UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 7
11201 Renner Boulevard
Lenexa, Kansas 66219

NOV 25 2013

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MEMORANDUM

SUBJECT: Response to KDHE and EPA Comments of July 19, 2013 HHRA Work Plan
Former Total Petroleum Refinery
Arkansas City, Kansas
Prepared for MRP Properties Company, LLC
RCRA ID# KSD087418695

FROM: Kelly Schumacher
Toxicologist
ENSV/EAMB

RCRA
527317

TO: Brad Roberts
Project Manager
AWMD/RCAP

As requested, we have reviewed the "Response to KDHE and EPA Comments of July 19, 2013 HHRA Work Plan" for the Former Total Petroleum Refinery, located in Arkansas City, Kansas. This response, dated September 30, 2013, follows a conference call held on September 3, 2013, to discuss comments provided by the U.S. Environmental Protection Agency and Kansas Department of Health and Envrionment on July 19, 2013. We have numbered our comments as they were numbered in the September 30 responses. The responses to Specific Comments 2, 3, 5, 8a, 8c, 8e, 8f, 8g, 9, 10a, 15a, 15b, 15c, 15e, 15f, 16, 17, 20, 21, 22a, 22b, and 24 are acceptable and are not discussed further. For the majority of the remaining comments, we provide or request additional clarification. We only have residual concerns for a limited number of comments. If you have any questions or need further assistance, please contact me at x7963.

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   Regarding groundwater, please be sure to evaluate the drinking water pathway in the HHRA, in addition to potential exposures via vapor intrusion.

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We are primarily concerned for potential exposures via the vapor intrusion pathway at this site because the groundwater is very shallow, but it is also important to address potential contributions from contamination in the vadose zone. The MRP's response seems appropriate, but we recommend including more details in the HHRA work plan or a work plan specific to a vapor intrusion investigation. These would include the planned sample locations and locations of any conduits, consideration of seasonal and temporal variability (i.e., multiple rounds of sampling are typically needed), and proposed sampling and analytical methods. At the existing buildings, indoor air samples may be warranted. If indoor air samples are collected, we also generally recommend collection of outdoor ambient air samples to help interpret the results, recognizing that concentrations of COPCs in ambient air at former refineries may be high.

Regarding the size of the exposure units, 10 acres may be acceptable. An exposure unit should represent the area that a current or future receptor is expected to come into equal contact over their duration of exposure. Exposure units may be defined differently for different types of receptors. When evaluating potential future human receptors, we delineate exposure units based on geographic features of the land, existing buildings and types of work/activities, potential future divisions and sale of the property, etc. We are unclear whether the MRP intends to include the Tank Farm in these exposure units. Please submit a figure that shows the exposure unit boundaries and sampling locations, along with accompanying text explaining the rationale for how the exposure units were selected. The number of samples to adequately characterize an exposure unit and calculate a statistically representative exposure point concentration should be determined by following the EPA's Data Quality Objectives process. Although 8 to 10 samples may be adequate to calculate a representative EPC for a smaller EU, larger EUs may require more samples, particularly if the distribution of contamination across an EU is heterogeneous. The following website contains information on the DQO process; including tools such as Visual Sample Plan that can be used to develop a technically defensible sampling plan (see http://www.epa.gov/quality/dqos.html). Further, we note that additional samples may be required to satisfy other RCRA objectives, such as delineation of the horizontal and vertical extent of contamination around Solid Waste Management Units, Areas of Concern, and hotspots.

Specific Comments

1. Originally, the EPA's comment requested that the work plan address not only soils, but also groundwater, sediment, surface water, and indoor air. The response indicated that the HHRA will now include groundwater and soil, and a later work plan and the HHRA will address surface water and sediment. This division is acceptable since we expect that the human receptors primarily exposed to site sediment and surface water (e.g., trespassers, recreational visitors, localized construction workers) will differ from those exposed to soil and groundwater (e.g., indoor and/or outdoor industrial workers, localized construction workers). However, please confirm our assumption that the agreement to include groundwater in the HHRA means that human exposures via the drinking water pathway and incidental ingestion of shallow groundwater will be evaluated, in addition to the vapor intrusion pathway.

4. Originally, this comment stated that evaluation of potentially complete drinking water and vapor intrusion pathways must occur. The response directed readers to the responses to General Comment 1 and Specific Comment 1. As mentioned above, the MRP has agreed to evaluate groundwater in the HHRA, but we request confirmation that this includes both the drinking water and vapor intrusion pathways.

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   We believe that the MRP's statement that MRLs will be used if the MDLs are elevated is similar to what we are requesting, with the understanding that MRLs reflect dilutions and other sample-specific adjustments. However, because analyzing censored datasets containing both MDLs and SQLs is problematic, please only use SQLs for screening COPCs.

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   When discussing uncertainties with using chronic-based surface soil RSLs to screen subsurface soil samples, please address variables that overestimate as well as underestimate risks.

8b. We initially requested adjustment of the RSLs to reflect a non-cancer hazard quotient of 0.1, along with an excess individual lifetime cancer risk of 1×10^{-6}. MRP responded that they would use RSLs based on a non-cancer hazard quotient of 0.1 and a cancer risk of 1×10^{-5}, "for consistency with the KDHE lifetime cancer risk point of departure."

   For screening COPCs, please use RSLs based on a non-cancer hazard quotient of 0.1 and a cancer risk of 1×10^{-6} to account for potential additivity of non-cancer and cancer health risks. As of May 2013, two sets of RSL tables are now available – please use those based on an HQ of 0.1 (and a target cancer risk of 1×10^{-6}), rather than those based on an HQ of 1. Please note that use of a 1×10^{-6} cancer risk for COPC screening does not preclude use of a different cancer risk

within the EPA's target cancer risk range when making risk management decisions such as establishing cleanup goals.

8d. As requested, the MRP agreed to screen total chromium results using RSLs based on hexavalent chromium. The MRP also stated that hexavalent chromium data will be collected at the site.

If the hexavalent form is not detected, the MRP intends to screen total chromium data using RSLs based on chromium(III). Note, the RSLs for soil are no longer available for total chromium, only for the pure hexavalent and trivalent forms. This approach is acceptable, provided an adequate number of representative hexavalent chromium samples are collected across the site.

If chromium(VI) is detected, the MRP intends to apply the ratio of chromium(VI):chromium(III) when evaluating risks. This approach may be acceptable, provided the supporting data are adequate and the ratio is consistent across the site. Please note that preliminary data suggest that quantitative risk estimates for total chromium in the various exposure units based on the chromium(VI) toxicity values may lie within the EPA's target risk range. It is possible that chromium speciation data may be unnecessary for this site.

10b. Please see Specific Comment 6.

11. This comment concerned the number of samples per exposure unit. The MRP's response to collect a minimum of eight samples per exposure unit is sufficient for ProUCL to calculate a 95% upper confidence limit on the mean, but we caution that the maximum detected concentration must used as the exposure point concentration if there are any data quality issues or other problems resulting in less than eight samples per exposure unit. As previously discussed in General Comment 1, eight samples may be insufficient to calculate an EPC for a larger exposure unit, and additional samples may also be necessary to satisfy the RCRA objectives such as delineation of contamination or identification of hotspots.

12. Please see Specific Comment 8b.

13. This comment pertained to screening and consideration of naturally-occurring background concentrations. The MRP agreed to retain all metals with concentrations exceeding RSLs into the quantitative risk assessment. In addition, the MRP noted that they would calculate total risks, as well as incremental risks above background.

This approach is acceptable, provided background is addressed appropriately. First, the number and locations of background samples must be truly representative of background. Second, we can examine whether an individual point exceeds a background threshold value calculated as an upper tolerance limit using ProUCL. However, we calculate "the" background level as the mean of the background dataset. Confirmation data with further statistical analyses is also required to demonstrate acceptable cleanup to background. As a reminder, it is possible that the exposure point concentrations of arsenic and other metals at this site do not exceed the EPA's target cancer risk range or a non-cancer hazard index of 1. In this case, additional background data may not be necessary.

14. Please see Specific Comment 4.

15d. Originally, this comment pertained to off-site recreational receptors. The MRP responded that "there is no reason to assume that off-Site impacts have occurred or that off-site recreational receptors are exposed to significant concentrations of Site contaminants." Without supporting data, this statement is subjective. We acknowledge that groundwater beneath the facility is currently supposed to be intercepted, but this may not have always been the practice. The EPA recommends a stepwise approach to first delineate the vertical and horizontal extent of groundwater contamination on-site and develop a groundwater conceptual site model, which should then inform potential next steps regarding off-site media.

18. Originally, we requested definition of additional exposure units to characterize the entire site. The MRP's response directed us to their responses to General Comment 1 and Specific Comments 1 and 2. However, we are still unclear whether the whole site, including the tank farm, will be evaluated. As requested in General Comment 1 of this memo, we recommend developing an updated figure showing the proposed exposure units and sampling locations.

19. In this comment, we described how the 95% upper confidence limit on the mean is used as the exposure point concentration in most situations, but central tendency estimates are used to evaluate exposures to lead. We also stated that if insufficient data were available to calculate a 95% UCL, then the maximum detected concentration should be used as the EPC. The MRP agreed with these practices.

    The MRP also stated that, "[i]n regards to the use of 95% UCL on the mean concentrations, vs. maximum concentrations, to evaluate lead exposures and risks, 95% UCL on the mean concentrations will be used in preference to maximum concentrations." We interpret this statement as when there are limited lead soils data for a given exposure unit, then a 95% UCL on the mean would be used as the EPC, rather than the mean. However, if data are too limited to have confidence in a mean value, insufficient data are available to generate a 95% UCL on the mean. Please ensure that sufficient lead soil samples are collected for each exposure unit to calculate a representative mean for use in risk assessment.

22c. This comment discussed averaging times, exposure frequencies, and exposure durations for construction projects. The MRP agreed with our comment, stating that the non-cancer averaging times "will match" the total exposure duration. As further clarification, please note that the ATs should match, but not generally equal, the duration of the construction project. However, the exposure duration term (in years) for projects lasting less than one year should be set at one year. This is because the ED term in years is simply multiplied by the EF in days per year in order to convert to units of days in the exposure equations. Otherwise, for exposures lasting less than a year, multiplying by an ED of less than one year would result in double-counting. As an example, consider a project lasting 10 weeks (non-cancer AT = 70 days), where workers are exposed 5 days/week, for a total of 50 days/year (EF) over the project. Here, 50 days/year exposure times 1 year gives 50 days of exposure. In contrast, 50 days/year times 0.19 years (70 days divided by 365 days) gives 9.6 days of exposure.

23. In this comment, we provided guidance on selection of toxicity values. In general, the MRP accepted this guidance. However, we disagree that there is a lack of available, peer-reviewed and agency-approved subchronic toxicity values. Tier 2 subchronic PPRTVs are found at: http://hhpprtv.ornl.gov/quickview/pprtv.php. Tier 3 intermediate-term Minimal Risk Levels are

found at: http://www.atsdr.cdc.gov/mrls/mrllist.asp. Subchronic values may also be found by selecting "subchronic" on the EPA's online RSL calculator: http://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search. To minimize uncertainty, please use subchronic toxicity values, where available, when evaluating subchronic exposure scenarios such as construction or excavation projects.

25. This comment discussed the proposed locations and depths for background arsenic samples. As discussed in Specific Comment 13, please note that we use a UTL generated by ProUCL as a BTV to determine whether an individual point exceeds background, but we calculate a background level as the mean concentration from an adequate background dataset. This means that a cleanup level based on background would be a mean concentration, not an upper-end BTV.

CONCURRENCE: Kristina:7665:112213:H:/ENSV/EAMB/RISKASSESSORS/MEMORANDUMS/FY2014/HHRA/KMSMRPPropertiesRTConHHRAWork Planddated Sept302013-FInal.docx				
DIV/BR	ENSV/EAMB	ENSV/EAMB		
NAME	Schumacher	Beringer		
DATE	11/25/2013	11/25/13		
INITIALS	KMS	MDB		

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