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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 7
901 NORTH 5TH STREET
KANSAS CITY, KANSAS 66101

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CERTIFIED MAIL
RETURN RECEIPT REQUESTED
Article No. 7006 2760 0000 8649 4368

Mr. Gary J. LeRock
Plant Manager
Koch Nitrogen Company, LLC
P.O. Box 1337
Dodge City, KS 67801-1337

Dear Mr. LeRock:

RE: Initial Interim Measures Work Plan – Groundwater Recovery System Optimization and letter dated December 5, 2008
Koch Nitrogen Company, LLC
EPA I.D. #KSD044625010

The U.S. Environmental Protection Agency Region 7 (EPA) is in receipt of the above-referenced document.

Based on our review of the above-referenced document, we are concerned that Koch Nitrogen Company, LLC (KNC) and EPA have a different vision of optimizing the groundwater remediation system and what is required to do so. I invite you to take the opportunity to review the enclosed comments and then meet with EPA to discuss the comments to try to reach resolution on how the groundwater remediation system should be optimized. I believe this meeting is necessary prior to KNC revising the above-referenced document for the reasons stated herein. Once KNC has had an opportunity to review the enclosed comments, please contact me to set up the meeting.

After KNC and EPA have had the opportunity to meet, KNC will need to respond to EPA's comments in writing; and submit the Revised Initial Interim Measures Work Plan – Groundwater Recovery System Optimization within thirty (30) calendar days after the date of the meeting.

Please note that failure to submit an approvable Work Plan could result in the EPA modifying and/or drafting the Initial Interim Measures Work Plan – Groundwater Recovery System Optimization. The EPA modified/drafted document *would be* the approved Initial Interim Measures Work Plan – Groundwater Recovery System Optimization as specified in the Part II Permit Condition C.14.c.

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If you have any questions regarding this letter, please call me at 1 (800) 223-0425, extension 7662 or direct at (913) 551-7662 to discuss.

Sincerely,

Andrea R. Stone

Andrea R. Stone
Environmental Scientist
Air and Waste Management Division
RCRA Corrective Action & Permits Branch

Enclosure (1)

cc: Everett Spellman, KDHE

ENCLOSURE

Initial Interim Measures Work Plan – Groundwater Recovery System Optimization

General Comments:

1. This document does not have any page numbers. Please include page numbers on any and all documents that are submitted.

2. KNC needs to take a step back and visualize a blank slate with respect to the remediation (pump & treat) system, and then consider where the remediation wells should be located to maximize capture of the plume. For example: If there were no wells installed at the facility, what steps would KNC need to conduct before it can determine where to strategically place the wells to effectively and expeditiously capture the plume?

3. Further delineation southeast of the Bogner property is needed in order to protect any downgradient wells. The Bogner's well has already been impacted with Nitrates/Nitrites over the maximum contaminant level (MCL). There are potential receptors located southeast of the Bogner property. Based on the work described in the Geologist's Comment #2, and the information obtained from the further delineation site-wide, additional well(s) may also have to be installed southeast of the Bogner property in order to protect any downgradient wells. See also Geologist's Comment 2.f.

Specific Comments:

1. Executive Summary, second page, number 10): Reference is made to TW-80 and may require additional remedial effort. EPA is in agreement that this area is not well defined and will require additional investigation and remediation. Previously EPA discussed with KNC about installing additional wells in the area south of the property boundary. KNC made a good start by installing three (3) wells south of the property boundary; however, EPA feels further delineation in this area is warranted. The EPA has concerns that the property owner south of KNC's facility could be potentially impacted by contamination that is located around TW-80 and south of the well. Please see Geologist's comment # 2.c., regarding this area.

2. Executive Summary, third page, fourth bullet: This discusses "Operational flexibility" with regards to the new pumping configuration. What does KNC mean? Please explain.

3. Executive Summary, last page, last bullet item: Reference is made to concrete encapsulation at AOC 1. Please explain. Please note that it is premature to state what the remedy will be at AOC 1 since this facility is in the investigation stage.

4. Section 1.3 Regulatory Drivers: Reference is made to a July 14, 2006 letter where EPA and KDHE gave approval for the optimization study. It should be noted that the letter and approval was from KDHE. Please correct.

5. Section 2.0 Optimization Approach, last paragraph: This paragraph discusses "sensitivity" with respect to the configurations tested and "sensitivity analysis." What does this mean? Please explain.

6. Section 2.1 Development and Application, first paragraph: This paragraph references optimizing the effectiveness of the groundwater recovery and treatment system using the initial optimization study with additional field optimization procedures. What does KNC mean by "with additional field optimization procedures?" Please explain.

7. Section 3.0 Optimization Study Results, first paragraph: This paragraph gives very little information on how capture zones were determined. Please provide additional information in this paragraph. Include information on how capture zones were analyzed and discuss the methodologies used for determining capture zones in the groundwater. See also Geologist's Comment # 3.

8. Section 3.0 Optimization Study Results, Optimization Configurations 1, 2, and 3, Item 3): This paragraph talks about Chromium and Nitrate/Nitrite being influenced by the changes in the pumping configuration. It goes on to give specific drops in concentrations for Chromium and Nitrate/Nitrite in offsite well TW-74, but fails to identify which well configuration (i.e., 1, 2, or 3) the drops in concentration occurred in. In addition, that same paragraph states that TW-56 increased in concentration, but fails to tell what constituent(s) increased (i.e., Cr, N, or both), and does not identify which configuration the increase occurred in. Please correct.

9. Section 3.0 Optimization Study Results, Optimization Configurations 1, 2, and 3, Item 7): This paragraph states, "...without the need for additional wells installations." EPA does not agree with this statement. Please see Geologist's comment #2 for further direction.

10. Section 3.1 Observations and Recommendations, Bullet #3: What is meant by "Operational flexibility?" Please explain.

11. Section 3.1 Observations and Recommends, second and third pages of that section: There are several references to "extended purging" and "enhanced pumping/purging" at TW-80. Please explain.

12. Section 3.1 Observations and Recommends, third page of that section, last bulleted item: Reference is again made regarding "concrete encapsulation at AOC 1. See comment #3 above.

13. Figure 3-3: It is difficult to determine which well configuration phase (i.e., 1, 2, or 3) changes took place in wells TW-74 and TW-80 depicted in this Figure. Please add shading and label the phases to coincide with the dates the phases occurred in. It is also unclear why KNC chose to try and make a comparison between wells TW-74 and TW-80 for Nitrate/Nitrite using different division (i.e., dividing by 10 for TW-74 and by 1000 for TW-80). Please explain.

14. Appendix A, Geologic Cross Section and Descriptions: Appendix A gives a description of each geologic cross section, then references a corresponding figure. In comparison of the text and figures, some discrepancies were noted as follows:

   a. XS29E-The text states that TW-82 encountered the Graneros Shale bedrock surface. At what elevation (i.e., amsl) did TW-82 encounter the Graneros Shale?
   b. XS37E-The text states that the Graneros Shale bedrock surface was encountered in six of the borings in this cross section. Please list the borings and its respective elevations.
   c. XS40S-What is meant in the next to last sentence that states, "...as occurs (and occurred?)..." Please explain. List in the text, the elevations for TW-94 and TW-80 where the Graneros Shale was encountered.
   d. XS64NE-The test states that four of the five borings encountered the shale bedrock surface. Please list the borings and its respective elevations.
   e. XS74S-The text states in the first paragraph, "The deepest boring, TW-81A, was advanced to a depth of approximately 180 feet to an elevation of approximately 2,348 ft amsl." In the second paragraph, next to last sentence, the text states, "Bedrock surface elevations range from ...to below 2,350 ft amsl at TW81A..." These sentences contradict each other. One says deepest boring was 2,348, and the other sentence says below 2,350 ft. Please explain.
   f. XS94E-Please list all borings and its respective elevations.
   g. XSRG02E- Please list all borings and its respective elevations.
   h. XSRG03E-Please include SIT-RG04 elevation in the text.

15. Figure B-2: This figure shows the Nitrate/Nitrite concentration in groundwater. There are large areas of uncertainty on this figure. Please explain how KNC plans to resolve the uncertainty. Has KNC considered installing additional wells/geoprobe locations to better define the area of contamination? See Geologist Comment #2.

16. Figure C-1: This figure is confusing. Some of the values have been divided by 100, while others have been divided by 1000. Please explain.

17. Appendix C: The charts should have each optimization configuration shaded and differentiated (labeled) between 1, 2, and 3 and correspond to the dates that each configuration was done.

Geologist Comments:

1. It is not clear from reading the work plan whether the intention is to temporarily optimize the groundwater recovery system in its present form through alternative pumping configurations before an assessment of the extent of groundwater contamination has been completed, or whether this work plan represents the totality of effort to improve the recovery system for a final remedy selection. Please clarify the intention and goals of this work plan as it relates to the long-term groundwater remedy at the facility.

2. The efforts to evaluate the groundwater contamination recovery system to date, including this work plan, have been focused almost entirely on horizontal groundwater flow. In order to truly optimize the effectiveness of the groundwater recovery system, Koch must evaluate groundwater flow patterns and contaminant distribution in three-dimensions. For instance, if it was found that the highest concentrations of contamination were located in a relatively thin preferential flow zone, a more effective and efficient remediation system could result from locating the recovery well intake in such a zone. Numerous cross sections were included in Appendix A of the work plan, but the distribution of groundwater contamination was not shown on any of them. Additionally, the vertical component of groundwater flow cannot be evaluated because this requires the measurement of water levels in wells completed to different depths at the same location.

   In reviewing the cross sections in Appendix A, the EPA notes that most of the wells utilized in the construction of the cross sections have excessively long screens relative to the saturated zone, which is approximately fifty (50) feet in thickness. Two problems with wells having screens of this length are that they (1) are unable to provide information on the vertical distribution of groundwater contamination, and (2) they are also unable to provide potentiometric data from within the aquifer at different depths so the vertical hydraulic gradient may be measured. The EPA believes that in order to determine both the horizontal and vertical distribution of groundwater contamination, and also to characterize the vertical as well as horizontal groundwater flow patterns, a number of monitoring well clusters need to be installed. Each cluster should consist of two (2) monitoring wells utilizing well screens preferably two (2) feet but no greater than five (5) feet in length. At each cluster location, one well screen should be placed in the upper part of the unconsolidated aquifer, with the top of the screen approximately five (5) feet below the groundwater surface, and the deeper well screen should be placed in the lower part of the unconsolidated aquifer with the bottom of the well screen approximately five (5) feet from the top of the shale bedrock. Because there are several distinct source areas for groundwater contamination, and several areas of concern regarding the off-site migration of contamination, the EPA will present recommendations for each area separately. The EPA would like to emphasize that the suggested locations for additional monitoring wells are approximate and dependent upon drilling and installation considerations such as off-site property access and the presence of overhead and underground utilities and pipelines.

   a. <u>Area of Impact of the Original Spills of Chromium Corrosion Inhibitors</u>

      In order to help assess the three-dimensional extent of contamination as well as the horizontal and vertical capture zones of the recovery system relative to the original Nalco 374 spills, the EPA recommends the installation of at least nine (9) of these two-well clusters. One well cluster should be located within 100 feet of existing well TW-54, one within 100 feet of TW-53, one within 100 feet of TW-50, one within 100 feet of TW-29, one within 100 feet of TW-28, one within 100 feet of TW-9, one within 100 feet of TW-10, and one 500 feet east of TW-31 (±100 feet).

As an added measure of protectiveness for the Conrardy water supply well, a monitoring well cluster needs to be installed near TW-51.

b. Area Surrounding TW-65

In order to help assess the three-dimensional extent of groundwater contamination in the area of TW-65, one well cluster should be installed near TW-65, one between TW-70 and TW-66, and one between TW-68 and TW-69.

c. Area Surrounding TW-80

In order to help assess the three-dimensional extent of groundwater contamination in the area of TW-80, one well cluster should be installed very near TW-80. Because they already provide water level and sampling data for the deep portion of the unconsolidated aquifer, one shallow aquifer monitoring well should be installed near each existing monitoring well SIT-RG-03, SIT-RG-04, and SIT-RG-05. These three well clusters will provide valuable information regarding contaminant concentrations and distribution, and also horizontal and vertical groundwater flow patterns in the area around TW-80, leading to the design of more effective capture of contaminants.

In order to provide an added measure of protectiveness for the Maxwell private water supply well directly south of the TW-80 area, the EPA believes that a well cluster needs to be installed at some point between TW-80 and the Maxwell well in order to monitor groundwater quality and ensure that water containing contamination exceeding MCLs does not reach the Maxwell well.

d. West Property Boundary

In order to monitor the off-site groundwater contamination west of the facility, at least two (2) clusters should be installed to assess the three-dimensional extent of groundwater contamination leaving the western boundary of the facility. One cluster should be installed at a location approximately 500 feet south of, and 700-900 feet west of, TW-37. Another cluster should be installed at a location approximately 700-900 feet west of SIT-RG-01.

e. East Property Boundary

In order to monitor the off-site groundwater contamination east of the facility, one monitoring well cluster should be installed between TW-82 and TW-83, one monitoring well cluster should be installed between TW-84 and TW-70, and one cluster should be installed near TW-86.

f. Area Downgradient from Bogner Residence

Although not depicted on Figure B-4, we know that nitrate exceeded MCLs in the Bogner domestic water supply well, resulting in connecting the Bogner residence to the local municipal water supply system. The EPA is concerned with the potential for further migration of this plume downgradient from the Bogner residence. The EPA believes a monitoring well cluster should be installed at a point downgradient of the Bogner residence in order to assess groundwater quality in this area. The exact location would be dependent upon configuration of the property boundaries and discussions with property owners. At this point the EPA would like to bring up this concern for future discussions with Koch.

3. The EPA recommends that Koch consider using the recently released EPA guidance manual "A Systematic Approach for Evaluation of Capture Zones at Pump and Treat Systems" (EPA 600/R-08/003), dated January 2008. This guidance may provide some useful approaches for assessing the performance of the groundwater recovery system.

4. The EPA recommends that Koch consider utilizing a groundwater flow model as an additional way to evaluate optimization of the groundwater recovery system.

5. A number of private water supply wells are located near the facility. These wells include those owned by Lix, Coker, Kansas Byproducts, Feed Mill, Bogner, Maxwell, Chaffin, Tawzer, Buehne, and Conrardy. Koch needs to consider these wells in the groundwater optimization work plan because they could potentially impact the operation of the groundwater recovery system. Additionally, optimization of the groundwater recovery system must strive to ensure that contamination is contained so that it does not impact any of these private production wells. Koch needs to obtain information on these wells that may be relevant with regard to optimization of the groundwater recovery system. Such information should include details such as the depth interval of the well screen(s), the diameter of the well, and the type and capacity of the pump. An accurate location of the well is also important; this may be determined by survey or use of a sufficiently precise global positioning system (GPS). Finally, information regarding the use(s) of the water and the rate of usage should be obtained from the well owner.

6. The EPA believes one of the most important goals of the recovery system is to prevent groundwater contamination from impacting neighboring off-site water production wells. Protection of these supply wells should be a primary goal during the process of optimizing performance of the groundwater recovery system. To this end, the EPA believes Koch needs to prepare a map for inclusion in the optimization work plan which shows all the property boundaries of all properties adjacent to the facility property. Each individually-owned parcel needs to be labeled with the owner's last name and all water production wells need to be located.

7. In Figure 3-2, there is a potentiometric surface map of the facility that was produced based on water level elevations collected on October 30, 2006 during the period when all of the site recovery wells were shut down. This is a very useful map, and should be reproduced in a larger size for the work plan, as it was for the Revised Phase II RFI Work Plan dated November 11, 2008.

8. The work plan presents no discussion regarding properties of the aquifer that need to be considered when evaluating a groundwater recovery system. The work plan needs to include a discussion of the hydraulic conductivity of the aquifer, citing hydraulic conductivity values and how they were determined, discuss any preferential flow zones that have been identified, and relate this information to the design of the recovery system.

9. In Appendix B, please include additional figures showing the locations of the private water supply wells surrounding the facility that are sampled quarterly, along with the results for chromium and nitrate/nitrite for December 2006 and May 2008 for these wells. This information may be put on the same figure (and scale) as Figure B-4.

10. Please provide a detailed description of the procedure used to collect groundwater quality samples from the TW-series recovery wells.