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DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION

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September 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:
Conceptual Site Model – February 28, 2005 – Kerr-McGee Response to NDEP may 6, 2005 Comments dated August 30, 2005

Dear Ms. Crowley,

The NDEP has received and reviewed KM's letter identified above and provides comments in Attachment A. The NDEP requests that KM provide a response-to-comments letter **by October 14, 2005.** The NDEP also believes that the issues that remain can be addressed in conjunction with the development of other project documents. It is requested that KM provide an updated project schedule to the NDEP **by September 23, 2005.** This schedule should remove any ties to the submission date of the aforementioned response-to-comments letter.

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
Bureau of Corrective Actions
NDEP-Las Vegas Office

CC: Jim Najima, NDEP, BCA, Carson City
Jeff Johnson, NDEP, BCA, Carson City
Barry Conaty, Akin, Gump, Strauss, Hauer & Feld, L.L.P., 1333 New Hampshire Avenue, N.W., Washington, D.C. 20036
Brenda Pohlmann, City of Henderson, PO Box 95050, Henderson, NV 89009
Mitch Kaplan, U.S. Environmental Protection Agency, Region 9, mail code: WST-5, 75 Hawthorne Street, San Francisco, CA 94105-3901
Rob Mrowka, Clark County Comprehensive Planning, PO Box 551741, Las Vegas, NV, 89155-1741
Ranajit Sahu, BEC, 875 West Warm Springs Road, Henderson, Nevada 89015
Craig Wilkinson, TIMET, PO Box 2128, Henderson, Nevada, 89009-7003
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, PO Box 86, Henderson, Nevada 89009
Mr. Paul Sundberg, Montrose Chemical Corporation, 3846 Estate Drive, Stockton, California 95209
Joe Kelly, Montrose Chemical Corporation of CA, 600 Ericksen Avenue NE, Suite 380, Bainbridge Island, WA 98110

Attachment A

1. Response 1c and 4, as discussed previously, KM should plan on completing a data validation report for the data sets to be used in the development of the CSM and other project documents. Please note that data validation is not only applicable to risk assessment.
2. Response 5, KM states that soils data will be added to the plates for chromium, TPH and manganese. All available soils data should be used in the development of the CSM.
3. Response 11, please explain if and when KM plans to start collecting TDS data as part of the quarterly sampling.
4. Response 24 (and related comments), where a data gap is identified (e.g.: site characterization incomplete), please make this clear in the text of the report.
5. Response 38 (and related comments), chromium (and other chemicals) can be compared to a threshold concentration, however, this concentration should have a basis (e.g.: USEPA Region IX PRGs, SSLs or similar).
6. Response 55, the NDEP disagrees with KM's proposal to omit this discussion. The data collected for airborne manganese are useful and should be discussed in the CSM. It is suggested that the data be retained and discussed in the CSM in a modified format.
7. Response 65, it is suggested that if KM would like to include any discussions relating to background that the NDEP-approved ENVIRON data set be used. Also, to be noted, the BMI/TIMET data set may be approved before the CSM is revised and this could also be used.
8. Response 76b, it is suggested that KM contact BMI to obtain the detection limits.
9. Response 77c (and related comments), please note that the NDEP prefers the presentation of the SQL (when available) as the detection limit.
10. Response 96, the NDEP disagrees with KM's response and provides the following comments:
    a. Please provide copies of the references cited in this response (for record keeping purposes of the NDEP).
    b. KM states that "water from precipitation is held within the root zone where it is removed by evapotranspiration", this statement implies that there are roots within the root zone. A vast majority of the KM site does not contain plants. Please explain the relevance of this statement as it applies to the KM site.
    c. KM references reports that were generated for the Yucca Mountain site which is vastly different than the KM site. The Yucca Mountain site is located in rural Nevada with a very deep water table. The KM site is located in an urban environment with dense population and a relatively shallow water table. It is likely that the hydrologic environment in these two areas behaves in a very different manner. Overland transport of storm water onto the BMI Complex from the surrounding urban areas has been noted and likely influences the percolation of rainwater into the subsurface.

d. KM states "areas that have a soil or alluvial depth of less than 5 meters (16.5 feet) and within active stream channels, rainwater could infiltrate and percolate to the water table, possibly driving contaminants with it." This does not respond to the NDEP's original comment which discusses infiltration into subsurface soils and the vadose zone. KM's statement also does not address the presence of preferential pathways within the subsurface environment (e.g.: geologic or anthropogenic).

e. The NDEP has responded to this issue as raised by other BMI Companies, a few examples of the NDEP's position on this subject are provided below:

   i. NDEP letter to Stauffer dated July 23, 2003, Page 5, Response to Comment 5: *Copies of the Scanlon, et al., 1990 paper and the Gee et. al. 1994 paper were provided to the NDEP to support statements in the RAS report for the former ACD Plant. The Scanlon, et al., 1990 paper could not be adequately reviewed because pages are missing. The Gee et. al. 1994 paper was provided to support the assertion in the RAS that "arid areas have such high rates of evapotranspiration relative to recharge that the net recharge into the vadose zone is zero"* **(KM should note that this statement is very similar to the position that is being asserted by KM to the NDEP).** *A review of the Gee et. al. 1994 paper does not appear to confirm the above statement. In fact the reference can be used to show that recharge could be significant. The paper states the following: "Results from independent studies at three desert sites in the western USA show the relative influence of soils and plants in reducing the potential for recharge. Vegetation appeared to be the primary control of water balance at these desert sites. Significant water accumulation in soils was observed at all three sites when plants were removed. Water accumulation and deep drainage accounted for as much as 50% of the annual precipitation at the Las Cruces and Hanford sites. Elevated water storage in bare soils persisted at Beatty for > 3 yr, even during years with below-normal precipitation, while water was quickly removed by evapotranspiration on an adjacent vegetated site." As previously noted by the NDEP, and acknowledged by Stauffer in their response to comment 4, vegetation does not appear to be present at the site to any extent that would influence evapotranspiration. The potential for recharge to occur appears to be significant. Without additional data, the amount of potential recharge that may occur cannot be estimated with reasonable accuracy. The facility-wide CSM needs to address this issue.*

   ii. NDEP letter to Stauffer dated July 23, 2003, *the response continues to state, "With respect to potential infiltration, it appears that little or no vertical infiltration occurs based on observations in the field during storm events. For example, during*

a storm event in August of 1983, heavy rainfall occurred for about 20 minutes. Overland flow was observed after 5 minutes of heavy rainfall and continued for about 20 minutes until the heavy rainfall ceased. A field geologist scraped away the wet surface sediment to see how far the wetting front had penetrated. He recalled that it had penetrated less than one-inch bgs, and there was a sharp edge noted between the wet and dry sand. This thunderstorm only generated runoff and did not generate any significant infiltration of water." While interesting, this study does not follow any scientific process and cannot be used to justify that infiltration doesn't occur. There is no supporting documentation regarding rainfall intensity, location of observations, condition of surface, etc. This study also contradicts the results of other studies in the arid southwest that were completed using scientific methods over a period of time. For example, USGS 1991 (see reference below) observed that after 3.5 inches of rainfall during the two-month period from July 1984 to August 1984, water levels in well PG220 (located in the Upper Ponds) rose 5 feet and peaked in June 1985, about 10 months later. This 5-foot rise in the water table occurred during the summer months when evaporation rates are typically high. Reference: USGS, 1991. Changes in Water Levels and Water Quality in Shallow Ground Water, Pittman-Henderson Area, Clark County, Nevada, Resulting from Diversion of Industrial Cooling Water From Ditch to Pipeline in 1985. Water-Resources Investigations Report 89-4093, page 15. The response continues to state, "The average rainfall in the area is about 4 inches. Assuming a 100% infiltration (0% runoff, 0% evaporation), this is only enough water to saturate about 12 to 16 inches of soil or bring about 30 or so inches of soil to field capacity. A 50-foot soil column with 25% porosity would take about 12.5 feet water to saturate; one foot of water would create about 2% soil moisture." This analysis is incomplete as it does not consider infiltration during heavy rainfall events and water accumulating below the evaporative zone over the long term. The analysis is also inconsistent with many other long-term studies that have been conducted for waste disposal sites in the arid southwest (see comment 9 in NDEP's letter dated August 29, 2001, comments 9 and 12 in this set of comments and the above paragraph). It should be noted that the ambient soil moisture content measured in other parts of the BMI complex (e.g., Upper Ponds) ranges from approximately 5% to approximately 12%. **The NDEP has mentioned this reference to KM in the past.**

iii. NDEP letter to Stauffer dated August 29, 2001, *Second bullet: High evaporation rates can prevent surface water from infiltrating beyond certain depths. However, a maximum evaporative zone depth exists beyond which evaporation will not remove moisture*

from soil. At sites where vegetation is absent (which appears to be the case for the site), the effects of evaporation are generally limited to the upper portion of the soil column. For example, the USGS has shown that the water content in the uppermost 4 feet of soil can increase at an arid site in the Mojave Desert when vegetation is removed (Andraske, B.J., et. al., Waste Burial in Arid Environments-Application of Information From a Field Laboratory in the Mojave Desert, Southern Nevada, USGS Fact Sheet FS-179-95). The USGS has also shown that the potential for deep percolation does exist in an arid climate, in spite of high annual evaporative demands (Nichols, W.D., 1987, Geohydrology of the unsaturated zone at the burial site for low-level radioactive waste near Beatty, Nye County, Nevada: U.S. Geological Survey Water-Supply Paper 2312, 57 p.). The extent to which rainfall percolates through the soil column below the maximum evaporation depth, during ponding or high intensity rainfalls, does not appear to have been evaluated at the site. If evaporation rates are used to justify that infiltration of precipitation does not occur beyond a certain depth, a quantitative evaluation, which considers site-specific conditions, needs be performed.

iv. These are a few examples of NDEP's responses to the same issue as raised at the Stauffer site. The NDEP has also covered this issue at length with BMI/BRC and can provide additional examples, however, it is the belief of the NDEP that further response from the NDEP is unnecessary. If KM would like to continue to discuss this topic the NDEP can provide additional documentation that supports the NDEP's position.

11. Response 106a, KM should also review and incorporate the data collected by others (e.g.: SNWA).
12. Response 107, please provide the appropriate reference in the report so that the reviewer can locate this information and review it (if necessary).
13. Response 112, it is not reasonable to expect the reviewer to seek out bills of lading and waste manifests to determine the composition of site-related wastes. Understanding and presenting the composition of these wastes is important in the development of a comprehensive CSM.
14. Response 113b, please note that the toxicity of phosphorous is significantly different than white phosphorous. It is suggested that this entry be deleted.
15. Response 113d, there are PRGs that are applicable to DDD and DDE and these should be added to Table 6.
16. Response 119, it is recommended that the bold type be retained, however, a note should be added that explains the significance of the bold type on this table.