

May 6, 2005

Ms. Susan Crowley
Kerr-McGee Chemical LLC
PO Box 55
Henderson, Nevada 89009

Re: **Kerr-McGee Chemical Corporation LLC (KM)**
NDEP Facility ID #H-000539
Nevada Division of Environmental Protection Response to:
Background Investigation Work Plan dated March 29, 2005

Dear Ms. Crowley,

The NDEP has received and reviewed KM's correspondence identified above and provides comments in Attachment A. The NDEP requests that KM address the issues outlined herein no later than **June 22, 2005**.

If there is anything further or if there are any questions please do not hesitate to contact me.

Sincerely,

Brian A. Rakvica, P.E.
Staff Engineer III
Remediation and LUST Branch
Bureau of Corrective Actions
NDEP-Las Vegas Office

Ms. Susan Crowley

5/17/2013

Page 2

CC: Jim Najima, NDEP, BCA, Carson City
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Washington, D.C. 20036
Brenda Pohlmann, City of Henderson, 240 Water Street, Suite 210, Henderson, NV 89015
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Kirk Stowers, Broadbent & Associates, 8 West Pacific Avenue, Henderson, Nevada 89015
Mr. George Crouse, Syngenta Crop Protection, Inc., 410 Swing Road, Greensboro, NC 27409
Mr. Lee Erickson, Stauffer Management Company, 1800 Concord Pike, Hanby 1, Wilmington,
DE 19850-5437
Mr. Chris Sylvia, Pioneer Americas LLC, 8000 Lake Mead Parkway, Henderson, Nevada 89015
Mr. Paul Sundberg, Montrose Chemical Corporation, 3846 Estate Drive, Stockton, California
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Joe Kelly, Montrose Chemical Corporation of CA, 600 Ericksen Avenue NE, Suite 380,
Bainbridge Island, WA 98110

ATTACHMENT A

1. General comment, CEM Jurat, the jurat should clarify who is the responsible CEM for this project. There are three signatures on the page and one of the signatures is by a non-CEM. Please revise.
2. General comment, this report does not discuss the statistical methods that will be used to evaluate the background data once it is collected. It is suggested that KM describe the statistical methods that will be used to evaluate the background data in the revised version of this report.
3. General comment, KM should discuss how the proposed background data set will be evaluated versus background data sets collected by others (i.e., the City of Henderson, TIMET and BRC). It may be necessary for KM to consider these other background data sets in the development of the KM background data set. If the background data collected by KM differs from the data collected by others in the same geologic formation KM may need to discuss and justify the differences.
4. General comment, KM should discuss what types of background are proposed to be evaluated. For example, surface soil, sub-surface soil, sub-surface alluvium, sub-surface Muddy Creek formation (and different intervals?), ground water in the water table aquifer, ground water in deeper aquifers, etc.
5. Section 1.0, page 1-1, KM references a meeting that was held on April 1, 2005. This meeting did not occur. Please revise.
6. Section 1.2, page 1-4, KM states "In February 2004, the NDEP provided a response to the Kerr-McGee Supplemental Phase II ECA. NDEP indicated that yet additional work would be required including..." The NDEP believes that the tone of this statement is inappropriate and has not been presented with data to not require "additional work". If KM believes that the scope of work that the NDEP is requiring is too onerous, then KM should develop an opinion paper and submit this document to the NDEP prior to the development of any additional reports.
7. Section 2.5, page 2-3, KM describes the water within the Muddy Creek formation as being of "generally good quality" and describes the water from the deeper coarse grained Muddy Creek Formation as containing "55 mg/l calcium, 180 mg/l chloride, 180 mg/l sodium and 250 mg/l sulfate". It would be helpful if this data was compared to site data that is impacted and off-site data that is not impacted. This data has limited meaning when it is not compared to other data sets. KM should substantiate statements in reports with data or references.
8. Section 3.0, page 3-1, it is requested that KM provide additional explanation on how the data that is collected for VOCs and TPH will be used. Ideally, background locations would be selected that are not impacted by anthropogenic activities. Also, please explain how KM will differentiate between site-related impacts from VOCs and TPH given the following:
 - a. KM has documented releases of TPH on-site and elevated levels of TPH on-site and in the Western Area Power Administration (WAPA) easement.
 - b. KM has a number of VOCs that are site-related chemicals.
 - c. KM has collected limited groundwater data to determine the breadth and depth of contamination with regards to TPH and VOCs.
9. Section 3.2, pages 3-1 and 3-2, the NDEP has the following comments:

- a. General comment, it may not be necessary to complete DQOs in order to develop a background data set. If KM chooses to develop a set of DQOs it is necessary to complete these DQOs in accordance with USEPA guidance. The NDEP believes that it is necessary to complete as many steps of the DQOs as possible in order to make sound decisions about site issues. KM has chosen to present an abbreviated implementation of the DQOs and the NDEP believes that this has limited value. Specific comments and examples are provided below.
- b. Step 1, State the Problem, the NDEP has the following comments:
 - i. The NDEP believes that the word “alluvium” in this sentence is extraneous. If KM disagrees, please explain how samples will be collected in the “alluvium” that are different than the soil and groundwater samples that are proposed. This comment applies to other steps in the DQOs as well.
 - ii. KM has not identified the planning team and decision makers.
 - iii. KM has not identified available resources, constraints and deadlines.
 - iv. The NDEP believes that a reference to the CSM should be included in this step.
- c. Step 2, Identify the Decision, the NDEP has the following comment:
 - i. KM has not identified the principal study question, the alternative actions, or organized multiple decisions (if necessary).
- d. Step 3, Identify Inputs to the Decision, the NDEP has the following comment:
 - i. The NDEP believes that additional inputs may include: results of field screening of soil and groundwater; results of geological data collected; and the results of physical data of the soil. An additional input that should be discussed are the parameters that KM will compare the background data set to in order to determine if the data set is representative of background conditions.
- e. Step 4, Study Area Boundaries, the NDEP has the following comments:
 - i. KM should also state the depth-related boundary, and the time-related boundary for this study. In addition, it would be helpful if the areal boundaries were correlated to a figure.
 - ii. Populations of interest should be defined. Including but not limited to the following examples: surface soil, subsurface soil (and possibly the different geologic formations), and groundwater (and possibly groundwater derived from different geologic formations).
 - iii. The scale of decision making and practical constraints have not been discussed.
- f. Step 5, Develop a Decision Rule, the NDEP has the following comments:
 - i. KM has not specified the statistical parameter(s) that will characterize the population(s) of interest; or the action level that will be the basis for the decision; or combined the statistical parameter, the scale of decision making and the action level into a decision statement.
 - ii. The decision statement should be presented in an if-then format to comply with the USEPA guidance.

- g. Step 6, Specify Limits on Decision Error, and Step 7, Optimize the Design, the NDEP has the following comments:
- i. KM has not specified the limits on decision errors for step 6. KM should also discuss the project goals for power and significance. In addition, the null hypothesis has not been stated.
 - ii. Step 7 has not been completed in accordance with the USEPA guidance.
 - iii. It may not be necessary to complete Steps 6 and 7 of the DQOs. KM is asked to review the USEPA guidance and contemplate if it is necessary to complete Step 6 and 7 of the DQOs.
10. Section 4.1, pages 4-1 and 4-2, KM discusses the analytical data for perchlorate associated with existing well M-10, however, the analytical data for other analytes and other existing locations is not discussed. It is suggested that KM review and discuss the existing data for wells and soil borings in the vicinity of the proposed background locations. Please see additional comments below regarding the proposed background locations.
11. Section 4.1, pages 4-1 and 4-2, KM has proposed to sample soil and groundwater in a number of different geologic formations, however, KM does not discuss how this data will be applied in the future. KM should clarify the purpose of the work plan and identify if this background data set is intended to be applied to soils in the alluvium and the Muddy Creek Formation. In addition, a reference to the applicable tables would be helpful.
12. Section 4.3.1, page 4-3, please explain the methodology by which KM will obtain PID readings. Sonic drilling tends to produce heat which in turn accelerates volatilization. PID readings on the outer surface of a soil boring may not be representative of sub-surface conditions.
13. Section 4.3.5, page 4-5, KM indicated that water generated from well development activities will be containerized and temporarily stored on site. Please explain what the final means of disposition and characterization will be for this material.
14. Section 4.3.6.2, pages 4-6 and 4-7, the NDEP has the following comments:
- a. Please include a discussion on well equilibration.
 - b. Per USEPA guidance (*Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures*, April 1996), please limit the variance for electrical conductivity to 3%.
 - c. Please clarify the criteria for low-flow purging versus traditional purging methodologies. It is likely that low-flow purging may produce variances in analytical results. KM should consider the implementation of either low-flow purging or traditional methodologies and implement this method uniformly.
 - d. KM should consider implementing low-flow purging for wells that are located in low yield formations. Please note that TIMET has successfully implemented a low-flow purging and sampling program with some wells yielding as little as 40 mL/minute.
15. Section 4.3.6.3, pages 4-7 and 4-8, please note that USEPA guidance recommends against the use of a bailer for sample collection (*Ground-Water Sampling Guidelines for Superfund and RCRA Project Managers*, May 2002).

16. Section 5.2, page 5-1, this section does not indicate that the analytical results will be statistically evaluated; see also general comment above on statistical methods. KM should describe how the background data will be evaluated if statistics are not proposed to be used.
17. Section 6.0, page 6-1, please note that the NDEP project manager for this case is Brian Rakvica not "Brian Ratvecka". Mr. Rakvica has been the project manager for this case for nearly two years and this type of error speaks to the lingering quality problems that KM continues to have.
18. Section 6.0, page 6-2, the Project Management Plan does not identify any personnel that perform QA/QC verification of documents prior to and after production. Based on the quality issues that KM has had in the past and continues to have, it is suggested that KM consider a more rigorous internal QA/QC program.
19. Section 7.0, pages 7-1 and 7-2, it would be helpful if KM listed the specific USEPA guidance that this document was prepared to be in compliance with.
20. Table 1, the NDEP has the following comments:
 - a. Wells H-11, TR-8, TR-9, TR-10, and M-103 all appear to be impacted by site operations due to elevated concentrations of perchlorate. These elevated levels of this site-related chemical would disqualify these locations as viable background sample locations. The concentrations of perchlorate in these wells range from 47 – 1,000 ppb. If KM believes that these perchlorate concentrations are representative of background conditions the NDEP will require additional documentation to support this opinion.
 - b. The NDEP requests that KM include a summary of the historic data from all of the existing wells that are proposed to be used for background. This data summary should include relevant data from the Montrose, Pioneer and Stauffer Corporations.
 - c. KM states that there is an upward hydraulic gradient from the Muddy Creek formation to the alluvial aquifer, however, well TR-9 contains 55 ppb perchlorate at 250' bgs. Please explain the mechanism by which perchlorate impacted this well at this depth.
 - d. Well H-11 is located south of the Montrose site and downgradient of an impacted site (the Fiesta Casino and adjacent properties). The properties upgradient of well H-11 that are impacted were historically used to stage ore materials and were also used as a historic dump by the BMI Companies. The NDEP explained this to KM in our meeting on March 16, 2005. It is suggested that KM review and present the historic data associated with well H-11. In addition, KM should present additional information to substantiate any opinion that the upgradient properties do not impact well H-11.
 - e. Screened intervals, the NDEP has the following comments:
 - i. Existing wells H-11, TR-7, TR-8, TR-9, and TR-10 are all screened well below the water table elevation as depicted on Figures 3, 4, and 5. Some wells are at greater than 200' below the existing water table elevation and are screened in a different geologic formation. KM should use existing wells or install new wells that are installed in the geologic formation that is closest to the alluvial aquifer and represents the "same water" that is found in the alluvial aquifer. It is not obvious

that the water located in the second coarse grained facies of the Muddy Creek Formation (MCF) is analogous to the water located in the alluvial aquifer.

- ii. It is not clear why new wells are being proposed to be screened nearly 100' below the water table elevation and in a different geologic formation. It is suggested that the wells be screened in the geologic formation that contains the water table aquifer. For example, proposed well M-118 is proposed to be screened from 120-140' bgs in the second fine grained facies of the MCF, however, the water table elevation is at approximately 50-60' bgs in the first coarse grained facies of the MCF. The NDEP does not understand the justification for such a proposal. Another example is proposed well M-117 is proposed to be screened from 120-140' bgs in the second fine grained facies of the MCF, however, the water table is at approximately 70' bgs in the first coarse grained facies of the MCF.

21. Table 2, the NDEP has the following comments:

- a. KM has proposed varying sample depths on a location by location basis. This will provide a limited data set for soils below 50' bgs. KM should discuss if two soil samples from depths of 60-120' bgs will be sufficient to evaluate background. Also, it is not clear that the number of samples proposed for the 0-50' bgs depth increment is sufficient. It is the belief of the NDEP that KM will likely need more soil samples from the various depth intervals to appropriately assess background conditions.
- b. Please discuss how the sampling program was developed. All analytes are not proposed to be analyzed at all depths. Further justification for the analyses in the selected depth intervals is required.
- c. Please discuss how the metals and radionuclides proposed for analysis relate to the site-related chemicals list and why some chemicals have been excluded. The following metals appear to be omitted: calcium, magnesium, platinum, phosphorous, potassium, sodium, strontium, and tin. The following radionuclides appear to be omitted: actinium 228, bismuth 212, polonium 210, radon 222, and isotopic uranium. The NDEP does not require that all site-related metals and radionuclides be included, however, justification should be provided for their exclusion.
- d. KM should list which VOCs are proposed for analysis.

22. Table 3, the NDEP has the following comments:

- a. Please note that the NDEP does not warrant the appropriateness of the methods selected by KM. It is the responsibility of KM to insure that the methods selected will provide data that is usable for the intended purposes and that KM will be in compliance with the NDEP Lab Certification Program. The comments provided below are for informational purposes.
- b. The method listed for perchlorate is EPA 350.1. This is the method for ammonia analysis. Please revise.
- c. It would be helpful if all of the VOCs and fuel alcohols intended for analysis be listed.

- d. The method listed for total uranium is EML ASTM D5174. This appears to be the method for uranium analysis in water. Please clarify and revise if necessary.
 - e. KM states that radon-222 is not proposed for analysis because there is “no test – too volatile”. The NDEP requests that this statement be clarified. There are analytical methods available to detect radon in soil. It appears that method DOE A-01-R (HASL 300) could be used for this purpose.
 - f. KM references “EML HASL 300” as the method for a majority of the radionuclides. EML HASL 300 refers to the procedures of the Environmental Measurements laboratory and can be applied to a number of different analyses (<http://www.eml.doe.gov/publications/procman/>) including: inorganics, organics, radiochemistry, atmospheric testing and a number of other procedures. Please identify the specific methods that are intended to be used. For example, method EML GA-01-R MOD is applicable to Lead-210, Lead-212, Lead-214, Bismuth-212, Bismuth-214, Actinium-228, Potassium-40, and Thallium-208.
23. Table 4, the NDEP has the following comments:
- a. Please discuss how the metals and radionuclides proposed for analysis relate to the site-related chemicals list and why some chemicals have been excluded. The following metals appear to be omitted: platinum, phosphorous, strontium and tin. In addition, hexavalent chromium is not specifically identified. The following radionuclides appear to be omitted: actinium 228, bismuth 212, polonium 210, and radon 222. The NDEP does not require that all site-related metals and radionuclides be included, however, justification should be provided for their exclusion.
24. Table 5, the NDEP has the following comments:
- a. Please note that the NDEP does not warrant the appropriateness of the methods selected by KM. It is the responsibility of KM to insure that the methods selected will provide data that is usable for the intended purposes and that KM will be in compliance with the NDEP Lab Certification Program. The comments provided below are for informational purposes.
 - b. Two methods are listed for cyanide. One method measures total cyanide and the other measures cyanide available to chlorination. Please discuss if KM plans to analyze by both methods or one of the methods. If KM is choosing to analyze using one of the indicated methods please delete the extraneous reference and explain why that method was chosen. The NDEP suggests that the analysis for total cyanide be used if KM is going to use one of the methods.
 - c. Perchlorate is listed twice. Please remove the duplicate reference.
 - d. As stated previously, it would be helpful if all of the VOCs and fuel alcohols intended for analysis be listed.
 - e. Similar to the comment for cyanide, please specify what is intended for phosphate, sulfate, and radon analysis.
 - f. KM references “EML HASL 300” as the method for uranium and thorium. EML HASL 300 refers to the procedures of the Environmental Measurements laboratory and can be applied to a number of different analyses (<http://www.eml.doe.gov/publications/procman/>) including: inorganics,

organics, radiochemistry, atmospheric testing and a number of other procedures. Please identify the specific methods that are intended to be used.

25. Figures 3, 4, and 5, it is suggested that these cross-sections be extended to present the data that shows that the water located in the MCF surfaces into the alluvial aquifer.