



**KERR-McGEE CHEMICAL LLC**

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August 30, 2005

Mr. Brian Rakvica, P.E.  
Nevada Division of Environmental Protection  
1771 East Flamingo Road, Suite 121-A  
Las Vegas, Nevada 89119

Dear Mr. Rakvica:

Subject: NDEP Facility ID H-000539 – Kerr-McGee ECA – *Conceptual Site Model – February 28, 2005* -  
Kerr-McGee Response to NDEP May 6, 2005 Comments

Kerr-McGee Chemical LLC (Kerr-McGee) has undertaken an Environmental Conditions Assessment (ECA) as directed by Nevada Division of Environmental Protection (NDEP). Integral to that investigation is understanding historical conditions associated with the site, by development of a Conceptual Site Model, describing site conditions. In late February 2005, Kerr-McGee submitted a *Conceptual Site Model – Kerr-McGee Facility Henderson, Nevada* (CSM) for NDEP review. NDEP provided comments regarding the CSM on May 6, 2005 and this correspondence provides responses to those comments. Our CSM has been revised to reflect the responses provided here but after discussion with your office we will hold on re-submittal of the revised CSM until you have reviewed the Attachment A enclosed and until additional information is available from site condition sampling. While this is the case, we have included a revised Table 9 and a revised Plate 10 for your review and comment as examples of how we would expect the CSM to be revised to reflect our responses to your May 6, 2005 comments.

Feel free to call me at (702) 651-2234 if you have any questions regarding this correspondence. Thank you.

Sincerely,

Susan M. Crowley  
Staff Environmental Specialist

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#### Attachment

SmclKM Response to NDEP 5-6-05 Comments - Cvr Ltr.doc



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ATTACHMENT A

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**Attachment A**  
**Kerr-McGee Response to NDEP May 6, 2005 Comments**  
**Regarding**  
**Conceptual Site Model dated February 28, 2005**

**NDEP Comment 1:**

1. General comment, purpose and uses of the Conceptual Site Model (CSM), the NDEP has the following comments:
  - a. The NDEP believes that it is important to distinguish between intended use versus end use of the CSM. As discussed by KM the intended use appears to be a description of the end use. "The intended use of the CSM is to compile and integrate available Site information and to identify potential data gaps. Furthermore, the CSM ... in reducing the exposure of environmental receptors to contaminants." The intended use of a CSM is not "to compile and integrate available Site information." ASTM International (2003) guidance states, "The conceptual site model is used to integrate all site information and to determine whether information including data are missing (data gaps) and whether additional information needs to be collected at the site." Note that the ASTM International definition includes 1) the notion that the CSM is to integrate site data and 2) an end use, "to determine whether information including data are missing (data gaps)."
  - b. The NDEP believes that the definition should not include an end use and that no one definition adequately describes a CSM. Thus, the following definition is suggested. A conceptual model is a pictorial, graphical, and descriptive representation of an environmental system using site data "that identifies all potential or suspected sources of contamination, types and concentrations of contaminants detected at the site, potentially contaminated media, and potential exposure pathways, including receptors (EPA, 1989)." This definition does not include an end use. This distinction is important because the CSM has a number of potential uses including: identifying potential data gaps, identifying potential sample locations, identifying potential remedial alternatives, developing DQOs, assessing data usability, developing analytical/numerical models, and evaluating risk.
  - c. Please note that ASTM International states that "The quality of the information being assembled should be evaluated, preferably including quantitative methods, and the decision to use the information should be based on the data's meeting objective qualitative and quantitative criteria. For more information on assessing the quality and accuracy of data, see *Guidance for Data Useability in Risk Assessment (Part A)* and *Guidance for Data Useability in Risk Assessment (Part B)*. Methods used for obtaining analytical data should be described, and sources of information should be referenced" (ASTM International, 2003). The NDEP understands that KM plans on completing a data useability assessment in the future and assumes that the CSM will require revisions in the future based on this assessment and the collection of additional data.

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**Response:**

- 1 a. *The introduction will be changed to reflect the guidance language more precisely.*
- 1 b. *References to end use will be omitted.*
- 1 c. *Comment noted, a data usability evaluation was provided to NDEP under separate cover.*

**NDEP Comment 2:**

- 2. 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.

**Response:**

*The jurat will be modified as requested.*

**NDEP Comment 3:**

- 3. General comment, Tables, it appears to the NDEP (based on a review of the tables and in a discussion with KM) that the tables generated for this report may not have utilized a database. If KM has not yet developed a project database, it is highly encouraged to do so at this time. As the investigation progresses it may become very cumbersome to generate tables and figures from the "Mother-hen Database" (which appears to be a spreadsheet, not a database). Furthermore, in the future, KM will be required to submit data to the NDEP in an EQUIS-compatible format to comply with the NDEP Electronic Data Deliverables protocol (under development).

**Response:**

*The groundwater data have been put in EQUIS format; however, Excel tables will continue to be used in the report. Soil data that are collected in the future will be put in EQUIS format.*

**NDEP Comment 4:**

- 4. General comment, Tables, KM references the method detection limit (MDL) and the practical quantitation limit (PQL) for use as the "detection limit" in various tables. It is preferred that this issue be standardized. Also please be advised that per the USEPA Guidance for Data Usability in Risk Assessment (9285.7-09A, April 1992, USEPA Office of Emergency and Remedial Response), is recommended that the sample quantitation limit (SQL) be reported. The guidance goes on to state "the SQL is the most useful limit for the risk assessor and should always be requested...they are the most relevant quantitation limits for evaluating non-detected chemicals".

**Response:**

*When available, these data will be included in the tables. Data validation will be performed in the future as needed on data to be used in a risk assessment.*

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**NDEP Comment 5:**

5. General comment, Soils Data, it would be helpful to include soil data on the plates that were developed for groundwater plume maps. TIMET has prepared figures that present similar data in an effective manner. These figures are located in the January 24, 2005 TIMET Environmental Conditions Investigation Addendum report and can be accessed through the NDEP offices or from TIMET (per previous correspondence it is preferred that this information be obtained directly from TIMET). In addition, there appears to be soil data that is available for a number of the LOU areas for common chemicals (arsenic, barium, chromium, etc). It would be helpful to present this information on figures (smaller paper sizes may be adequate depending on the spatial distribution of the data). Please note that some of the specific comments below are intended to help identify specific areas of the site, which may not have any soils data and may require additional characterization.

***Response:***

*The plates have been modified to include soil concentration data for chromium, TPH, and manganese.*

**NDEP Comment 6:**

6. General comment, Discussion of LOU Areas, many LOU areas are discussed for several different site-related chemicals, however, the discussion is not tailored to the specific chemical of interest in that section. A more tailored discussion would result in the elimination of unnecessary text from the report and would provide a more concise description of the specific chemical that is being discussed. There are numerous examples of this issue, which will not be listed on a section-by-section basis (in general). For example, sections 4.2.6, 4.4.6, and 4.8.7 all address LOU #15 and each section contains very similar information. Section 4.8.7 is meant to address "miscellaneous chemicals", however, the only specific data that is discussed is relative to chromium. It is suggested that KM tailor the discussion in each section to the chemical that is being focused on and provide a reference to other applicable sections. The comments below provide some specific examples, however, every instance in the CSM will not be discussed specifically in this comment letter.

***Response:***

*As discussed with the NDEP, the text will be modified to introduce each LOU with all the data pertinent to that LOU. In each succeeding chemical specific section, only the data pertinent to the specific chemical will be included.*

**NDEP Comment 7:**

7. General comment, Elevated Concentrations, throughout this comment letter the NDEP notes where chemical concentrations appear to be elevated. These comments are not meant to imply that the NDEP has reviewed every data point in the report for comparison to potential (non-site specific) risk-based concentrations. The NDEP's

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review is qualitative in nature and compares select data to available guidance levels such as USEPA PRGs and SSLs.

**Response:**

*Comment noted.*

**NDEP Comment 8:**

8. General comment, Total Petroleum Hydrocarbons (TPH) in Ground Water, in the future, please complete analyses for benzene, ethylbenzene, toluene and xylene (BTEX) in groundwater for areas where TPH is being characterized.

**Response:**

*Future analysis for TPH in groundwater will be expanded to include BTEX as requested.*

**NDEP Comment 9:**

9. Section 1.1, page 1-1, KM defines the purpose of the CSM to be to describe the Site, and document the sources, pathways, release mechanisms, exposure routes and receptors. It should also be noted that the CSM will likely be used to develop DQOs, workplans and risk assessments. In this case, the quality of the data used in developing the CSM needs to be assessed. This report should discuss how the quality of the data presented in this report will be assessed. It is the understanding of the NDEP that this data will be assessed in data usability and data quality assessments. In addition, it is requested that KM tie the use of the CSM to specific long-term goals rather than the generalized statements that are presented in the third paragraph of this section.

**Response:**

*A data quality assessment was provided to the NDEP under separate cover. The paragraph will be omitted.*

**NDEP Comment 10:**

10. Section 1.2, page 1-1, KM states that "Environmental investigations relating to the Site have been conducted since 1991." In section 3.1, page 3-1, KM states that environmental impacts were investigated in the 1970s. Please clarify this issue and revise the text accordingly.

**Response:**

*The text will be modified to clarify that the ECA soil and groundwater sampling started in 1991 but that other environmental investigations were conducted as early as the 1970s.*

**NDEP Comment 11:**

11. Section 2.5.2, page 2-5, KM states "Evapotranspiration concentrates the natural salts in the shallow aquifer, resulting in low-quality water with high total dissolved solids levels". It should be noted that evapotranspiration is not likely to be the driving force

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behind the elevated total dissolved solids (TDS) levels in the shallow aquifer in the vicinity of the site. Industrial activities have been contributing to the elevated levels of TDS in the vicinity of the site for over 60 years. Furthermore, background levels of TDS in groundwater have not yet been established by KM or approved by the NDEP. In addition, KM discusses TDS in terms of parts per million, however, Plate 9 presents groundwater conductivity in terms of mS/cm. It is requested that future discussions/presentations provide a presentation of TDS in terms of parts per million.

**Response:**

*The groundwater data are recorded in terms of mS/cm which do not convert directly to TDS in terms of parts per million. The Source Area Workplan will evaluate the need for additional data collection including TDS data.*

**NDEP Comment 12:**

12. Section 2.5.2, page 2-5, KM states "...groundwater can flow in these paleochannels at an average rate of 35 feet per day... Extrapolating this velocity over the total distance involved and assuming that perchlorate travels at the same velocity as the groundwater ... the residence time is about 6 months." The NDEP does not concur. The average velocity was used to calculate the residence time of six months. The calculation accounts only for contaminant advection and does not consider the effects of contaminant dispersion. Because of the effects of dispersion the contaminant front will arrive in advance of the "average" time (six months) and the tail will take longer than the "average" time. The total residence time would be the time required for the tail of the contaminant breakthrough curve to pass. This time would be in excess of six months. Total residence time could be calculated but would require the use of an advection-dispersion equation.

**Response:**

*The text is qualified as average travel time and is not describing first arrivals or tail times. The sentence describing residence time will be removed.*

**NDEP Comment 13:**

13. Section 2.5.2, page 2-5 and 2-6, KM discusses salinity in terms of milligrams per liter (mg/l) and micro Siemens per centimeter interchangeably ( $\mu\text{S}/\text{cm}$ ). It is requested that KM standardize this discussion with a uniform set of units. The NDEP prefers that KM use mg/l or provide the analyses required to support the conversion from  $\mu\text{S}/\text{cm}$  to mg/l.

**Response:**

*As described in the response to comment 11, the groundwater data are recorded in terms of mS/cm which do not convert directly to TDS in terms of parts per million. The Source Area Workplan will evaluate the need for additional data collection including TDS data.*



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**NDEP Comment 14:**

14. Section 3.1, page 3-1, it should also be noted that a variety of tenants have occupied portions of the BMI Complex. While it may not be possible to list all of the tenants that have occupied portions of the BMI Complex it is necessary to identify the tenants that have occupied portions of the KM site.

***Response:***

*A list of KM tenants will be provided in Section 3.1.*

**NDEP Comment 15:**

15. Section 3.3, page 3-4, KM discusses LOU areas where “no further action is required at this time”. This is also discussed in section 4.1.2 and other sections of the report. As the NDEP has noted previously to KM, previous designation as “no further action” does not exclude these LOU areas or any other portion of the site from additional characterization and remedial activities (if necessary). There are a number of technical issues relating to the site characterization (which have been discussed previously) that necessitate additional characterization and remedial activities (if necessary) at the site. It is the assumption of the NDEP that the statements contained in the CSM are meant to summarize the historic data collected and actions taken to date at the site.

***Response:***

*The NDEP is correct in assuming that the statements contained in the CSM are meant to summarize the historic data collected and actions taken to date. It is understood that the NDEP may require additional characterization and remedial activities, if necessary, for LOUs or other areas that may have been designated “no further action” in the past.*

**NDEP Comment 16:**

16. Section 3.4, page 3-8, KM states “Groundwater capture from the targeted buried alluvial channel underlying Athens Road appears to be complete.” KM has stated in separate reports that the capture efficiency at the Athens Road well field is 97.5%. The NDEP is currently evaluating the efficiency of this well field to verify the capture efficiency. To state that capture is complete implies 100% capture. The NDEP requests that this statement be revised.

***Response:***

*The statement has been revised to state: “capture is nearly complete.”*

**NDEP Comment 17:**

17. Section 4.0, page 4-1, it should be noted that the analyses completed to date have not included the full suite of chemicals on the site-related chemical (SRC) list. In addition, the analyses completed to date have primarily focused on surface soil, near surface soil and groundwater samples. Once additional site characterization is completed, additional groupings of source areas may be applicable. Also, LOU areas may be

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found to be applicable to additional groups of source areas once site characterization is complete.

**Response:**

*Comment noted.*

**NDEP Comment 18:**

18. Section 4.0, page 4-1, KM states "In response to an NDEP request in the February 11, 2004 letter, Table 6 summarizes the applicable 2004 EPA Region IX Preliminary Remediation Goals (PRGs) and Federal Maximum Contaminant Levels (MCLs) for drinking water." Please provide the comment number and actual NDEP comment for the basis of this statement. The NDEP has not found any text within the 2/11/04 letter that requested this table. It should be noted that this table is useful as a starting point for the tracking of ARARs and should remain in the document.

**Response:**

*Kerr-McGee agrees that the table is useful. Comment 12 c. i. of the NDEP February 11, 2004 letter is where MCLs, SSLs and PRGs were requested.*

**NDEP Comment 19:**

19. Section 4.1, page 4-2, perchlorate is listed as being a "potential chemical contaminant". It is the opinion of the NDEP that sufficient data exists to identify perchlorate as a site-related chemical contaminant.

**Response:**

*The text will be changed to read, "Perchlorate was identified as a site-related chemical and has on-going remediation in place, both on-Site and off-Site."*

**NDEP Comment 20:**

20. Section 4.1.1, page 4-2, this section also discusses nitrate and chromium, it seems that this information would be better addressed in sections 4.8 and 4.4, respectively.

**Response:**

*As indicted in response to comment number 6, the text will be modified to introduce each LOU with all the data pertinent to that LOU. In each succeeding chemical specific section, only the data pertinent to the specific chemical will be included.*

**NDEP Comment 21:**

21. Section 4.1.2, page 4-2, this section notes that the waste stored in this area may have been contaminated with "other industrial wastes, such as cooling tower sludge and iron oxide sludge." KM should describe the composition of the cooling tower sludge and iron oxide sludge as well as any other industrial wastes that may have contaminated the trash stored in this area. If this is unknown it should be stated as such. The discussion on the (non-perchlorate) composition of these wastes should be contained

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in section 4.8 or whichever section is applicable. Also, this section does not provide any discussion on analytical data in this area. Additional characterization of this area may be necessary.

**Response:**

*Additional data on the cooling tower sludge and iron oxide sludge were not found in the files reviewed. Additional characterization, if needed, will be addressed in the Source Area Workplan. The report will be reorganized as explained in the response to comment number 6.*

**NDEP Comment 22:**

22. Section 4.1.3, pages 4-2 and 4-3, this section does not provide any discussion on analytical data collected for this area. Additional characterization of this area may be necessary.

**Response:**

*Analytical data were not found in the files reviewed. Additional characterization, as needed, will be addressed in the Source Area Workplan.*

**NDEP Comment 23:**

23. Section 4.1.4, page 4-3, this section contains a discussion on the impacts of iron oxide. It is the opinion of the NDEP that this discussion should be relegated to section 4.8.

**Response:**

*The iron oxide discussion will be moved to section 4.8.*

**NDEP Comment 24:**

24. Sections 4.1.5, 4.1.6, 4.1.7, 4.1.8, 4.1.9, 4.1.10, and 4.1.11, pages 4-3 through 4-5, these sections do not provide any discussion on analytical data collected for these areas. Additional characterization of these areas may be necessary.

**Response:**

*Analytical data were not found in the files reviewed. Additional characterization, as needed, will be addressed in the Source Area Workplan.*

**NDEP Comment 25:**

25. Section 4.2, page 4-5, KM states "Kerr-McGee has focused groundwater remediation efforts on ... containment and clean-up of the impacted groundwater downgradient from suspected source areas." Section 4.2 discusses chlorate. It should be noted that the operation of remedial systems, prior to the recent installation of the Fluidized Bed Reactor, did not address chlorate. This section of the report needs to be revised and clarified.

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**Response:**

*The sentences will be revised to state, "Historic remediation systems did not remove chlorate from groundwater. Currently, chlorate is removed from groundwater in the Fluidized Bed Reactor."*

**NDEP Comment 26:**

26. Section 4.2.1, page 4-5, this section includes discussion on chromium. It is the belief of the NDEP that the discussion in this section and the remainder of section 4.2 should be limited to chlorate. It appears that, based on the discussion in the text, these LOU areas were investigated for chromium impacts to the environment but not chlorate.

**Response:**

*As indicted in response to comment number 6, the text will be modified to introduce each LOU with all the data pertinent to that LOU. In each succeeding chemical specific section, only the data pertinent to the specific chemical will be included.*

**NDEP Comment 27:**

27. Section 4.2.3, page 4-6, please note that discoloration of soil is not an adequate means of delineation of the extents of contamination; human health or ecological risks associated with the soil; or the potential for the contaminants to migrate to groundwater. Also, no analytical data were presented or discussed for soil or groundwater in this area. Additional characterization may be necessary.

**Response:**

*Kerr-McGee understands the limitations of using discolored soil to identify impacted areas. Analytical data were not found in the files reviewed. Additional characterization, as needed, will be addressed in the Source Area Workplan.*

**NDEP Comment 28:**

28. Section 4.2.4, page 4-6, no analytical data was presented or discussed for soil or groundwater in this area. Additional characterization may be necessary.

**Response:**

*Analytical data were not found in the files reviewed. Additional characterization, as needed, will be addressed in the Source Area Workplan.*

**NDEP Comment 29:**

29. Section 4.2.5, page 4-7, please note that EP toxicity data is not an adequate means of delineation of the extents of contamination; human health or ecological risks associated with the soil; or the potential for the contaminants to migrate to groundwater. The NDEP has similar comments regarding TCLP concentrations and other statements throughout the report. Please refer to the NDEP's February 11, 2004 letter to KM. This comment will not be repeated for other sections of the CSM. It is the assumption of the

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NDEP that the statements contained in the CSM are meant to summarize the historic data collected and actions taken to date at the site.

**Response:**

*Kerr-McGee understands the limitations of the EP toxicity and TCLP data. NDEP is correct in its assumption that Kerr-McGee is summarizing historic data collected and actions taken at the Site.*

**NDEP Comment 30:**

30. Sections 4.2.6 and 4.2.7, page 4-7, these sections contain no discussion on chlorate or any analytical data. Please see general comment above regarding "Discussion of LOU Areas".

**Response:**

*Analytical data were not found in the files reviewed. Additional characterization, as needed, will be addressed in the Source Area Workplan. As indicted in response to comment number 6, the text will be modified to introduce each LOU with all the data pertinent to that LOU. In each succeeding chemical specific section, only the data pertinent to the specific chemical will be included.*

**NDEP Comment 31:**

31. Section 4.2.8 and 4.2.9, pages 4-7 and 4-8, these sections do not reference any analytical data. These areas may require additional characterization.

**Response:**

*Analytical data were not found in the files reviewed. Additional characterization, as needed, will be addressed in the Source Area Workplan.*

**NDEP Comment 32:**

32. Section 4.3, page 4-8, KM states "Kerr-McGee has focused groundwater remediation efforts on...are primarily focused on perchlorate and chromium." Please explain how this statement and the groundwater treatment systems relates to TDS. It is the understanding of the NDEP that none of the historic or existing groundwater treatment systems have ever addressed TDS as a contaminant. This comment also applies to sections 4.5, 4.6, 4.7 and 4.8.

**Response:**

*Comment noted. As indicted in response to comment number 6, the text will be modified to introduce each LOU with all the data pertinent to that LOU. In each succeeding chemical specific section, only the data pertinent to the specific chemical will be included.*

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**NDEP Comment 33:**

33. Section 4.3.3, page 4-9, this section states that ponds WC-West and WC-East contained "process water". If the composition of this process water is known it should be summarized. KM discusses the contents of some of the ponds (e.g.: Pond Mn-1) and LOU areas but not consistently. If the composition of an area is not understood, that should be stated.

***Response:***

*Analytical data were not found in the files reviewed. Additional characterization, as needed, will be addressed in the Source Area Workplan.*

**NDEP Comment 34:**

34. Section 4.3.3, page 4-9, KM discusses metals and VOCs for this LOU area. Section 4.3 of the report is intended to deal with TDS and the NDEP believes that the discussion on metals and VOCs should be relegated to their appropriate sections. In addition, the discussion on the spill of water treatment chemicals should be discussed in terms of the composition of the chemicals that were spilled.

***Response:***

*As indicted in response to comment number 6, the text will be modified to introduce each LOU with all the data pertinent to that LOU. In each succeeding chemical specific section, only the data pertinent to the specific chemical will be included. Additional data regarding the chemical composition of the spills were not found in the files reviewed. Additional characterization, as needed, will be addressed in the Source Area Workplan.*

**NDEP Comment 35:**

35. Section 4.3.4, page 4-10, this section should specify which groundwater treatment unit is being discussed. The chromium treatment, the fluidized bed reactor, the GAC columns or some combination thereof? In addition, no analytical data is discussed for this area. This area may require additional characterization. This comment also applies to other discussions of the groundwater treatment unit throughout the report.

***Response:***

*The sentence will be modified to state, "the chromium GWTP." Analytical data were not found in the files reviewed. Additional characterization, as needed, will be addressed in the Source Area Workplan.*

**NDEP Comment 36:**

36. Section 4.3.5, page 4-10, no analytical data is discussed for this area. This area may require additional characterization.

***Response:***

*Analytical data were not found in the files reviewed. Additional characterization, as needed, will be addressed in the Source Area Workplan.*

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**NDEP Comment 37:**

37. Section 4.3.6, page 4-10, KM states "Removal of the impacted soil beneath these buildings would likely require destruction of each building." In section 4.5.3, KM describes a process by which the floor of Unit #6 was removed and sub-surface soil was contoured. It appears to the NDEP that a similar process could be undertaken beneath Units #4 and #5 (the floor could be removed) and an in-situ remedial technology could be implemented to address the large source area beneath these buildings. This process may not be feasible or warranted for other reasons, however, KM has not described these other reasons. It would be appropriate to discuss this issue under separate cover in conjunction with other source area removals or a remedial alternatives study.

***Response:***

*The soil removal under Unit 6 was not a full scale removal, as NDEP has noted. Kerr-McGee will provide additional information to NDEP regarding this issue under separate cover as requested.*

**NDEP Comment 38:**

38. Section 4.4.1, pages 4-11 and 4-12, KM compares chromium data to 100 mg/kg and 1,000 mg/kg. This comparison is repeated elsewhere in the document. The basis or significance for comparison to these numbers is not clear. KM proceeds to assert that "these results indicated that soils impacted with chromium...are primarily limited to the interior areas of the ponds." The NDEP does not agree with this statement. KM has not shown that a concentration of 100 mg/kg chromium is protective of human health or the environment. Furthermore, there is a large plume of chromium (primarily hexavalent) that emanates from the KM property and it has not been shown that a concentration of 100 mg/kg is protective of the migration to groundwater pathway. There is a significant amount of discussion by KM comparing site concentrations to 100 mg/kg. As stated above, this discussion is not pertinent.

***Response:***

*The discussions comparing chromium in soil concentrations to a 100 mg/kg threshold will be omitted.*

**NDEP Comment 39:**

39. Section 4.4.1, page 4-11, KM states that sample SB2-5 did not have a concentration above 100 mg/kg. The concentration listed on Table 8 for this sample is 131 mg/kg.

***Response:***

*Comment noted. The concentration for SB2-5 was confirmed to be 131 mg/kg, which is above 100mg/kg. As stated above in the response to comment 38, the discussions comparing chromium in soil concentrations to a 100 mg/kg threshold will be omitted.*

**NDEP Comment 40:**

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40. Section 4.4.1, page 4-12, KM states "The total chromium concentration in all samples from P-3 decreased with depth." The previous sentence states that samples SB2-2 and SB2-8 did not decrease with depth and that these samples were located in Pond P-2. Table 8 shows these samples as being located in Pond P-3. Please review this issue and revise the text and tables as necessary.

**Response:**

*The data were confirmed and the paragraph was clarified and revised in Section 4.4.1 to read:*

*With the exception of SB2-3 and SB2-6, the 0 to 12 inches deep samples in the boreholes contained total chromium above 100 milligrams per kilogram (mg/kg). Also, in several areas (SB2-1, SB2-8, SB2-10, and SB2-11), the chromium concentrations from the 0 to 12 inch depths were above 1,000 mg/kg (Plate 17 and Figure 4). All 24 to 36 inches deep samples, with the exception of SB2-3, SB2-5, and SB2-6, were analyzed for total chromium. Subsequent analysis in P-3 pond of the 24" to 36" deep samples indicated a decrease in total chromium concentration, with the exception of SB2-2 and SB2-8. The total chromium concentration in all samples from Old P-2 decreased with depth.*

**NDEP Comment 41:**

41. Section 4.4.1, page 4-12, KM states "elevated pH values tend to retard the mobility of chromium, especially trivalent chromium." No evidence has been presented to suggest that a majority of the plume is trivalent chromium, in fact the data presented to date suggest that the plume is nearly 100% hexavalent. Furthermore, since the existing plume covers several miles it is difficult to envision significant retardation of its migration due to elevated pH levels.

**Response:**

*The paragraph will be omitted.*

**NDEP Comment 42:**

42. Section 4.4.1, pages 4-11 and 4-12, in summary, the NDEP believes that KM has not defined the extent and depth of contamination associated with these areas. As stated in previous comments, the NDEP encourages KM to investigate the feasibility of source removal in these areas.

**Response:**

*Additional characterization, as needed, will be addressed in the Source Area Workplan. Identification of remedial actions will be addressed through a feasibility study following site characterization and a risk assessment.*



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**NDEP Comment 43:**

43. Section 4.4.2, page 4-13, KM discusses the quarterly perchlorate monitoring in this section. The NDEP believes that this discussion would be better contained in the section on perchlorate rather than the section on chromium.

***Response:***

*The perchlorate information will be moved.*

**NDEP Comment 44:**

44. Section 4.4.3, page 4-13, see comment on Section 4.2.3.

***Response:***

*Please refer to response to comment 27.*

**NDEP Comment 45:**

45. Section 4.4.4, page 4-13, no analytical data is discussed for this area. This area may require additional characterization.

***Response:***

*No analytical data were found in the files reviewed. Additional characterization, as needed, will be addressed in the Source Area Workplan.*

**NDEP Comment 46:**

46. Section 4.4.5, pages 4-13 and 4-14, please note that EP Toxicity data may not be sufficient to characterize the nature and extent of contamination in this area. Additional sampling and analysis may be necessary.

***Response:***

*Kerr-McGee understands the limitations of EP toxicity data. Additional characterization, as needed, will be addressed in the Source Area Workplan.*

**NDEP Comment 47:**

47. Section 4.4.7, page 4-14, the concentrations of chromium in pond AP-3 are not discussed. The concentrations of chromium in ponds AP-1 and AP-2 (3.13 and 2.80 mg/liter, respectively) are elevated with respect to the applicable groundwater standards. It is the belief of the NDEP that these ponds should be included as a potential source of chromium. In addition, please describe the "statistical guidelines" that were used to determine the average concentrations of chromium in this area.

***Response:***

*Chromium concentrations for pond AP-3 were not obtained during the sampling referenced in the KM, October 1996 Response to LOU. No other analytical data from pond AP-3 were found in the files reviewed. Ponds AP-1 and AP-2 will be added to the*

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*chromium potential source areas. The sentence will be revised to state, "The statistical guidance used is from US EPA SW-846 Chapter 9, dated 1986. Specifically Table 9-1, equation 2a was used to calculate the average and a series of equations were used to calculate the confidence interval for the mean: 3a, 4, 5 and 6 using a student's "t" value for a two tailed confidence interval in a probability of 0.20 with 7 degrees of freedom."*

**NDEP Comment 48:**

48. Section 4.4.8, page 4-14, please describe the composition of the flammable and "miscellaneous compatible" wastes used in this area. This description should be contained in the appropriate section of the report unless the flammable wastes contributed to the chromium impacts in this area.

***Response:***

*Additional information on the composition of the flammable and miscellaneous compatible wastes was not found in the files reviewed. Discussions will be limited to chromium in this section.*

**NDEP Comment 49:**

49. Section 4.4.9, page 4-15, see comment on Section 4.3.4.

***Response:***

*See response to comment number 35.*

**NDEP Comment 50:**

50. Sections 4.4.10 and 4.4.11, pages 4-15 and 4-16, no analytical data is discussed for this area. This area may require additional characterization.

***Response:***

*No analytical data were found in the files reviewed. Additional characterization, as needed, will be addressed in the Source Area Workplan.*

**NDEP Comment 51:**

51. Section 4.4.11, page 4-16, this section does not discuss how the old main cooling tower relates to the chromium issue. Please expand the discussion in this section.

***Response:***

*Chromium was added as a treatment chemical in the cooling tower. As indicted in response to comment number 6, the text will be modified to introduce each LOU with all the data pertinent to that LOU. In each succeeding chemical specific section, only the data pertinent to the specific chemical will be included.*

**NDEP Comment 52:**

52. Section 4.5.1, page 4-17, KM states that "Mn-1 does not appear to be contributing to groundwater impacts in the area." The NDEP would like to note that the detection limits

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used by KM for the purposes of the historical investigations are likely elevated and need to be revised in order to make meaningful conclusions about the impacts of manganese in site groundwater. A review of the guidance values which may be applicable to manganese are listed below. It should be noted that half of these values are below the detection limit (0.15 mg/liter) used by KM.

- a. USEPA Tap Water PRG = 0.876 mg/liter
- b. National Secondary Drinking Water Regulation = 0.05 mg/liter
- c. Nevada Beneficial Use Standard for the Las Vegas Wash = 0.2 mg/liter
- d. Nevada Secondary Drinking Water Standard = 0.1 mg/liter

**Response:**

*Kerr-McGee understands the limitations of the historic data and elevated detection limits. The sentence will be omitted.*

**NDEP Comment 53:**

53. Section 4.5.2, page 4-17, KM states “there is no significant manganese impact to groundwater in the vicinity of the tailings.” It is difficult for the NDEP to determine what the specific source of manganese in groundwater is. Well M32 is downgradient of a number of source areas and it is difficult to determine whether or not the eastern portion of LOU #34 is contributing to the elevated concentrations of manganese in this well. In addition, there is very limited data in the vicinity of the western portion of LOU #34. This comment also applies to Section 4.5.5.

**Response:**

*The sentences will be modified or omitted.*

**NDEP Comment 54:**

54. Section 4.5.4, page 4-18, and Table 18, please provide any radionuclide analysis associated with the ore. To be noted, Pioche Manganese historically operated on the TIMET Plant Site and a radionuclide survey of the former operations areas revealed elevated levels of radionuclides. If no radionuclide data is available it is suggested that the analyses be completed.

**Response:**

*No radionuclide analytical data were found in the files reviewed. Additional characterization, as needed, will be addressed in the Source Area Workplan.*

**NDEP Comment 55:**

55. Section 4.5.4, page 4-18, KM discusses the concentrations of manganese that various workers are exposed to on the site (0.058 – 1.74 mg/m<sup>3</sup>), however, these concentrations are not discussed in terms of acceptable risk. In addition, no data is presented to discuss airborne off-site impacts to workers and residents. As a point of reference, the USEPA Ambient Air PRG for manganese is 0.0000511 mg/m<sup>3</sup>.

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**Response:**

*The discussions will be omitted.*

**NDEP Comment 56:**

56. Section 4.6, page 4-18, the only potential source area discussed for boron is Pond C-1 and associated piping. Please explain if other areas of the site could be a potential source of boron. For example, the building in which the boron is produced; the area in which raw products are received, and any waste disposal areas associated with the boron production. These are only examples of potential sources of boron on the site, it is the responsibility of KM to thoroughly review all historic records to determine the possible sources of boron.

**Response:**

*Additional potential boron source areas will be added to this section and Plate 15.*

**NDEP Comment 57:**

57. Section 4.6.1, pages 4-18 and 4-19, the composition of pond C-1 is not discussed. In addition, pond C-1 is not discussed in terms of boron (section 4.6 refers to boron). In addition, this section directs the reviewer to Table 13 which does not contain any analytical information on boron.

**Response:**

*As indicted in response to comment number 6, the text will be modified to introduce each LOU with all the data pertinent to that LOU. In each succeeding chemical specific section, only the data pertinent to the specific chemical will be included. In this case, there were no boron data found in the files reviewed.*

**NDEP Comment 58:**

58. Section 4.7.1, page 4-19, KM states "Arsenic was detected at 0.124 mg/l, which is within the expected range." The USEPA MCL for arsenic is currently 50 µg/l (to be reduced to 10 µg/l in 2006) and it is not clear what the basis for the "expected range" is. Please clarify.

**Response:**

*The sentence will revised to state only: "Arsenic was detected at a 0.124 mg/l concentration."*

**NDEP Comment 59:**

59. Section 4.7.1, page 4-19, KM states "the constituents of concern were either not detected, were detected at low levels as a result of laboratory procedures, or were not representative of adverse environmental conditions." The NDEP does not agree with this statement for the following reasons:
- a. Constituents of concern have not been identified yet. The list of site-related chemicals has not been reduced to a list of constituents (chemicals) of potential

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concern (COPCs) or chemicals of concern (COCs). KM is advised to utilize the approved USEPA methodology and terminology consistent with it's intent.

- b. Chemicals present in groundwater may or may not present an "adverse environmental condition", however, this is currently not known. KM has not analyzed for a broad suite of chemicals and the chemicals that have been detected are present at concentrations that may be of concern. See comment above regarding arsenic concentrations. Chromium was detected at concentrations near its MCL, perchlorate concentrations are elevated, electro-conductivity levels are elevated, and chloroform concentrations may or may not be elevated (present at 22.5% of the Total Trihalomethane (TTHM) MCL).

**Response:**

*The sentence will be omitted.*

**NDEP Comment 60:**

60. Section 4.7.3, page 4-20, KM discusses a historic excavation project to address TPH-impacted soils. These soils had elevated levels of diesel and motor oil, however, the second confirmation sample only analyzed for diesel. It appears to the NDEP that additional characterization in this area may be warranted. This comment also applies to section 4.7.5.

**Response:**

*Additional characterization, as needed, will be addressed in the Source Area Workplan.*

**NDEP Comment 61:**

61. Section 4.7.5, page 4-21, please note that the NDEP action level for TPH is 100 mg/kg, therefore, the sample that was collected was at the action level not below the action level. This comment also applies to Section 4.7.8. and will not be repeated for other occurrences throughout the report.

**Response:**

*The sentence will be changed to state: ".. which is at the NDEP action level," in Section 4.7.4, Page 4-21 and Section 4.7.8, Page 4-24. No other occurrences were identified.*

**NDEP Comment 62:**

62. Section 4.7.5, page 4-21, KM states that the samples were analyzed for "polychlorinated biphenyls (PAHs)". Please note that this should read "polynuclear aromatic hydrocarbons (PAHs)" or "polycyclic aromatic hydrocarbons (PAHs)".

**Response:**

*The sentence will be revised to state: polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270.*

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**NDEP Comment 63:**

63. Section 4.7.5, page 4-21 and table 23, Table 23 presents a generalized column titled "PAHs" and all of the results of listed as ND(<0.5) in terms of µg/l. It is necessary to list each of the chemicals that were analyzed for as different PAHs exhibit different toxicities.

***Response:***

*The list of PAHs analyzed for will be listed in the Notes at the bottom of Table 23.*

**NDEP Comment 64:**

64. Section 4.7.6, page 4-22, this section (and others throughout the report) discuss composite sampling (or averaged data) and draw conclusions from this composite sampling regarding the potential environmental effects from areas of the site. As the NDEP has discussed previously, composite sampling may not be appropriate for risk based closures. Please refer to the NDEP's February 11, 2004 letter for all such instances within the CSM.

***Response:***

*Kerr-McGee understands the limitations of composite sampling and will revise the text.*

**NDEP Comment 65:**

65. Section 4.7.6, page 4-23, KM discusses metal concentrations with respect to "average background concentrations in Western U.S. soils." This is not appropriate. Please refer to the NDEP's February 11, 2004 letter for additional information. This comment applies to Section 4.8.1 as well as any other occurrences within this report.

***Response:***

*The comparisons of metals concentrations to average background concentrations in Western US soils will be omitted.*

**NDEP Comment 66:**

66. Section 4.7.6, page 4-23, KM discusses a chromium concentration (composite, surface sample) of 42.9 mg/kg and states that this "is not at concentrations likely to represent an environmental concern." As a point of reference, this concentration exceeds the USEPA SSL DAF1 of 2.0 mg/kg. In addition, a composite sample has the potential to mask elevated concentrations in some locations through the act of mixing these soils with soils of lower concentrations.

***Response:***

*The statement will be omitted.*

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**NDEP Comment 67:**

67. Section 4.7.6, page 4-23, KM states “the former J.B. Kelley Trucking operation has not affected surface and subsurface soil.” The NDEP does not agree with this conclusions based on the reasons outlined above and due to incomplete characterization (limited suite of analytes and limited depth of sampling) of the entire KM site.

***Response:***

*The statement will be omitted. Additional characterization, as needed, will be addressed in the Source Area Workplan.*

**NDEP Comment 68:**

68. Section 4.7.7, page 4-23, please see previous comments regarding the use of staining as a means to delineate the extents of contamination. It should be noted that concentrations of hexachlorobenzene (a persistent, bio-accumulative and toxic compound) appear to be elevated in this area (above USEPA PRGs and SSLs). Please note that PAH and dioxin/furan analysis would be appropriate for an asphalt emulsion plant (and the surrounding area).

***Response:***

*Kerr-McGee understands the limitations of using discolored soil to identify impacted areas. Additional characterization, as needed, will be addressed in the Source Area Workplan.*

**NDEP Comment 69:**

69. Section 4.7.9, page 4-24, no data is presented for this area of the site. Please provide the available data for this area.

***Response:***

*No data were found in the files reviewed for this area of the Site. Additional characterization, as needed, will be addressed in the Source Area Workplan.*

**NDEP Comment 70:**

70. Section 4.7.10, please describe if this business is still in operation. Also, please describe what action was taken to address TPH releases in this area (if any). Please note that any release (or series of releases) that exceeds 25 gallons of TPH or 3 cubic yards of TPH-impacted soils is required to be reported to the State of Nevada Spill Hotline. If these releases appear to exceed these criteria, KM must contact the Spill Release Hotline at 1-888-331-6337. It is possible that the site soils are also impacted from glycols (antifreeze) and other automotive fluids. KM should discuss these other chemicals as well.

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**Response:**

*The Pick A Part business is in operation. With regard to other information, there was none found in the files reviewed. Pick A Part is responsible for spill notifications. Additional characterization, as needed, will be addressed in the Source Area Workplan*

**NDEP Comment 71:**

71. Section 4.8.1, page 4-25, KM describes the fluid conveyed to the Trade Effluent Ponds as "acid waste neutralized with caustic liquor". It is the understanding of the NDEP that the liquid wastes conveyed to the Trade Effluent Ponds contained a variety of chemicals. The NDEP requests that KM include additional detail on the composition of the liquid wastes conveyed to the Trade Effluent Ponds.

**Response:**

*The following will be added to the text, "As described in Kleinfelder 1993, the acid liquor was composed of hydrochloric acid generated from primary and secondary scrubbing towers. The waste caustic solution is presumed to be sodium hydroxide."*

**NDEP Comment 72:**

72. Section 4.8.1, page 4-25, the detection limits for the pesticides and Silvex analyses appear to be elevated and may not be useful for qualitative or quantitative assessment of this area of the site.

**Response:**

*Comment noted.*

**NDEP Comment 73:**

73. Section 4.8.1, page 4-25 and Table 26, please note that the concentrations of arsenic, barium, cadmium (elevated detection limits and detections), chromium, and selenium (elevated detection limits) appear to be elevated when qualitatively compared against applicable USEPA PRGs and SSLs. Please see general comment above regarding the NDEP's review of site data.

**Response:**

*Comment noted.*

**NDEP Comment 74:**

74. Section 4.8.2, page 4-25, see comment for Section 4.8.1.

**Response:**

*See response to comment number 71.*



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**NDEP Comment 75:**

75. Section 4.8.3, a figure which presents a depiction of the air emission model (as well as an attachment with the associated back up data and calculations) would be helpful.

***Response:***

*The information and figures supporting the air modeling will be included as an appendix in the revised CSM.*

**NDEP Comment 76:**

76. Section 4.8.4, pages 4-26 and 4-27, please note that the data associated with the Beta Ditch will likely need to be re-evaluated once KM derives appropriate risk-based screening levels. Also, please note the following comments on Table 28.
- a. Asbestos – no units are provided.
  - b. Detection limits are not provided.
  - c. Blank contamination is widespread.
  - d. Concentrations are elevated for most analytes including (but not limited to): arsenic, barium, chromium, lead, alpha-BHC, beta-BHC, DDT, and hexachlorobenzene. Please see general comment above regarding the NDEP's review of site data.

***Response:***

- 76 a. *The table will be revised to show that the units for asbestos are percent (%) per sample.*
- 76 b. *No detection limits were provided in the original report, BMI Common Areas ECI, Henderson, NV, Table 6-1.*
- 76 c. *Comment noted.*
- 76 d. *Comment noted.*

**NDEP Comment 77:**

77. Section 4.8.5, page 4-27 and Table 29, please see previous comments on "contaminants of concern". Also, please be advised that additional sampling of this ditch was completed by the American Pacific Corporation (AmPac). Data may be obtained from the NDEP files or from AmPac. The NDEP offers the following comments on Table 29:
- a. Concentrations of several chemicals appear elevated in groundwater, including but not limited to: chloroform, arsenic, chromium, and manganese.
  - b. Concentrations of several chemicals appear elevated in soil, including but not limited to: antimony, arsenic, barium, chromium, alpha-BHC, beta-BHC, gamma-BHC, and hexachlorobenzene. Please see general comment above regarding the NDEP's review of site data.
  - c. This table includes a column that lists "All Others" with a value of "ND". This is not useful information unless the specific chemicals and their associated detection limits are listed. This issue is repeated elsewhere in the document and this comment applies to all occurrences.

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**Response:**

- 77. *The sentence will be changed to state: "Table 29 presents the results of the chemical analysis.*
- 77 a. *Comment noted.*
- 77 b. *Comment noted.*
- 77c. *Per the discussion between the NDEP, Kerr-McGee, and ENSR at a meeting on June 22, 2005, the decision was made for the tables in the CSM where 'All Others' is listed with a value of 'ND' to include a list of analytes and their PQL in the notes section of the table.*

**NDEP Comment 78:**

- 78. Section 4.8.6, page 4-27 and Table 30, the concentrations of perchlorate, chromium, and manganese appear elevated. In addition, a brief discussion of the annual sampling conducted for the hazardous waste landfill would be helpful.

**Response:**

*Data from the annual sampling of the hazardous Waste Landfill will be included on Table 30.*

**NDEP Comment 79:**

- 79. Section 4.8.9, page 4-28, please describe what "miscellaneous contaminants" are associated with this area. This comment also applies to Section 4.8.10.

**Response:**

*The term "miscellaneous contaminants" refers to site-related chemicals excluding perchlorate, chlorate, chromium, manganese, hydrocarbons, TDS and boron.*

**NDEP Comment 80:**

- 80. Sections 4.8.11, 4.8.12, 4.8.13, and 4.8.14, pages 4-28 and 4-29, no analytical data has been provided for these areas of the site. Please provide any available analytical data.

**Response:**

*No analytical data were found in the files reviewed for this area of the Site. Additional characterization, as needed, will be addressed in the Source Area Workplan.*

**NDEP Comment 81:**

- 81. Section 4.8.15, page 4-30, KM notes that this area may have been impacted by TPH, flammable solvents, hexavalent chromium, and miscellaneous wastes, however, data is presented only for TPH and PCBs. This area will require additional characterization.

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**Response:**

*Comment noted. No additional data were found for this area of the site in the files reviewed. Additional characterization, as needed, will be addressed in the Source Area Workplan.*

**NDEP Comment 82:**

82. Section 4.8.16, page 4-30, KM states that some of the dumpsters historically used in this area were used for "common trash". Over the past 60 years the definition of "common trash" has evolved. It is reasonable to assume that wastes that were considered "common trash" in the past may now be considered hazardous waste. In addition, no analytical data has been presented for this area of the site. This area should be characterized in the future.

**Response:**

*Comment noted. Additional characterization, as needed, will be addressed in the Source Area Workplan.*

**NDEP Comment 83:**

83. Section 4.8.17 and 4.8.18, pages 4-30 and 4-31, these sections do not discuss any analytical data or which "miscellaneous contaminants" would be associated with these portions of the site.

**Response:**

*No analytical data were found in the files reviewed for this area of the Site. Additional characterization, as needed, will be addressed in the Source Area Workplan.*

**NDEP Comment 84:**

84. Section 4.8.19, page 4-31 and Table 31, please refer to previous comments regarding background concentrations of metals in soil. The NDEP offers the following comments on Table 31:

- a. The footnotes state that ND = not determined. Please clarify if this is correct and how this differs from NA = not analyzed. This is somewhat confusing as ND typically represents "not detected".
- b. The following chemicals appear to be elevated in concentration: arsenic, barium, chromium, and selenium. Please see general comment above regarding the NDEP's review of site data.

**Response:**

- 84 a. *ND will be defined in the table as 'not detected'. NA indicates a sample was not analyzed by the lab for the respective constituent.*
- 84 b. *Comment noted.*

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**NDEP Comment 85:**

85. Sections 4.8.20, 4.8.21, 4.8.22, and 4.8.23 page 4-32, KM does not present any data for these areas of the site. These areas may require additional characterization.

***Response:***

*No data were found in the files reviewed for this area of the Site. Additional characterization, as needed, will be addressed in the Source Area Workplan.*

**NDEP Comment 86:**

86. Section 4.8.24, page 4-33, this section references the analytical data for the manganese ore composition, however, there does not appear to be any analytical data referenced for site characterization. This area may require additional characterization.

***Response:***

*No additional analytical data were found in the files reviewed for this area of the Site. Additional characterization, as needed, will be addressed in the Source Area Workplan.*

**NDEP Comment 87:**

87. Section 4.8.25, page 4-33 and Table 32, the NDEP offers the following comments:
- a. This laboratory historically used a septic tank and leach field for the purposes of disposal of wastewater effluent, however, KM states "hazardous solutions were collected and shipped to an appropriate disposal facility." Please explain how the "hazardous solutions" were collected and disposed of historically. It would seem to the NDEP that it is likely that a number of "hazardous" chemicals were likely disposed of in the facility's septic system (historically) and this provided a pathway to groundwater.
  - b. None of the analytical data for VOCs or SVOCs were presented, therefore, it is not possible for the NDEP to review this data. Historic data often has elevated detection limits (relative to risk based concentrations) and an analysis that is historically non-detect may require re-characterization. Please summarize the available VOC and SVOC data. In addition, KM may not have analyzed for all applicable site-related chemicals and additional characterization may be necessary in this area.
  - c. KM compares metals data to ASTM ranges of data. As stated previously, this is not appropriate.
  - d. The locations of the soil borings are not shown on any of the referenced plates.
  - e. The pH of sample SB6-1 appears to be slightly elevated at depth.
  - f. The following chemicals may have elevated concentrations: arsenic, barium, chromium, and selenium. Please see general comment above regarding the NDEP's review of site data.

***Response:***

*87 a. The following will be added to the text. "The laboratory personnel placed chemicals in containers that were transferred to four satellite collection areas." As stated in the text and presented on Table 32, two boreholes were advanced and*

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*three samples collected and analyzed from each borehole from the former septic system leach field.*

*87 b. As noted in the response to 77 c., per the discussion between the NDEP, Kerr-McGee, and ENSR at a meeting on June 22, 2005, the decision was made for the tables in the CSM, where 'All Others' is listed with a value of 'ND' to include a list of analytes and their PQL in the notes section of the table.*

*87 c. Comment noted. The sentences will be revised.*

*87 d. Plate 6 as referenced in the first sentence of section 4.8.25, shows the locations of the two soil borings SB6-1 and SB6-2.*

*87 e. Comment noted.*

*87 f. Comment noted.*

**NDEP Comment 88:**

88. Section 4.8.26 and 4.8.27, page 4-34, KM does not present any data for these areas of the site. These areas may require additional characterization.

***Response:***

*No data were found in the files reviewed for this area of the Site. Additional characterization, as needed, will be addressed in the Source Area Workplan.*

**NDEP Comment 89:**

89. Section 4.8.28, page 4-34 and Table 33, the NDEP offers the following comments;
- a. The locations of the soil borings are not shown on any of the referenced plates.
  - b. The pH of several samples appears to be low.
  - c. It appears that analysis for cyanide was never conducted. It is the understanding of the NDEP that cyanide is a chemical associated with the historic use of the site in this area.
  - d. Analyses were completed for beryllium, cobalt, molybdenum, and vanadium in this area. It is understood that these chemicals are site-related chemicals and are contained in the manganese ore. Please explain if these chemicals were associated with State Industries operations as well.
  - e. The following chemicals may have elevated concentrations: arsenic, barium, chromium, nickel, selenium, silver, PCE, and TCE. Please see general comment above regarding the NDEP's review of site data.

***Response:***

*89 a. The borings have been added to Plate 10.*

*89 b. Comment noted.*

*89 c. Comment noted. Additional characterization, if needed, will be addressed in the Source Area Workplan.*

*89 d. The analysis run was a CAM 17 standard analysis for metals. Data indicating use of these metals specifically at the State Industries were not found in the files reviewed.*

*89 e. Comment noted.*

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**NDEP Comment 90:**

90. Section 4.8.29, page 4-35, see comments above on Section 4.7.6.

***Response:***

*See response to comment number 67.*

**NDEP Comment 91:**

91. Sections 4.8.30, 4.8.31, and 4.8.32, pages 4-35 and 4-36, KM does not present any data for these areas of the site. These areas may require additional characterization.

***Response:***

*No data were found in the files reviewed for this area of the Site. Additional characterization, as needed, will be addressed in the Source Area Workplan.*

**NDEP Comment 92:**

92. Section 4.8.33, page 4-36 and Table 34, All of the analytical data is not summarized on this table. Chemicals that are not detected should be listed with their corresponding detection limits.

***Response:***

*As noted in the response to 77 c., per the discussion between the NDEP, Kerr-McGee, and ENSR at a meeting on June 22, 2005, the decision was made for the tables in the CSM, where 'All Others' is listed with a value of 'ND' to include a list of analytes and their PQL in the notes section of the table.*

**NDEP Comment 93:**

93. Section 5.4, page 5-2, KM states "several remediation systems have been set up to control, capture and treat the impacted groundwater." This statement should be qualified because the treatment systems have not been demonstrated to treat all contaminants in the groundwater that is being captured.

***Response:***

*The statement has been changed to state "...control, capture and treat specific constituents in the impacted groundwater."*

**NDEP Comment 94:**

94. Section 5.5, page 5-2, this pathway should also include microbial organisms which can affect the bioconcentration, bioaccumulation and biomagnification processes.

***Response:***

*The text will be changed to state, "It is noted that microbial organisms could affect the bioconcentration, bioaccumulation and biomagnification processes primarily through decay of the parent compound, and potentially through the formation of daughter compounds." However, if this migration pathway is quantitatively evaluated in a risk*

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*assessment, it will not be possible to account for the effects of microbial organisms. Compound uptake in biota is typically modeled through the use of compound-specific bioaccumulation factors that are applied to the measured media concentrations of specific compounds. If microbial organisms are causing increased decay of these compounds, it is not possible to account for these effects in the model. In general, not accounting for increased decay is a conservative approach.*

**NDEP Comment 95:**

95. Section 7.0, page 7-1, 2nd paragraph, KM should note that these figures also present the soil pathway.

**Response:**

*The text will be changed to read: "These diagrams illustrate in a schematic manner the potential source areas, vadose zone, soil, air, groundwater, and surface water pathways and potential receptors."*

**NDEP Comment 96:**

96. Section 7.0, page 7-1, 3rd paragraph, KM discusses possible mechanisms for vadose zone transport of site-related chemicals. Additional mechanisms include: leaking sewer, water or process piping. In addition, the NDEP does not agree that it is necessary to have a "rainstorm of sufficient quantity and duration to saturate the soil beyond its field capacity". The NDEP believes that rainstorms allow water to infiltrate or percolate into the subsurface soils and possibly drive contaminants in the vadose zone towards the water table.

**Response:**

*Based on the research and publications conducted for Yucca Mountain Nevada by Alan L. Flint, Lorraine Flint, and others, soils and alluvial deposits that are deeper than 5 meters (16.5 feet) virtually eliminate the penetration of water to deeper zones in arid regions because storage capacity is large enough that the water from precipitation is held within the root zone where it is removed by evapotranspiration. It is acknowledged that 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.*

**References:**

*Flint, Alan L., Flint, Lorraine E., Kwicklis, Edward M., Bodvarsson, Gudmundur S., and Fabryka-Martin, June M., 2001, Hydrology of Yucca Mountain, Nevada, American Geophysical Union, Reviews of Geophysics, 39, 4 / November 2001 pages 447-470.*

*Flint, Alan L. and Flint, Lorraine E., 2000, Near Surface Infiltration Monitoring using Neutron Moisture Logging, Yucca Mountain Nevada, Chapter 3 in Vadose Zone Science and Technology Solutions, pages 457-474.*

*Flint, Alan L., Flint, Lorraine E., Bodvarsson, Gudmundur S., Kwicklis, Edward M. and Fabryka-Martin, 2001, Evolution of the conceptual model of unsaturated zone hydrology at Yucca Mountain, Nevada, Journal of Hydrology 247 (2001) pages 1-30.*

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*Flint, Alan L., Flint, Lorraine E., Hevesi, Joseph A., D'Agnese, Frank, Fuunt, Claudia, 2000, Estimation of Regional Recrags and Travel Time through Unsaturated Zone in Arid Climates, Dynamics of Fluids in Fractured Rocks, Geophysical Monograph 122, American Geophysical Union pages 115 – 128.*

**NDEP Comment 97:**

97. Section 7.0, page 7-1, 4th paragraph, KM states “As discussed Flingin Section 3...” Please clarify this sentence.

***Response:***

*The sentence has been changed to read, “As discussed in Section 3 ...”*

**NDEP Comment 98:**

98. Section 7.0, page 7-1, 4th paragraph, KM states “the interceptor well field/groundwater barrier wall...effectively capture groundwater”. The NDEP offers the following comments:
- a. KM has not demonstrated that the on-site well field and barrier wall provide effective capture for all site-related chemicals in groundwater.
  - b. The perchlorate plume maps are delineated to 1 ppm and the provisional state action level for perchlorate in drinking water is 18 µg/l. The mapping generated by KM does not show complete capture at the 1 ppm or 10 ppm contours for perchlorate.
  - c. In addition, for total chromium, the contouring is still being refined and adjacent data suggest that the 0.1 ppm contour is not being captured at this well field and barrier wall. Data provided by KM suggest that this chromium plume is nearly 100% hexavalent and this 0.1 ppm contour is not likely to represent an acceptable risk-based concentration.
  - d. A number of other site-related chemicals may not be fully captured either, however, KM has not presented adequate data to support or refute this statement.
  - e. A number of other site-related chemicals may be captured, however, the current remediation systems may not be adequately treating these chemicals. KM has not presented adequate data to support or refute this statement.

***Response:***

*98 a. The sentence has been revised to state, “Figures 2 and 3 show that the interceptor well field/groundwater barrier wall and Athens Road well field capture the highest concentrations of chromium and perchlorate impacted groundwater in those areas.”*

*98 b. Comment noted.*

*98 c. Comment noted.*

*98 d. Comment noted.*

*98 e. Comment noted.*



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**NDEP Comment 99:**

99. Section 7.0, pages 7-1 and 7-2, 4th paragraph, KM discusses the Seep area capture systems. The NDEP would like to note the following:
- a. The nine recovery wells that are described in the CSM have not been shown to fully capture the plumes associated with the KM site. The capture efficiencies at these points in the plume have not yet been quantified.
  - b. The surface water collection and recovery sump has not been shown to fully capture the plumes associated with the KM site. The capture efficiencies at these points in the plume have not yet been quantified.
  - c. See also comments above regarding site-related chemicals capture and treatment.

***Response:***

- 99 a. *Comment noted.*  
99 b. *Comment noted.*  
99 c. *Comment noted.*

**NDEP Comment 100:**

100. Section 7.0, page 7-2, please note that microbial organisms, verticulture, and insects are also potential receptors.

***Response:***

*Comment noted.*

**NDEP Comment 101:**

101. Section 7.0, page 7-2, KM states “the groundwater pathway is the predominant one for transporting constituents of concern from the Site.” Please see previous comments on the use of the words “constituents of concern”. The NDEP has not seen data to suggest that KM can conclude that groundwater is the predominant pathway for contaminant transport.

***Response:***

*The sentence will be revised to state “the groundwater pathway is a significant one for transporting chromium, perchlorate and other site-related chemicals from the Site.”*

**NDEP Comment 102:**

102. Section 7.0, page 7-2, KM states “If impacted groundwater emerges off site in Las Vegas Wash, the surface water pathway grows in significance.” KM has demonstrated (in the investigation of the perchlorate plume) that impacted groundwater does emerge in the Las Vegas Wash. Please revise this statement and any related text.

***Response:***

*The sentence will be revised to state “When groundwater emerges ... “*

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**NDEP Comment 103:**

103. Section 7.0, page 7-2, regarding surface water, KM should note that the storms that occurred in late 2004 and early 2005 demonstrated that soils from the BMI sites can be transported via overland flow of storm water. This surface water flow was not confined to the historic ditch system and transported sediments/surface soils from the sites to off-site areas. It is likely that some portion of these sediments were conveyed to off-site storm sewer systems (which convey water and sediments to the Las Vegas Wash). In addition, KM discusses the Beta Ditch but does not discuss the Northwestern ditch. Please clarify this paragraph.

***Response:***

*The sentence will be revised to read, "Surface water transport of Site-related chemicals is generally minimized by the lack of on-Site surface water. Stormwater and water from leaking supply lines occasionally flows overland and in the Beta Ditch and other ditches constructed for water control or conveyance such as the Northwestern Ditch."*

**NDEP Comment 104:**

104. Section 7.0, page 7-2, KM states "Historic transport of selected Site-related chemicals via surface water also occurred when impacted groundwater day lighted in a spring close to the Las Vegas Wash." It is the understanding of the NDEP that groundwater continues to daylight (seasonally) near the Las Vegas Wash. This statement requires clarification.

***Response:***

*The sentence has been changed to read, "Transport of selected Site-related chemicals via surface water also occurs when impacted groundwater daylights in a spring close to the Las Vegas Wash. Las Vegas Wash transports surface water to Lake Mead. "*

**NDEP Comment 105:**

105. Section 8.0, page 8-1, Data Gap #3, the NDEP offers the following comments:
- a. This data gap is labeled "Chemicals of Potential Concern", please see previous comments on the use of this terminology.
  - b. KM states "it is expected that the remedial actions addressing chromium and perchlorate impacts will also address other chemicals of concern." This CSM does not discuss the mechanisms by which the existing treatment system will address other site-related chemicals with a few exceptions. It is known that the existing Fluidized Bed Reactor addresses nitrate and chlorate. KM should investigate what other chemicals (besides nitrate and chlorate) are addressed by the existing remedial systems and submit a detailed report to the NDEP on this subject. This report should include analytical data and a comparison to applicable discharge limitations.

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**Response:**

- 105 a. *The term "Chemicals of Potential Concern" throughout most of the CSM document has been changed to "Site-Related Chemicals," however, in this instance where identification of data gaps is the subject being discussed, using the term "Chemicals of Potential Concern" or "Chemicals of Concern" is considered appropriate.*
- 105 b. *Comment noted. As suggested, Kerr-McGee will address the issue of what other site-related chemicals are being addressed by the groundwater treatment activities under a separate document.*

**NDEP Comment 106:**

106. Section 8.0, pages 8-1 and 8-2, the NDEP suggests that the following data gaps be considered:
- a. Las Vegas Wash, the potential exists for some site-related chemicals to be transported to the Las Vegas Wash and to accumulate in the sediments of the Las Vegas Wash. Sediment sampling of the Las Vegas Wash has not been completed by any of the BMI Companies. KM needs to determine the applicability and logistics for sampling of the Las Vegas Wash sediments. This may be an issue that the BMI Companies may decide to work cooperatively on. In addition, the waters of the Las Vegas Wash are sampled extensively by the Southern Nevada Water Authority (SNWA). KM needs to determine if supplemental sampling of this surface water body is necessary and to what extent this sampling is needed.
  - b. Influence of off-site impacts, KM should consider the possible impacts to the site and the co-mingling of plumes downgradient of the site due to impacts from off-site sources. A substantial amount of information has been collected by the other BMI Companies, BMI, the American Pacific Corporation, SNWA and others. This information may be valuable to the further development of KM's CSM.
  - c. The influence of subsurface utilities and tunnels have not been investigated as preferential pathways for contaminant migration. Often, subsurface utilities are bedded with highly permeable backfill, which can act as a preferential migration pathway. This pathway may require additional investigation as site characterization progresses.

**Response:**

- 106 a. *Las Vegas Wash will be added to the data gaps, assuming the BMI companies jointly agree to investigate and evaluate the data.*
- 106 b. *Comment noted.*
- 106 c. *Comment noted.*

**NDEP Comment 107:**

107. Figure 5, many of the colors on this figure are similar and it is difficult to interpret what color applies to a particular zoning area. It would be helpful if the colors on the figure were labeled with a numeric code.

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**Response:**

*Figure 5 is from the City of Henderson (COH) and data concerning land use zoning is available at the COH website. Adding codes to the map is not planned at this time.*

**NDEP Comment 108:**

108. Figure 6, please note the following examples of items that appear to be missing from this figure:

- a. Lined, leaking surface impoundments are another source of contaminant loading to the subsurface that is not covered by this figure.
- b. Volatization of chemicals in to buildings or low-lying areas is not addressed by this figure.
- c. Stack emissions and deposition of contaminants (such as dioxins/furans) is not addressed by this figure.
- d. The materials used to construct the railroad (typically containing PAHs, arsenic, etc.), the operation of coal-fired rail equipment (historically?), and discharges associated with railroad operations can also represent a source of contamination.

**Response:**

*108 a. The "no leaks" will be removed and an arrow (downward) added beneath the lined surface impoundment. Number 7 will be changed to state, "leaks from lined and unlined surface impoundments."*

*108 b. An arrow into the building will be added. Number 16 will be added to state, "volatization of chemicals into buildings or low lying areas."*

*108 c. An arrow will be added at the top of the stack. Number 10 will be modified to include air emissions.*

*108 d Number 14 will be modified to say: "Spills to soil along the Railroad line from construction and operations as well as from loading and unloading materials."*

**NDEP Comment 109:**

109. Figures 6 and 8, it should be noted that these figures do not include all source areas and are only examples of potential exposure areas, pathways and receptors.

**Response:**

*A note will be added to Figure 6 stating, "This figure may not include all source areas."*

*A note will be added to Figure 8 stating, "This figure may not include all source areas, exposure routes, release mechanisms, and receptors."*

**NDEP Comment 110:**

110. Figure 7, the NDEP offers the following comments:

- a. It appears to the NDEP that it is reasonable to assume that a terrestrial receptor could have dermal contact or ingestion of shallow groundwater.
- b. Please note that as the understanding of sources and release mechanisms is refined, this figure may also be refined.
- c. It is suggested that KM consider grouping the LOU areas into broad categories for the purpose of this figure. For example, waste storage areas, surface

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impoundments, industrial production areas, etc. This should also be discussed in section 4.0 of the text as some LOU areas may fall into more than one of these broad categories. It is the belief of the NDEP that this will aid in the understanding of source types and release mechanisms. This will also aid KM in knowing that the CSM has been appropriately completed with the correct release mechanisms and pathways.

**Response:**

110 a. Dots will be added in the terrestrial receptor ingestion and dermal contact for groundwater.

110 b. Comment noted.

110 c. Additional Source areas will be added to Figure 7.

**NDEP Comment 111:**

111. Table 1, the NDEP would like to note (as stated previously) that areas listed as “no further action required” may require additional characterization and/or remediation due to the reasons outlined above and in previous letters to KM. This same comment applies to Table 3.

**Response:**

*The footnote on Table 3 will be changed to state, “No action required by NDEP in 1994, additional characterization and/or remediation may be requested as indicated in 2004 and 2005 NDEP correspondence.”*

**NDEP Comment 112:**

112. Table 2, the NDEP requests that the description of the wastes be expanded. Please provide a description of the composition of each of the waste streams. If KM does not have a full understanding of the composition of the waste streams, please state as such.

**Response:**

*The footnote in Table 2 will state additional information including waste manifests and bills of lading are typically maintained at the respective landfills identified.*

**NDEP Comment 113:**

113. Table 6, the NDEP has the following comments:

- a. Please provide the reference for the MCLs that are listed for hexavalent chromium and monochlorobenzene.
- b. Please explain the comment “free product” in the cyanide row and “phosphorous white” in the phosphorous row. Please explain if KM has reason to believe that white phosphorous would be present at the site.
- c. The applicable standards for radionuclides are not listed on this table. Uranium is listed as chemical toxicity only. Uranium exhibits toxicity from a chemical and radionuclide perspective.

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- d. Rows for total trihalomethanes, TPH, DDD, DDE, etc. should be added to this table.
  - e. For standards and guidance with several leading zeros, scientific notation is preferred. For example, dioxins/furans.
  - f. Please note that the NDEP did not verify all of the standards and guidance that is listed on this table and requests that KM thoroughly review the site-related chemicals list versus applicable guidance and standards.
  - g. It should be noted that Nevada has standards which differ from MCLs, PRGs and SSLs. KM should review the applicable Nevada drinking water standards. In addition, for surface water, the Nevada Beneficial Use Standards for the Las Vegas Wash should be reviewed.

**Response:**

- ✓ 113 a. *The reference for monochlorobenzene is noted at the bottom of the table (2004 EPA MCLs). The MCL for hexavalent chromium was removed.*
- ✓ 113 b. *EPA lists the PRGs for cyanide as "free product cyanide" and EPA lists PRGs and MCLs for phosphorus as "white phosphorus". KM has no reason to believe that white phosphorus is present at the site.*
- ✓ 113 c. *The MCL for uranium radionuclide has been added.*
- 113 d. *There is not an MCL for TPH, DDD, or DDE. Thus, the MCL cells for these items have been left blank.*
- 113 e. *Comment noted.*
- 113 f. *Comment noted.*
- 113 g. *The Nevada standards have been added.*

**NDEP Comment 114:**

114. Table 8, the NDEP has the following comments:
- a. Footnote 1 states the regulatory limit for chromium in soil is 0.5 ppm. This corresponds to the SSL DAF1, however, this is not a regulatory limit. The SSLs can be used to guide decisions, however, they are not regulatory limits. Please clarify.
  - b. Data qualifiers are included on this table, however, they are not defined in the notes section. Please include the definitions in the revised table.

**Response:**

- 114 a. *The "regulatory limit" for Chromium has been changed to "laboratory reporting limit."*
- 114 b. *The data qualifier of 'J' has been added to the Notes section of the Table.*

**NDEP Comment 115:**

115. Table 9, the units for EC are not listed. This same comment applies to Table 13. Additional instances of this issue will not be repeated.

**Response:**

*The units for EC (electrical conductivity) have been added,  $\mu\text{mho/cm}$ . Other tables have been revised accordingly.*

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**NDEP Comment 116:**

116. Table 15, the title of this table is "Manganese in Groundwater Analytical Data". This table contains a number of other types of data and should be renamed. In addition, the units for "Total Depth" and "Depth to Water" are not listed. Please identify if this is depth below ground surface, from top of casing or some other measurement. This comment applies to other tables and will not be repeated.

***Response:***

*The title of Table 15 has been revised to read "Manganese & Additional Groundwater Analytical Data". The units for "Total Depth" has been revised in all applicable tables, feet below ground surface (ft bgs). "Depth to Water" is measured from the Top of Casing in feet. This has been revised in all applicable tables.*

**NDEP Comment 117:**

117. Table 18, lead mono-oxide is listed at 0.00%. Please clarify if this compound is present or not. The NDEP would like to note that other compounds may be present at levels below 0.002% (e.g.: radionuclides) but are not listed in this table. Additional analysis of the ore material may be warranted prior to additional site characterization.

***Response:***

*Table 18 has been revised. The analyte result for Lead mono-oxide has been revised to read 0.004%. Comment noted regarding the possibility that other compounds may be present at levels below 0.002% (e.g. radionuclides). Comment noted that additional analysis of the ore material may be warranted prior to additional site characterization.*

**NDEP Comment 118:**

118. Table 30, in the "location" field KM uses statements such as "further upgradient" or "just downgradient". It is suggested that KM apply a distance to this field. For example, "100' upgradient" instead of "upgradient".

***Response:***

*Table 30 has been revised with actual distances in feet between the LOU and wells sampled. All other tables have been revised accordingly.*

**NDEP Comment 119:**

119. Table 31, please explain the significance of the bolded values on this table.

***Response:***

*Bolded values were to aid identification of detected values. The table has been revised to remove the bold type.*

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**NDEP Comment 120:**

120. Plate 3, this plate appears to require revision, examples are provided below. Please note that the NDEP has not verified all contours and all data points. KM should review this figure to insure that the contour that are presented are reasonable.
- a. The 30' contour is drawn between a 21' and 26' data point at wells PG201 and PG202, respectively.
  - b. The 30' contour is drawn between a 32' and 31.5' data point at wells M86 and M81A, respectively.
  - c. The 30' contour is represented as three isolated 30' contours in the vicinity of the on-site barrier wall. It is not clear to the NDEP that the data support such a depiction.
  - d. There is a 20' contour drawn in the vicinity of well M92. There is also a 40' contour, however, there is no 30' contour in this area. It appears that a 30' contour should be drawn and the 20' contour should be revised.
  - e. A 50' contour is drawn around a data point of 36' at MTC-3.
  - f. A 40' contour separates data points of 59.5' and 48' at locations J2U2 and J2U1, respectively.
  - g. A 40' contour separates data points of 44' and 45.5' at locations H22 and H21R, respectively.
  - h. There is a contour in the vicinity of well H42 that is not labeled.
  - i. There is a contour in the vicinity of well PC40 that is not labeled.
  - j. There is a 50' data point a location DW-1 which is between a 30' and a 40' contour.
  - k. A 30' contour separates data points of 31' and 41' at locations PC1 and PC6, respectively.
  - l. There appears to be a 34' data point between the 40' and 50' contours in the vicinity of location PC61.

***Response:***

*Plate 3 will be revised.*

**NDEP Comment 121:**

121. Plate 4A, there are a number of abbreviations on this plate and there are no definitions. This comment applies to other figures and plates as applicable.

***Response:***

*Plate 4A will be revised to define abbreviations. Other plates will also be revised to define abbreviations.*

**NDEP Comment 122:**

122. Plates 4A, 4B, 4C and 4D, the yellow line is not defined on these plates.



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**Response:**

*The yellow line is the contact between the Alluvium and the Muddy Creek formation. Since the term Alluvium is above the yellow line and the term Muddy Creek is below the yellow line, further definition was not included.*

**NDEP Comment 123:**

123. Plate 5, the NDEP offers the following comments for areas of the figure that appear to require revision.

- a. There is a 1761' data point at location M97 between the 1755 and 1760 contours.
- b. The 1790 contour does not appear to be appropriately located in the vicinity of location M10.
- c. There is a 1715' data point at location I-A-R between the 1725 and 1730 contours.
- d. The eastern portion of the following contours appears to be inferred and should be dashed: 1665, 1670, 1675, 1680, 1685, 1690, 1705, 1710 and 1715. This may apply to other contours as well (for example, the 1640, 1645, and 1650 contours). It is requested that KM review and revise this figure as appropriate.
- e. The 1665 contour does not intersect the 1665 data point at location H50.
- f. It appears that the 1575 and 1580 contours can be extended to the west.
- g. There is a 1563' data point at location PC112 between the 1565 and 1570 contours.
- h. The 1550 data point at location PC99R2/R3 appears to conflict with the contouring in that area.

**Response:**

*Plate 5 will be revised.*

**NDEP Comment 124:**

124. Plate 6, this plate is described as "source areas identified in the LOU". The LOU (letter of understanding) is a letter that was written by the NDEP in 1994. Identification of source areas is the responsibility of KM. This plate should not be limited to source areas identified by the NDEP. It appears that there may be additional source areas that have not been identified. For example, the gasoline tank west of the administration building; the railroad tracks; air emissions from process operations; new AP-6 pond; the GW-11 pond; the Chemstar facility; the TIMET facility; the Pioneer-Stauffer-Montrose facility; the former U.S. Vanadium facility; historic BMI operation; etc. Some of these areas may not have enough data to determine if they are source areas or not. If an area is a suspected (or possible) source area it may be helpful to show these areas on this figure in a different color or hatching.

**Response:**

*The plate will be revised to include GW-11, the gas tank and other pertinent features. Air emissions will not be illustrated.*

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**NDEP Comment 125:**

125. Plate 7, the NDEP offers the following comments for areas of the figure that appear to require revision. Please note that the comments that apply to this plate may also be applicable to other iso-concentration contour maps. Also, please note that the NDEP has not verified every data point and contour presented on the plate. It is requested that KM review the entire plate and address any issues that are discovered. The comments below are intended to be examples of issues that may need to be resolved.

- a. As stated previously, it is requested that this figure (and others, as applicable) include data collected by others such as TIMET and BMI. As stated previously, this will dramatically change the depiction of the 0.05 and 0.1 ppm contours on the eastern side of the plant site area.
- b. The 0.01 ppm contour nearly passes through location PC73 which has a concentration of 0.3 ppm.
- c. The 1 ppm contour in the vicinity of well M44 appears to be too close to well M44 and too far away from well PC71. A similar comment also applies to location PC54. Please verify these occurrences and the development of the contours on the remainder of the plate.
- d. Data in the vicinity of the on-site well field and the Athens Road well field is nearly illegible and it is difficult to correlate data to a location identifier. The data needs to be presented in an alternate format in these areas.
- e. Please see additional comments (dated February 9, 2005 and March 2, 2005) developed by the NDEP with regard to the semi-annual chromium performance reports.

***Response:***

*The plate will be revised and inserts added as needed to illustrate data more clearly.*

**NDEP Comment 126:**

126. Plate 9, the NDEP offers the following comments for areas of the figure that appear to require revision.

- a. The contour that passes through location PC50 appears to be a 10 mS/cm contour and there appear to be additional 10 mS/cm contours directly to the west and the east.
- b. Contours in the vicinity of the on-site well field are not labeled. There are contours in the vicinity of the Athens Road well field that are labeled elsewhere on the figure, however, it is requested that labels be added in the vicinity of the Athens Road well field.
- c. The 5 mS/cm contour passes through location MC22 (3.4 mS/cm).
- d. The contour that passes through location MW-TWE-15 is not labeled.
- e. The 15 and 20 mS/cm contours in the vicinity of locations MC65, MC50, MC27, MC6, MC7 and MC69 appear to require revision. There are several locations below 15 mS/cm which are located between the 15 and 20 mS/cm contours.
- f. It appears that the 5 mS/cm contour surrounding location PC56 could be combined with the 5 mS/cm contour in the Seep area. This contour may be able

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- to be continued south towards location PC53 or the 10 mS/cm contour which ends at location MW-K5 may need to be extended north and east.
- g. A 5 mS/cm contour passes through locations PC94 and MW-K8 (4.6 and 4.9 mS/cm, respectively). It is not clear how this contour was developed.

**Response:**

*The Plate will be revised.*

**NDEP Comment 127:**

127. Plate 10, it is not clear why this Plate was not combined with Plate 7. Also, please see comments above regarding Plate 7. This same comment applies to Plates 11 and 12.

**Response:**

*Plate 7 is at a scale of 1 inch = 1,000 feet. It illustrates the chromium in groundwater from the site to Las Vegas Wash. Plate 10 is at a scale of 1 inch = 300 feet and it shows more detail of the on-Site source areas. The scale of data depicted on each map is different and therefore does not lend itself to combining the two.*

**NDEP Comment 128:**

128. Plate 14, this plate does not present any of the TPH data that is provided in the text. Please explain. This comment may also apply to Plate 15 if data is available.

**Response:**

*Plate 14 will be revised to show TPH data in soil and groundwater where available. There are no boron data.*

**NDEP Comment 129:**

129. Plate 18, it appears that this Plate could be combined with Plates 1 and 6.

**Response:**

*Plate 18 has been omitted.*

**NDEP Comment 130:**

130. Appendix A, the NDEP offers the following comments:
- a. In the "Drilled By" column please explain what is meant by "other". Please explain if "other" is meant to imply "unknown".
  - b. The top of casing elevation is missing for some wells including some wells that are listed as "active". KM should plan on gathering this information as part of a future workplan.
  - c. Total depth is not listed for some wells, including some wells that are listed as "active". KM should plan on gathering this information as part of a future workplan.
  - d. Table A-2 is titled "Groundwater Analytical Data", however, this table does not include all of the data that is available for groundwater. There is a significant

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amount of data that is described in the text and tables that is not included on this table. The purpose and content of this table should be clarified.

**Response:**

*The tables will be revised.*

**NDEP Comment 131:**

131. Appendix D, the sample locations from previous reports should be incorporated in to the applicable figures and plates. It is not clear if this has already been completed. If these sample locations are included in the applicable plates and figures, Appendix D may not be necessary. Please clarify.

**Response:**

*The data have been incorporated into the applicable plates and figures from Appendix D. Appendix D will remain as a reference.*

**NDEP Comment 132:**

132. Appendix E, the NDEP has not verified the completeness of the biological surveys that are presented in this Appendix. As the project progresses towards ecological risk assessment (qualitative or quantitative), the NDEP will review these reports in detail. It is likely that additional work will be completed by others (BMI) in the future on this subject and this information may be useful to KM.

**Response:**

*Comment noted.*

**ATTACHMENT B**

**Table 9**  
**Summary of Analytical Data for LOU # 4**  
 Hardesty Chemical Monitoring well MW-97 Analytical Data  
 Kerr-McGee Chemical LLC Facility, Henderson, Nevada

**Analysis of water from M-97**

Water Sample	Date	Conductivity (µS/cm) EPA 120.1	TPH-d (mg/l) EPA 8015M	Volatile organic compounds (µg/l) EPA 8240			SVOCs (µg/l) EPA 8270		Arsenic (µg/l) EPA 6010 ICP	pH EPA 150.1
				Acetone	Chloro-form	All Others	Di-n-butyl-phthalate	All Others		
M-97	4/9/1997	3690	<1.0	3.1 JB	18	ND	7.8	ND	0.124	7.72
<b>PQL</b>		1	1	10	5	various	10	various	0.01	0.1

**Periodic analysis of water from M-97**

WELL #	Date	Total Depth (ft bgs)	Depth to Water (ft TOC)	pH (Lab)	EC (Lab, µmho/cm)	Cr-total (ppm)	ClO <sub>4</sub> (ppm)	LAB	Well Location from LOU (Approximate)
M-97	5/6/99	47.86	40.63	7.6	3290	0.09	11	KMC	320 ft N
M-97	5/5/00	47.86	41.31	8.09	3550	0.10	22	KMC	
M-97	5/4/01	47.86	40.53	--	3980	--	31	KMC	
M-97	5/1/02	47.86	39.00	7.5	4590	0.059	34	MW	
M-97	5/7/04	47.86	40.22	7.6	3640	0.076	18	MW	

**Notes:**

TPH-d = Total Petroleum Hydrocarbons, diesel range

SVOCs = Semi-volatile organic compounds

ft bgs = feet below ground surface

ft TOC = feet from Top of Casing

EC = Electrical Conductivity

Cr-total = Total Chromium

ClO<sub>4</sub> = Perchlorate

LOU = Letter of Understanding

J = estimated value, constituent detected at a level less than the RDL or PQL and greater than the or equal to the MDL

B = Reported value is less than the contract required detection limit but greater than or equal to the instrument detection limit.

-- = Either no data was obtained or was not analyzed for the respective constituent.

Labs: KMC Kerr-McGee Chemical LLC Company

MW Montgomery Watson

**Analytic Data for M-97 on 4/9/1997 from ENSR, 1997 Phase II ECA.**

**Well Data From: Kerr-McGee Chemical LLC Company, Mother-hen Database.**

**\*\* Analytes and detection limits for VOC's that were non-detect (µg/L):**

Analyte	PQL	Analyte	PQL	Analyte	PQL
Chloromethane	5	Chloroform	5	1,1,2-Trichloroethane	5
Vinyl Chloride	5	1,1,1-Trichloroethane	5	Tetrachloroethene (PCE)	5
Bromomethane	5	Carbon Tetrachloride	5	Dibromochloromethane	5
Chloroethane	5	1,2-Dichloroethane	5	Chlorobenzene	5
Trichlorofluoromethane	5	Benzene	5	Ethyl benzene	5
Acetone	10	Trichloroethene (TCE)	5	m, p-Xylenes	5
1,1-Dichloroethene	5	1,2-Dichloropropane	5	o-Xylene	5
Carbon Disulfide	5	Bromodichloromethane	5	Styrene	5
Methylene Chloride	5	2-Chloroethylvinyl ether	20	Bromoform	5
trans-1,2-Dichloroethene	5	4-Methyl-2-Pentanone	10	1,1,2,2-Tetrachloroethane	5
Vinyl Acetate	10	cis-1,3-Dichloropropene	5	1,3-Dichlorobenzene	5
1,1-Dichloroethane	5	Toluene	5	1,4-Dichlorobenzene	5
2-Butanone	10	trans-1,3-Dichloropropene	5	1,2-Dichlorobenzene	5

**Table 9**  
**Summary of Analytical Data for LOU # 4**  
Hardesty Chemical Monitoring well MW-97 Analytical Data  
Kerr-McGee Chemical LLC Facility, Henderson, Nevada

cis-1,2-Dichloroethene ..... 5 | 2-Hexanone ..... 10 | .....

**\*\* Analytes and detection limits for SVOC's that were non-detect (µg/L):**

Analyte	PQL	Analyte	PQL	Analyte	PQL
Phenol	10	Hexachlorobutadiene	10	N-Nitrosodimethylamine	10
Bis (2-chloroethyl) ether	10	4-Chloro-3-methylphenol	20	4-Bromophenyl phenyl ether	10
2-Chlorophenol	10	2-Methylnaphthalene	10	Hexachlorobenzene	10
1,3-Dichlorobenzene	10	Hexachlorocyclopentadiene	10	Pentachlorophenol	50
1,4-Dichlorobenzene	10	2,4,6-Trichlorophenol	10	Phenanthrene	10
Benzyl alcohol	20	2,4,5-Trichlorophenol	10	Anthracene	10
1,2-Dichlorobenzene	10	2-Chloronaphthalene	10	Carbazole	10
2-Methylphenol	10	2-Nitroaniline	50	Di-n-butyl phthalate	10
Bis (2-chloroisopropyl) ether	10	Dimethyl phthalate	10	Fluoranthene	10
4-Methylphenol	10	Acenaphthylene	10	Pyrene	10
N-Nitroso-di-N-propylamine	10	2,6-Dinitrotoluene	10	Butylbenzylphthalate	10
Hexachloroethane	10	3-Nitroaniline	50	3,3-Dichlorobenzidine	20
Nitrobenzene	10	Acenaphthene	10	Benz (a) anthracene	10
Isophorone	10	2,4-Dinitrophenol	50	Chrysene	10
2-Nitrophenol	10	4-Nitrophenol	50	Bis (2-ethylhexyl) phthalate	10
2,4-Dimethylphenol	10	Dibenzofuran	10	Di-n-octyl phthalate	10
Benzoic Acid	50	2,4-Dinitrotoluene	10	Benzo (b) fluoranthene	10
Bis (2-chloroethoxy) methane	10	Diethyl phthalate	10	Benzo (k) fluoranthene	10
2,4-Dichlorophenol	10	4-Chlorophenyl phenyl ether	10	Benzo (a) pyrene	10
1,2,4-Trichlorobenzene	10	Fluorene	10	Indeno (1,2,3-c,d) pyrene	10
Naphthalene	10	4-Nitroaniline	20	Dibenzo (a,h) anthracene	10
4-Chloroaniline	20	4,6-Dinitro-2-methylphenol	50	Benzo (g,h,i) perylene	10

**Todd Croft**

---

**From:** Crowley, Susan [SCROWLEY@KMG.com]  
**Sent:** Thursday, August 25, 2005 1:02 PM  
**To:** Todd Croft; Bailey, Keith  
**Cc:** Shannon Harbour; Peggy.Roefer@snwa.com  
**Subject:** RE: Reduction in Frequency of NDEP Perchlorate Sampling of Northshore Road

Todd,  
Thanks for the heads up on the sampling frequency change. I'll pass this along to our lab. It is true that a lot of information has been gathered by the weekly sampling. I think we've tracked storm events and seasonal changes and know more now than before we started.

Also ... it will be interesting to see what finally shakes out of the USGS revision of their flow estimates. We won't know the significance of the recent step change in North Shore Road perchlorate loading until we get final flow numbers several months from now. Then hopefully we'll know whether values prior to the step need modification or the step is not as dramatic as now seen (maybe both). We'll see.

If Shannon needs anything from me - please let me know. Thanks.

Susan Crowley  
Kerr-McGee Chemical LLC  
PO Box 55  
Henderson, NV 89009  
(702) 651-2234 office  
(702) 592-7727 cell  
(405) 228-6882 fax

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-----Original Message-----

**From:** Todd Croft [mailto:tcroft@ndep.nv.gov]  
**Sent:** Thursday, August 25, 2005 10:50 AM  
**To:** Crowley, Susan; Bailey, Keith  
**Cc:** Shannon Harbour; Peggy.Roefer@snwa.com  
**Subject:** Reduction in Frequency of NDEP Perchlorate Sampling of Northshore Road

Susan & Keith:

The NDEP plans to revert back to monthly sample collection (for perchlorate analysis) for the Northshore Road monitoring station beginning September 2005. We will maintain weekly sample collection through the end of August 2005 with the last weekly sample being collected on Tuesday (08/30/05). We will continue to collect multiple samples (replicate samples) during the monthly sampling event and provide a sample to Metropolitan Water District (MWD), Kerr-McGee Chemical LLC (KMC-LLC), and the NDEP contract laboratory as we have done for the past two years. Maintaining this portion of the sampling program will allow for continued data comparison of perchlorate concentrations reported by several different analytical laboratories. Maintenance of the monthly sampling and analysis also will allow for continued tracking of mass flux at the Northshore Road monitoring station and posting of this data against the modeled breakthrough (decay) curve established by McGinley & Associates in 2003.

Rationale for this change includes:

8/25/2005



- weekly sampling has occurred for two years (08/26/03 through 08/30/05);
- perchlorate mass flux (loading) at Northshore Road has reduced from approximately 300 lbs/day to approximately 100 to 160 lbs/day with periodic spikes apparent during this two-year period;
- elevated mass flux values (spikes) coincide with and following precipitation events or can be attributed to changes in groundwater conditions related to precipitation events;
- the precipitation events are relatively short lived;
- the mass flux values are in general agreement with the modeled breakthrough curve;
- lower perchlorate mass flux measured at Northshore Road over the past year or so has translated into water quality improvements in Lake Mead and the Colorado River system;
- perchlorate concentrations at Willow Beach fell below 6 ug/L in February 2004, have remained less than 4 ug/L since June 2004, and have dropped below 2 ug/L as of July 2005;
- we understand downstream water quality analyzed by MWD also shows this declining trend with perchlorate concentrations being reported at < 4 ug/L since mid 2004;
- NDEP continues to oversee the perchlorate remediation projects and continues to look for ways to optimize mass reduction; and
- the planned commissioning of new remediation systems later in 2004 and in early 2005 will further reduce perchlorate mass flux approaching the Las Vegas Wash.

The NDEP has discussed this w/ MWD and understands they agree with the reduction in sampling. The cooperative sampling program conducted over the past two years provided good quality data with sufficient data density to track mass flux declines at a critical point of the perchlorate remediation program in the Las Vegas Valley. Now that mass flux values measured at the Northshore Road monitoring station have declined to approximately 100 to 160 lbs/day and Colorado River concentrations are less than 2 ug/L, monthly sampling and analysis should be adequate to track perchlorate concentrations and mass flux entering Lake Mead and the Colorado River system. In the event conditions change that would warrant more frequent sampling, NDEP will evaluate how best to manage that effort at that time.

Todd J. Croft  
Remediation Branch Supervisor  
Bureau of Corrective Actions  
Nevada Division of Environmental Protection  
1771 E. Flamingo Road, Suite 121-A  
Las Vegas, Nevada 89119-0837  
tcroft@ndep.nv.gov  
(702) 486-2850 x 230 (Phone) Please note the Change  
(702) 486-2863 (Fax)

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Thank you.

**Todd Croft**

---

**From:** Todd Croft  
**Sent:** Thursday, August 25, 2005 12:24 PM  
**To:** 'Bailey, Keith'  
**Cc:** Crowley, Susan  
**Subject:** RE: Reduction in Frequency of NDEP Perchlorate Sampling of Northshore Road

Keith:

1) Yes, we are still on for our 09/20 Quarterly Meeting. I'll see Susan many times prior to that date as we work on the BRC related issues.

2) As I understand, through visual observation of the LV Wash beneath Northshore Road bridge and discussions w/ Joe Leising, the channel geometry has not changed. Work conducted several years ago to stabilize the bridge provided a concrete/gunite matt that covers the floor and sides of the channel beneath the bridge where the USGS gauge is deployed. The flow meter measurements my staff observed being taken (observations from a distance) likely were used by USGS staff to re-calibrate the pressure transducer deployed to routinely monitor flow.

The re-calibrated gauge led to revised "provisional" flow rates for a several week period (moving back in time). The data we use are all "provisional". The USGS does not post "final" flow numbers until several months following the close of the year. Re-calibration occurs periodically.

We have not confirmed the above w/ USGS personnel but will attempt to do so.

Even prior to the revised USGS flow numbers, the Northshore Road Mass Flux numbers were moving up and were back up above 100 lbs/day (i.e. in the 115 to 130 lb/day range). I believe we are now seeing the groundwater discharge into the LV Wash w/ higher loading following our wet winter. Our local groundwater system continues to be approximately 2 feet higher than typical.

3) DMRs from the dischargers is a good idea, however, they lag so we likely will not have that data available for a few more months. I also considered looking at the Pabco USGS gauge data. Based upon discussions w/ Joe Leising over time and looking at recent Bureau of Reclamation reports, Pabco and Northshore Road data are not identical. All other things held equal, there are several cfs of gains from groundwater between these gauges. Consequently, I do not believe either the DMRs or Pabco gauge will help much.

I'll let you know what we learn from the USGS when that occurs.

THX BYE

Todd J. Croft  
Remediation Branch Supervisor  
Bureau of Corrective Actions  
Nevada Division of Environmental Protection  
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(702) 486-2863 (Fax)

-----Original Message-----

**From:** Bailey, Keith [mailto:KBAILEY@KMG.com]  
**Sent:** Thursday, August 25, 2005 11:03 AM  
**To:** Todd Croft  
**Cc:** Crowley, Susan  
**Subject:** RE: Reduction in Frequency of NDEP Perchlorate Sampling of Northshore Road

8/25/2005

Todd,

Thanks for the update.

Any luck in better understanding the USGS step change in flow at Northshore Road? When did the channel actually widen and do the sewage treatment plant DMRs support the higher flow figures?

I assume we are still on schedule for our September 20th meeting with NDEP and USEPA.

Keith

-----Original Message-----

**From:** Todd Croft [mailto:tcroft@ndep.nv.gov]

**Sent:** Thursday, August 25, 2005 12:50 PM

**To:** Crowley, Susan; Bailey, Keith

**Cc:** Shannon Harbour; Peggy.Roefer@snwa.com

**Subject:** Reduction in Frequency of NDEP Perchlorate Sampling of Northshore Road

Susan & Keith:

The NDEP plans to revert back to monthly sample collection (for perchlorate analysis) for the Northshore Road monitoring station beginning September 2005. We will maintain weekly sample collection through the end of August 2005 with the last weekly sample being collected on Tuesday (08/30/05). We will continue to collect multiple samples (replicate samples) during the monthly sampling event and provide a sample to Metropolitan Water District (MWD), Kerr-McGee Chemical LLC (KMC-LLC), and the NDEP contract laboratory as we have done for the past two years. Maintaining this portion of the sampling program will allow for continued data comparison of perchlorate concentrations reported by several different analytical laboratories. Maintenance of the monthly sampling and analysis also will allow for continued tracking of mass flux at the Northshore Road monitoring station and posting of this data against the modeled breakthrough (decay) curve established by McGinley & Associates in 2003.

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- weekly sampling has occurred for two years (08/26/03 through 08/30/05);
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8/25/2005

monitoring station have declined to approximately 100 to 160 lbs/day and Colorado River concentrations are less than 2 ug/L, monthly sampling and analysis should be adequate to track perchlorate concentrations and mass flux entering Lake Mead and the Colorado River system. In the event conditions change that would warrant more frequent sampling, NDEP will evaluate how best to manage that effort at that time.

Todd J. Croft  
Remediation Branch Supervisor  
Bureau of Corrective Actions  
Nevada Division of Environmental Protection  
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Thank you.

185050  
8/22/05

### Meeting Minutes

Project: Kerr-McGee (KM)  
Location: KM  
Time and Date: 1:00 PM, Monday, August 15, 2005  
Meeting Number: ---

In Attendance:  
NDEP-BCA - Brian Rakvica  
Kerr-McGee (KM) Susan Crowley, Keith Bailey  
ENSR (via telephone)- David Gerry, Sally Bilodeau, Tom Reed (via videophone)

CC: Jim Najima, Jeff Johnson

1. Meeting was held to review progress of ECA activities.
2. Discussed Background.
  - a. NDEP noted that the BMI/TIMET report should be expected by the end of August or early September.
  - b. KM to request a copy of the COH Environ dataset for review.
  - c. KM noted that the revised background workplan might require additional phases of investigation. NDEP agreed that this was acceptable and suggested that the submittal be very brief for additional sampling. The addendum to the workplan would contain a map showing locations of samples, any revisions to the sampling protocol, any revisions to the analytical list and a very brief description of what is proposed.
  - d. It has not yet been determined when this revised workplan will be submitted. KM plans on trying to submit by the end of September.
3. Discussed the CSM.
  - a. It was agreed that the CSM should not be resubmitted until the Source Areas Workplan has been completed. This revised CSM can present the findings of the workplan.
  - b. It was agreed that the data presented in Appendix A could be presented on a disk in future reports. The database should be in MS Access format.
4. Discussed Source Area Workplan.
  - a. Discussed use of field screening techniques.
  - b. Discussed COPC selection. The NDEP noted that this should be in accordance with the USEPA guidance.
  - c. Discussed submittal of an interim deliverable. KM may present the concept of the workplan to the NDEP in an informal deliverable. NDEP agreed that this is a good idea.
  - d. Schedule: KM hopes to submit by the end of September.
5. Discussed data.
  - a. NDEP suggested that KM contemplate submitting data validation reports for any historic data to be used. KM to review this.
6. Discussed chromium treatment system.

- a. KM has some ideas about treating the water in the “dead zone”. KM noted that amendments would not work very well due to the stagnant nature of this water. KM has done some preliminary estimates and is contemplating a low flow pump out of the dead zone wells. KM estimates that it will take approximately 1 year to pump out the impacted water. NDEP concurred that this was an acceptable idea.
7. Discussed perchlorate. KM noted that the next quarterly meeting is on 9/20/05.
8. Discussed fact sheet. KM proposes to submit the fact sheet in the 2<sup>nd</sup> week of November.
9. Next meeting: Monday, September 27, 2005 at 2:00 PM

## Todd Croft

---

**From:** Mark Kaminski  
**Sent:** Friday, August 19, 2005 3:47 PM  
**To:** Darrell Rasner; Alan Tinney; Jim Hogan; Nadir Sous; Todd Croft; Diana Silsby  
**Subject:** FW: CIO4 Mass Discharged in 2004 - Required by Kaminski.xls

FYI:

This spreadsheet was the last item due in from the Kerr-McGee 2005 inspection (#NV0000078). For last year, the mass of perchlorate discharged in stormwater and water leaks was 30 lbs. There are no discharge limits with these two outfalls (M&R).

-----Original Message-----

**From:** Crowley, Susan [mailto:SCROWLEY@KMG.com]  
**Sent:** Tuesday, August 16, 2005 8:09 AM  
**To:** Mark Kaminski  
**Subject:** CIO4 Mass Discharged in 2004 - Required by Kaminski.xls



CIO4 Mass  
ischarged in 2004 -.

Perchlorate Mass in NPDES Discharge from the Kerr-McGee Henderson Plant

Month	Storm						Water Leaks						
	Outfall 001			Outfall 002			Outfall 001			Outfall 002			
	Flow - Storm	Concentration	Mass lb/mon	Flow - Storm	Concentration	Mass lb/mon	Flow - Water Leak *	Concentration **	Mass lb/mon ***	Flow - Water Leak *	Concentration **	Mass lb/mon ***	
Jan-04	0		0	0		0	0		0		0		
Feb-04	252	1.22	2.60037	28	3.70	0.87626	0		0		0		
Mar-04	0		0	0		0	421	0.16	0.56974		0		
Apr-04	160	0.25	0.33875	6	1.3	0.06048	114	0.064	0.06171		0		
May-04	0		0	0		0	0		0		0	0.00558	
Jun-04	14	0.05	0.00575	4	5.7	0.18320	0		0		0		
Jul-04	0		0	0		0	0		0		0		
Aug-04	0		0	0		0	8,915	0.14	10.55662		41	0.59	
Sep-04	0		0	0		0	0		0		1	0.18	
Oct-04	59	0.27	0.13565	12	2.5	0.26220	407	0.06	0.20629		0		
Nov-04	239	0.20	0.40345	114	1.4	1.34874	4	0.27	0.01005		1	0.19	
Dec-04	680	0.52	2.98904	431	2.0	7.29093	1,227	0.18	1.86807		0		
2004 Total			6.47			10.02			13.27				0.21

\* Daily average for the flow days of that month

\*\* average concentration for the flow days

\*\*\* mass for the month.



**Todd Croft**

---

**From:** Todd Croft  
**Sent:** Tuesday, August 09, 2005 1:39 PM  
**To:** 'Bailey, Keith'; Shannon Harbour; Ed Krish (E-mail); Crowley, Susan  
**Subject:** RE: Northshore Road Perchlorate Data - July Update

Keith:

We will likely footnote the graphs. It is my understanding that the flow numbers have changed due to recent measurement of the channel geometry. I understand the USGS issued revised flow numbers going back several weeks (06/21, 06/28, and 07/07). The flow numbers we use are not daily average flow numbers but rather real-time flow numbers for that time of day. We time our sampling to coincide w/ the 15 minute mark when the USGS gauge reports to reduce the chance for additional error in our mass calculations.

It is curious why the perchlorate concentration remains relatively consistent (120-160 ug/L for NDEP data) even though the real-time flow rate changes over a larger range (143-229 cfs for the monthly sample dates).

We will continue to track this and evaluate possible reasons.

THX BYE

Todd J. Croft  
tcroft@ndep.nv.gov (Please note the Change)  
(702) 486-2871 (Phone)

-----Original Message-----

**From:** Bailey, Keith [mailto:KBAILEY@KMG.com]  
**Sent:** Tuesday, August 09, 2005 1:01 PM  
**To:** Shannon Harbour; Ed Krish (E-mail); Crowley, Susan; Todd Croft  
**Subject:** RE: Northshore Road Perchlorate Data - July Update

Shannon,

Thanks for the information, but I have a question regarding the revised flow numbers at Northshore Road. While the recent perchlorate concentrations at Northshore have been relatively stable, the flow has been revised significantly upward. This makes it look like there has been a 60% increase in the mass of perchlorate entering Lake Mead. I am concerned that people will get a wrong impression.

In our regular call this morning, Todd Croft indicated that the channel at Northshore was recently remeasured, which increased the width and raised the measured flow number. Do we know when this type of recalibration was done in the past? Since it is unlikely that the actual average flow had a step change of over 50%, would it make sense to go back and use a consistent reference measurement? At a minimum it would be helpful to put a footnote on the graphs explaining the step change.

Another possibility would be to use a consistent flow reference such as measuring the water depth going between the blocks on the concrete Pabco Road structure. Those dimensions are not likely to change.

Thanks.

Keith Bailey

-----Original Message-----

8/9/2005

**From:** Shannon Harbour [mailto:sharbour@ndep.nv.gov]  
**Sent:** Tuesday, August 09, 2005 11:04 AM  
**To:** Ed Krish (E-mail); Bailey, Keith; Crowley, Susan  
**Subject:** Northshore Road Perchlorate Data - July Update

Attached is the July update for the sampling conducted at Northshore Road.

Shannon Harbour, EI  
Staff Engineer  
Bureau of Corrective Actions  
NV Division of Environmental Protection  
1771 E. Flamingo Rd. Ste 121-A  
Las Vegas, NV 89119  
Office: (702) 486-8267  
Fax: (702) 486-2863  
<<Northshore Rd Data.xls>>

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08/09/05

Tuesday

70 10F  
J

AP-5 Project Status

Keith Bailey  
Susan

Jim Hogan  
Tobias Croft

1) AP5

- (1) Group out to TSI's ... Hope to have bids  
Back by end of Aug  
\* Keith to ✓ w/ J

2) NPDES

- (1) Working on TSI's letter back to EPA  
(in NPDES must review)  
get rid of IX  
18-PPB is the discharge limit  
request in monitoring as requested  
give them a few days to review (EPA)

discussed Hatzinger report ... Tobias to  
FWD to Jim Hogan (done 08/09/05 w/)

- 2) comment review closed 08/01 ... give them  
1 week until 08/08 for postal delivery

**Todd Croft**

---

**From:** Crowley, Susan [SCROWLEY@KMG.com]  
**Sent:** Tuesday, August 09, 2005 11:02 AM  
**To:** Todd Croft  
**Subject:** RE: E-copies of reports

Todd,

I'll have a CD forwarded to you - but on the off chance you can receive larger files - attached is the pdf, zipped to reduce size. This should get you an-e-copy now and you'll get the CD in several days. We'll forward an e-copy to you each time in the future. Thanks.

Susan Crowley  
Kerr-McGee Chemical LLC  
PO Box 55  
Henderson, NV 89009  
(702) 651-2234 office  
(702) 592-7727 cell  
(405) 228-6882 fax

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-----Original Message-----

**From:** Todd Croft [mailto:tcroft@ndep.nv.gov]  
**Sent:** Tuesday, August 09, 2005 10:24 AM  
**To:** Crowley, Susan  
**Subject:** E-copies of reports

Susan:

I have a CD of the Semi-Annual Performance Report Chromium Mitigation Program January - June 2005 provided by ENSR in late July.

I do not have a CD for the Quarterly Performance Report Perchlorate Recovery System Henderson, Nevada April - June 2005. **Please have ENSR provide a CD for the Perchlorate Quarterly Report.**

THX BYE

Todd J. Croft  
Remediation Branch Supervisor  
NDEP Bureau of Corrective Actions - Las Vegas Office  
tcroft@ndep.nv.gov (Please note the Change)  
(702) 486-2871 (Phone)  
(702) 486-2863 (Fax)

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