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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

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

CERTIFIED MAIL
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Article No. 7006 2760 0000 8653 9694

08 NOV 2007

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

Dear Mr. LeRock:

RE: RFI Interim Status Report and letter dated August 10, 2007
Koch Nitrogen Company
EPA I.D. #KSD044625010

The U.S. Environmental Protection Agency Region 7 (EPA) is in receipt of the above-referenced document. This document is not a requirement of the Permit and will, therefore be neither approved nor disapproved. This document was voluntarily submitted by Koch as a status update report. EPA appreciates the update and would like to take this opportunity to focus the investigation further. EPA has reviewed this document and is offering the enclosed comments on this document, to ensure the Final RFI Report addresses EPA's concerns.

KNC will need to submit a Phase II RFI Work Plan, for review and approval, to incorporate the additional sampling that EPA is requiring, as specified in the enclosed comments. The Phase II RFI Work Plan should be a very concise document and should include the sampling, as specified in the enclosed comments, with the proposed sampling locations described and diagramed, number of samples per location, depths of the samples and the constituents to be sampled for. The Phase II RFI Work Plan should also include the appropriate Figures/Diagrams. Please state that the work in the Phase II RFI Work Plan will be done in accordance with the approved RFI Work Plan and SAP/QAPP.

Please respond to EPA's comments in writing; and submit the Phase II RFI Work Plan within thirty (30) days of receipt of this letter. If you have any questions regarding this letter, please contact me at 1-800-223-0425, extension 7662; or (913) 551-7662.

Sincerely,

Andrea R. Stone

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

Enclosure (1)

cc: Everett Spellman, KDHE
AnnieLaurie Burke, KNC-Dodge City, KS

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ENCLOSURE

General Comments:

1. The purpose of the RCRA Facility Investigation is to define the vertical and horizontal extent of contamination. Agreement was reached with Koch Nitrogen Company (KNC) in the approved document entitled, "Background Assessment WorkPlan," dated December 2005, that KNC would define the vertical and horizontal extent out to background levels. Those levels are defined as 0.010 milligrams per liter (mg/L) as the background chromium concentration in groundwater; and 2.8 mg/L for nitrate, plus nitrite as N concentration in groundwater.

   The soil background levels approved in the Soil Background Assessment Report for surface soil (0-6 inches below ground surface) for chromium are 19.6 mg/kg and 26 mg/kg for nitrate, plus nitrite as N; and for subsurface soil (6-inches to 2-feet below ground surface) for chromium are 20.1 mg/kg, and 6 mg/kg for nitrate, plus nitrite as N.

   KNC has not defined the vertical and horizontal extent to background levels for the SWMUs/AOCs. KNC will need to review the information collected and wherever the sample results are above the established background levels; KNC will need to conduct additional sampling horizontally and vertically at the SWMUs/AOCs until it reaches background levels. Please include the sampling information in the Phase II RFI Work Plan.

2. Tables 6-1 and 6-3 in the approved RCRA Facility Investigation Work Plans dated May 2006 and October 2006 list the constituents/analyses and test methods that will be sampled for at each SMWU and AOC. In a comparison of Tables 6-1 and 6-3 with what was actually sampled for, there appear to be numerous discrepancies, as detailed below in the specific comments.

   KNC will need to sample each SWMU/AOC for the constituents/analyses that are listed in the approved RFI Work Plan, Tables 6-1 and 6-3 wherever those samples have not been collected. Please include the sampling information in the Phase II RFI Work Plan.

3. Table 6-1 in the approved RFI Work Plan lists: "app IX metals." For clarity, Appendix IX metals are the following: Silver, Arsenic, Barium, Beryllium, Cadmium, Cobalt, Chromium, Copper, Mercury, Nickel, Lead, Antimony, Selenium, Tin, Thallium, Vanadium, and Zinc. This document references "RCRA Metals." It should be noted that "RCRA Metals" are not the same as Appendix IX metals. RCRA Metals are the following: Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, and Silver.

   KNC will need to sample for the metals not previously sampled for at the SWMUs/AOCs. A suggestion would be to go back to the most heavily-contaminated locations (several locations per SWMU/AOC) at each SWMU/AOC and analyze for

the Appendix 9 metals that were missed (not sampled for) previously. For example: At SWMU X, if the most heavily-contaminated location is sample 1 at a depth of two (2) foot, then you would go back to that sample location and sample for the missing Appendix 9 metals at the two (2) foot depth. Then, move on to the next most heavily-contaminated location at that SWMU/AOC. Please include the sampling information in the Phase II RFI Work Plan.

Specific Comments:

1. Page ES-ii, Table E-1, First Item: AOC 1 - Chromate Spill

The EPA believes that before any remediation efforts are considered, Koch needs to first determine the areal (horizontal) and depthwise (vertical) extent of both chromium and nitrate-nitrite soil contamination at AOC 1. The effectiveness of any remediation effort will depend upon first acquiring an accurate characterization of the three-dimensional distribution and concentrations of the contamination. Contamination with chromium and nitrate-nitrite occurs wherever concentrations exceed background levels. The extent (limit) of contamination is determined when background levels are reached as subsequent sampling proceeds outward in all directions from previously identified contaminated areas. A number of samples should also be collected for analysis for hexavalent chromium so that a determination of the valence state (hexavalent and trivalent) of the chromium contamination may be determined, as this is a key factor in assessing risk and in determining cleanup levels. Please include a proposal for sampling and analysis which will determine the nature and extent of chromium and nitrate-nitrite contamination at AOC 1 in the Phase II RFI Work Plan.

2. Page ES-ii, Table E-1, Third Item: AOC 5 - UAN Tank Leak

The EPA believes that before any remediation efforts are considered, Koch needs to first determine the areal (horizontal) and depthwise (vertical) extent of nitrate-nitrite soil contamination at AOC 5. Contamination with nitrate-nitrite occurs wherever concentrations exceed background levels. The extent (limit) of contamination is determined when background levels are reached as subsequent sampling proceeds outward in all directions from previously identified contaminated areas. The three locations sampled within the footprint of the tank have a range of nitrate-nitrite concentrations from 66 mg/kg to 3130 mg/kg within the upper 6 feet of soil. Please include a proposal for sampling and analysis which will determine the nature and extent of nitrate-nitrite contamination at AOC 5 in the Phase II RFI Work Plan.

3. Page ES-ii, Table E-1, Fourth Item: AOC 6 - Dakota Formation

Koch needs to include more information regarding the assessment of groundwater contamination within the Dakota Formation that has been performed to date. Before the EPA can evaluate Koch's proposal for no further action, the EPA needs to review such information as the location, boring logs, and installation diagrams of all monitoring wells installed in the Dakota Formation, the potentiometric surface maps generated with water level data from these wells, hydrogeologic cross sections based

on the logs and construction of the monitoring wells, and analytical data from groundwater samples collected from the monitoring wells. If Koch already has this information and would like for the EPA to review it to evaluate Koch's proposal for no further action, Koch should provide this information to the EPA. If Koch has not yet obtained the information requested in this comment, then Koch should propose how they will obtain it in the Phase II RFI Work Plan.

4. Page ES-ii, Table E-1, Fifth Item: SWMU 1 - South Pond:

Please explain the statement that chromium is 99+% insoluble.

Samples from the northwest area of SWMU 1 indicated significant levels (up to 1280 mg/kg) of chromium in the soils, primarily from 0-4 feet below ground surface (BGS). Samples from this same area and depth also had nitrate-nitrite up to 2800 mg/kg. Contamination with chromium and nitrate-nitrite occurs wherever concentrations exceed background levels. The extent (limit) of contamination is determined when background levels are reached as subsequent sampling proceeds outward in all directions from previously identified contaminated areas. A number of samples should also be collected for analysis for hexavalent chromium so that a determination of the valence state (hexavalent and trivalent) of the chromium contamination may be determined, as this is a key factor in assessing risk and in determining cleanup levels. Please include a proposal for sampling and analysis which will determine the nature and extent of chromium and nitrate-nitrite contamination at SWMU 1 in the Phase II RFI Work Plan.

5. SWMU 1-Identified in Table E-1, page ES-ii; Section 4.2.4, page 13, and Figures 4-7, 4-8, 4-9, & 4-10: Table 6-1 in the approved RFI Work Plan lists the Analyses/Test Methods for each SWMU/AOC. For SWMU 1, Table 6-1 lists for Soil: VOCs, SVOCs, TPH, app IX metals, nitrate-nitrite, sulfate, and pH. For Surface Water (if present) it lists: VOCs, SVOCs, TPH, app IX metals, nitrate-nitrite, and sulfate.

KNC sampled for chromium, VOCs, RCRA metals, sulfate and nitrate plus nitrite, although no sampling results were given for sulfates in the descriptive text of section 4.2.4, or on any map for SWMU 1. In addition, nitrate plus nitrite is not mentioned on Table E-1. KNC did not sample for all constituents listed and agreed to in Table 6-1 of the approved RFI Work Plan. KNC will need to sample for the constituents not sampled for at SWMU 1, in accordance with the approved RFI Work Plan. Please include the sampling information in the Phase II RFI Work Plan.

6. Page ES-iii, Table E-1, First Item: SWMU 2 - North Pond

The extent of chromium and nitrate-nitrite in soil appears to be fairly well defined in SWMU 2. However, there is an area of elevated chromium in the southwest corner of SWMU 2 near the inlet from the South Pond (sample S02-SB01) that should be further characterized to determine the extent of contamination. Please include a proposal for sampling and analysis which will determine the nature and extent of chromium contamination at SWMU 2 in the Phase II RFI Work Plan.

Please explain the statement that chromium is 99+% immobile.

The EPA noticed that bis (2-ethylhexyl) phthalate was detected at 0.6 mg/kg at the same depth and in the same relative areas of both the North Pond (SWMU 2) and the South Pond (SWMU 1); could one of these detections be an error?

7. SWMU 2-Identified in Table E-1, page ES-iii; Section 4.2.5, page 14, and Figures 4-11, 4-12, 4-13, & 4-14: Table 6-1 in the approved RFI Work Plan lists the Analyses/Test Methods for each SWMU/AOC. For SWMU 2, Table 6-1 lists for

Soil: VOCs, SVOCs, TPH, app IX metals, nitrate-nitrite, sulfate, and pH. For Surface Water (if present) it lists: VOCs, SVOCs, TPH, app IX metals, nitrate-nitrite, and sulfate.

KNC sampled for chromium, VOCs, RCRA metals, sulfate and nitrate plus nitrite, although no sampling results were given for sulfates in the descriptive text of section 4.2.5, or on any map for SWMU 2. KNC did not sample for all constituents listed and agreed to in Table 6-1 of the approved RFI Work Plan. KNC will need to sample for the constituents not sampled for at SWMU 2, in accordance with the approved RFI Work Plan. Please include the sampling information in the Phase II RFI Work Plan.

8. Page ES-iii, Table E-1, Second Item: SWMU 3 - East Pond

In addition to sample location S03-SS15, there were also detections of chromium higher than background at S03-SS10, S03-SS11, S03-SS14, S03-SS16, and S03-SS17. Contamination with chromium occurs wherever concentrations exceed background levels. The extent (limit) of contamination is determined when background levels are reached as subsequent sampling proceeds outward in all directions from previously identified contaminated areas. A number of samples should also be collected for analysis for hexavalent chromium so that a determination of the valence state (hexavalent and trivalent) of the chromium contamination may be determined, as this is a key factor in assessing risk and in determining cleanup levels. Please include a proposal for sampling and analysis which will determine the nature and extent of chromium contamination at SWMU 3 in the Phase II RFI Work Plan.

9. SWMU 3-Identified in Table E-1, page ES-iii; Section 4.2.6, page 16, and Figures 4-15, 4-16, 4-17, & 4-18: Table 6-1 in the approved RFI Work Plan lists the Analyses/Test Methods for each SWMU/AOC. For SWMU 3, Table 6-1 lists for Soil: VOCs, SVOCs, TPH, app IX metals, nitrate-nitrite, sulfate, and pH. For Surface Water (if present) it lists: VOCs, SVOCs, TPH, app IX metals, nitrate-nitrite, and sulfate.

KNC sampled for chromium, VOCs, RCRA metals, and nitrate plus nitrite. KNC did not sample for all constituents listed and agreed to in Table 6-1 of the approved RFI Work Plan. KNC will need to sample for the constituents not sampled for at SWMU

3, in accordance with the approved RFI Work Plan. Please include the sampling information in the Phase II RFI Work Plan.

10. Page ES-iii, Table E-1, Third Item: SWMU 4 - Former Disposal Well #1

The text states that groundwater samples collected from four depths detected no chromium in filtered samples, but had minor detections of chromium in the unfiltered groundwater samples due to silt from the uncased borehole. The text also states that sampling at the shallower well screened above the Dakota Formation found no chromium, with N at 75 mg/L. Please include this analytical data in the final RFI Report, and also clarify how many wells were installed and provide boring logs, installation diagrams, and map locations for the wells.

11. SWMU 4-Identified in Table E-1, page ES-iii; Section 4.2.7, page 17, and Figure 4-19: Table 6-3 in the approved RFI Work Plan lists the Analyses for each well. For SWMU 4, Table 6-3 lists: VOCs, chromium, nitrate, SVOCs, TPH, app IX metals, sulfate, and pH.

KNC sampled for chromium, VOCs, and nitrate plus nitrite, although no discussion regarding VOCs is detailed in Section 4.2.7, and there is no map for VOCs. KNC did not sample for all constituents listed and agreed to in Table 6-3 of the approved RFI Work Plan. KNC will need to sample for the constituents not sampled for at SWMU 4, in accordance with the approved RFI Work Plan. Please include the sampling information in the Phase II RFI Work Plan.

12. SWMUs 5, 6, & 21-Identified in Table E-1, pages ES-iii & iv; Section 4.2.8, page 17, and Figures 4-20, 4-21, 4-22, & 4-23 : Table 6-1 in the approved RFI Work Plan lists the Analyses/Test Methods for each SWMU/AOC. For SWMUs 5 & 6, Table 6-1 lists: VOCs, SVOCs, TPH, app IX metals, nitrate-nitrite, sulfate, and pH. For SWMU 21, Table 6-1 lists: "Conduct surface geophysical surveys to determine exact location and aerial extent of the SWMU. Survey the boundary of the SWMU."

For SWMUs 5 & 6, KNC sampled for total chromium, nitrate plus nitrite, VOCs, RCRA metals and sulfate. It should be noted that in Table E-1, chromium is the only constituent listed for SWMU 6. In addition, the descriptive text in section 4.2.8 does not discuss sulfate, and there is no corresponding map. Also, there is no descriptive text for SWMU 21. The text in Section 4.2.8. states, "The soil investigation for the SWMU 5, 6, and 21 grouping included analysis for ..." It should be noted that no samples were obtained from SWMU 21.

KNC did not sample for all constituents listed and agreed to in Table 6-1 of the approved RFI Work Plan. KNC will need to sample for the constituents not sampled for at SWMU 5 & 6, in accordance with the approved RFI Work Plan. KNC also needs to collect several samples from SWMU 21. Please include the sampling information in the Phase II RFI Work Plan.

13. Page ES-iii, Table E-1, Sixth Item: SWMU 7 - Trash Landfill

In addition to collecting deeper samples at S07-SB02, the areal (horizontal) extent of chromium also needs to be assessed. At S07-SB01, nitrate-nitrite was found at levels exceeding background, and tetrachloroethene was found at four feet below ground surface; additional assessment is needed for these constituents. Contamination with chromium and nitrate-nitrite occurs wherever concentrations exceed background levels. The extent (limit) of contamination for chromium and nitrate-nitrite is determined when background levels are reached as subsequent sampling proceeds outward in all directions from previously identified contaminated areas. Because tetrachloroethene is not a naturally-occurring substance, any amount detected represents contamination. A number of samples should also be collected for analysis for hexavalent chromium so that a determination of the valence state (hexavalent and trivalent) of the chromium contamination may be determined, as this is a key factor in assessing risk and in determining cleanup levels. Please include a proposal for sampling and analysis which will determine the nature and extent of chromium, nitrate-nitrite, and tetrachloroethene contamination at SWMU 7 in the Phase II RFI Work Plan.

14. SWMU 7-Identified in Table E-1, page ES-iii; Section 4.2.9, page 18, and Figure 4-24: Table 6-1 in the approved RFI Work Plan lists the Analyses/Test Methods for each SWMU/AOC. For SWMU 7, Table 6-1 lists for Native Soil: VOCs, SVOCs, TPH, app IX metals, nitrate-nitrite, sulfate, pH, organochlorine pesticides, organochlorine herbicides.

For Geotechnical Testing it lists: gradation-sieve analysis and hydrometer, Atterberg Limits, and soil classification.

KNC sampled for RCRA metals, nitrate plus nitrite, SO_4, pH, SVOCs, VOCs and TPH; although Table E-1 lists only Cr and metals.

KNC did not sample for all constituents listed and agreed to in Table 6-1 of the approved RFI Work Plan. KNC will need to sample for the constituents not sampled for at SWMU 7, in accordance with the approved RFI Work Plan. Please include the sampling information in the Phase II RFI Work Plan.

15. Page ES-iv, Table E-1, First Item: SWMUs 8, 23, 24, and 25 - Former Chrome Destruct Unit

Although the conclusions/recommendations in the executive summary propose no further sampling, the EPA agrees with recommendations on page 20 in Section 4.2.10 to complete the original sampling. Koch should also collect samples for analysis for hexavalent chromium so the levels of both valences can be determined. Please include the sampling information in the Phase II RFI Work Plan.

16. SWMUs 8, 23, 24, and 25-Identified in Table E-1, page ES-iv; Section 4.2.10, page 20, and Figure 4-25: Table 6-1 in the approved RFI Work Plan lists the Analyses/Test Methods for each SWMU/AOC. For SWMUs 8, 23, 24, and 25, Table

6-1 lists for Surface Water: total Cr; Concrete Chips and Asphalt-TCLP and total CR; 0-1 ft Soil Sample: total CR and TCLP CR; Shallow Soil (<8 ft): total CR, hex CR; and Deep Soil (> 8 ft)-total CR.

KNC sampled for Total CR. EPA agrees in part with the rationale provided in Table 3-1 for SWMU 8 regarding "No DPT through Influent box, as this would breach structural integrity of the structure." Also, no samples of the water in the influent box could be taken, since no water was present in influent box. However, as stated above in Comment 15, KNC should collect samples for analysis of hexavalent chromium.

KNC did not sample for all constituents listed and agreed to in Table 6-1 of the approved RFI Work Plan. KNC will need to sample for the constituents not sampled for at SWMUs 8, 23, 24, and 25, in accordance with the approved RFI Work Plan. Please include the sampling information in the Phase II RFI Work Plan.

17. Page ES-iv, Table E-1, Second Item: SWMUs 10 and 11 - East and West Cells of Lime Sludge Pond

Sampling should be done near location S10-SB02 where chromium was found at 834 mg/kg with analysis for hexavalent chromium and total chromium, and sampling at deeper intervals at this location should be done in order to determine vertical extent. Please include the sampling information in the Phase II RFI Work Plan.

18. SWMUs 10 & 11-Identified in Table E-1, page ES-iv; Section 4.2.11, page 20, and Figure 4-26, 4-27, 4-28, and 4-29: Table 6-1 in the approved RFI Work Plan lists the Analyses/Test Methods for each SWMU/AOC. For SWMUs 10 & 11, Table 6-1 lists for Settleable Matter: total CR, nitrate-nitrite, sulfate, and pH; Settleable Matter (Midpoint Depth)-VOCs, SVOCs, TPH, app IX metals, nitrate-nitrite, sulfate, and pH; Native Soil: nitrate-nitrite, sulfate, pH, and total CR; Geotechnical-visually log DPT samples for texture, color, and consistency, moisture content gradation-sieve analysis and hydrometer; Atterberg Limits; soil classification.

KNC sampled for chromium, nitrate plus nitrite, RCRA metals, and VOCs.

KNC did not sample for all constituents listed and agreed to in Table 6-1 of the approved RFI Work Plan. KNC will need to sample for the constituents not sampled for at SWMUs 10 & 11, in accordance with the approved RFI Work Plan. Please include the sampling information in the Phase II RFI Work Plan.

19. SWMU 12-Identified in Table E-1, page ES-iv; Section 4.2.12, page 22, and Figure 4-30: Table 6-1 in the approved RFI Work Plan lists the Analyses/Test Methods for each SWMU/AOC. For SWMU 12, Table 6-1 lists for Shallow and Subsurface Soil: VOCs, SVOCs, TPH, app IX metals, nitrate-nitrite, sulfate, and pH.

KNC sampled for chromium, nitrate plus nitrite, RCRA metals, and VOCs.

KNC did not sample for all constituents listed and agreed to in Table 6-1 of the approved RFI Work Plan. KNC will need to sample for the constituents not sampled

for at SWMU 12, in accordance with the approved RFI Work Plan. Please include the sampling information in the Phase II RFI Work Plan.

20. Page ES-iv, Table E-1, Fourth Item: SWMU 17: East Lime Landfill

The text states that surface soils were above background levels for chromium. However, in Figure 4-31 only two borings were advanced in SWMU 17, and the shallowest depth interval sampled was seven (7) feet BGS. Additional sampling needs to be done for near surface soils (0-1) feet in order to assess the shallow soils; several deeper intervals should be sampled at the same time to also assess deeper soils. Samples for hexavalent chromium should also be collected. Please include the sampling information in the Phase II RFI Work Plan.

21. SWMU 17-Identified in Table E-1, page ES-iv; Section 4.2.13, page 22, and Figure 4-31: Table 6-1 in the approved RFI Work Plan lists the Analyses/Test Methods for each SWMU/AOC. For SWMU 17, Table 6-1 lists for Settleable Matter: total CR, nitrate-nitrite, sulfate, and pH; Settleable Matter (Midpoint Depth): VOCs, SVOCs, TPH, app IX metals, nitrate-nitrite, sulfate, and pH; Native Soil: nitrate-nitrite, sulfate, pH, and total CR; Geotechnical Settleable Matter: visually log DPT samples for texture, color, and consistency, moisture content, gradation-sieve analysis and hydrometer; Atterberg Limits; soil classification; Geotechnical Soil Cover (0 to 2 ft): gradation-sieve analysis and hydrometer; Atterberg Limits; soil classification.

KNC sampled for chromium, nitrate plus nitrite, RCRA metals, and VOCs.

KNC did not sample for all constituents listed and agreed to in Table 6-1 of the approved RFI Work Plan. KNC will need to sample for the constituents not sampled for at SWMU 17, in accordance with the approved RFI Work Plan. Please include the sampling information in the Phase II RFI Work Plan.

22. Page ES-iv, Table E-1, Fifth Item: SWMU 19: West Industrial Landfill

In reviewing Figures 4-32 and 4-33, the results for chromium and nitrate-nitrite from sampling locations S19-SB06 and S19-SB07 indicate a probable burial area at a depth of 6 to 8 feet (possibly shallower also) in the northern part of SWMU 19. Additional sampling should be done to determine the extent of this contamination, since chromium levels were significant (13,000 mg/kg). Samples for hexavalent chromium analysis should also be performed. Contamination with chromium occurs wherever concentrations exceed background levels. The extent (limit) of contamination is determined when background levels are reached as subsequent sampling proceeds outward in all directions from previously identified contaminated areas. A number of samples should also be collected for analysis for hexavalent chromium so that a determination of the valence state (hexavalent and trivalent) of the chromium contamination may be determined, as this is a key factor in assessing risk and in determining cleanup levels. Please include a proposal for sampling and analysis which will determine the nature and extent of chromium contamination at SWMU 19 in the Phase II RFI Work Plan.

23. SWMU 19-Identified in Table E-1, page ES-iv; Section 4.2.14, page 23, and Figure 4-32, 4-33, 4-34, and 4-35: Table 6-1 in the approved RFI Work Plan lists the Analyses/Test Methods for each SWMU/AOC. For SWMU 19, Table 6-1 lists for Settleable Matter: total CR, nitrate-nitrite, sulfate, and pH; Settleable Matter (Midpoint Depth): VOCs, SVOCs, TPH, app IX metals, nitrate-nitrite, sulfate, and pH; Native Soil: nitrate-nitrite, sulfate, pH, and total CR; Geotechnical Settleable Matter: visually log DPT samples for texture, color, and consistency, moisture content, gradation-sieve analysis and hydrometer; Atterberg Limits; soil classification; Geotechnical Soil Cover (0 to 2 ft): gradation-sieve analysis and hydrometer; Atterberg Limits; soil classification.

KNC sampled for chromium, nitrate plus nitrite, RCRA metals, and VOCs.

KNC did not sample for all constituents listed and agreed to in Table 6-1 of the approved RFI Work Plan. KNC will need to sample for the constituents not sampled for at SWMU 19, in accordance with the approved RFI Work Plan. Please include the sampling information in the Phase II RFI Work Plan.

24. Page ES-v, Table E-1, First Item: SWMU 22: UIC Well #3 Cuttings

The Report states that the cuttings pit has well-defined boundaries that were located during a geophysical survey. Koch needs to collect several samples from the pit for analysis. Please include the sampling information in the Phase II RFI Work Plan.

25. Page ES-v, Table E-1, Last Item: Offsite Wells Delineation South of Facility

While the areal (horizontal) extent of chromium contamination in groundwater appears to be well-defined as shown in Figure 4-37, Koch needs to prepare hydrogeologic cross sections in order to provide a clear assessment of the depthwise (vertical) extent of chromium in groundwater. These cross sections should be constructed in a similar manner as the geologic cross sections prepared for the report (Figures 2-2 through 2-5); with the hydrogeologic cross sections illustrating the locations and screened intervals of the monitoring wells, the water table, and the distribution of chromium in groundwater using isoconcentration contours based on the most recent groundwater analytical data. The hydrogeologic cross sections should approximately transect the entire plume in at least two directions - parallel to the direction of flow through the approximate center of the plume, and perpendicular to the direction of flow through the approximate center of the plume. The EPA noted that the chromium isoconcentration map (Figure 4-37) was contoured to 0.1 mg/L; chromium should be contoured in all maps and cross sections to 0.010 mg/L, the background level as stated in the approved "Background Assessment Work Plan" dated December 2005.

The areal (horizontal) extent of nitrate plus nitrite in groundwater has not been defined. Some of the highest concentrations were found in the southernmost wells as shown in Figure 4-38. Additional delineation of the nitrate plus nitrite plume will be needed downgradient (south) of wells SIT-RG-03, SIT-RG-04, and SIT-RG-05. Additional delineation of nitrate plus nitrite in groundwater is also needed to the west

of the facility since substantial levels were found in the westernmost wells TW-19, TW-37, TW-38, SIT-RG-01, and SIT-RG-02. Koch also needs to prepare hydrogeologic cross sections as described in the previous paragraph above in order to provide a clear assessment of the depthwise (vertical) extent of nitrate plus nitrite, and nitrite alone, in groundwater. These cross sections should clearly illustrate the subsurface materials, the locations and screened intervals of the monitoring wells, the water table, and the distribution of nitrate plus nitrite in groundwater using isoconcentration contours based on the most recent groundwater analytical data. Koch must also characterize, separately, nitrite in groundwater because there is a separate, lower MCL for nitrite alone. The EPA noted that the nitrate plus nitrite isoconcentration map (Figure 4-38) was contoured to 10 mg/L; nitrate plus nitrite should be contoured in all maps and cross sections to 2.8 mg/L, the background level as stated in the approved "Background Assessment Work Plan" dated December 2005. The EPA recommends that Koch first collect groundwater samples for nitrite alone from key wells around the perimeter of the plume shown in Figure 4-38. Next, after this data is available, Koch should prepare cross sections for both nitrate plus nitrite and nitrite alone, plus an isoconcentration contour map for nitrite alone. At that point Koch can then propose an approach to delineate the horizontal and vertical extent of both nitrate plus nitrite and nitrite alone in groundwater.

Please include all requested information in the Phase II RFI Work Plan.

26. Page 7, Table 3-1

In the reference to section I-3.9, it is stated that only the locations for new monitoring wells and rotasonic boring locations were surveyed by a licensed surveyor, and that all other sampling locations were located using a handheld GPS system.

In general this is an acceptable practice. Monitoring well locations require surveyed locations and elevations in order to enable the preparation of accurate and precise groundwater elevation contour maps and plume maps, while the locations for collected soil samples, especially in the large SWMUs such as the North, South, and East Ponds may be less precise. The degree of accuracy should be shown on all maps where GPS was used to locate the sampling points. Include this information in the final RFI Report.

The EPA would like to point out that at some point in assessing the extent of contamination, it may be necessary to survey the boundaries of a given SWMU or AOC so that its location may be precisely shown for future reference and/or for the establishment of institutional controls.

27. Section 4.2.2 AOC 1 – Chromate Spill Area, pages 11-12: This section discusses the sampling results and locations. In comparison of the approved RFI Work Plan sampling locations with the locations described in this section and shown on Figures 4-1 and 4-2; there are discrepancies in the sampling locations. For example: the sampling locations for this AOC in the approved RFI Work Plan show the sampling locations to the west of the UAN Plant Cooling Tower and to the southwest of the Fire Pump Building; however, the actual sampling locations for this AOC are located

north of the UAN Plant Cooling Tower and south of the Fire Pump Building. Since the spill locations and sampling locations are identified in the same areas in the approved RFI Work Plan, it would be logical to sample where the spills occurred and were specified and approved. Please explain the changes in the sampling locations.

28. Page 27, Section 4.3.2 - Total Chromium and Nitrate Plus Nitrite (as N)

This section discusses the site-wide distribution of total chromium and nitrate-nitrite in groundwater, and there are several issues the EPA would like to bring to the attention of Koch.

a. Groundwater samples have been analyzed for total chromium. This is appropriate because the health-based standard which the EPA applies to chromium in groundwater is the Safe Drinking Water Act (SWDA) maximum contaminant level (MCL) which is 0.1 mg/L for total chromium, CAS # 7440-47-3. However, there are three (3) MCLs that apply to nitrate and nitrite in drinking water. The MCL for nitrate alone is 10 mg/L, and for nitrate plus nitrite (as N) the MCL is also 10 mg/L. For nitrite alone, CAS # 14797-65-0, the MCL is 1 mg/L. Therefore groundwater analytical results must also include the concentrations of nitrite alone. If analysis for nitrite alone was also performed, Koch needs to include isoconcentration maps and cross sections based on nitrite concentrations, in addition to the nitrate-nitrite (as N) concentration distribution as shown in Figure 4-38 and include this information in the final RFI Report. If analysis for nitrite alone was not completed then it must be included in future groundwater analyses. Please include the sampling information in the Phase II RFI Work Plan.

b. The report states that the general distribution of total chromium in groundwater for December 2006 is illustrated in the isoconcentration map, Figure 4-37. Although this map depicts the areal (horizontal) distribution and extent of total chromium, Koch needs to also include an appropriate number of hydrogeologic cross sections with isoconcentration contours of total chromium concentrations in order to present the depthwise (vertical) distribution of total chromium. Please describe how this information will be obtained and include in the Phase II RFI Work Plan.

c. The report states that the general distribution of nitrate plus nitrite (as N) in groundwater for December 2006 is illustrated in the isoconcentration map, Figure 4-38. Review of Figure 4-38 indicates that the areal (horizontal) extent of the nitrate plus nitrite (as N) plume to the south and west of the facility has not yet been defined to background levels. Koch needs to install additional monitoring wells to the south and west of the facility in order to define the areal extent of nitrate plus nitrite (as N) in groundwater. Before this is done, EPA recommends that Koch first determine the extent of nitrite contamination using the current monitoring network so that any additional work is focused on characterizing the extent of both nitrate plus nitrite (as N) as well as nitrite alone. Because there are specific, separate MCLs for nitrate-nitrite (as N) and for nitrite alone, individual isoconcentration contour maps and cross sections

will need to be prepared for each of these contaminants. Please describe how this information will be obtained, include number of monitoring wells and locations and include all of this information in the Phase II RFI Work Plan.

d. Koch needs to include (1) an appropriate number of hydrogeologic cross sections with isoconcentration contours of nitrate plus nitrite (as N) levels, and (2) an appropriate number of hydrogeologic cross sections with isoconcentration contours of nitrite alone in order to present the depthwise (vertical) distribution of each of these contaminants. Please include in the Phase II RFI Work Plan.

29. Page 27, Section 4.3.3 - Select VOCs

The report needs to illustrate the horizontal and vertical distribution of the volatile organic compounds in groundwater using isoconcentration contour maps and cross sections. Isoconcentration contour maps and cross sections should be prepared for each contaminant if that contaminant is detected at three (3) or more monitoring well locations. Please include in the Phase II RFI Work Plan.

30. Page 27, Section 4.3.4 - Filtered Samples

Regarding the issue of unfiltered versus filtered groundwater samples; the EPA requires the evaluation of groundwater contamination using unfiltered samples only. The reason for this is because research has shown that many contaminants, organic as well as inorganic, can sorb to colloidal-size particles and be transported in groundwater. The use of the standard 0.45 micron filter can effectively remove much of the colloidal fraction, resulting in inaccurately low determinations of contaminant concentrations in groundwater. Also, filtering using a 0.45 micron filter constitutes a form of treatment that the end users of the groundwater would not employ. The use of unfiltered samples will therefore result in a more protective characterization of groundwater contamination.

The EPA acknowledges that the analysis of unfiltered samples can also result in an overestimation of contaminant levels, particularly the naturally-occurring metals, by including particles larger than colloidal size which are not part of the normal mobile fraction of groundwater. In instances when this situation is suspected as when turbidity is either visually apparent or indicated using a nephelometer, the EPA recommends the use of low-flow purging and sampling techniques as a means to collect samples most closely representative of the mobile fraction.

If Koch believes that inflated values of chromium concentrations are resulting from the presence of particles larger than colloidal size in the unfiltered samples, then the EPA recommends that Koch employ an approved low-flow groundwater sampling technique.

Please make sure the Phase II RFI Work Plan describes the use of unfiltered samples.

31. Page 28, Section 4.3.5 - Ongoing Ground Water Monitoring

The EPA will consider proposals to alter the groundwater monitoring program after the areal (horizontal) and depthwise (vertical) extent of groundwater contamination has been defined as described above in Comment 16.

In addition, the first two paragraphs in this section are the same. Please delete the duplicate paragraph.

32. Page 28, Section 4.3.6 - Additional Characterization of the Saturated Zone

The EPA agrees with the proposal to further characterize the saturated zone for the purpose of increasing the efficiency and effectiveness of the groundwater remediation effort. Identification of significant preferential flow zones and zones where the highest concentrations of contaminants occur can lead to the design of more effective and efficient recovery systems that remove the highest concentrations of contaminants per unit volume of groundwater. Please include information on characterization in the Phase II RFI Work Plan.

33. Page 29, Section 4.3.7 - Pumping System Optimization

The EPA is very concerned that the proposal for optimizing pumping of the current groundwater recovery system, as presented in this report, is based solely on a two-dimensional analysis of the flow regime and configuration of the chromium and nitrate-nitrite plumes (Figures 4-36, 4-37, 4-38, and 4-39). Before a decision is made to alter the pumping, Koch needs to assess the depthwise (vertical) configuration of the plumes as well as screened intervals of all relevant recovery, water production, and monitoring wells. This is essential before pumping is altered because the surrounding water supply wells screened in the unconsolidated aquifer (Lix, Conrardy, Buehne, Tawzer, and Chaffin) which are monitored quarterly are known to be free of contamination exceeding MCLs *under the present pumping configuration.* Therefore nothing should be done that could potentially change this before the complete hydrogeologic flow regime, in particular the distribution of the contaminants and the placement of screened intervals of monitoring, remediation, and water supply wells is adequately characterized in three dimensions.

Therefore, before proposing to change the operation of the current groundwater recovery system, Koch needs to prepare hydrogeologic cross sections that illustrate the water table surface, the vertical distribution of the contaminant plume(s), and the locations and screened intervals of all relevant monitoring, remediation, and water supply wells. Several cross sections should be prepared in order to illustrate the plume(s) in several directions. The locations of these cross sections should be shown on the potentiometric surface maps, and the combination of the potentiometric surface maps and cross sections should clearly illustrate the three-dimensional distribution of the plume(s).

Because of the importance of characterizing groundwater flow in order to increase the effectiveness and efficiency of the remediation system and to also protect the water supply wells, the EPA recommends that Koch consider the use of groundwater computer modeling techniques in order to better assess the current groundwater flow regime. Computer modeling can also be helpful in assessing the effects of any proposed changes in the configuration and operation of the remediation system on the capture of the plume(s) and the protection of the water supply wells.

Please include/describe this in the Phase II RFI Work Plan.

34. Page 31, Section 5.1 - Soil

The EPA would like to make two (2) general comments concerning the primary contaminants of concern, chromium and nitrate/nitrite, relative to soil contamination:

a. In areas where total chromium in soils has been found to exceed site-specific background levels for chromium, further characterization will be needed in order to define the three-dimensional extent of chromium contamination. The EPA recommends that when this additional sampling is being done samples should be analyzed for hexavalent chromium in addition to total chromium so that an accurate site-specific assessment of risk may be performed. Because a site-specific risk assessment will determine whether remedial action is necessary, review of the preliminary remediation goals (PRGs) for chromium illustrates the substantial differences in levels depending on whether the chromium present is hexavalent (64 mg/kg industrial scenario), the assumed 1:6 ratio of hexavalent to trivalent with total chromium results (450 mg/kg industrial scenario), or trivalent (100,000 mg/kg industrial scenario). Analysis for hexavalent chromium along with total chromium provides the concentrations for both valences of chromium, as the value for trivalent is derived by subtracting the value for hexavalent from the value for total chromium. For SWMUs/AOCs for which additional sampling is needed in order to define the extent of chromium contamination, please include at least a subset of samples to be analyzed for both total and hexavalent chromium so that both trivalent and hexavalent chromium concentrations may be quantified.

b. In areas where nitrate/nitrite in soils has been found to exceed site-specific background levels, further characterization will be needed in order to define the three-dimensional extent of contamination. Because the action levels for nitrate/nitrite/ammonia in soils are risk-based standards established by the state of Kansas, Koch needs to report the results in soils with the conversion to nitrogen as explained in "Risk-Based Standards for Kansas - RSK Manual 4th Version" dated June 2007 for all soil samples analyzed for nitrate/nitrite/ammonia.

35. Page 31, Section 5.1 - Soil

The EPA has a general comment on the figures used to illustrate the soil sampling results. There are several problems with these figures, particularly the figures of smaller-area SWMUs and AOCs. For example, in Figure 4-1, which illustrates the total chromium results for AOC 1, the use of a larger scale aerial photograph to depict a small area has required enlargement which has resulted in the photograph being severely out of focus. The EPA suggests that for SWMUs and AOCs of smaller area, Koch should utilize a drafted figure/map to illustrate sampling locations and results. Another problem is that the SWMU/AOC boundary is not visible and therefore the area defined as the AOC is not clear. For the larger SWMUs/AOCs such as the East Pond, this technique is more effective; however the boundaries of the areas are still not shown. For SWMUs/AOCs for which a substantial amount of sampling remains to be done, such as AOC 1 - Chromate Spill Area, please include revised figures in the Phase II RFI Work Plan. For remaining SWMUs/AOCs Koch may wait until the final RFI Report is prepared.

The EPA does note the technique was very effective in illustrating the locations where the background samples were collected (Figures 4-4 and 4-5).

36. Page 31, Section 5.1 - Soil (AOC 1 - Chromate Spill Area)

The sampling locations and concentrations of chromium are shown on Figure 4-1. This AOC is believed to be the source area for the chromium contamination in groundwater. Some very significant concentrations of chromium were found in the small number of sampling locations, such as 20,000 mg/kg in a shallow (1 ft) interval at location AO1-SB10. Additional sampling is necessary in AOC 1 in order to delineate the extent of chromium in soil. The extent (limit) of contamination is determined when background levels are reached as subsequent sampling proceeds outward in all directions from previously identified contaminated areas. Samples should be analyzed for both hexavalent and total chromium. Please include a proposal for sampling and analysis which will determine the nature and extent of chromium contamination at AOC 1 in the Phase II RFI Work Plan.

The sampling locations and concentrations of nitrate/nitrite are shown on Figure 4-2. Results from several locations indicate nitrate/nitrite at levels exceeding site-specific background; therefore additional sampling is necessary in order to delineate the extent of nitrate/nitrite in soil in AOC 1. The extent (limit) of contamination is determined when background levels are reached as subsequent sampling proceeds outward in all directions from previously identified contaminated areas. Please include a proposal for sampling and analysis which will determine the nature and extent of nitrate-nitrite contamination at AOC 5 in the Phase II RFI Work Plan.

The enlarged aerial photograph of AOC 1 is severely out of focus and the SWMU boundaries are not shown. Please use a different form of graphic representation for AOC 1, and illustrate the boundaries of AOC 1. Please include the revised figure/diagram/map in the Phase II RFI Work Plan.

37. Page 31, Section 5.1 - Soil (AOC 5 - UAN Tank Leak)

Koch needs to determine the areal (horizontal) and depthwise (vertical) extent of nitrate-nitrite soil contamination at AOC 5. Contamination with nitrate-nitrite occurs wherever concentrations exceed background levels. The extent (limit) of contamination is determined when background levels are reached as subsequent sampling proceeds outward in all directions from previously identified contaminated areas. The three locations sampled within the footprint of the tank have a range of nitrate-nitrite concentrations from 66 mg/kg to 3130 mg/kg within the upper 6 feet of soil. Please include a proposal for sampling and analysis which will determine the nature and extent of nitrate-nitrite contamination at AOC 5 in the Phase II RFI Work Plan.

38. Page 31, Section 5.1 - Soil (SWMU 1 - South Pond)

Additional sampling is needed to better define the horizontal and vertical extent of chromium contamination in the northern part of the South Pond. Several locations had significant detections of chromium, including SB-07, SB-12, SB-33, and SB-34 (Figure 4-7). Samples should be analyzed for both hexavalent and total chromium. Please include a proposal for sampling and analysis which will determine the nature and extent of chromium contamination at SWMU 1 in the Phase II RFI Work Plan.

Additional sampling is needed to better define the horizontal and vertical extent of nitrate-nitrite contamination, also primarily in the northern part of the South Pond. Significant detections of nitrate-nitrite were found at sampling locations SB-06, SB-31, SB-33, and SB-34 (Figure 4-8). Please include a proposal for sampling and analysis which will determine the nature and extent of nitrate-nitrite contamination at SWMU 1 in the Phase II RFI Work Plan.

The EPA noted that there was a low level detection of Bis(2-ethylhexyl) phthalate at 0.6 mg/kg at the two foot interval at location SB-06 (Figure 4-10). It was also noted that at the North Pond (SWMU 2), Bis(2-ethylhexyl) phthalate was also detected at 0.6 mg/kg (Figure 4-14) at the two foot interval at a location, SB-05, analogous to the location of the detection in the South Pond. Is it possible that one result was erroneously replicated for both SWMUs?

39. Page 31, Section 5.1 - Soil (SWMU 2 - North Pond)

The extent of chromium contamination in the soil at SWMU 2 has been fairly well defined. The EPA does recommend some limited sampling for hexavalent and total chromium at locations and depths where chromium was found previously at levels significantly higher than background. This would facilitate a more accurate assessment of risk based on the actual valence states of the chromium. Please include a proposal for sampling and analysis which will determine the nature and extent of chromium contamination at SWMU 2 in the Phase II RFI Work Plan.

The EPA noted that concentrations of nitrate-nitrite increased with depth at location S02-SB30. Did the boring log indicate the possibility of buried materials at this location?

40. Page 32, Section 5.1 - Soil (SWMU 3 - East Pond)

There are some locations where the chromium levels found require additional sampling to assess the extent of contamination. Locations SS-14 and SB-14, and SS-15 and SB-15 indicated the presence of chromium well above background levels. Additional sampling should include analysis for hexavalent and total chromium. Please include a proposal for sampling and analysis which will determine the nature and extent of chromium contamination at SWMU 3 in the Phase II RFI Work Plan.

41. Page 32, Section 5.1 - Soil (SWMU 5, 6, & 21)

The second sentence states that SWMU 6 and 21 had Cr levels comparable to background. It should be noted, from the maps provided, that no samples were obtained from SWMU 21. As previously noted, KNC needs to obtain several samples from SWMU 21. Please include sampling information in the Phase II RFI Work Plan.

42. Page 32, Section 5.1 - Soil (SWMU 10 & 11)

Significant levels of both chromium and nitrate-nitrite were found in SWMU 10. Additional sampling is needed in order to assess the extent of this contamination. Additional sampling should include analysis for both hexavalent and total chromium. Please include a proposal for sampling and analysis which will determine the nature and extent of chromium and nitrate-nitrite contamination at SWMU 10 in the Phase II RFI Work Plan.

43. Page 33, Section 5.1 - Soil (SWMU 19)

The EPA agrees that further assessment of the high chromium at S19-SB07 needs to be performed. Chromium samples should be analyzed for both total and hexavalent chromium. Several semi-volatile organic compounds (SVOCs) were also found at S19-SB07 (Figure 4-35) and additional sampling in this area should evaluate the extent of these compounds. Significant levels of sulfate were found in SWMU 19 also (Figure 4-35); Koch needs to determine the background levels for sulfate.

44. Figures 4-29, 4-30, 4-31, and 4-35

In these figures the title blocks and legends indicate that the results are for volatile organic compounds, while the individual data boxes present results for sulfates. Please correct these.