From: WORTMAN, RYAN J CIV USAF AFCEC AFCEC/CZO
To: Davidson, Naomi, ENV; Bollinger, Samuel, ENV; Marquez, Autumn, ENV
Cc: McKenze Booth; SEGURA, CHRISTOPHER G CIV USAF AFCEC/CZO; Nance, JD, ENV
Subject: [EXTERNAL] Bulk Fuels Facility Clarification Response
Date: Friday, January 30, 2026 2:23:21 PM
Attachments: CommonResponseForm_Phase II RFI_20260130.pdf

CAUTION: This email originated outside of our organization. Exercise caution prior to clicking on links or opening attachments.

Good afternoon,

The response to NMED's clarification request regarding the Bulk Fuels Facility Phase II RFI is attached. There are several large files associated with the USAF's response, which are now available on the project file transfer site, link and file path provided below. If you need login credentials McKenze Booth (CC'ed) on this email can help you in get access to the files. Additionally, if NMED would like the files via CD, please coordinate with McKenze Booth to drop Monday February 2nd, 2026. Have a great weekend!

Portal Home - Transfer. Final files> 7. Phase II RFI Report Clarification

Thanks,

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Date	Reviewer	Document Title (version)	
01/30/2026	NMED HWB	Phase II RCRA Facility Investigation Report Bulk Fuels Facility Solid Waste Management Units ST-106/SS-111 Kirtland Air Force Base, New Mexico	NMED Permit No. NM9570024423
NMED Comment Number	**Comment**		**Response**
1	The Phase II RFI presents what can be seen as two separate models for the downward migration of LNAPL: one where the LNAPL pools at the clay layers until the hydrostatic head is sufficient to permeate the layer, and one where the LNAPL slowly migrated downwards through preferential flow paths in the discontinuous clay layers. The Permittee must clarify the current understanding of how the LNAPL progressed downward through the vadose zone: • The Permittee must state if both mechanisms are considered equally likely, based on the available evidence, to have occurred and if it is unknown which mechanism happened, or • The Permittee must state if both processes are considered to have occurred and that some portion of LNAPL pooled at the clay layers and overcame hydrostatic forces to proceed downward, while other portions flowed along preferential pathways in a long and tortuous way downward. The Permittee must provide a robust discussion that summarizes the available data presented within the RFI that supports the model of downward migration determined to be most likely to have occurred. If the Permittee considers both models to be equally likely, the Permittee must demonstrate that the usage of two models will not affect the deployment and function of any future remedies.	The Phase II Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Report concludes that both downward migration mechanisms identified by New Mexico Environment Department (NMED) occurred, and that the observed distribution of light non-aqueous phase liquid (LNAPL), soil vapor, and dissolved-phase contaminants is best explained by a combined transport model in which (1) portions of LNAPL temporarily accumulated on low-permeability clay units until sufficient hydrostatic head allowed downward penetration, while (2) other portions migrated vertically and laterally through discontinuous clay layers and preferential flow pathways in a slow, tortuous manner. These mechanisms are not considered mutually exclusive; rather, they are consistent with one another and with the heterogeneous lithologic framework documented at the Site. This conclusion is supported by multiple independent lines of evidence presented in the Phase II RFI Report. Continuous soil coring, lithologic logging, and geophysical data demonstrate that the so-called “250-foot (ft) clay” is not a laterally continuous confining unit but instead consists of interbedded clays and silts with variable thickness, lateral extent, and hydraulic continuity. Cross sections developed from 11 source-area borings, supplemented by lithologic and resistivity induction logs from a total of 67 wells, show localized clay thickening and thinning, as well as vertical and lateral heterogeneity that would facilitate preferential migration pathways around or through lower-permeability zones. This geologic framework supports slow, vertically progressive migration through discontinuous clay units rather than a single, laterally continuous pooling surface. At the same time, Phase II RFI data indicate that the 250-ft clay unit exerted a measurable influence on temporary lateral spreading of LNAPL, consistent with localized pooling and head-driven penetration. Soil vapor plume shells for benzene and ethylene dibromide (EDB), developed from more than 300 soil vapor monitoring locations sampled semiannually since 2007, supported by more than 900 photoionization detector (PID) readings which show elevated concentrations aligned along this stratigraphic interval before resuming downward migration. Figures 6-45 and 6-46 explicitly depict this behavior, illustrating downward migration pathways derived from the highest soil vapor concentrations and showing lateral deflection consistent with interaction with the 250-ft clay unit prior to continued vertical transport. Additional support for a combined mechanism is provided by the vertical distribution of residual LNAPL and the smear zone, as described in Sections 7.6.1 and 7.6.3. The smear zone spans the historical range of groundwater elevations and reflects repeated episodes of downward migration, temporary accumulation, and redistribution of LNAPL as hydraulic conditions evolved. The presence of residual LNAPL both above and below the current water table, including trapped LNAPL within lower-permeability sediments, is consistent with incremental downward movement through heterogeneous media rather than a single, discrete breakthrough event. Accordingly, the Phase II RFI Report does not consider the two mechanisms to be equally speculative or interchangeable. Instead, the weight of evidence supports a hybrid conceptual model in which both processes occurred and collectively explain the observed contaminant architecture. This integrated model is reflected in the Conceptual Site Model (CSM) and underpins the interpretation of soil vapor, LNAPL, and groundwater data throughout the Report. Importantly, recognition of a combined downward migration mechanism does not affect the deployment or performance of future remedial actions. The vertical and lateral distribution of LNAPL, the associated smear zone, and the dissolved-phase groundwater plumes have been defined using empirical soil vapor, LNAPL, and groundwater data collected to date and will continue to inform site understanding at the time the Corrective Measures Evaluation (CME) is developed. As a result, the robustness and protectiveness of future remedies are not sensitive to uncertainty in the relative contribution of each downward migration mechanism. Upon NMED’s official response, Section 7.6.3 can be updated to include discussion of the additional data sets utilized to support the LNAPL migration pathway CSM based on the highest concentrations of soil vapor data.

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2	The Phase II RFI describes the contaminants as essentially pooling along some of the clay layers before overcoming the hydrostatic head and proceeding downwards through the vadose zone. The Permittee must expand on this with a discussion that identifies locations within the site where this was observed, including these locations in the updated cross sections and other figures as needed. The discussion must include all available lines of evidence of these observations. If the pooling is suggested by lines of evidence, but not observed at the site, provide a discussion on the lines of evidence that suggest this.		The nature and extent of contamination presented in the Phase II RFI Report focuses on the clay layers that have impacted vertical LNAPL migration, consisting of only the 250 ft clay layer. No other clay layers have been observed to significantly impact migration. Section 7.6.1 of the Phase II RFI Report discusses the general conceptual migration of LNAPL through a heterogenous clay/silt and sand layered geologic unit like the Santa Fe Group. Upon NMED's official response, Section 7.6.1 the Phase II RFI Report can be revised to differentiate LNAPL migration that is conceptual versus observed.
3	The Phase I RFI required the submittal of searchable/sortable analytical data from the above 20 ft bgs investigation/excavation that was a part of the former pipeline investigations. In response to NMED Comment 1 of the approval with modifications for the Phase I RFI, located in Appendix A-2 of the Phase II RFI, the Permittee states that a searchable/sortable dataset of the confirmation samples from the 2012 and 2014 former pipeline investigation have been included in Appendix H-2 of the Phase II RFI. Appendix H of the Phase II RFI presents historical groundwater elevations and hydrographs for select wells, while Appendix C-2 presents the analytical data from the 2014 former pipeline investigation. The analytical data contained within Appendix C-2 is only from the year 2014. The Permittee must provide clarification on why only the 2014 data was included (as discussed, cite the 2012 removal action, point to the documentation of the action, and include any other pertinent details).		The 2012 soil investigation defined the excavation footprint, while the 2014 investigation results reflect current post-excavation Site conditions. The 2012 soil data, although not indicative of current conditions, are contained in the Former Fuel Offloading Rack Excavation Report on the NMED Administrative Record (AR) as Number KAFB4227. Upon NMED's official response Appendix A-2 will be revised to remove reference to 2012 soil data, including the title of the Appendix, as that is not applicable to current nature and extent of contamination at the site. In addition to the changes to Appendix A-2, Section 6.1.2.4 of the Phase II RFI Report can be revised to include a discussion of the 2012 versus 2014 investigation purposes.
4	NMED Comment 26 for the Phase I RFI further requires at least two aquifer tests to be conducted at the site, one at the source area, and one at the leading edge of the EDB plume (the Trumbull well field is given as an example). Section 7.2.2.1 of the Phase II RFI describes how transmissivity values were estimated using data from aquifer tests "mostly in City of Albuquerque drinking water supply wells". The Permittee must clarify which wells were used for these estimates along with the associated dates and times that these aquifer tests were performed. The Permittee must expand on the methodology used for these estimates and clarify how the referenced report Geologic Framework and Hydrologic Conditions in the Albuquerque Basin, Central NM (Thorn et al., 1993) was used to derive the estimations provided within the section. Additionally, the Permittee must provide a detailed discussion that demonstrates why an aquifer test within the source area was not necessary. This discussion must include what standards were used to make this determination and provide all available lines of evidence that shows that the material used to define the aquifer properties is sufficient for understanding of site conditions.		The report Geologic Framework and Hydrologic Conditions in the Albuquerque Basin, Central New Mexico (NM) (Thorn et al., 1993) (https://pubs.usgs.gov/wri/1993/4149/report.pdf) summarizes aquifer properties in the Albuquerque area from several investigations including Bjorklund and Maxwell (1961), Groundwater Management, Inc. (1988), Wilkins (1987) Shomaker (1988, 1990, and 1991). Table 2 in the referenced report, beginning on page 38 (PDF page 46), lists 95 groundwater wells for which aquifer properties are discussed including transmissivity and hydraulic conductivity, where hydraulic conductivity is transmissivity divided by the screen length. There are numerous wells within the Albuquerque Basin that give a range of aquifer parameters. Final remedy design will be informed by the range of possible hydrologic parameters and have the flexibility to adjust based on conditions encountered during implementation. Based on depositional history, hydrologic conditions in the source area are anticipated to be variable, falling within the Thorn et al., 1993, referenced range. Additionally, the lithologic logs, source area cross sections, and 10 years of the pump and treat interim measure operation at the Site will inform final remedy design. Upon NMED's official response, Section 7.2.2.1 of the Phase II RFI Report can be revised to include this clarification. Hydrologic condition testing in the source area would provide data that is no more beneficial for design of the final remedy than what is already available from the well characterized Albuquerque Basin Aquifer, site investigation data, and interim measure activities. The Air Force recommends that the final remedy for the source area be discussed and evaluated within the CME based on the hydraulic parameters and data already presented within the Phase II RFI Report. Additionally, pump testing in the source area can be performed as source area extraction wells are installed at the Site within the Corrective Measures Implementation Phase.

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5	Section 7.2.2.4 of the Phase II RFI states that “Additional pump testing was performed in 2021 which included injection well KAFB-106IN2”. The Permittee must clarify if other pump testing was included in this event aside from KAFB-106IN2. The Permittee must also provide a discussion of the location of KAFB-106IN2 relative to the site and must demonstrate that the data obtained from this location is representative of the conditions at the site.		The Phase II RFI Report from April 2025 states that “Additional pump testing was performed in 2021 which included injection well KAFB-106IN2.” No specific pumping tests were performed outside of the four interim extraction wells. The well KAFB-106IN2 is located 7,000 ft from the Source Area. As discussed in Section 7.2.2.4, physical aquifer properties such as hydraulic conductivity are highly variable across the site corresponding with the depositional history of the Sante Fe Group. Depending on the depositional regime of the ancestral fluvial deposits, measurements of physical aquifer properties, such as hydraulic conductivity and transmissivity, vary laterally and vertically within the Site. The Air Force recommends that the CME remedial designs accommodate a range of hydrogeologic conditions given the heterogeneity observed within the Santa Fe Group, as well as site-specific geologic cross sections of anticipated screen intervals. Upon NMED’s official response, Section 7.2.2.4 can be revised to clarify that no other pumping data was collected during the Phase II RFI, outside of the 2021 pump test at KAFB-106IN2 and the four interim measure extraction wells.
6	NMED Comment 26 of the Approval With Modifications for the Phase I RFI notes that the Aquifer Test Report for Groundwater Extraction Well KAFB-106228 indicates that the aquifer test was unsuccessful. The Permittee states in the Phase II RFI that the aquifer test for KAFB-106228 was successful. The Permittee must provide a discussion that demonstrates that the aquifer test for KAFB-106228 was a successful test. The discussion must include any issues that affected the test and provide evidence for why these issues did not affect the applicability of the data.		On January 22, 2016, NMED provided comments regarding the aquifer pump test at KAFB-106228 and highlighted several concerns regarding the calibration and flow rate verification. These comments were addressed in the July 28, 2016, Aquifer Test Report for KAFB-106228 (NMED AR # KAFB4437), which presented corrected flow rates. The Air Force received no additional comments from NMED regarding the pump test methods or results to date. Additionally, the results of aquifer test and evaluation yielded hydrogeologic parameters consistent within the Albuquerque basin aquifer. The mean hydraulic conductivity measured during the constant-rate aquifer test at KAFB-106228 was 150 ft per day (transmissivity of 44,000 square ft per day during step-drawdown and constant rate testing). Transmissivity for the aquifer system ranges widely due to variations in thickness and hydraulic conductivity across the basin, falling between 3,000 and 70,000 square ft per day, used to estimate a horizontal hydraulic conductivity ranging from 4 to 150 ft per day (Thorn et al., 1993). The well KAFB-106228 has a decade of performance metric available from interim measure operations, which can be used to confirm the aquifer test results and final remedy design. Section 7.2.2.4 of the Phase II RFI Report can be updated to include these regulatory correspondences concerning the aquifer pump test, pending NMED’s official response.
7	The Phase II RFI presents hydrocarbon/contaminant removal volumetric estimates throughout the Phase II RFI (e.g., Executive Summary, Section 2.2.1, Section 7.6.1, and others). Add statements along with each of these estimates to clarify that these numbers are estimates and that they are being used within the RFI for illustrative purposes only.		Concur, the volumetric estimates used were calculated previously and within the Phase II RFI Report are used for illustrative purposes only. Upon NMED’s official response, the Executive Summary, Section 2.2.1, Section 2.3.2, Section 2.3.3, Section 2.3.4, Section 7.6.1, and Section 8.2 of the Phase II RFI Report will be updated to state “The volumetric estimates shown in this report were calculated and reported in previous documents; the use of volumes in this report is for illustrative purposes only.” Additionally, the CME can propose methodologies for volumetric estimates for specific remedial technologies to ensure concurrence on methods prior to final remedy implementation and performance monitoring.
8	Section 2.3.4 describes the modified bioslurping systems as featuring a small diameter drop pipe. Page 5-2 (5th paragraph) of the Phase I RFI states that the bioslurping systems did not have a small diameter drop pipe. The Permittee must clarify whether this feature was a part of the design or not and clarify the discrepancy between the two RFI documents.		Upon further review, Section 2.3.4 from the April 2025 Phase II RFI Report and August 2018 Phase I RFI Report describe the modified bioslurping system consistently. They correctly indicate bioslurping as featuring a small diameter drop pipe as a part of the design. Based on the clarification provided above, no revisions to Section 2.3.4 are proposed at this time regarding this comment.

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9	NMED Comment 11 from the Phase I RFI approval with mods, and the Permittee's response to the comment, indicate that there was an issue with airtight seals on the SVMPs present at the site at the time. From context, it appears that this issue was rectified post-2016. The Permittee must clarify if the issue with the seals was rectified and provide a brief discussion of this issue.		For clarification, please refer to the Phase II RFI Report Executive Summary which states that "This report evaluates soil vapor data between 2016 and 2023, following the soil vapor monitoring point (SVMP) retrofit to reduce the influence of barometric pumping in Quarter (Q)1 2015." Section 3.1.1 states "SVMPs are sealed to atmospheric air, which minimizes exchanges with atmospheric "inhalation" and "exhalation" cycles driven by barometric pressure…" Additionally, in Q1 2015, prior to the soil vapor extraction (SVE) system shutdown and rebound test, the entire soil vapor monitoring (SVM) network was retrofitted to seal SVMPs minimizing influence of barometric pressure changes on soil vapor samples. Prior to the sealing, the SVMP polyvinyl chloride (PVC) pipes had loose fitting caps that allowed the influence of atmospheric inhalation/exhalation cycles. All Phase II RFI soil vapor data were collected after SVMPs were sealed. Upon NMED official response, Appendix A-2 in the Phase II RFI Report response to NMED Comment 11 from the Phase I RFI approval with modification can be amended to include the additional background information included in this response regarding the timing of the data sets utilized and the sealing of the SVMPs.
10	The Quant-ArrayTM-Chlor and reduced gases (Hydrogen/Methane/Ethene/Ethane) Study was removed from the Phase I RFI due to multiple issues. Section 3.2.1 (pg. 3-6) of the Phase II RFI presents Quant-ArrayTM-Chlor as a method used for analysis of cores collected in the vadose zone. The Permittee must provide clarification that core analysis is unrelated to the Quant-ArrayTM-Chlor study that was removed from the Phase 1 RFI.		The Bulk Fuels Facility (BFF) Source Zone Characterization (SCZ) included analysis of core samples to characterize microbial communities using Quant Array-Chlor®, as this analytical method was required by the NMED-approved work plan. Results are reported in Section 5.2.5 and Appendix G-3 of the SCZ Report (Kirtland AFB, 2021b). For clarification, the decision to remove the Quant-ArrayTM-Chlor® and Reduced Gasses Study from the Phase I RFI was based on that individual investigation and not the analytical method itself. The Qant-Array- Chlor® method within the Phase II RFI Report is unrelated to the study removed from the Phase I RFI Report. From the Air Force's perspective, use of the method Quant Array-Chlor® in the Source Zone Characterization, in accordance with the approved work plan, does not conflict with NMED Comment 13 from the Phase I RFI Report Approval with Modification. Based on the clarification provided above, no revisions are proposed at this time regarding this comment.
11	The status of the supply well KAFB-03 is unknown, though monthly sampling results for this well are included in the Phase II RFI. Provide a brief description of the current and historical usage for KAFB-03.		Pumping from KAFB-003 has idled due to mechanical failure of the well pump. Kirtland AFB plans to replace KAFB-003 with a new supply well in the same area due to its age and deterioration of KAFB-003 well steel. KAFB-003 historical pumping volumes during the Phase II RFI are attached to this clarification response. Upon NMED's official response, this data can be included as Appendix F-4 and referenced in Section 4.3.3.4.
12	In response to NMED Comment 3 of the second revision of the SZC Report, the Permittee states that "All relevant data will be utilized to define the horizontal and vertical extent of LNAPL within Section 3.1.2.2 of the RFI Phase II.". The Phase II RFI does not contain a Section 3.1.2.2. Section 3.1.2 describes the groundwater monitoring activities completed for the SZC, and it does not appear that a missing section on LNAPL extent was left out. The Permittee must define where the information the horizontal and vertical extent of LNAPL is found within the Phase II RFI.		For clarification, Figure 6-64 displays the approximate horizontal extent of the LNAPL footprint using the benzene effective solubility of 1.43 milligram per liter (mg/L) and historical LNAPL measurements across the Site. Soil vapor data and historical groundwater elevations are utilized to define the vertical extent of LNAPL. As stated in clarification comment #1, multiple lines of evidence were utilized to derive and confirm the LNAPL migration pathway nature and extent. The nature and extent of LNAPL is discussed in Section 7.6.3 of the Phase II RFI Report, and the spatial distribution is discussed in Section 7.6.3.1. The response to NMED Comment 3 of the second revision of the SZC Report calls out the wrong report section. An updated "clean" version of the SZC Report is attached to this clarification response. Additionally, upon NMED's official response the correct section callouts will be added to the response in Appendix A-2 of the Phase II RFI Report.

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13	In response to NMED Comment 4, Permittee defends the usage of the description “diffused and dispersed” LNAPL at the site, and states that Section 6.2.3 through Section 6.2.5 of the Phase II RFI demonstrate that the usage of this description is accurate. The Permittee must clarify what Sections of the Phase II RFI include this information as Sections 6.2.3 and Section 6.2.4 discuss LNAPL field screening results and analytical results, respectively, and Section 6.2.5 does not exist in the Phase II RFI.		Sections 6.2.3 and 6.2.4, from the Phase II RFI Report, include the LNAPL Field Screening Results and the LNAPL Analytical Results, respectively. Upon NMED official response the correct section callouts will be added to the response in Appendix A-2. The response to NMED Comment 3 of the second revision of the SZC Report was revised to remove the defense of the description “diffused and dispersed” and updated to state, “Sections 7.6.1 and 7.6.3 of the Phase II RFI Report discuss historical LNAPL migration and current nature and extent.” An updated “clean” version of the SZC Report is attached to this clarification response.
14	In response to NMED Comment 5, the Permittee states that as NMED did not define the “Qualitative Soil Vapor COCs”, the Permittee would use numerical soil vapor concentrations to bound the nature and extent of the SV plume and define the LNAPL migration pathway in Section 6.1.3 of the Phase II RFI. Section 6.1.3 of the Phase II RFI does not exist, and it appears that this information is included in Sections 6.1 and 6.2. Clarification is needed on where this information is included in the report.		Concur, the response to NMED Comment 5 of the second revision of the SZC Report, which is found in Appendix A-1 of the “clean” SZC Report which is attached to this RTC, Page A-1-2, PDF page 4, was revised to call out the definition of the LNAPL migration pathway in Section 7.6.1 of the Phase II RFI Report. An updated “clean” version of the SZC Report is attached to this clarification response. The Site vadose zone contamination is discussed in Section 6.1 of the Phase II RFI Report. Upon NMED official response the correct section callouts will be added to the response in Appendix A-2.

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15a	In review of the second revision of the SZC Report, NMED requested cross sections and specified the requirements of what needed to be included in the cross sections. After reviewing the cross sections provided in the Phase II RFI, there are multiple deviations from the requests as well as other issues that need to be addressed. As discussed in the meetings between NMED and KAFB, the Permittee must submit a comprehensive document (referred to in the meetings as a "nexus") that addresses all concerns related to the cross sections presented in the Phase II RFI. Below are some issues identified in relation to the NMED requirements for cross sections from the SZC report. a. The Cross Sections needed to include lithology based on USCS classifications as logged by a field geologist. There were a few issues with the presentation of this information: i. All Transects: USCS lithologic identification is presented on the cross sections only for select wells on most of the transects. The Permittee needs to specify why this was done (e.g. left out to reduce clutter, certain wells were not logged during drilling, etc.). ii. Transect A-A': KAFB-106244 is labeled as "Projected". The Permittee needs to explain what the use of this term signifies. A projected lithology is not appropriate to be used as a defined data point in the cross section. iii. Transect B-B': USCS classifications are not included in the cross sections for this transect. All cross sections must include USCS classifications. iv. Transect D-D' through J-J': The lithologic classifications change for these transects and are not as detailed. The Permittee must use the same classification for all cross sections, or explain what the differences in classification are and why there was a need to change the classification scheme. v. Transects H-H' through J-J': There are black bars represent.	A comprehensive discussion of cross section development and presentation in the Phase II RFI Report is attached to this response to comment (RTC) matrix. Additionally, a crosswalk table was generated to document the specific figure numbers that were updated based on responses provided below. Upon NMED's official response the updated cross sections will be incorporated into the Phase II RFI Report. a. Additional information and answers to NMED's questions on development or changes to the cross sections are provided below. Changes to cross sections are described in Crosswalk table columns C through G. i. The response is included in the auxiliary document titled Standalone Response Document for Comments 15a.i, 15h.iii, 15H.iv, 15h.v, and 16. ii. The term "Projected" implies that the particular well was not directly on the line of the transect but was used for reducing a data gap. However, the three wells previously identified on the cross sections as projected were in fact located close enough to be considered on the cross-section lines. Therefore, the cross sections were revised to remove the term "Projected". iii. The GSL classifications were added to all cross sections other than cross section B-B', which did not use any boring logs/GSLs for interpretation. A note was added to the cross section saying: "Note: Grain-Size Index not shown due to no data being described from boring logs." iv. The lithologic classifications were standardized for all cross sections other than cross section B-B' (see above response to 15a.iii). v. Some cross sections have lithologic classifications with black borders that appear as black bars when zoomed out on the figure. The black borders of the classifications were manually deleted from these cross sections.
15b	b. Depth to water at the time of drilling was required to be indicated for each transect, as well as historic high, intermediate, and low levels: i. Transect A-A' and B-B': The required water levels are not shown on any of the cross section figures presented for Transect A-A' or B-B'. The Permittee needs to include this information for all transects. ii. Transects C-C' through F-F': A water level is depicted for "2001-2011". The Permittee must clarify what is meant by this timeframe, as it is unlikely that the water levels stayed the same for a period of 10 years. iii. Transects G-G' through J-J': Water levels were not provided for any of these transects. The Permittee needs to include these levels for all cross sections (at least presented on one cross section figure per transect) or provide a comprehensive discussion on why they were not included.	b. Depth to water at the time of drilling was added to cross sections where applicable. However, many soil vapor monitoring wells did not reach the groundwater table at time of drilling. The historic high and low water levels were also added to cross sections. Changes to cross sections are described in crosswalk table columns H through K. i. Depth to water was added to all "-A" cross-section figures. ii. The water level depicted for "2001-2011" was removed from these cross sections and replaced with the 2009 water level at the Site. iii. Depth to water was added to the cross sections on transects G-G' and J-J'.

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15c	c. Surface features were required to be included on the top horizontal axis of the cross section such as the FFOR, Ridgecrest Drive, Bullhead Park, etc. i. Transect A-A' and Transect B-B': None of the surface features are indicated on the top horizontal axis, but they are shown (unlabeled) on the small aerial photo included at the bottom left of the figures. Provide surface features at the top horizontal axis for easy reference. ii. Transect F-F': Ridgecrest Blvd is not depicted on any of the cross section figures for this transect. iii. Transects G-G' through J-J': See comment for Transects A-A' and B-B'.		c. Surface features were included on the top horizontal axis of the cross sections as described below. Changes to cross sections are described in Crosswalk table columns L through O. i. Surface features were added to the top of the horizonal axis on transects A-A' and B-B'. ii. Ridgecrest Boulevard (Blvd) does not intersect transects A-A' or B-B'; however, Randolph Road (Rd) south east (SE) was added as a surface feature for intersecting transects. iii. Surface features were added to the top of the horizonal axis on transects G-G' through J-J'.
15d	d. PID results were required to be included on the cross sections; some cross sections are missing these readings. All PID readings have a minimum detection range of 0-1000 ppm. The Permittee must discuss the limitations of this range, as it does not distinguish between a sample in the 20 ppm range and a sample in the 900 ppm range. i. Transect A-A': No PID results were included for this transect. The Permittee must include PID results or state that there were no PID readings available for the wells/borings within the transect. ii. Transects B-B' through D-D': The cross sections provided for these transects only contain PID results for select wells. The Permittee must include PID results for all wells or include a list of wells/borings within the transect in which there were no PID readings available. iii. Transect F-F': See Transects B-B' through D-D'. iv. Transects G-G' through J-J': PID readings are not included for any of the figures for these transects. The Permittee must include PID results or state that there were no PID readings available for the wells/borings within the transect.		d. PID ranges were reassessed and revised on the updated cross sections attached to these RTCs. Geometric intervals were chosen to represent the data classification method in the revised cross sections. Geometric intervals create class breaks based on class intervals that have a geometric series. The algorithm creates geometric intervals by minimizing the sum of squares of the number of elements in each class. This method typically provides results that are cartographically comprehensive, highlighting neither the middle nor extreme ranges of values. This method is designed to accommodate non-normally distributed and extremely skewed data, making it a valuable tool for visualizing and analyzing data distributions. Changes to cross sections are described in Crosswalk table columns P through T. i. Transects B-B', C-C', D-D', E-E' and F-F' were selected for showing analytical data and field screening data (e.g. PID) because they intersect the source area or dissolved EDB or benzene groundwater plumes. ii. All available PID data for transects B-B' through D-D' are shown on the figures. If no PID readings are shown on a specific well, none are available. iii. All available PID data for transect F-F' are shown on the figure. If no PID readings are shown on a specific well, none are available. iv. Select transects include analytical and PID data; transects B-B', C-C', D-D', E-E' and F-F' show data in the source area.

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15e	e. UV screening results were required to be included on the cross sections. For all cross sections that do not include this information, the Permittee must clarify if the UV results were not included or are not available for each well/borehole. i. Transect A-A': No UV screening results were presented on any of the figures for this cross section. ii. Transect B-B': The list of acronyms for Figure 7-5-D includes UV, but there is no mention of UV screening on the key. iii. Transect C-C': UV markers are shown without any identification (it is assumed that these markers indicate areas within the vadose zone where the UV response was positive). A brief discussion of the UV response is needed, along with the spectrum range used for positive identification. iv. Transect D-D': See comments for C-C'. Also, there are multiple boreholes indicated by the figure for this run. Explain whether there are multiple wells in this set with positive UV detection or otherwise indicate which well had UV run. v. Transect E-E': UV is included in the list of acronyms for Figure 7-8-D, but no boreholes on the figure indicate that UV run was completed. If there were any boreholes that had UV run, include them in the figure. vi. Transect F-F': See previous comments. vii. Transects G-G' through J-J': None of these transects include UV analysis. If there were any boreholes within the transects that included UV analysis, they need to be included in their corresponding figures.		e. Ultraviolet (UV) screening results were included if available, on transects B-B', C-C', D-D', E-E', and F-F'. Changes to cross sections are described in Crosswalk table columns U through AB. i. UV screening results were only presented on a subset of transects, no UV screening data were collected on the wells presented in transect A-A'. ii. The legend was revised to include UV Fluorescence on transect B-B'. iii. The UV fluorescence markers are shown if there was a positive response within that zone of screening. A brief explanation of this positive response was added to the cross section. iv. The UV fluorescence markers are shown if there was a positive response within that screening zone. A brief explanation of this positive response was added to the cross section. In addition, an asterisk was added to KAFB-106V2 with an explanation that UV fluorescence analysis data are available. v. The list of acronyms was revised to remove UV as no UV screening data are available for these previously installed wells. vi. The UV fluorescence markers are shown if there was a positive response within that zone of screening. A brief explanation of this positive response was added to the cross section. vii. UV screening results were only presented on a subset of transects, not including transects G-G' through J-J'.
15f	f. Depths of samples collected for laboratory analysis and the results of the analysis were requested to be depicted at the appropriate depths for each cross section. i. Transect A-A': This information was not included for this transect. Add the information to the transects, or provide a discussion if there is a compelling reason why this data was not included for this transect. ii. Transects B-B' through F-F': The only data included is for EDB and Benzene. If Benzene is being used as an indicator for all BTEX compounds, provide a robust discussion about the merits of this approach, as well as any data gaps that may potentially emerge from using the dataset in this manner. iii. Transects G-G' through J-J': The information was not provided for these transects. Add the information to the transects, or provide a discussion if there is a compelling reason why this data was not included for these transects.		f. Analytical data was shown on a subset of cross sections, which includes B-B', C-C', D-D', E-E' and F-F' as the source zone. Changes to cross sections are described in Crosswalk table columns AC through AF. i. Analytical data was not shown on transects A-A', G-G', H-H', I-I' and J-J'. ii. Benzene was used as an indicator for contaminants of potential concern (COPCs) as the isopleth contours of toluene, total-xylenes, and ethylbenzene fit within the plume benzene plume as shown on Figure 6-53 in the Phase II RFI Report. This is further discussed in Section 8.1 of the Phase II RFI Report. iii. Analytical data was only shown on a subset of cross sections, which included B-B', C-C', D-D', E-E' and F-F' as the source zone. Analytical data was not shown on transects A-A', G-G', H-H', I-I' and J-J'.

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15g	g. The depth to LNAPL was required to be depicted in the cross sections, and although Transects B-B' through F-F' give data from which LNAPL depth may be inferred, the Permittee did not depict the projected depth to LNAPL in the cross sections. The Permittee also did not give any LNAPL data for the remaining transects.		g. Where LNAPL has been previously detected, a depiction was added alongside the historical water levels on the corresponding cross sections. Note that a small subset of wells has recorded LNAPL, as shown on Figure 6-64 in the Phase II RFI Report. Changes to cross sections are described in Crosswalk table column AG.

15h	h. Geological and geophysical issues in the cross sections: i. Steel centralizers are present on many of the wells at the site. The centralizers affect the readings of the resistivity logs and need to be identified. The Permittee must identify all wells that included steel centralizers in their construction, and identify at what interval they are present within the cross sections. Provide a discussion of the centralizers and their effect on the resistivity logs. ii. Provide a detailed discussion on the pros and cons of ARCH drilling in regard to geologic logging (potential issues such as losing fines, mixing layers, etc.). Include a discussion that identifies wellbores that were not both geologically and geophysical logged. Discussion should note these wellbores and detail what uncertainties with identification were encountered when determining the lithology. iii. Calibration issues were identified for some of the geophysical logs of wellbores within the site. Provide a discussion that identifies the affected logs and provides the rationale for their lithologic interpretation. Discuss any issues and uncertainties related to these improperly calibrated logs. iv. Page 7-5 of the Phase II RFI states that "Gamma logs were not used on the cross sections due to the presence of a 'hot sand' in the locality consisting of feldspars and heavy minerals that result in high gamma value like in clay…". Provide a more in-depth discussion of this issue along with sample cross sections showing the gamma and the "hot sand" zones in relation to the lithology as determined in the cross sections provided in the Phase II RFI. v. Provide a comprehensive guide to the construction of the cross sections (specify that the information requested in previous comments for the cross section was included). Discuss the reasoning for each lithologic layer displayed on the cross sections and what resources were used to make each decision.	h. Geological and geophysical comment responses: i. Steel centralizers can distort subsurface data in enormous contrast in electromagnetic properties of steel and earth formations. Steel casing is 10^7 to 10^{10} times more conductive than the formations being measured and has a magnetic permeability that is 10 to 200 times greater. The net effect of this wide dynamic range is that the tiny formation signal is masked by the overwhelming casing signal (Oilfield Review, 2001). On the log trace, a centralizer may manifest as sharp, short-duration conductive spike (a drop in measured resistivity). However, after reviewing the well construction diagrams of each well used in the cross sections, none of the wells used in cross sections in the Phase II RFI Report had steel centralizers. All centralizers were identified as PVC centralizers. PVC centralizers are non-conductive (an electrical insulator) and, therefore, do not interfere with electrical current flow during resistivity logging. The use of PVC allows the logging tool to measure the true formation resistivity more accurately without the distortion caused by conductive steel components. ii. ARCH drilling utilizes air as the circulation medium instead of a fluid such as bentonite slurry. The air cools the drill bit and also brings the cuttings to the surface around the outside of the drill stem to keep the borehole clean. It can be used to great depths (approximately 1,000 ft below ground surface or deeper) and the borehole can be advanced relatively fast. It can be helpful when determining the top of the water table as the air begins to blow the water out of the borehole with the cuttings. Pros: • No secondary waste stream: As an air rotary drilling method, ARCH does not generate secondary waste streams like mud rotary drilling. • Efficient surface casing: ARCH allows setting a surface casing without permanent materials like steel and grout, saving time and money. • Instantaneous Cuttings Recovery: Air drilling in alluvial formations provides immediate cuttings recovery visible in the cyclone or containment vessel, making it easy to identify formations. • Controlled well construction: Like hollow stem auger or sonic drilling, the hole is cased, allowing for well construction in a controlled atmosphere and preventing borehole degradation. • Speed: ARCH is a fast method, capable of drilling 300 feet in four to six hours, often faster than sonic drilling. Cons: • On the downside, ARCH drilling can be problematic for contaminant investigations, as when foam needs to be added to recover the cuttings it introduces foreign materials. The collected samples are poor in comparison to other methods, and more expertise is needed to interpret the cuttings. This method may not be suitable for some unconsolidated formations as there is minimal control of borehole caving if unconsolidated sands and silts are drilled. • Performance Limitations – Water Saturated Formations: In aquifers with high water inflow, the air can't effectively remove water and cuttings, hindering progress and requiring a switch to mud drilling. • Unconsolidated soils: Loose sands and gravels can slough into the borehole due to air pressure, causing instability and making sampling difficult. • Hard rock & boulders: ARCH isn't designated for hard rock or large cobbles/boulders, limiting its use in certain geological settings. • Operational Challenges – Sample contamination: Flowing sands and water can infiltrate samples, requiring alternative methods for accurate environmental/geotechnical data. • Equipment & Complexity: The technology involves complex high-tech equipment, increasing operation complexity and maintenance needs. • Cost: While efficient in some scenarios, it can be more expensive than basic air or mud roaty for simpler, shallow projects. • Dispersed Cuttings: Cuttings dispersed by air can be harder to manage in sensitive areas compared to mud rotary. • Potential for fracturing: In very hard formations, the vibrations could potentially create new fractures, affecting testing, though this is less common than with sonic drilling. iii. The response is included in the auxiliary document titled Standalone Response Document for Comments 15a.i, 15h.iii, 15H.iv, 15h.v, and 16.

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			iv. The response is included in the auxiliary document titled Standalone Response Document for Comments 15a.i, 15h.iii, 15H.iv, 15h.v, and 16. v. The response is included in the auxiliary document titled Standalone Response Document for Comments 15a.i, 15h.iii, 15H.iv, 15h.v, and 16.
16	Using the updated cross sections, inclusive of all the changes requested in this letter, the Permittee must expand on the lithologic understanding of the site. The Permittee must provide an in-depth discussion of the lithologic structure of the site as depicted in each cross section. This description must make use of all available lines of evidence to provide a robust and comprehensive description of how each lithologic determination was constructed and what factors (data/literature/site knowledge) were used as a basis for these determinations. This discussion should differentiate between silts and clays identified at the site and on the cross sections.		The response is included in the auxiliary document titled Standalone Response Document for Comments 15a.i, 15h.iii, 15H.iv, 15h.v, and 16. Upon NMED's official response, Section 7.2.1.4 of the Phase II RFI Report will be revised to include the text in the Standalone Response Document.
17	The SZC states on page 5-11 that 11 samples were collected from KAFB-106S7, KAFB-106S8, and KAFB-106247. The lab report also states that all mentioned samples were submitted to the lab for microbial analysis. In the attached lab reports, three samples from KAFB-106S7, two samples from KAFB-106S8, and three samples from KAFB-106247 are listed. The Permittee needs to either correct the text to eight samples, or provide the missing analysis. Additionally, the Permittee discusses an unidentified substance that potentially interfered with the PCR. The Permittee must provide a brief discussion on the interference and if there was ever any identification of the substance causing the interference.		Section 5.2.5 of the "clean" SZC Report (attached) states, that 11 samples were collected from KAFB-106S7, KAFB-106S8, and KAFB-106247 was verified. Three samples were collected from KAFB-106S7, two from KAFB-106S8, and six samples were collected from well KAFB-106247. Table 3-1 of the SZC Report shows the sample depths for each well and the Microbial Insights lab report 053QA, starting on page G-3-59 (PDF Page 60), of Appendix G-3 of the SZC Report provides the analytical results. Microbial Insights lab report 072PJ, Appendix G-3 in the SZC Report, page G-3-1 of G-3-183, PDF page 2 states under the comments "Please note the total bacterial biomass on samples BMS9-181018-477, BM-S5-231018-491, BM-S5-231018-506, BM-S4-051118-494, BM-S2-161118-499, BM-S3-20118-489, and BM-S3-211118-494 was low, and the samples may have polymerase chain reaction (PCR) inhibition." PCR inhibition may be caused by naturally occurring substances such as humic acid that interfere with the reaction. The interfering substance is not identified as part of the analysis. Based on the clarification provided above, no changes are proposed at this time to the Phase II RFI Report or SZC Report.
18	The request letter for deferment of the air-lift enhanced bioremediation pilot test mentioned in the report for KAFB-106S1 never received an official response. The Permittee included a copy of the well construction diagram that had a note scribbled on it that appeared to provide NMED approval from a previous NMED official. The Permittee must provide additional information and material on this matter, such as email correspondence relating to the matter, and provide a discussion detailing what happened regarding the approval process.		All available regulatory and informal email correspondences with NMED regarding the deferment of the air-lift enhanced bioremediation pilot test are included in Appendix A-4 of the SZC Report. The last official regulatory correspondence of this matter was the July 23, 2018, deferment request (NMED AR # KAFB4688, see attached) from the US Air Force, which documents the collaborative decision-making processes and reasoning for the deferment. The reasoning for deferment is still valid to date. No official response has been received from NMED and issues identified in the deferral letter remain applicable to the site. Based on the clarification provided above, no revisions are proposed to Appendix A-4 of the SZC Report.
19	The Permittee stated that an additional discussion of the effects of groundwater rise in relation to dissolved contaminants was added to the last paragraph of Section 5.3 of the SZC Report. The last paragraph of this section does not appear to have been altered in any way. The Permittee must clarify where the additional discussion was added.		The response to NMED comment number 15 on the SZC Report Revision 2, indicates that additional discussion can be found in Section 5.3 of the SZC Report, not that it was added or revised within the section. The response was intended to highlight the following text: "*Finally, submerged LNAPL in response to the rising water is a persistent source to benzene solute contamination by direct partitioning of benzene from LNAPL to groundwater. These LNAPL sources will continue to source solute plumes of all site contaminants of concern—TPH, EDB, toluene, ethylbenzene, and xylenes, until depleted by dissolution into pore water or groundwater, degradation by natural attenuation processes, or by active remediation*." Similar discussion can be found in Section 7.6.3.1 of the Phase II RFI Report. Upon NMED's official response, the response to NMED comment number 15 of the SZC Report in Appendix A-2 can be changed to clarify that no additions were made and quote the text presented above from Section 5.3 of the SZC Report.
20	Hold time flags were required by previous NMED comments to be listed for Appendix J. Although Appendix J-2 includes the identification of these flags, Appendices J-1 and J-3 do not include hold time flags as part of their data qualifiers listed in the footnotes. If this is because no samples exceeded the hold times for the datasets listed within the appendices, this should be stated.		There were no hold time exceedances for Appendix J-1 (groundwater) or Appendix J-3 (soil vapor) in the SZC Report. Based on this clarification, no revisions are proposed to the SZC Report.

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21	In response to NMED comment 27, the Permittee lists examples of field documentation that supports the usage of 55-gallon steel drums for IDW collection and storage along with their locations within Appendix F. Many of these locations are off by a page or two or are in a slightly different location. The Permittee must accurately direct the reader to the material.		Note: This discussion is pertinent to Comment 24 on the SZC Report, not Comment 27. Concur: The following pages from Appendix B-Daily Quality Control Reports (DQCRs) in the Final SZC Report provide the information: Appendix page B-181 of page 438, PDF page 182, Appendix page B-347 of page 438, PDF page 348, Appendix page B-351 of page 438, PDF page 352, Appendix page B-428 of page 438, PDF page 429, and Appendix page B-434 of page 438, PDF page 435 Additionally, Appendix F Site Photographs, page F-3 of F-3, PDF page 4 of the Final SZC Report provides a photograph showing a 55-gallon steel drum. Upon NMED's official response, the Response to NMED Comment 24 within Appendix A-2 will be revised with the corrected references listed above. These corrected page references are included in the "clean" version of the SZC Report, in Appendix A-2.
22	The Permittee was required to include a discussion and evaluation of contaminants present at the site that are not related to the fuel spill at the BFFs. In the RTC's, the Permittee states that these contaminants are discussed in Sections 6.1.2 and 6.2.2.3 of the Phase II RFI. Although Section 6.1.2 contains the required material, there is no Section 6.2.2.3 within the Phase II RFI, nor is there pertinent information contained within Sections 6.2.2 or 6.2.3. The Permittee must clarify if and where more information on non-fuel spill related contaminants present at the site is provided.		The Phase II RFI Report from April 2025 referenced Section 6.1.2 and 6.2.2.3 in the text; however, the correct sections are 6.1.2 for Soil Vapor and 6.2.1.2 for Groundwater. Upon NMED's official response Appendix A-2, NMED comment 28 on the SZC Report will be revised to contain the corrected section callouts listed above.
23	The RTC states that a discussion of benzene concentrations north of Ridgecrest drive was included in Section 6.2.2.2 of the Phase II RFI. The actual location of this information is in Section 6.1.2.2. The Permittee must clarify that there is not missing additional information related to this.		The response to NMED comment number 52, as shown on Page A-2-45, indicated that benzene concentrations, as well as other COPCs for groundwater, are discussed in Section 6.2.1.1. The April 2025 Phase II RFI Report includes groundwater COPCs north of Ridgecrest Drive SE in Section 6.2.1.1. Upon further review, there was no missing information. Based on the clarification provided above, no revisions are planned to the Phase II RFI Report based on this comment.
24	The RTC states that a footnote was added to Table 5-7 specifying which laboratory soil moisture content data set was used, along with the rationale for its use. Although the footnote did specify which data set was used, the footnote did not adequately provide the rationale for each datasets usage. The Permittee must provide a discussion that describes the rationale behind each data choice.		The following footnote is included on Tabe 5-7 within the "clean" version of the SZC Report attached to this clarification response: "The Test America, Inc. data set for total petroleum hydrocarbons was used for moisture content because it represents the most complete data set. The remaining data sets are included for information only." Upon NMED's official response, this revision can also be incorporated into the Phase II RFI.
25	As discussed in the meetings between NMED and KAFB, the provision of a "clean" version of the SZC report, along with an updated response to comments containing accurate Phase II RFI references, would clear up many technical issues that were noted by NMED for the SZC report.		A "clean" version of the SZC report is provided with these clarification responses. Upon NMED's official response, a "clean" version, with these clarification comments and responses, can be incorporated into the Phase II RFI Report.
26	KAFB-106V1-252 and KAFB-106V2-252 had maximum benzene concentrations recorded in Q4 2019 after which concentrations decreased by an order of magnitude. KAFB-106116-250 and KAFB-106117-250 have soil vapor concentrations that were measured in the tens of thousands µg/m3 to barely detected after 2018. Provide a discussion as to why soil vapor concentrations would decrease by orders of magnitude between monitoring events.		The wells KAFB-106V1 and KAFB-106V2 were cored continuously from the ground surface to a total depth, then over-reamed via ARCH to a nominal 10-inch diameter to accommodate nested well installation. During the ARCH drilling, changes in the soil vapor plume shells were seen as the air rotary induced flow but have since rebounded. Oscillations have occurred periodically at wells KAFB-106116-250 and KAFB-106117-250, which do not appear seasonal, and are likely related to diffusion mechanisms in the vadose zone. Upon NMED's official response, this additional information can be added to Section 7.6.2 of the Phase II RFI Report. Due to the changes observed in soil vapor concentrations over time, the Phase II RFI uses the most recent and/or the maximum concentrations observed to define nature and extent of contamination. This will allow the CME to develop a robust remedial design using the most recent maximum concentrations observed.

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27	Provide an expanded discussion on how the term 250 ft clay layer is used within the report to denote a discontinuous layer that is approximately 250 ft deep rather than a layer that is continuous throughout and limited to 250 ft. Describe the observed depth and height variations within this layer and provide examples of these variations.		The April 2025 Phase II RFI Report describes the "250 ft clay" as a low-permeability unit of interbedded clays and silts at approximately 250 ft below ground surface. Section 3.2.3 refers to this 250 ft clay as a mostly continuous clay unit across the BFF consisting of dark, plastic clay to silty-clay and silt with variable organic content. Section 7.2.1.4 references this clay from observations of the cross sections which identify a mostly continuous clay unit across the Site defined as the 250 ft clay (Figures 7-4 through 7-13). Although individual clay deposits lie at differing elevations and exhibit variable thickness across the Site, they are mapped as one zone. Resistivity and lithology show one persistent clay layer at approximately 250 ft below ground surface (bgs). Other clay deposits are present above and below the 250 ft clay but do not show site-wide continuity (Figures 7-4 through 7-13). This unit has influenced the LNAPL lateral migration pathway, as discussed in comment response #1, and Section 7.6.1 in the Phase II RFI Report. The variable thickness of the 250 ft clay is demonstrated by cross sections (Figures 7-4 to 7-13) in the Phase II RFI Report. Cross section A to A (Figure 7-4) shows an approximate 15 to 85 ft thick clay with a gap at KAFB-106244, while B to B′ shows a 15 to 50 ft thick clay with a gap at KAFB-106139. All transects clearly demonstrate the presence of this clay layer across the Site, especially near the source area and LNAPL migration pathway. Upon NMED's official response, this expanded discussion can be incorporated into Section 7.2.1.4 of the Phase II RFI Report.
28	Provide a depiction and a discussion of the vertical component of the LNAPL smear zone.		Attached to this clarification response is Figure 7-16, *Vertical LNAPL Smear Zone*, which depicts the LNAPL smear zone. The vertical extent of the LNAPL smear zone is bounded by groundwater levels: when LNAPL first reached the water table (approximately 1980s) and the low water-level mark prior to the water table rise in 2009. The vertical extent was also confirmed by soil coring activities during the SZC as discussed in the Phase II RFI Report Sections 3.2.1 and 4.3.1. The smear zone cannot exist outside these bounds. Upon NMED official response, the attached Figure 7-16 can be incorporated into the Phase II RFI Report and referenced as Section 7.6.3.
29	Soil vapor monitoring point KAFB-106115 has elevated benzene and EDB concentrations at the 450-ft monitoring interval and is located 1000 ft SE of the source area. Provide a brief discussion on this monitoring point.		There are two sources of soil vapor contamination at the site: 1. Diffusion and dispersion from the fuel itself, or the fuel adsorbed to soils (historic LNAPL migration pathway), which is the main source throughout the site, and 2. Diffusion and dispersion of dissolved phase contaminants from the groundwater contaminant plumes. Soil vapor monitoring well KAFB-106115 is 50 feet south of the southeast corner of the Q4 2023 benzene plume. Elevated concentrations of EDB and benzene in soil vapor at this location are due to its proximity to the dissolved groundwater plume. Upon NMED's official response, Section 7.6.2 of Phase II RFI can be revised to expand upon and include the sources of soil vapor contamination discussed above.
30	Soil vapor and soul analytical data indicate fuel migration as far as KAFB-106142 (supported by analytical data from KAFB106S5). Provide a brief discussion on these data points.		Soil vapor monitoring well KAFB-106142, shown on Phase II RFI Report Figure 3-3, is located at the northern end of the Q4 2023 benzene plume and 200 ft north of KAFB-106S5. Well KAFB-106S5 had an elevated heated headspace reading of 1,957 parts per million by volume (ppmv) at a depth of 491 ft bgs. As shown on Phase II RFI Report Figure 6-64, KAFB-106S5 lies within the approximate LNAPL footprint (i.e., the benzene concentration is greater than the effective solubility of benzene at 1.43 mg/L). Soil vapor analytical data from both SVM locations support the CSM, which concludes diffusion of soil vapor contaminants from the dissolved-phase groundwater plumes. Upon NMED's official response, discussion of these soil vapor data points and how they support the CSM can be added to Section 7.6.2 of the Phase II RFI Report.

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31	Expand/reinforce the discussion of water level rise that notes any stability in water levels observed. Include any data that indicates that the LNAPL footprint within the water table is not expected to expand past the maximum observed boundaries.		Water level rise at the site is discussed in Section 7.2.2.3, which states "*Between 2009 and 2020, groundwater levels at the Site have risen at a rate between 1.5 ft to 4 ft per year, as seen in the hydrographs in Appendix H, because of reduced withdrawals from the unconfined aquifer…In 2020 and 2021, groundwater levels were measured as declining due to increased groundwater pumping in response to low flow from the Rio Grande (Kennedy and Bell, 2023), though the emerging trend from 2020 to 2024 based on the Site's wells, as observed in the hydrographs in Appendix H, has become level with only minor fluctuations in groundwater level from 4,875 ft above mean sea level (amsl) to 4,878 ft amsl*." Section 7.2.2.3 of the Phase II RFI Report discusses the USGS groundwater pumping simulations which modeled the effect of groundwater in five different scenarios. The results of this simulation indicate the future water-table elevation, with model cells at the location of the EDB plume increases approximately 44, 29, and 26 ft over the initial 206 ft water table elevation based on high supply and low demand, medium supply and medium demand, and low supply and high demand pumping scenarios, respectively. The LNAPL footprint has been consistent since 2007. Nearly 20 years of observation show the same LNAPL footprint, as exhibited on Phase I RFI Report Figures 5-1 through 5-4 and Phase II RFI Report Figure 6-64, indicating that the extent will likely not change in the future regardless of water table increase or decrease observed at the site. The effective solubility of benzene shown on Figure 5-1 of the Phase I RFI Report and Figure 6-64 of the Phase II RFI Report represents the approximate LNAPL horizontal extent, which has remained consistent during this time period. Further, this timeframe has experienced the most significant change in regional groundwater elevation that this site is likely to encounter due to the Rio Chama Diversion Project and water conservation practices implemented by the Albuquerque Bernalillo County Water Utility Authority (ABCWUA). With NMED's concurrence, Section 7.2.2.4 can be revised to include this expanded discussion on the observed and anticipated impacts of the fluctuating water table on the LNAPL footprint.
32	Provide a brief discussion on the differences between the datasets obtained from inundated wells and wells screened across the top of the water table. Discussion should describe how each are used, and should make note of any observed trends within each set.		Wells screened across and below the water table provide key monitoring data to delineate the dissolved-phase contaminant plumes. To develop the plume extent, screen interval elevations are used to delineate the three-dimensional plume concentration contours. Wells screened across the water table inform the presence or absence of free-phase LNAPL and provide groundwater chemistry conditions at the water table, which are impacted by vadose zone interactions and the historical LNAPL migration pathway. In general, the site wells screened across the water table within the contaminant plume trend toward higher concentrations. With the rising water table, fuel contaminants adsorbed to soils dissolve into groundwater, increasing the dissolved-phase plume concentrations. Specifically, wells KAFB-106241, KAFB-106014, KAFB-106005, KAFB-106064, KAFB-106008, and KAFB-106076 have shown increasing benzene concentrations as the water table rises across their well screens. Concentration increases have not expanded the lateral extent of the benzene plume, which has remained stagnant due to a relatively flat groundwater gradient and contaminant degradation factors. Upon NMED's official response, Section 4.2.2 of the Phase II RFI Report can be updated with the data quality objectives based on the well screen depth and the observed trends in shallow groundwater wells.

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33	Section 7.2.2.3 states that “Contingency well screens were set approximately 50 ft higher than the wells with screens that intersected the water table at the time of installation.” The Permittee must provide a brief discussion/explanation on how this height was determined.		The design for contingency well screens was developed during the July 13, 2016, Kirtland Air Force Base Fuel Spill Cleanup Hydrogeology Working SubGroup Meeting and documented in the December 2017 Work Plan for Data Gap Monitoring Well Installation. The Work Plan stated that “Each well nest will be comprised of two wells within a single borehole, each screened at a different depth interval, beginning with a 40-ft screen across the current water table elevation in the deeper well. A second screen, extending upwards to shallower depths, will be completed as a “dry” contingency well to function in the future with rising groundwater elevations. The contingency wells will have a 25-ft screen length that extends above the 40-ft screen interval in the deeper well.” As discussed in Section 7.2.2.3, the US Geological Survey (USGS) conducted groundwater pumping simulations to assess the potential effects of a change in groundwater levels from pumping groundwater from the EDB plume. The simulations produced water-table elevation increases of 44, 29, and 26 feet over the 2016 water table elevation using various pumping scenarios. Contingency well screens were placed 50 feet above the original screens, greater than the maximum increase of 44 ft produced by the USGS pumping simulations. Based on these simulations the contingency screens will never be completely submerged and the shallowest portion of the groundwater will continue to be characterized into the future. Upon NMED official response, Section 7.2.2.3 can include the clarification provided above.
34	Elevated heated headspace readings were detected in the vadose zone at KAFB-106V1 and KAFB-106V2. Provide a discussion on these and any other elevated heated headspace readings detected at the site.		Table 6-1 in the Phase II RFI Report provides hydrocarbon concentrations in heated headspace as measured with a PID during the installation of on-Base groundwater monitoring wells and soil vapor monitoring wells. Soil vapor monitoring wells KAFB-106V1 and KAFB-106V2 are located within the source area. Heated headspace readings from KAFB-106V1 were consistently over 1,000 ppmv from 20 ft bgs to a total depth of 285 ft bgs with a maximum reading of 8,563 ppmv at 254 ft bgs. Heated headspace readings at KAFB-106V2 were above 1,000 ppmv from 50 to 260 ft bgs, with measurements below 1,000 ppmv from 270 ft to the total depth of 285 ft bgs; the maximum reading was 3,707 ppmv at 260 ft bgs. Maximum heated headspace readings at KAFB-106V1 and KAFB-106V2 support the CSM and indicate the presence of petroleum hydrocarbons within the 250 ft clay. Heated headspace readings were 4,049 ppmv at 260 ft bgs, just above the clay, representing former LNAPL saturation. Other elevated heated headspace readings detected at the Site are discussed in Section 6.1.1 of the Phase II RFI Report. Figures 7-5-D, 7-6-D, 7-7-D, 7-8-D, and 7-9-D exhibit cross sections with measured hydrocarbon concentrations. No revisions are recommended based on clarification provided above.
35	Significant measurable LNAPL at KAFB-106EX1 and KAFB-106EX2 should be noted in Figure 6-64. A footnote should be added to Figure 6-64 that indicates the status of these wells and the reason for the significant LNAPL measured there. Provide a discussion of LNAPL measurements in these wells through time.		A revised Figure 6-64, attached to these clarification responses, includes wells KAFB-106EX1 and KAFB-106EX2 with a footnote indicating the wells were part of the recirculation system for the EDB *in situ* biodegradation pilot test. During the EDB *in situ* biodegradation pilot test in January 2020, LNAPL in extraction wells KAFB-106EX1 and KAFB-106EX2 was measured at 0.65 ft and 11.2 ft, respectively, after significant groundwater pumping and recirculation. The August 2024 Work Plan for Groundwater Monitoring added wells KAFB-106EX1 and KAFB-106EX2 to the gauging program. LNAPL measurements have ranged from a sheen to 0.02 ft at KAFB-106EX1 and sheen to 0.74 ft at KAFB-106EX2, indicating that the 11.2 ft measurement in January 2020 is attributable to the recirculation system and is not representative of steady state conditions. Upon NMED’s official response, the discussion above can be added to Phase II RFI Report Sections 4.3.3.2, 6.2.2, and 7.6.1 and the revised Figure 6-64, attached, can be incorporated into the report as well.

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36	Provide a more robust discussion on seasonal variation in sampling data. This discussion should include any observed trends. Describe how these variations affect site understanding or dataset interpretation.		Evaluation of seasonal variation in groundwater, soil vapor, and LNAPL data was conducted using the long-term monitoring dataset collected between 2016 and 2023 and summarized in the Phase II RFI Report, including time-series plots and trend analyses presented in Appendices E-1 through E-4 and hydrographs in Appendix H. Overall, seasonal influences on groundwater concentrations and plume configuration are limited and do not materially affect the interpretation of plume extent or fate and transport. Groundwater elevations at the Site exhibit a long-term rising trend driven by regional water management practices rather than short-term seasonal recharge effects. Although minor intra-annual fluctuations are observed, these variations are small relative to the multi-foot increase in groundwater elevation documented since 2009. Seasonal groundwater concentration variability is most apparent in monitoring wells screened across or immediately adjacent to the water table. In these wells, higher dissolved-phase concentrations—particularly benzene—are periodically observed during periods of rising groundwater elevation as groundwater comes into contact with residual LNAPL and contaminated vadose-zone soils within the smear zone. This mechanism is consistent with the CSM and is documented in wells KAFB-106241, KAFB-106014, KAFB-106005, KAFB-106064, KAFB-106008, and KAFB-106076, where increasing concentrations correlate with water-table rise rather than seasonal recharge events. Importantly, these transient increases do not result in lateral plume expansion; plume footprints for benzene and other fuel-related analytes have remained stable from 2016 through 2023, as demonstrated by reference elevation interval figures and plume comparisons presented in the Phase II RFI Report Section 6 and Exhibits E and F. Soil vapor data show greater short-term variability than groundwater data; however, this variability is controlled primarily by physical and environmental factors rather than by seasonal contaminant migration. As described in Section 7.5.2.1 of the Report, soil vapor concentrations are influenced by soil moisture, barometric pressure, temperature gradients, vadose-zone permeability contrasts, and proximity to residual LNAPL. Following retrofitting of soil vapor monitoring points in 2015 to minimize barometric pumping effects, observed temporal fluctuations represent localized concentration oscillations rather than systematic seasonal trends. Appendix D-3 and Appendix E-1 illustrate that while “observed anomalies” occur at specific locations and depths, the overall soil vapor plume geometry for EDB and benzene has remained consistent across multiple monitoring events, including Q2 2016, Q2 2020, Q2 2022, Q4 2023, and Q2 2024, in both plan view and cross section from ground surface to 450 feet below ground surface. From a site interpretation perspective, seasonal variability does not introduce uncertainty into plume delineation or conclusions. Instead, the observed temporal patterns reinforce the conceptual understanding that contaminant behavior at the Site is governed by long-term groundwater elevation changes, residual LNAPL distribution, and vadose-zone transport processes rather than seasonal recharge-driven plume migration. The stability of plume footprints over multiple years and monitoring seasons confirms that seasonal effects do not obscure contaminant trends or compromise the reliability of the dataset that will be used to support the CME. Upon NMED’s official response, this expanded discussion can be added to Section 6.1.2 of the Phase II RFI Report.

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37	An expanded discussion should also be provided for the rationale behind the well selection for multiple analyses provided in Section 6 (Mann-Kendall Trend Analysis, hydrographs, and time series evaluations, etc.). Additionally, the EDB trend graphs should be revised to account for the multiple methodologies used during quarterly sampling.		Overall, well locations were selected based on consistent detections of both EDB and benzene as there must be at least 3 detectable concentrations of contaminants to run the Mann-Kendall Trend Analysis. Groundwater: Monitoring wells selected for contaminant trend analyses lie inside the Q4 2023 benzene and EDB plume footprints. Figure E-2-1 shows the locations of wells selected for trend analysis in relation to the EDB and benzene footprints. Soil Vapor: Soil vapor contaminant trend analysis was conducted for locations with more than five data points (sample results). This excluded newly installed shallow soil vapor monitoring points. Figure E-3-1 displays the locations of the soil vapor monitoring wells used for trend analysis in relation to the Q4 2023 groundwater benzene plume footprint. The EDB trend graphs were revised to account for the multiple methodologies used during quarterly sampling and are included as an attachment to these clarification responses. Upon NMED's official response, the Phase II RFI Report Appendices E-2 and E-4 will be updated to include these revisions. Additionally, this expanded discussion on how well locations were selected can be added to Section 6.2.1 for groundwater discussions and Section 6.1.2 for soil vapor discussions within the Phase II RFI Report.