Five-Year Review incorporates Operable Unit 2 (OU2) and Operable Unit 3 (OU3) in the scope of this review. However, through out the document, OU 2 and OU 3 have not been adequately addressed in any detail. Very little detail has been included in this report. The reason given is that the ROD for OU 2 and OU 3 was signed less than five years ago. Both the NCP, 40 CFR 300.430(f) (4) (ii) and CERCLA ,121 c, require reviews every five years where "remedial actions where hazardous substances, pollutants, or contaminants will remain on site above levels that allow for unlimited use and unrestricted exposure." When incorporating OUs into a five-year review when a five-year review is not due, those OUs are addressed in the same scrutiny as OU undergoing the five-year review. All the OUs will be on the same schedule for five-year reviews. The manner in which OU2 and OU3 are addressed in this five-year review, nine years will have passed before they are first reviewed.

4. When more than one OU is addressed in a five year review, each OU has to be reviewed separately. They can not be added to discussions of any other OU. Each will have, for example, a separate technical assessments and their own protectiveness statement.

5. The Five-Year Review does not adequately describe the operation and maintenance issues that occurred during the five year period. Table 6-1 identifies the periods when individual and multiple pumps were not operating, but the Five-Year Review does not summarize the periods when one or more pumps were operating far below their designed pumping rates, sometimes for extended periods. Likewise, Section 8.0 provides only a brief description of the types of problems experienced with the extraction system, but

does not include discussion of the significant pumping reductions caused by those maintenance issues. While it is acknowledged that the Navy has done much to begin to rectify these problems, the periods of reduced pumping that occurred during the five-year period should be documented. Revise the Five-Year Review, as necessary, to address these issues.

6. The Records of Decision (RODs) for OU2 and OU3 were both signed in September 2003, at the very end of the last five-year review period. According to Section 4.1, neither of these documents were addressed "in significant detail" as part of the second five-year review. However, the third Five-Year Review also provides only a limited discussion of the OU2 and OU3 RODs. For instance, the land use control performance objectives are listed, but there is no discussion of how they have been implemented or enforced over the last five years. Revise the Five-Year Review to provide additional discussion of the compliance activities and current status of OU2 and OU3.

7. The Five-Year Review Guidance (Page E-6) also indicates the section on Progress since last Five-Year Review (Section 5 in the Five-Year Review) should include the status of any prior issues. The Second Five-Year review noted electrical device failures, biological iron fouling, and capture issues (such as potential assignment of monitoring wells to different aquifer zones). Some of these issues have been completed while others continue to be issues. Revise the Five-Year Review to include a summary of the issues identified in the Second Five-Year Review and their current status.

8. The Five-Year Review Guidance (Page E-7) indicates the Technical Assessment section (Section 7 of the Five-Year Review) should include a technical assessment summary that briefly summarizes the findings and conclusions related to questions A, B, and C. Revise the Five-Year Review to include a technical assessment summary.

9. The Five-Year Review Guidance (Page E-8) indicates that the Recommendations and Follow-up Actions section (Section 9 in the Five-Year Review) should note the parties responsible for actions, note the agency with oversight authority, and provide a schedule for completion of actions related to resolution of issues. Revise the Five-Year Review to include these items listed in the Five-Year Guidance.

SPECIFIC COMMENTS

1. **Section 1.0, Introduction, Page 1-2:** The Five-Year Review indicates "that the cutoff for data and information for this Five-Year Review is January 10, 2008." The Five-Year Review further indicates that "because the AMR for 2007 analytical and operational data had not been drafted and reviewed, the evaluation of 2006 groundwater extraction and treatment system data is included in this report." In spite of this statement, figures from the 2007 AMR depicting trichloroethylene concentrations in groundwater and groundwater capture zones are presented in Attachment 1. This apparent inconsistency

should be resolved, and the Five-Year Review should adopt a consistent approach regarding which data sets will be presented in the Review.

When considering which data sets, figures, etc. to present in the Five-Year Review, it is recommended that figures depicting the 2007 potentiometric surface not be used for purposes of demonstrating capture. The 2007 water-level data were collected during a period when a number of the extraction wells were not operational and the potentiometric surfaces generated using these data are not representative of the hydraulic influence of the extraction system under normal operating conditions.

2. **Section 3.0, Background, Page 3-3:** When discussing the results of the vegetable oil pilot study, the Five-Year Review states that "although effective by several metrics, migration and distribution of substrate beyond the injection point did not occur." This statement does not appear to adequately reflect the results of the pilot study. The Five-Year Review should be revised to accurately reflect the results of the vegetable oil pilot study (see Specific Comment 9).

3. **Section 4-2, OU1 Remedial Actions, Page 4-1:** The Five-Year Review states that "contaminated groundwater remains downgradient of the NIROP facility in [Anoka County Park] ACP. Although no time frame for dissipation was provided in the ROD, to date it is not apparent that natural dissipation of this groundwater is occurring as predicted in the ROD." This statement appears to ignore the significant improvements in groundwater quality in ACP after the 1995 and 2001 upgrades to the extraction system. The Five-Year Review should be revised to more clearly reflect the current understanding regarding the origin of contamination observed in ACP (see Specific Comment 6)

4. **Section 4.2.4, OU1 Operations and Maintenance, Page 4-7:** The second to last paragraph of this section describes the disruptions to pumping at the extraction system periodically throughout the five-year period. The last sentence states, "There are no indications that these failures have impaired the long-term performance of the system or resulted in any increased risk to human health or the environment." This statement appears to be somewhat questionable based on the stable, variable, or increasing contaminant trends for some of the monitoring wells downgradient of the extraction system. While it is understood that limited periods of downtime or reduced pumping rates are to be expected with any system, the previous five years have included reduced pumping rates and/or shutdown of several wells for extended periods. Revise the Five-Year Review to acknowledge the potential for these extraction rate reductions to limit capture over such periods.

5. **Section 5.0, Progress since the Last Five-Year Review, Page 5-3:** When recounting the response to the recommendations in the Second Five-Year Review, the current Five-Year Review does not indicate that the U.S. Geological Survey (USGS) Capture Evaluation has been completed and finalized. The Five-Year Review should indicate that the USGS Capture Zone Analysis, including the additional hydraulic testing

identified in the Second Five-Year Review, has been completed. The Five-Year Review should also provide a brief summary of the conclusions of the USGS report. This summary should acknowledge the uncertainty noted in the USGS report regarding the delineation of the capture zones in the shallow and intermediate zones.

6. **Section 5.0, Progress Since the Last Five-Year Review, Page 5-3:** When recounting the response to the recommendations in the Second Five-Year Review, the current Five-Year Review does not indicate that the nests of monitoring wells (monitoring well clusters MS-54, MS-55 and MS-56) and associated geologic borings were intended to help with delineating extent of the intermediate zone and with the evaluation of capture in the shallow and intermediate flow zones. These additional borings and well installations were included in the recommendations of the Second Five-Year Review and should be documented in the current Five-Year Review. The current Five-Year Review should verify that this additional work has been completed and that groundwater elevation and quality data have been collected at these new wells. The current Five-Year Review should also briefly summarize the results of groundwater elevation and quality monitoring at these wells. In addition, the Five-Year Review should discuss the impact of these new geologic and hydrologic data on the delineation of the capture zone in the shallow and intermediate flow zones.

7. **Section 5.0, Progress Since the Last Five-Year Review, Page 5-3:** Although the most recent modifications to the extraction system were completed in 2001 and documented in the Second Five-Year Review, the impact of these system upgrades on groundwater quality in ACP were not readily apparent at the time the Second Five-Year Review was written. Significant declines in groundwater contamination have been observed since the 2001 system upgrades. There appears to be a consensus that these system upgrades are responsible for much of the improvement in groundwater quality observed in ACP since 2001. Based on these results, there also appears to be a consensus that much of the contamination previously observed in ACP is not due to residual contamination in ACP but due to contaminated groundwater bypassing the extraction system. The current Five-Year Review should be revised to document and discuss the impact of the 2001 upgrades to the extraction system, including recent improvements in groundwater quality observed in ACP. The impact of these results on the site conceptual model should also be discussed briefly.

8. **Section 5.0, Progress since the Last Five-Year Review, Page 5-3:** The fifth bullet on this page states that operational issues with the groundwater extraction system have been resolved. Since some operational issues are still being resolved, it is recommended that the wording be changed from "since resolved" to indicate that many of the issues have been resolved.

9. **Section 5.0, Progress Since the Last Five-Year Review, Pages 5-3 through 5-4:** When discussing the results and conclusions of the Final Report for A Field Application to Enhance In-Situ Bioremediation of Chlorinated Solvents via Vegetable Oil Injection, dated November 2006, (Vegetable Oil Pilot Project Report), the Five-Year Review

indicates that "the addition of vegetable oil was marginally successful in accelerating biologically mediated reductive dechlorination of chlorinated VOCs in discrete areas." The Five-Year Review further adds that "based on the results documented in the report, the Navy concurs with report conclusion that the performance of the vegetable oil pilot test was not adequate to warrant consideration of broader-scope application." These statements do not appear to adequately represent the results and conclusions reported in the Vegetable Oil Pilot Project Report. The results of the pilot study indicate that the addition of the organic substrate was successful in creating conditions conducive to reductive dechlorination of chlorinated volatile organic compounds. The Vegetable Oil Pilot Project Report (page 5-1) acknowledged that the induced "geochemical changes (were) neither spatially uniform nor temporally consistent." Nevertheless, significant reductions in chlorinated solvent concentrations were observed in the pilot test area. As a result, the Vegetable Oil Pilot Project Report (page 5-7) concludes that "the vegetable oil pilot test has been successful in enhancing the destruction of chlorinated solvent mass in the subsurface and has thus been successful in reducing the overall toxicity of the groundwater plume." The authors of the Vegetable Oil Pilot Project Report (page 5-7) recommended that "organic substrate addition in general and vegetable oil injection specifically be considered as a future remedial option at this site." The authors of the report have also recommended that the application of this technology be limited to "defined contaminant hot spots or source areas instead of attempting to treat large areas." The report also acknowledges that the decision to implement the vegetable oil technology in ACP can only be made within the context of other factors, such as the decreasing levels of contamination recently observed in ACP due presumably to recent upgrades in the extraction system. It is recommended that the Five-Year Report be revised to more accurately reflect the results and conclusion of the Vegetable Oil Pilot Project Report.

10. **Section 7.0, Technical Assessment, Question A: Is the remedy functioning as intended by the decisions documents?, OU1, Page 7-1:** The discussion of the extent of containment of contaminated groundwater achieved by the extraction system is not complete. Five-Year Review results should discuss the findings of the now finalized USGS Capture Evaluation as wells as the boring, hydraulic, and groundwater quality data now available from the MS-54, 55 and 56 monitoring well clusters. This discussion should acknowledge the uncertainties regarding the delineation of capture in the shallow and intermediate zone identified in the USGS Capture Evaluation Report. Similarly, the concerns raised by water elevation and water quality data from the MS-54, MS-55 and MS-56 monitoring wells should be acknowledged and discussed.

11. **Section 7.0, Technical Assessment, Question A: Is the remedy functioning as intended by the decisions documents?, OU1, Pages 7-1 and 7-2:** The Five-Year Review states that "current operating procedures maintain system effectiveness." It also acknowledges that "temporary shutdown of individual wells or of the complete well system has been necessary," but further indicates that "to date, there is not evidence that downtime for system repairs places protectiveness at risk." These statements do not reflect the extent and potential impact of the recent system and individual well

shutdowns. Should the operational efficiency of the extraction system remain as has occurred in recent years, the protectiveness of the remedy will clearly be at risk. The Five-Year Review should be revised to more accurately characterize the extent of the current problems with operation of the extraction system and the potential impact of these problems on the protectiveness of the remedy.

Specifically, the last paragraph on OU1 notes the temporary shutdowns of individual wells and the system, but does not acknowledge the reduced pumping and recurring maintenance problems that have impacted the system's effectiveness during the five-year period. Revise the Five-Year Review to more clearly document when the remedy was not functioning as intended over the previous five years. Also see General Comment 1.

Similarly, this section notes the expenditures made to improve the system but does not completely document future planning efforts underway to improve operation and maintenance procedures. The Navy has committed to the development of an operation and maintenance plan that will allow for a more proactive approach to maintaining the system and responding to recurring biological fouling issues. Specifically, resolution of contractual issues is proposed to allow for more timely performance of maintenance activities. At a minimum, this should be reflected in Section 9.0, Recommendations and Follow-Up Actions. It may also be appropriate to add similar language to the Section 7.0, under the operation and maintenance discussion for Question A.

12. **Section 7.0, Technical Assessment, Question A: Is the remedy functioning as intended by the decisions documents?, OU2 and OU3, Page 7-3:** The description of the OU2 and OU3 remedies is quite brief. While the protectiveness is likely adequate for these two OUs, the current documentation does not clearly support that determination. At a minimum, additional discussion should be included in Sections 4 or 5 to support the response to Question A in Section 7.0. Revise the Five-Year Review to incorporate a more comprehensive description of the OU2 and OU3 institutional and land use controls and measures in place to enforce them (see General Comment 2).

13. **Section 7.0, Technical Assessment, Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of remedy selection still valid?, Remedial Action Objectives – All OUs, Page 7-5:** The Five-Year Review states that "the overall RAOs for NIROP have not changed in the past five years; however, groundwater RAOs have been refined by application of a series of DQOs. These DQOs can be found in the September 2005 RAWP." The Five-Year Review should be revised to include a more complete discussion that specifically indicates how the RAOs have been modified by the data quality objectives (DQOs). Relevant DQOs should be provided as part of this discussion.

14. **Section 7.0, Technical Assessment, Question C: Has any other information come to light that could call into question the protectiveness of the remedy?, Page 7-5:** This section begins with a discussion of sampling planned by the MPCA to determine concentrations of 1,4-dioxane and perfluorochemicals in groundwater at the NIROP

facility. This discussion may be more appropriate in the previous section (last paragraph under Question B) at the point in the text where the Five-Year Review indicates that "no new contaminants or contaminant sources have been identified."

15. **Section 7.0, Technical Assessment, Question C: Has any other information come to light that could call into question the protectiveness of the remedy?, Page 7-5:** The discussion of the Question C includes a brief discussion of the USGS capture analysis and current concerns regarding the adequacy of capture. While a similar discussion was included under Question C in the previous Five-Year Review, it may be more appropriate to include such a discussion only under Question A (Is the remedy functioning as intended by the decision documents?). As indicated in EPA's Comprehensive Five-Year Review Guidance (page 4-9), "It is expected that most considerations related to protectiveness of the remedy will be covered by Questions A and B," and Question C is generally reserved for special concerns that were not originally considered in selection of the remedy (e.g., unexpected inundation by a flood, land use changes considered by local officials). It would also be less confusing and duplicative if all of the discussion in this chapter regarding the adequacy of capture were consolidated under one Question. The Navy should consider moving the discussion regarding the USGS report and current concerns regarding the adequacy of capture to Question A (see Specific Comment 10).

16. **Section 8.0, Issues, Page 8-1:** The concerns regarding the adequacy of the capture currently achieved by the extraction system when operating fully are not adequately represented in the presentation of current issues presented in this section. The discussion of capture should be revised to fully reflect the current concerns regarding the adequacy of capture, particularly the concerns regarding capture along the northern reaches of the extraction system in the shallow and intermediate zones (see Specific Comments 4, 5, and 8). Revise the Five-Year Review, as necessary, to address these issues.

17. **Section 8.0, Issues, Page 8-1:** The discussion of the Vegetable Oil Pilot Project Report included in this section of the Five-Year Review is not consistent with the discussions of the Vegetable Oil Pilot Project Report included elsewhere in the Five-Year Review. Also, it does not adequately address the concerns expressed regarding these discussions in other comments (see Specific Comments 2, 7 and 15). It is recommended that the discussion of the Vegetable Oil Pilot Project Report included in Section 8.0 be revised to be consistent with other discussions of the Vegetable Oil Pilot Project Report included in the Five-Year Review and to reflect the concerns identified in these Technical Review Comments.

18. **Section 9.0, Recommendations and Follow-Up Actions, Page 9-1:** Under the discussion of the Vegetable Oil Pilot Project Report, the Five-Year Review indicates that "the Navy will discuss lessons learned from the pilot study with EPA and MPCA to support potential future actions." A consensus regarding the path forward for implementation of the vegetable oil technology appears to have been reached during the May 6 and 7 Partnering Meeting. While this meeting was held after the January 10

cutoff date, inclusion of the group consensus regarding the future implementation of the vegetable oil technology within this Five-Year Review would likely be beneficial to all parties involved.

It is recommended that a statement reflecting the consensus developed during the May 6 and 7 Partnering Meeting be added to the current Five-Year Review. Language similar to the following is suggested:

> The Vegetable Oil Pilot Project Report indicated that the vegetable oil technology should be limited in its application to areas of significantly elevated contamination (hot spots). With the possible exception of the immediate area surround and downgradient of MS-46S, which has already been addressed by the pilot study, no hot spots are currently observed in ACP. While the potential use of the vegetable oil technology in ACP may be reevaluated in the future, the use of this technology will not actively be considered at this time. However, the potential application of the vegetable oil technology to source areas beneath the NIROP building will be considered as part of an exit strategy now being developed by the Navy.

19. **Section 9.0, Recommendations and Follow-Up Actions, Page 9-1:** The Five-Year Review does not include an explicit recommendation to evaluate water elevation data and trends in groundwater quality data obtained in the next two years to determine if adequate capture, particularly along the northern reaches of the extraction system, is being achieved. Revise the Five-Year Review to indicate that should analysis of groundwater quality and elevation data indicate that adequate capture is not being achieved, an expansion of the groundwater extraction system and other potential remedial options will be considered.

20. **Section 9.0, Recommendations and Follow-Up Actions, Page 9-1:** The Navy has recently indicated that it plans to develop an exit strategy for the NIROP Facility. The Navy should consider including a recommendation in Section 9 of the Five-Year Review that development of such a strategy be performed.

    Section 10.0, Protectiveness Statement, Page 10-1: The Protectiveness Statement will have to be revised after the concerns raised by the EPA are adequately addressed. This statement, as it stands, doesn't reflect the concerns we have commented on in this Five-Year Review.

21. **References, Pages R-1 through R-2:** The reference list does not include the first two five-year reviews or the USGS report titled Evaluation of the Contributing Area for Recovery Wells at the Naval Industrial Reserve Ordnance Plan, NIROP, Fridley, Minnesota (2007). Revise the reference list to include these documents.

22. **Attachment 2, Treatment Plant Report:** The report in Attachment 2 is based on February 2008 operations of the groundwater treatment facility. These operations

occurred after the stated cutoff date of January 10, 2008 for the Five-Year Review. Revise the Five-Year Review to modify the cutoff date to accommodate all of the data and information used in the Five-Year Review, or to acknowledge information, such as Attachment 2, that was compiled after the cutoff date. Also see Specific Comment 1.