Appendix E
Response to Comments

Responses to Comments on the Draft Groundwater Record of Decision, Travis Air Force Base, California

EPA Region IX

No.	Comments	Responses
GENERAL COMMENTS – Nadia Hollan Burke, EPA Region IX dated April 4, 2013		
1.	The Draft Groundwater Record of Decision (ROD) does not include all of the items recommended in the EPA guidance document *Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents (the ROD Guidance), dated July 1999.* The following are examples of deficiencies relative to the Recommended Outline and Checklist for a Record of Decision (the ROD Checklist), Chapter 6, Page 6-60, of the ROD Guidance, however additional elements recommended by the ROD Guidance are also included in the Specific Comments: • The last paragraph of Section 1.4, Description of Selected Remedies, discusses principal threat wastes, but does not describe how these wastes are addressed, as per the third item under Part 1, Section D of the ROD Checklist. • Section 2.4, Scope and Role of Operable Unit or Response Action, does not discuss the planned sequence of actions or how it fits into the overall management strategy for Travis AFB (first item under Part 2 and second item under Part 1, Section D of the ROD Checklist). • Section 2.5, Site Characteristics, does not include all of the information needed to describe the complete Conceptual Site Model for each Site. For example, the following elements are missing: a subsection describing fate and transport of COCs, discussion of whether any groundwater modeling was conducted, and estimation of the quantity/volume of contaminants to be addressed by the remedies (second bullet of the fifth item and fifth bullet of the seventh item under Part 2, Section E). • Section 2.7.1, Human Health Risk Assessment (HHRA), indicates that the uncertainties analysis summarizes the basic assumptions used in the HHRA, as well as limitations of data and methodology, but does not provide any of this information in the ROD (fourth bullet of the of the first item under Part 2, Section G). The HHRA also does not include tables which provide each specific Site, the media of interest, COCs, the pathways, cumulative risk for each area.	Although guidance provides a recommended structure for the ROD and a suggested level of detail, guidance also allows for modification of this recommended structure, where appropriate, on a site-specific basis to promote a clear and logical presentation of the rationale for remedy selection. • We revised the last paragraph of Section 1.4 as follows: "Principal threat wastes are defined by CERCLA as hazardous or highly toxic source materials that (1) result in ongoing contamination to surrounding media, (2) generally cannot be reliably contained, or (3) present an unacceptable risk to human health or the environment should exposure occur. For Sites SS015, SS016, SD036, SD037, and DP039, portions of the plumes contain high contaminant concentrations and residual dense nonaqueous phase liquid (DNAPL) is likely present. At Sites SS015, SD036, and SD037, the principal threat wastes and portion of the plume with the highest concentration of contaminants will be addressed by in situ ERD treatment via injection of EVO. At Site SS016, the principal threat wastes and portion of the plume with the highest concentration of contaminants will be addressed by ERD treatment using an in situ bioreactor in combination with a GET system. At Site DP039, the principal threat wastes and portions of the plume with the highest concentrations of contaminants will be addressed by the combination of ERD treatment using an in situ bioreactor, biological treatment using an area of phytoremediation, and further ERD treatment using an EVO PRB. For Site SD034, Stoddard solvent, a light nonaqueous phase liquid (LNAPL), is floating on the groundwater table and containing dissolved COCs that pose an ongoing source of contamination to the underlying groundwater. The Stoddard solvent will be physically removed by passive skimming to address the principal threat. The remaining concentrations of COCs in groundwater at Sites FT004, FT005, and LF006; Subareas LF007B, LF007C, and LF007D; and Sites LF008, ST027B, SS029, SS030, SD031, SD033, SS035, SS041, and SD043 do not constitute principal threat wastes as defined by CERCLA." • Consistent with the response to Specific Comment 32, also regarding the Scope and Role of Operable Unit or Response Action, we added the following text to the end of Section 2.4: "To address the residual contamination in groundwater that remains after approximately a decade of interim remediation, the overall cleanup strategy for Travis AFB groundwater is to transition from the current interim actions to final remedies. This ROD presents the final response actions for groundwater. Changes, if they occur, to the remedies described in this ROD will be documented using a technical memorandum in the Administrative Record, an Explanation of Significant Differences (ESD), or ROD amendment.

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		• Other environmental media at Travis AFB have previously been addressed in separate decision documents. Final remedies for soil, sediment, and surface water contamination at Travis AFB have been previously selected in the final *Soil ROD for the WABOU (*Travis AFB, 2002b) and the final *NEWIOU Soil, Sediment, and Surface Water ROD* (Travis AFB, 2006a)." • Text describing fate and transport of COCs is provided in Sections 2.5.7.1 and 2.5.7.2. In reference to groundwater modeling, we added the following last paragraph to Section 2.5.7.2: "Three-dimensional, finite element computer modeling of contaminant transport was conducted using MicroFEM® software during development of the site-specific interim GET systems designs. After implementation of the IRAs, an empirical approach was taken for evaluating the long-term performance of the interim GET systems and MNA assessments. For over a decade, groundwater performance monitoring data was collected and evaluated under the GSAP in lieu of specific fate and transport modeling." • Data regarding plume dimensions, areas, and volumes are provided in Table 2.5-2. However, we added a new Appendix A – Conceptual Site Models to further describe each site's physical characteristics, distribution of contamination (including plume dimensions for indicator contaminants), and IRA status as well as to provide plan view figures and cross-section figures. New Table 2.12-1 – Basis for Remedy Summary also provides summary descriptions of this information. • Consistent with guidance (see Section 6.3.7), the Summary of Site Risks section of the ROD provides (1) the basis for taking action at the site and (2) a brief summary of the relevant portions of the human health risk assessment. This section focuses on the information that is driving the need for the specific response action and supports the decision to take the remedial action. Although guidance provides an example table format and a suggested level of detail, guidance also allows for modification of this recommended structure, where appropriate, on a site-specific basis. As indicated in the text, the human health risk assessments (HHRAs) were performed prior to implementation of the IRAs, and provided the basis for interim actions. This ROD addresses the residual concentrations of COCs remaining in groundwater at concentrations above cleanup levels after over a decade of interim remediation. Therefore, inclusion of a greater level of detail is considered unnecessary and not relevant to support the basis for taking further action. We revised Table 2.7-1 to summarize the human health risk values from groundwater on a site-by-site basis rather than by operable unit as previously presented.

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SUPPLEMENTAL GENERAL COMMENT 1 – Nadia Hollan Burke, EPA Region IX dated August 29, 2013		
1a	The responses to the first three bullet points address the comments. However, some of the information listed in Part 2, Section E (Site Characteristics) of the Recommended Outline and Checklist for a Record of Decision (the ROD Checklist) from the EPA guidance document Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents (the ROD Guidance), dated July 1999, has not been included in Appendix A, Conceptual Site Models (Appendix A) as discussed in the response to bullet point number 4. Specifically, information is not included which describes the potential routes of contaminant migration related to the groundwater to surface water pathway where groundwater discharges to Union Creek and the West Branch of the Upper Creek. For example, the third bullet point in Section A.2.5 states that groundwater discharges to Union Creek due to typical upward vertical gradients measured at piezometer pair PZ01Sx29/PZ01Dx2 (latter piezometer assumed to be PZ01Dx29). Review of Figure A-8 indicates these piezometers are located within the Site SS029 plume, but further information for this groundwater to surface water pathway is not provided. As another example, Section A.8.3 discusses contaminated groundwater of the West Industrial Operable Unit (WIOU) that discharges to the West Branch of the Union Creek, where concentrations of trichloroethylene (TCE) were detected. Current TCE concentrations in surface water are low, but it is unclear if this potential exposure pathway has been previously considered and evaluated, as it is not discussed in Section 2.7, Summary of Site Risks, of the Draft Final Groundwater Record of Decision, Travis Air Force Base, Fairfield, California (the ROD). Please revise Appendix A to include a statement that the groundwater to surface water pathway was addressed and a discussion is included in the NEWIOU SSSW ROD.	We revised Appendix A to include a "Surface Water" subsection for each site. These new subsections describe the surface water feature(s) present within each site, if any. At those sites with surface water features, including the sites referenced in the comment, we also provided a statement to address the issue of contaminant migration from groundwater to surface water consistent with Section 5.1 of the final Soil, Sediment, and Surface Water (SSSW) ROD (Travis AFB, 2006). This section of the SSSW ROD states that extraction of groundwater (i.e., interim remedial action) has reduced levels of TCE in the creeks to levels that do not pose risks to human health or the environment. Therefore, we added the following typical statement for sites with surface water features: "No physical or administrative action is required for surface water at this site. The surface water at the site does not pose an unacceptable risk to ecological or human receptors (Travis AFB, 2006)." We also added the following new last paragraph to Section 2.7 Summary of Site Risks: "The groundwater to surface water pathway is addressed in Section 5.1 of the final Soil, Sediment, and Surface Water (SSSW) ROD. This section of the SSSW ROD states that extraction of groundwater has reduced levels of TCE in surface water to levels that do not pose risks to human health or the environment. Accordingly, SSSW ROD Alternative 10 – No Action for Surface Water was the selected remedial action at all sites with surface water features (Travis AFB, 2006)."
SUPPLEMENTAL GENERAL COMMENT 1 – Nadia Hollan Burke, EPA Region IX dated October 18, 2013		
1b	The response addresses the comment; however, the Section 2.5.7.2, Downgradient Plumes, of the Revised ROD does not include the text referred to in the third bullet of the response: "Three-dimensional, finite element computer modeling of contaminant transport was conducted using MicroFEM® software during development of the site-specific interim GET systems designs. After implementation of the IRAs, an empirical approach was taken for evaluating the long-term performance of the interim GET systems and MNA assessments. For over a decade, groundwater performance monitoring data was collected and evaluated under the GSAP in lieu of specific fate and transport modeling." Please revise the Section 2.5.7.2 of the Revised ROD to include this text.	We added the following paragraph as the last paragraph of Section 2.5.7.2: "Three-dimensional, finite element computer modeling of contaminant transport was conducted using MicroFEM® software during development of the site-specific interim GET systems designs. After implementation of the IRAs, an empirical approach was taken for evaluating the long-term performance of the interim GET systems and MNA assessments. For over a decade, groundwater performance monitoring data was collected and evaluated under the GSAP in lieu of specific fate and transport modeling."

No.	Comments	Responses
2.	The ROD does not present the selected remedial actions in accordance with the ROD **Guidance**, particularly Chapter 9.4 Documenting Ground-water Remedy Decisions, with sufficient detail and consistency for each groundwater Site. Please revise the ROD to more clearly present the basis for remedy selection and details for the selected remedies for each groundwater Site on a Site-by-Site Basis. It may be useful to add a table that shows a summary of each Site's Conceptual Site Model, such as plume size, width, depth, including the COCs and concentrations, with a matching "decision table" summarizing the remedial action objectives and description of the remedies, including the expected duration of each component of remediation, required ICs/LUCs, etc.	We revised Section 2.12 – Selected Remedies to provide descriptions of the selected remedies by alternative and also to summarize the basis for remedy selection by individual site. We added the following paragraph to the end of Section 2.12.2: "The following subsections describe each of the selected remedies. Also, a site-by-site summary of the remedies is provided in Table 2.12-1 – Basis for Remedy Summary. This table provides a summary of the COCs, concentrations, and plume dimensions; the status of the interim remedy, the selected remedy, RAOs, and the basis for remedy selection at each site." We then reorganized Section 2.12 to include the remedy descriptions entirely under Section 2.12.2 – Descriptions of the Selected Remedies. The former Section 2.12.3 was deleted, and the subsections for Land Use Controls and Performance Monitoring were placed at the end of Section 2.12.2. We added a new Table 2.12-1 – Basis for Remedy Summary. This table provides site-specific listings of the COCs, concentrations of COCs, plume size information (length, width, thickness, area, volume), the interim remedy and interim remedy status, the selected remedy, the RAOs for the selected remedy, a summary description of the selected remedy (including LUCs), and the basis for remedy selection. We also added a new Appendix A – Conceptual Site Models that further describes physical characteristics, distribution of contamination (including plume dimensions for indicator contaminants), IRA status, and provides plan view and cross-section figures of each site. Existing Table 2.5-2 also provides information about the COCs and plume dimensions at each site.
3.	There are a number of items that appear to be inconsistent with, incomplete, or absent based on a comparison of the ROD with the EPA guidance document Sample Federal Facility Land Use Control ROD Checklist with Suggested Language (the LUC Checklist), dated January 2013. These include the LUC Checklist Items 8, 10, 11, 12, 14, 15, and 17. Please revise the ROD to incorporate all applicable items included on the LUC Checklist, and minimize deviations from the language as much as possible. Please refer to Attachment 1, Federal Facility Land Use Control ROD Checklist, prepared March 8, 2013, for Specific Comments.	We reviewed Attachment 1, Federal Facility Land Use Control ROD Checklist (prepared March 8, 2013), and made the specific responses to the EPA comments on LUC Checklist Items #8, 10, 11, 12, 14, 15, and 17. To avoid confusion, we listed the specific LUC checklist item, followed by the EPA comment and Air Force response. Revised text is shown in *italics*. Please note that Section 2.12.2.1 of the draft ROD is now Section 2.12.2.8 as a result of the response to EPA General Comment #2. <u>LUC ROD Checklist #8.</u> Where someone else will or the federal agency plans that someone else will ultimately be implementing, maintaining, reporting on, and enforcing land use controls, the following language should be included: "Although the [federal agency] may later transfer [has transferred] these procedural responsibilities to another party by contract, property transfer agreement, or through other means, the [federal agency] shall retain ultimate responsibility for remedy integrity." EPA Comment: This language is not currently in the ROD. This exact language should be added at the end of page 2.12-4 where Travis discusses transfers of property. It is key that the AF state that it "shall retain ultimate responsibility for remedy integrity." Air Force Response: We revised the first paragraph after the bullets in the "Mechanisms for Achieving LUC Performance Objectives" subsection (originally on page 2.12-4) as follows: "The AF is responsible for implementing, maintaining, monitoring, reporting, and enforcing LUCs. The AF has an obligation to inform, monitor, enforce, and bind, where appropriate, authorized lessees, tenants, contractors, and other authorized occupants of the groundwater sites of LUCs impacting the sites. *Although the AF may later transfer these procedural responsibilities to another party by contract, property transfer agreement, or through other means, the AF shall retain ultimate responsibility for remedy integrity*."

No.	Comments	Responses
		LUC ROD Checklist #10. Commitment by federal agency to address any situation that may interfere with the effectiveness of LUC: "Any activity that is inconsistent with the IC objectives or use restrictions, or any other action that may interfere with the effectiveness of the ICs will be addressed by the [federal agency] as soon as practicable, but in no case will the process be initiated later than___ days [10 days suggested] after the [federal agency] becomes aware of the breach." EPA Comment: This is NOT fully addressed in the ROD. The AF should add the language above, including a 10 or 15 day time period, as EPA and the AF have already agreed upon this language. Currently, the ROD in the fifth paragraph on page 2-12.5 states the "AF shall take prompt measures to correct the violation or deficiency and prevent it recurrence," but does not define this time-frame. Air Force Response: We revised the fifth paragraph on page 2.12-5 within Section 2.12.2.8 as follows: "*Any activity that is inconsistent with the LUC objectives or use restrictions or any other action that may interfere with the effectiveness of the LUCs will be addressed by the AF as soon as practicable, but in no case will the process be initiated later than ten days after the AF becomes aware of the breach. The AF will notify EPA and the state as soon as practicable, but no longer than ten days after discovery of any activity that is inconsistent with the LUC objectives or use restrictions, or any other action that may interfere with the effectiveness of the LUCs. The AF will notify EPA and the state regarding how the AF has addressed or will address the breach within ten days of sending the EPA and state notification of the breach.* For corrective measures taken after the notification, the AF shall notify EPA and the state when the measures are complete." LUC ROD Checklist #11. Commitment by federal agency to notify EPA of and address any situation that may interfere with the effectiveness of LUC: "The [federal agency] will notify EPA and [the state] as soon a practicable but no longer than ten days after discovery of any activity that is inconsistent with the IC objectives or use restrictions, or any other action that may interfere with the effectiveness of the ICs The [federal agency] will notify EPA and [the state] regarding how the [federal agency] has addressed or will address the breach within 10 days of sending EPA and [the state] notification of the breach." **EPA Comment:** Not fully addressed in ROD. Again, the AF should just incorporate the language above which has already been agreed upon. Currently, similar language is found in the fifth paragraph of page 2.12-5, but it says only that "For corrective measures taken after the notification, the AF shall notify EPA and the state when the measures are complete." [not within 10 days as noted above] Air Force Response: The revised text from this checklist item is shown in the AF response to LUC ROD Checklist # 10 above.

No.	Comments	Responses
		LUC ROD Checklist #12. Notification to EPA and the state regarding land use changes: [For closing base]:[We are seeing in federal agency RODs language requiring the property transferee to notify EPA and the state prior to notifying the federal agency about possible land use changes. We have switched that around so that the federal agency reviews the proposal first. This should save EPA some resources.] Prior to seeking approval from the EPA and [the state] the recipient of the property must notify and obtain approval from the [federal agency] of any proposals for a land use change at a site inconsistent with the use restrictions and assumptions described in this ROD Amendment. [For active base]: The [federal agency] shall notify EPA and state ____ days [45 days suggested] in advance of any proposed land use changes that are inconsistent with land use control objectives or the selected remedy. EPA Comment: Not fully addressed in the ROD. Again, the AF should just incorporate the language above which EPA and the AF have already agreed upon. The AF's rewritten sentence is too long and too complex and consequently confusing. Currently, similar concept but different language for the active base is used in third paragraph on page 2-12.5. It states: "The AF shall not modify or terminate LUCs or modify land uses that may impact the effectiveness of the LUCs or take any anticipated action that may disrupt the effectiveness of the LUCs or any action that may alter or negate the need for LUCs without 45 days prior to the change seeking and obtaining approval from EPA and/or the State of any required ROD modification." Air Force Response: We revised the third paragraph on page 2.12-5 within Section 2.12.2.8 as follows: "*The AF shall notify EPA and state 45 days in advance of any proposed land use changes that are inconsistent with land use control objectives or the selected remedy*. The AF shall not modify or terminate LUCs or modify land uses that may impact the effectiveness of the LUCs or take any anticipated action that may disrupt the effectiveness of the LUCs or any action that may alter or negate the need for LUCs without 45 days prior to the change seeking and obtaining approval from EPA and *seeking concurrence from* the State of any required ROD modification." LUC ROD Checklist #14. Concurrence language: The [federal agency] shall not modify or terminate Land Use Controls, implementation actions, or modify land use without approval by EPA and the [state]. The [federal agency] shall seek prior concurrence before any anticipated action that may disrupt the effectiveness of the LUCs or any action that may alter or negate the need for LUCs. EPA Comment: Only partially covered. See comments in item 12; the AF should used the exact language in item 14 above to avoid confusion in addition to the language in item 12. See the language noted in item 12 above. AF appears to combine the language in items 12 and 14 and substitute the term "approval" for concurrence. See third paragraph at page 2.12-5. Air Force Response: Disagree with EPA comment. This LUC language is from the AF LUC checklist and is substantially the same language as in EPA's checklist. DoD has not agreed to use only the suggested LUC language in EPA's Federal Facility Land Use Control ROD checklist. A minor text revision from this checklist item is shown in the AF response to LUC ROD Checklist # 12 above.

No.	Comments	Responses
		LUC ROD Checklist #15. Monitoring and reporting language: Monitoring of the environmental use restrictions and controls will be conducted annually [or more or less frequently as may be determined to be necessary based upon site activities or conditions] by the [federal agency]. The monitoring results will be included in a separate report or as a section of another environmental report, if appropriate, and provided to the USEPA and the [the state]. The annual monitoring reports will be used in preparation of the Five Year Review to evaluate the effectiveness of the remedy. The annual monitoring report, submitted to the regulatory agencies by the [federal agency], will evaluate the status of the ICs and how any IC deficiencies or inconsistent uses have been addressed. The annual evaluation will address whether the use restrictions and controls referenced above were communicated in the deed(s), whether the owners and state and local agencies were notified of the use restrictions and controls affecting the property, and whether use of the property has conformed with such restrictions and controls. EPA Comment: Not fully addressed in the ROD. The AF should use the exact language above. Portions of the two paragraphs above and some of the key concepts are provided in the fourth and sixth paragraphs on page 2.12-5. There is no mention, however, about the type and contents of the report conveyed to EPA with the monitoring results nor any mention of the Five Year Review, etc. It is important that the ROD spell out what should be included in the monitoring reports. Air Force Response: We deleted the fourth paragraph on page 2.12-5 within Section 2.12.2.8 and replaced the sixth paragraph on this page with the following text: "*Monitoring of the environmental use restrictions and controls will be conducted annually by the AF. The monitoring results will be included in a separate report or as a section of another environmental report, if appropriate, and provided to EPA and the State. The annual monitoring reports will be used in preparation of the Five Year Review to evaluate the effectiveness of the remedy. The annual monitoring report, submitted to the regulatory agencies by the AF, will evaluate the status of the LUCs and how any LUC deficiencies or inconsistent uses have been addressed.*" LUC ROD Checklist #17. For active facilities, a description of the internal procedures for implementing the LUCs (e.g., orders, instructions, Base Master Plan) and a commitment by the [federal agency] to notify EPA in advance of any changes to the internal procedures that would affect the LUCs. EPA Comment: Only partially addressed in the ROD. Again, the AF should use the exact language above already agreed upon by EPA and the AF. The description of internal procedures is fully detailed at pages 2.12-3 -2.12-4; however, there is no mention of notifying EPA in advance of any changes to the internal procedures that would affect the LUCs. Air Force Response: Disagree with EPA comment to the extent of notifying the EPA in advance of changes to internal procedures. The AF acknowledges its responsibility for implementing, maintaining, monitoring, reporting and enforcing LUCs and its responsibility to obtain advance approval from the EPA and state of any anticipated action that may disrupt the effectiveness of the LUCs or any action that may alter or negate the need for LUCs. As the AF is solely responsible for maintaining its LUCs, changes to internal mechanisms the AF may need to make to maintain and monitor its LUCs which do not affect the LUCs themselves are not subject to EPA and state approval.

No.	Comments	Responses
Text Revisions to Original Draft Final ROD Based on AF/EPA Negotiations on LUC Checklist Items – April to May 2014 Timeframe		
3a		LUC ROD Checklist #13: We deleted the second sentence of the second paragraph on page 2.12-17 of the original draft final ROD (listed as the AF response to LUC ROD Checklist #12 above), because it is redundant with the new LUC ROD Checklist #14 text, shown below. LUC ROD Checklist #14: We added the following paragraph after the fourth paragraph on page 2.12-17 of the original draft final ROD: "Travis Air Force Base (AFB) shall not modify or terminate LUCs, implementation actions, or land use that are associated with the selected remedy without the approval of EPA and the opportunity for concurrence by the State. Travis AFB shall seek prior concurrence of EPA and the State before any anticipated action that may disrupt the effectiveness of the LUCs or any action that may alter or negate the need for LUCs." LUC ROD Checklist #15: We added the following text at the end of the fourth paragraph on page 2.12-17 of the original draft final ROD: "The annual evaluation will address whether the use restrictions and controls referenced above were communicated in the deed(s), whether the owners and state and local agencies were notified of the use restrictions and controls affecting the property, and whether use of the property has conformed to such restrictions and controls." LUC ROD Checklist #17: On page 2.12-15 of the original draft final ROD, we revised the first sentence after the Mechanisms for Achieving LUC Performance Objectives subheading as follows: "The internal procedures that Travis Air Force Base will use to implement the LUCs include but are not limited to the following:" On page 2.12-16 of the original draft final ROD, we added the following bullet at the end of the Mechanisms for Achieving LUC Performance Objectives bullet list: • **Base Well Permitting System –** All Travis AFB ERP groundwater monitoring, extraction and injection wells are managed under the Groundwater Remediation Implementation Program (GRIP). Approval of the construction of new wells is received during the regulatory review and acceptance of work plans for groundwater remedial actions and technology demonstration projects. Approval of the decommissioning of old wells is received during the regulatory review and acceptance of the annual Groundwater Remediation Implementation Status Report (GRISR). All modifications to the Travis AFB well network receive base approval through the submission and approval of the AF Form 332 and the 60AMW Form 55, as described above." After this bullet, we added the following paragraph: "The Air Force will notify EPA in advance of any changes to internal procedures associated with the selected remedy that might affect the LUCs."

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4.	Stoddard solvent is mentioned as a threat to groundwater throughout the ROD but Stoddard solvent is a generic term and has no maximum contaminant level (MCL) or risk-based clean up level. Please revise the ROD to address the support for taking a remedial action for Stoddard solvent on-site.	We revised multiple references to Stoddard solvent in the ROD to support taking a remedial action. In summary these revisions clarify that Stoddard solvent (aka PD-680) is a petroleum distillate mixture of 15 percent trimethylbenzene and 85 percent n-nonane. As noted in the comment, neither of these constituent compounds have a primary California or federal MCL. However, the Stoddard solvent is a non-aqueous medium also containing dissolved-phase COCs (primarily cis-1,2-DCE) at concentrations above MCLs. The COCs contained in the free product will dissolve into the surrounding groundwater over time. Therefore, action is warranted to remove the free product that acts as an ongoing source of contamination to the groundwater. In response to Specific Comment 46, we revised the first paragraph of Section 2.7.3 – Basis for Action as follows: "Stoddard solvent free product (LNAPL) is floating on the groundwater table at Site SD034 and potentially impacts designated beneficial uses. Stoddard solvent (aka PD-680) is a petroleum distillate mixture of 15 percent trimethylbenzene and 85 percent n-nonane. Neither of these constituent compounds have a primary California or federal MCL. However, the Stoddard solvent is a non-aqueous medium also containing dissolved-phase COCs (primarily cis-1,2-DCE) at concentrations above MCLs. The COCs contained in the free product will dissolve into the surrounding groundwater over time. Therefore, action is warranted to remove the free product that acts as a source of contamination to the groundwater. The free product will be removed to the maximum extent practicable, in a manner that minimizes the spread of contamination into previously uncontaminated zones by using recovery and disposal techniques appropriate to the hydrogeologic conditions at the site." In response to Specific Comment 47, we revised the bullet list of RAOs provided in Section 2.8 as follows: "Remove Stoddard solvent, containing dissolved COCs, floating on the groundwater table at Site SD034 and potentially impacting designated beneficial uses to the maximum extent practicable." In response to Specific Comment 36, we revised Section 2.5.7 – Nature and Extent of Contamination to include similar statements regarding that nature of Stoddard solvent contamination. We also added a new Appendix A - Conceptual Site Models to clarify the nature of contamination related to Stoddard solvent and groundwater and added the following document to Section 4 – References: "CH2M HILL. 1999. *SD034 Interim Groundwater Remedial Design/Remedial Action Work Plan.* Prepared for Travis Air Force Base, California. Final. March."

No.	Comments	Responses
5.	Aldrin, acetone, naphthalene, and chloromethane were listed as COCs [contaminants of concern] and preliminary cleanup goals (PCGs) for these chemicals were included in the Proposed Plan, but are not identified as such in the ROD. It appears there is no information or reference in the ROD to concentrations or risk associated with these COCs. Please revise the ROD to include aldrin, acetone, naphthalene, and chloromethane as COCs, discuss the risk associated with these COCs, and develop cleanup values to address these risks, if necessary.	Consistent with the Proposed Plan, we added aldrin, acetone, naphthalene, and chloromethane as COCs addressed by the ROD. We revised the second paragraph of Section 1.3 on page 1-3 for consistency with the response to Specific Comment 4 and to include aldrin, acetone, naphthalene, and chloromethane in the list of COCs, as follows: "During this period, groundwater contamination has been reduced, but concentrations of COCs remain in groundwater above levels that allow for designated beneficial uses of groundwater (domestic, municipal, agricultural, and industrial supply) as well as unlimited use and unrestricted exposure (concentrations of some VOCs pose a potential indoor air risk based on industrial and hypothetical residential land use exposure scenarios). Routine groundwater monitoring continues to identify chlorinated volatile organic compounds (VOCs) (primarily trichloroethene [TCE]), non-chlorinated VOCs, and organochlorine pesticides in the groundwater at concentrations above the lowest of either the California or federal primary maximum contaminant levels (MCLs) or risk-based cleanup levels based on EPA's Regional Screening Levels (RSLs). The chlorinated VOCs include TCE, 1,1-dichloroethene (DCE), 1,2-dichloroethane (DCA), chloroform, bromodichloromethane, 1,2-dichloropropane, chlorobenzene, cis-1,2-DCE, 1,4-dichlorobenzene (DCB), 1,1,2-trichloroethane (TCA), 1,1,1-TCA, carbon tetrachloride, methylene chloride, chloromethane, tetrachloroethene (PCE), and vinyl chloride. Non-chlorinated VOCs include acetone, benzene, toluene, and naphthalene. Organochlorine pesticides include aldrin, alpha-chlordane, and heptachlor epoxide." We revised Table 2.8-1 - Groundwater Cleanup Levels for Direct Contact to include aldrin, acetone, naphthalene, and chloromethane as COCs and provided their risk-based groundwater cleanup levels. We also added these COCs to Table 2.8-2 - Groundwater Concentrations Requiring Vapor Intrusion Land Use Controls and Mitigation Measures. We also revised the second sentence in the first paragraph of Section 2.14 to delete the listing of aldrin, acetone, naphthalene, and chloromethane as COCs previously identified in the Proposed Plan but not included in the ROD. We also revised the last bullet as follows: "Cleanup levels for aldrin, acetone, naphthalene, and chloromethane were described in the FFS and Proposed Plan as MCLs; they are actually EPA RSLs, since none of these compounds have a California or federal primary MCL."
6.	There are several sections of the ROD that does not include information for SS035. It is understood that SS035 is part of the overall West Industrial Operable Unit (WIOU) plume; however, the other WIOU plume Sites have been listed individually in sections where SS035 is not included. For example, Section 1.4 includes bullet points summarizing the alternative selected for each Site; however, SS035 is not included under any of the seven alternatives. Also, there is no discussion of SS035 in Section 1.5, Statutory Determinations. Some Site-specific tables for SS035 are also missing from the ROD, such as the cost estimate table at the end of Section 2.12. Specific comments have been included below for some of these instances. Please revise the ROD to ensure SS035 is included in all relevant sections of the ROD.	We added Site SS035 under Alternative 2 in Section 1.4, as well as in the discussion provided in Section 1.5 and the other relevant sections of the ROD.

No.	Comments	Responses
SUPPLEMENTAL GENERAL COMMENT 6 – Nadia Hollan Burke, EPA Region IX dated October 18, 2013		
6a	The response addresses the comment; however, the second bullet in Section 1.5, Statutory Determinations, does not include discussion of Site SS035. Please revise the Revised ROD to include Site SS035 in the second bullet of Section 1.5.	We revised the second bullet of Section 1.5 to include Site SS035 as follows: • "Sites FT004 and LF006, Site LF007 – Subareas LF007B and LF007D, and Sites LF008, ST027B, SD031, SD033, SS035, and SD043" We also revised the third tick under the second bullet as follows: "In 2010, the GET systems at Sites FT004, LF008, SD031, SD033, SS035, and SD043 were shut down as part of a contaminant rebound study and concentrations of COCs have not increased (CH2M HILL, 2012b). The concentrations of groundwater COCs at Sites SS035 and SD043 are already below MCLs (CH2M HILL, 2010d and 2012a)."
7.	Several sections of the ROD, such as Sections 1.4 and 2.9, include groundwater monitoring as part of the remedy. While performance and verification monitoring are required to assess remedial alternatives during operation and after completion, respectively, they are not a remedy. Please revise these sections so that groundwater monitoring is not referenced as a remedy but instead characterized as operation and maintenance to document the remedy is performing as intended.	We deleted references to groundwater monitoring in the Section 1.4 – Description of Selected Remedies bullet list. We then added a new paragraph at the end of the bullet list as follows: "For each of the listed remedies, except Alternative 1 – No Further Action, performance groundwater monitoring will be conducted during the period of long-term operation (LTO) to assess if the remedy is performing as intended. The period of LTM monitoring will be conducted until groundwater cleanup levels have been achieved. After the monitoring data indicate that groundwater cleanup levels have been achieved, then a period of long-term monitoring (LTM) will be conducted semiannually for an additional two years to verify that the concentrations of contaminants have been permanently reduced to cleanup levels or below." We also deleted references to groundwater monitoring in the Section 2.9 – Description of Alternatives. We added the following footnote to Table 2.9-1: "For each of the listed remedies, except Alternative 1 – No Further Action, performance groundwater monitoring will be conducted during the period of LTO to assess if the remedy is performing as intended. This monitoring will be conducted until groundwater cleanup levels have been achieved. After monitoring data indicate that groundwater cleanup levels have been achieved, then LTM will be conducted semiannually for an additional two years to verify that the concentrations of contaminants have been permanently reduced to cleanup levels or below."
8.	Several alternatives include possible reactivation of a groundwater extraction and treatment (GET) system that either has been or will be shut down, but the alternatives do not appear to include maintaining the existing GET system and it is unclear if this maintenance is included in the cost estimates. Please revise the ROD to include GET system maintenance for those alternatives that include possible reactivation of GET systems. In addition, please clarify whether these maintenance costs have been included in the cost estimates.	Costs are provided for the remedies that are selected in the ROD and do not include provisional costs for hypothetical future events, such as reactivating the existing GET systems, installing new GET system components, or implementing other possible remedial technologies in the future as contingency replacements for the remedies selected in the ROD.
9.	The ROD did not include tabbed section dividers to indicate the location of the various sections. Please add section dividers to assist the reader in navigating the document.	We added tabbed section dividers.

No.	Comments	Responses
SPECIFIC COMMENTS		
1.	**Section 1.1, Site Name and Location, Page 1-1, and Section 2.1, Site Name, Location, and Description:** EPA has designated the following Operable Unit numbers for the various Record of Decisions (RODs) for Travis Air Force Base (AFB): OU 1 for NEWIOU Groundwater, OU 3 for WABOU Groundwater, and OU 6 for this Final Basewide Groundwater ROD. Please include these numbers in the identification of the Operable Unit/Site information, and indicate that the interim NEWIOU and WABOU groundwater will be combined into one Basewide Groundwater OU and that the OU 6 Groundwater ROD will supersede the interim RODs. Please also add the EPA Site Specific Identification (SSID) number 09M7 in addition to the CERCLIS ID number.	We revised the Operable Unit/Site information in Section 1.1 to include the following: "Groundwater underlying 15 North, East, West Industrial Operable Unit (NEWIOU [EPA designation OU 1]) Environmental Restoration Program [ERP] Sites (designated as FT004, FT005, LF006, LF007, SS015, SS016, ST027B, SS029, SS030, SD031, SD033, SD034, SS035, SD036, and SD037) and four (4) West/Annexes/Basewide Operable Unit (WABOU [EPA designation OU 3]) ERP Sites (designated as LF008, DP039, SS041, and SD043). The interim NEWIOU and WABOU groundwater are combined into a single groundwater OU that EPA has designated for its own purpose as OU 6." We also added a row for "EPA SSID Number: 09M7" in addition to the CERCLIS ID number.
2.	**Section 1.2, Statement of Basis and Purpose, Page 1-1:** Please revise this section to indicate that this Basewide ROD is to consolidate and finalize all of the previous AFB groundwater remedial actions into a final decision document, and that the new ROD will supersede the previous two OUs, NEWIOU and WABOU.	We revised the first paragraph of Section 1.2 as follows: "This decision document presents the selected remedies for groundwater at Travis AFB, Fairfield, California. The selected remedies were chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, and to the extent practicable, the National Contingency Plan (NCP). These decisions are based on the Administrative Record for 19 ERP Sites, which are designated as FT004, FT005, LF006, LF007, LF008, SS015, SS016, ST027B, SS029, SS030, SD031, SD033, SD034, SS035, SD036, SD037, DP039, SS041, and SD043, that were historically organized into two (2) operable units (OUs), the NEWIOU and WABOU, to facilitate the overall cleanup program. Site LF007 is also divided into three (3) subareas (LF007B, LF007C, and LF007D) to address different chemicals of concern (COCs). This ROD consolidates the previous NEWIOU (EPA-designated OU 1) and WABOU (EPA-designated OU 3) groundwater IRODs into a single decision document for groundwater at Travis AFB (EPA-designated OU 6) that supersedes the previous IRODs."
3.	**Section 1.3, Assessment of Sites, Page 1-2**: Please add the term "pollutant" to the first paragraph, second sentence as follows: "The selected remedies are also necessary to protect the public health . . . from actual or threatened releases of POLLUTANTS OR contaminants that may present…"	We revised the second sentence as follows: "The selected remedies are also necessary to protect the public health or welfare or the environment from actual or threatened releases of pollutants or contaminants that may present an imminent and substantial endangerment to public health or welfare."

No.	Comments	Responses
4.	**Section 1.3, Assessment of Sites, Page 1-3:** This section states that the COCs remain in groundwater above levels that allow for unlimited use and unrestricted exposure (UU/UE), however UU/UE is generally meant for all uses (e.g., resident farmer) and this is not a term that is generally applied to a drinking water aquifer. Please clarify that the requirement to restore the aquifer to drinking water levels (MCLs) is driven by the CERCLA requirement to restore groundwater to beneficial reuse (*Summary of Key Existing EPA CERCLA Policies for Groundwater Restoration* June 26, 2009). Additionally, groundwater cleanup levels also need to be protective of other exposure pathways, such as the inhalation pathway due to vapor intrusion from groundwater. Therefore, cleanup to MCLs may not be sufficient if there remains a risk to human health and the environment due to this pathway. LUCs and requirements for vapor intrusion mitigation systems may need to remain in place after achievement of MCLs to ensure protection due to this pathway. Please address this issue in the ROD, and state whether the AF intends to achieve UU/UE for vapor intrusion Sites as well, or will continue to have LUCs in place.	We revised multiple statements throughout the ROD to clarify that groundwater cleanup will be conducted to levels that "…allow for designated beneficial uses of groundwater (domestic, municipal, agricultural, and industrial supply) as well as unlimited use and unrestricted exposure..." For example, we revised the first sentence of the fourth paragraph in Section 1.3 as follows: "During this period, groundwater contamination has been reduced, but concentrations of COCs remain in groundwater above levels that allow for designated beneficial uses of groundwater (domestic, municipal, agricultural, and industrial supply) as well as unlimited use and unrestricted exposure (concentrations of some VOCs pose a potential indoor air risk based on industrial and hypothetical residential land use exposure scenarios)." We also revised the last paragraph of Section 1.5 to state the following: "Because these remedies will result in hazardous substances, pollutants, or contaminants remaining onsite above levels that allow for designated beneficial uses of groundwater (domestic, municipal, agricultural, and industrial supply) as well as unlimited use and unrestricted exposure (concentrations of some VOCs pose a potential indoor air risk based on industrial and hypothetical residential land use exposure scenarios), a statutory review will be conducted within 5 years after initiation of the remedial actions selected in this ROD to ensure that the remedies are protective of human health and the environment." Cleanup levels for restoring designated beneficial uses of groundwater and cleanup levels for the protection of indoor air are addressed in Section 2.8 and provided in Tables 2.8-1 and 2.8-2. As indicated, MCLs are lower than cleanup levels for the protection of indoor air.
5.	**Section 1.3, Assessment of Sites, Pages 1-3 and 1-4:** Section 1.3 discusses off-base current and future use, however it is not clear how the off-base uses are associated with the groundwater contamination at the Site currently and in the future. For example, this section states "in the future, it is anticipated that the Base water will be entirely supplied by production wells located at the Cypress Lakes Golf Course Annex;" however, the Cypress Lakes Golf Course Annex currently supplies only 10 percent of the water used at Travis Air Force Base (AFB), so it is not clear why it is believed that the supply will eventually rise to 100 percent, and when this will occur. Additionally, the text indicates that the water supply is hydraulically separate from the AFB, but does not provide information to support this statement, including how the changes in water supply and pumping rates would not be anticipated to affect the current hydraulic separation in the future, nor clearly indicates whether there are any plans anticipated for off-base water use that would be hydraulically connected to the AFB. Please provide additional context for the off-base current and planned uses as they relate to the Site groundwater contamination and support and explain the statements regarding expected changes in off-base groundwater use.	We clarified the seventh paragraph of Section 1.3 as follows: "Travis AFB does not use groundwater from beneath its geographical footprint and does not plan to do so in the future. Approximately 90 percent of the water currently used at Travis AFB is surface water originating from Lake Berryessa and Lake Oroville. This water is conveyed to a water treatment facility managed by the City of Vallejo, which provides potable water to the Base. Groundwater production wells located at the Travis AFB Cypress Lakes Golf Course Annex intermittently provide the remaining 10 percent of the Base water supply. These production wells draw water from a deep aquifer that is not hydrogeologically connected to the shallow aquifer beneath Travis AFB and are managed by the Travis AFB Base Civil Engineering group. The production wells are located approximately 3 miles north of Travis AFB. Travis AFB is currently evaluating alternate sources of potable water because of relatively high supplier costs (City of Vallejo treatment facility) and the cost of infrastructure improvements needed to address future treatment requirements. In the future, it is possible that the Base water will be entirely supplied by the deep production wells (greater than 1,000 feet bgs) located at the Cypress Lakes Golf Course Annex and that service from the City of Vallejo will be discontinued (Weston, 2011). Because of the 3-mile distance between the main Base and the Annex and the greater than 1,000 ft. depth of the production wells, increased pumping from the Cypress Lakes wells will have no significant hydraulic impact on the on-base contaminated groundwater zone."

No.	Comments	Responses
6.	**Section 1.3, Assessment of Sites, Page 1-4, third and sixth paragraphs:** The discussion of the required land use restrictions appears in two places, and as it is worded, appears to be premature in the Assessment of Sites section. In this section, the focus is on the current status of the Site and what land use restrictions may be in place as a result of the interim or other actions taken by the AF. Please clarify whether the land use restrictions discussed are currently in place and move language associated with the requirements of remedy to appropriate sections of the ROD.	We deleted the third and sixth paragraphs and revised the discussion of land use restrictions in the second paragraph as follows: "Travis AFB currently enforces land use restrictions for groundwater and soil vapor. At each restoration site, Travis AFB currently restricts land use to industrial purposes only, prohibits water supply well construction on-base and consumption of contaminated groundwater, and restricts soil excavation and other subsurface work where a worker might encounter contaminated groundwater or vapors. These restrictions are described in the Base General Plan and managed through administrative requirements. For off-base portions of three (3) solvent plumes, Travis AFB has purchased access and environmental response easements from the landowners that contain legal restrictions preventing the landowners from engaging in water development or soil disturbing activities that could interfere with cleanup activities. Additionally, a Solano County Ordinance requires a permit to construct a well and the permitting process ensures Travis AFB would be notified of applications for wells in the easement areas. No water supply wells would be allowed at Travis AFB without prior approval from the AF and appropriate regulatory agencies. Travis AFB has also instituted a vapor intrusion mitigation policy that restricts new residential/industrial construction at portions of sites unless vapor barriers and passive ventilation systems are installed."
7.	**Section 1.3, Assessment of Sites, Page 1-4, fourth paragraph:** According to the text on page 1-4, "no current risks are posed to industrial workers from exposure to volatiles in indoor air," but the text does not indicate whether there is no current risk because there are no currently occupied buildings above the groundwater plumes or because current soil gas concentrations are below screening levels. Please clarify why there is no current risk posed to industrial workers related to vapor intrusion in indoor air.	We revised the first sentence of the fourth paragraph as follows: "No current risks are posed to industrial workers from exposure to volatiles in indoor air (i.e., VOCs migrating from groundwater underlying the sites into indoor air) because either (1) groundwater VOC concentrations, soil gas VOC concentrations, subslab VOC concentrations, and/or indoor air VOC concentrations are below risk-based screening levels or (2) no occupied building is located within 100 feet of the VOC plume exceeding risk-based groundwater screening levels (CH2M HILL, 2010a; CH2M HILL, 2013a)".
8.	**Section 1.4, Description of Selected Remedies, Page 1-5 through 1-7:** Section 1.4 includes bullet points summarizing the alternative selected for each Site; however, Site SS035 is not included under any of the seven alternatives. Please revise Section 1.4 to include SS035 under the selected alternative description.	We added Site SS035 to the list of sites included in the description of Alternative 2 – MNA.
9.	**Section 1.4, Description of Selected Remedies, Page 1-5:** According to the first bullet point, "cleanup levels for heptachlor epoxide were achieved [at SS041] by the interim action, which consisted of successful long-term operation of a GET system;" however, the text does not indicate whether the GET system has already been shut down and decommissioned or if these tasks will be completed after the ROD is implemented. Please clarify whether the GET system at SS041 has already been shut down and decommissioned or if these tasks will be completed after the ROD is implemented. If the GET system has not yet been decommissioned, then please indicate whether a decommissioning work plan will be provided for Regulatory Agency review.	We revised the first bullet point as follows: "No further action is selected for groundwater underlying Site SS041. No further actions, including no LUC provisions, will occur to remediate or manage COCs in groundwater. Cleanup levels for heptachlor epoxide were achieved by the interim action, which consisted of successful long-term operation of a GET system. The Site SS041 GET system has already been shut down and the single extraction well decommissioned in January 2004 (URS Group, Inc., 2004)." We added the cited document to Section 4 – References as follows: "URS Group, Inc. 2004. *Central Groundwater Treatment Plant Quarterly Reports, Third Quarter 2004*. October."

No.	Comments	Responses
10.	**Section 1.4, Description of Selected Remedies, Page 1-5:** The second bullet point states that "groundwater monitoring will continue to assess the performance of natural attenuation processes under the existing GSAP [Groundwater Sampling and Analysis Program];" however, the existing GSAP is inadequate for assessing monitored natural attenuation (MNA), particularly at Sites that previously had GET systems (i.e., Sites with GET systems may not have been monitored for MNA parameters, such as dissolved oxygen, sulfate, chloride, etc.) Further, the sampling and analysis program should be revised as part of the long-term groundwater monitoring and maintenance program to be developed after the ROD is signed. Please revise the ROD to include the specific performance objectives and monitoring requirements to support development of the operation and maintenance and groundwater monitoring strategy for each Site, and remove references to the GSAP.	In response this Specific Comment and the response to General Comment 7, the statement regarding groundwater monitoring under the GSAP was deleted. Beginning with the 2012 reporting period, groundwater sampling formerly conducted under the GSAP will be conducted under the Groundwater Remediation Implementation Program (GRIP) and the annual GSAP Report will be replaced with an annual Groundwater Remediation Implementation Status Report (GRISR). The GRISR will combine the key features of the current annual GSAP reports and annual Remedial Process Optimization (RPO) Reports. The GRISR will provide a transition from reporting on the status and performance of the current groundwater interim remedial actions (IRAs) to the status and performance of the final remedial actions described in the ROD. We also added the following paragraphs after the bullet list of alternatives and the response to General Comment 7: "After the final remedy for each site is selected in the ROD, the requirements for remedial action implementation will be developed during the Remedial Design (RD) phase of the CERCLA process. The RDs will describe the detailed designs and technical specifications required to implement the selected remedy at each site. The RDs will also describe the performance monitoring requirements for each remedy, including the objectives and rationale of monitoring, the locations and screened intervals of monitoring wells, the frequency of monitoring, the COCs and analytical methods, and the quality assurance/quality control (QA/QC) requirements. The existing network of monitoring wells at each site will be incorporated into the monitoring network to the extent that is necessary and practicable. The RD will also specify the technical requirements for any new monitoring wells that may be necessary to achieve the performance monitoring objectives. Potential new monitoring wells, or other remedy components, will be installed in accordance with work plans approved by the regulatory agencies. Groundwater sample collection will be conducted under the Travis AFB Groundwater Remediation Implementation Program (GRIP) and in accordance with applicable EPA guidance documents, including the *Performance Monitoring of MNA Remedies for VOCs in Groundwater* (EPA, 2004). Existing Travis AFB documents, groundwater data, and assessments of interim remedial action performance will also be used in the development of the sampling requirements documented in the annual Groundwater Remediation Implementation Status Reports (GRISRs). Laboratory analyses of samples will be conducted in accordance with the *RD/RA Quality Assurance Project Plan (RD/RA QAPP)* (CH2M HILL, 2009a). Monitoring results will be provided in annual GRISRs. As remediation of the contaminant plumes progresses under each site remedy, it is expected that the distribution of groundwater contamination will change over time. The monitoring networks will evolve appropriately for those future conditions. As the plumes change in shape and concentration, some monitoring wells may no longer be necessary and/or new wells may be required to adequately monitor the progress of remediation. It is also possible that the frequency of monitoring may increase or decrease under future conditions or that the required list of analytes may increase or decrease. Corrective actions to remedies resulting from deficiencies identified in five-year reviews may also trigger changes to the monitoring schemes. Potential changes to the performance monitoring will be specified in the annual GRISRs and implemented under the GRIP.

No.	Comments	Responses
		After cleanup levels for all COCs have been attained for the entirety of each site plume, then two additional years of semiannual sampling will be conducted to verify that cleanup has been achieved." We also added the following documents to Section 4 – References: EPA. 2004. *Performance Monitoring of MNA Remedies for VOCs in Groundwater*. EPA/600/R-04/027. CH2M HILL, 2009a. *Analytical Quality Assurance Project Plan for Remedial Design/Remedial Action, Long-term Maintenance, and Long-term Operation Programs, Revision 2*. Prepared for Travis Air Force Base, California. Final. July."
11.	**Section 1.4, Description of Selected Remedies, Page 1-5 through 1-7:** Section 1.4 does not discuss the scope and role of the Basewide Groundwater Operable Unit, and is organized by Remedial Alternative instead of by Site. Please revise Section 1.4 to include a discussion of the scope and role of the Basewide Groundwater Operable Unit and how it fits into the overall groundwater management strategy for Travis AFB, and outline the specific components of each Site's selected management strategy.	The "Basewide Groundwater Operable Unit" referenced in the comment was designated by EPA and is not a designation previously used by the Air Force during the administration and management of groundwater contamination at Travis AFB. Further, the Basewide Groundwater Operable Unit is not an operable unit designated in the Federal Facilities Agreement. However, for EPA's ease of reference, the EPA-designated OU 6 is used to address the consolidation of the groundwater contamination within the existing NEWIOU and WABOU. We revised the beginning of Section 1.4 to include the following new paragraphs: "In October 1995, the AF, with concurrence from the EPA, DTSC, and State Water Board, organized the environmental restoration sites at Travis AFB into two (2) OUs, the NEWIOU and the WABOU. The groundwater contamination at the sites within both of these OUs is described below: • **NEWIOU –** groundwater with chlorinated VOCs, primarily TCE, 1,2-DCE, 1,1-DCE, 1,2-DCA, vinyl chloride, TPH-G, TPH-D, and related compounds originating from Sites FT004, FT005, LF006, LF007, SS015, SS016, ST027B, SS029, SS030, SD031, SD033, SD034, SS035, SD036, and SD037. Site LF007 is divided into three subareas (LF007B, LF007C, and LF007D) to address different COCs. • **WABOU –** groundwater with chlorinated VOCs (primarily TCE and related compounds) at Sites DP039 and SD043 and organochlorine pesticides (primarily alpha-chlordane) originating from Sites LF008 and SS041. Ongoing groundwater monitoring continues to detect chlorinated VOCs and organochlorine pesticides in the groundwater at concentrations above the lowest of either the state or federal primary maximum MCLs. TPH-G and TPH-D also continue to be detected in the groundwater (CH2M HILL, 2012a). For more than a decade, Travis AFB has implemented and successfully operated IRAs for groundwater, which were selected in the final *NEWIOU Groundwater IROD* (Travis AFB, 1998a) and the final *WABOU Groundwater IROD* (Travis AFB, 1999). This ROD consolidates the previous NEWIOU and WABOU groundwater IRODs into a single decision document for groundwater at Travis AFB that supersedes the previous IRODs. In this ROD, an EPA-designated "Basewide Groundwater Operable Unit" (EPA-designated OU 6) is used to address the consolidation of groundwater contamination within both the NEWIOU (EPA-designated OU 1) and WABOU (EPA-designated OU 3)." We also added a new Table 1.4-1, organized by site, to supplement the existing bullet list of remedies that is organized by alternative. This new table provides summaries of the key components of each site's selected management strategy.

No.	Comments	Responses
12.	**Section 1.4, Description of Selected Remedies, Page 1-7:** The paragraphs regarding the land use restrictions do not indicate whether these restrictions will be in place until groundwater cleanup goals are in place, or whether some may need to remain. For example, with the vapor intrusion LUCs, it is possible that the groundwater cleanup levels are met, but the threat to vapor intrusion may still exist, requiring maintenance of the LUCs until it can be determined that the cleanup is protective. Please revise this section so that it is clear that LUCs will remain after groundwater cleanup goals are met and it is determined that the goal is protective for the vapor intrusion pathway.	We added the following statement to the end of the second paragraph on Page 1-7: "Travis AFB will enforce LUCs for vapor intrusion until the residual contaminant concentrations in groundwater, as referenced in Table 2.8-2, are protective of the vapor intrusion pathway."
13.	**Section 1.5, Statutory Determinations, Page 1-9:** The last paragraph of Section 1.5 states "a statutory review will be conducted within five years after initiation of remedial actions." Please revise the statement to clarify that five-year reviews must be completed every five years while unacceptable levels of contaminants remain present and clarify the trigger date for the reviews.	We added the following sentence to the paragraph: "The next five-year review will be conducted in 2018."
14.	**Section 2.1.1, NEWIOU ERP Sites, Page 2.1-3:** The first bullet on page 2.1-3 describes SS030 as "undeveloped land near the southern Base boundary," but indicates that "historical practices associated with Building 1125 are believed to have resulted in groundwater contamination with chlorinated VOCs [volatile organic compounds]." The text does not describe where Building 1125 is located relative to SS030 (i.e., this building is assumed to be located outside SS030 because the Site is described as undeveloped). Please revise the text to describe the location of Building 1125 relative to SS030.	We revised the first bullet as follows: "**Site SS030 (MW-269 Area):** Mostly undeveloped land near the southern Base boundary. Historical practices associated with Building 1125, formerly located in the northernmost portion of the site near the South Base Boundary Groundwater Treatment Plant, are believed to have resulted in groundwater contamination with chlorinated VOCs. The original Building 1125 and associated infrastructure were demolished and replaced with a new building. This area currently consists of a concrete slab, a new single antenna tower, and a small shed housing electronic equipment used to support airfield operations. The contaminant plume extends onto off-base privately owned property."

No.	Comments	Responses
15.	**Section 2.2, Site History and Enforcement Activities, Page 2.2-1:** Please include the site history and enforcement activities for the entire CERCLA site, including the soils and surface water Operable Units and associated RODs, and the status of the Potrero Hills Annex Operable Unit, so that soil sources and other actions that are being conducted as part of CERCLA can be discussed in the context of the groundwater Sites subject to the Basewide Groundwater ROD.	We revised Section 2.2 to broaden the discussion to include soil, sediment, and surface water actions in addition to groundwater actions. We added a new "Decision Documents" bullet item that includes the two finalized "RODs for Soil, Sediment, and Surface Water" along with the two "IRODs for Groundwater". We also added a new bullet item to summarize the "Remedial Actions for Soil, Sediment, and Surface Water" along with the "IRAs for Groundwater" bullet item. We added the following new bullet item to discuss the Potrero Hills Annex: • "Potrero Hills Annex Operable Unit: As described in Part I, Table I-1 and Item C of "Assessment of the Site" of the final Soil Record of Decision for the WABOU (Travis AFB, 2002b), the Potrero Hills Annex was transferred from the WABOU to another operable unit to manage its future remedial activities and will be addressed in a subsequent ROD. The Potrero Hills Annex is a 25-acre noncontiguous parcel of property under the jurisdiction of the Travis installation commander that was originally part of a former NIKE missile battery. The WABOU RI detected PCB-1254 adjacent to an electrical transformer pad and metals and explosives in the vicinity of currently active explosive test facilities. • On 22 September 1999, the California Regional Water Quality Control Board issued a Site Cleanup Requirements Order to OEA Aerospace (OEAA) and Travis AFB. The Order tasks both parties with the environmental investigation of the Annex and the adjacent 525-acre OEAA property and the selection and implementation of appropriate remedial actions on both properties. • To allow Travis AFB to comply with this Order, the Air Force and regulatory agencies agreed in the WABOU ROD to pull the Annex out of the WABOU and postpone the application of CERCLA to the Annex while OEAA and its successors, and Travis AFB take action under the Water Board order. Investigative activities under the Water Board Order at the Annex continue, primarily to determine the nature and extent of perchlorate contamination. Additionally, since removal from the WABOU, remedial activities conducted at the Annex under the Water Board Order have resulted in the removal of the PCB and metals-contaminated soil. Once the perchlorate-related investigative activities are complete, and any appropriate remedial action is in place, the agencies will review the results of the Water Board Order and determine whether any other CERCLA-related activities are required." We added the dates of the final Soil ROD for the WABOU and final NEWIOU Soil, Sediment, and Surface Water ROD to the chronology of key events listed in Table 2.2-1.
16.	**Section 2.2, Site History and Enforcement Activities, Page 2.2-1 and Table 2.2-1, Chronology of Key Events, Pages 2.2-14 and 2.2-15:** Section 2.2 does not discuss Interim Remedial Actions (IRA; e.g., GET startup) and treatability studies related to groundwater. These events should also be included on Table 2.2-1, which summarized the chronology of events. Please revise Section 2.2 and Table 2.2-1 to IRAs and treatability studies related to groundwater.	We added site-specific subsections in a new Appendix A – Conceptual Site Models that provide discussion of the IRAs, treatability studies, and treatment demonstrations related to groundwater. We added the dates of treatability studies and demonstrations to Table 2.2-1.

No.	Comments	Responses
17.	**Section 2.2.1, Interim Remedial Actions, Page 2.2-3; Section 2.2.2 Optimization of Interim GET Systems, Page 2.2-4; and Table 2.2-2, Page 2.2-17:** There are some inconsistencies in the information presented in these sections. Please ensure these sections are updated to ensure current information is provided, clarify the studies, assessments, and optimizations that were taken as part of a selected interim remedial action as well as those that were conducted to support selection of the final remedial action, and correct inaccuracies. For example, the issues include, but are not limited to: • The performance optimization status and information provided for Site LF007C in Section 2.2.2.1, Subarea LF007C GET System, is not consistent with the information in Table 2.2-2; the Table appears to be outdated. Additionally, some of the information in the Table is not clear nor well described in the text, such as the sentence in the last column alluding to the Site access and operational constraints. • Site LF008 is included in Section 2.2.1 as a NEWIOU Site in the introductory paragraph and in the GET discussion on page 2.2-3, however is listed as a WABOU Site on Page 2.2-4 and Table 2.2-2. Further, the interim remedial action is described as GET on Page 2.2-4 and on Table 2.2-2, however Section 2.2.5.6 includes a discussion of the Interim MNA Performance as Site LF008 but this Site was not listed as an MNA Assessment Site in the description of the interim remedial actions. • Site ST027B is listed as a NEWIOU Site in the first paragraph of Section 2.2.1, is not listed in either the MNA assessment or GET categories in Section 2.2.1, but appears alone in the last paragraph without transition information or a separate heading, while the Table indicates the Site is a NEWIOU MNA Site.	We revised Table 2.2-2 as follows: Regarding Site LF007C: We revised the last sentence in the "IRA Performance and Status" column to state the following: "Based on the results of the investigation, optimization measures for the GET system will be conducted in 2013." We revised the "IRA Optimization, Technology Demonstration, or Study" column to state the following: "GET system optimization will be conducted during 2013. These optimization measures will include achieving greater groundwater extraction rates and expanded hydraulic capture of the off base plume by installation of a higher capacity extraction well pump and expansion of the solar panel array that provides electrical power to the pump." We also revised the statement in the last column to clarify site access and GET system operational constraints at Site LF007C as follows: "Continuing to comply with seasonal site access and GET system operational constraints imposed by the USFWS. Most of site is located off-base and is within a large vernal pool. In accordance with the USFWS requirements, the site can only be accessed by personnel or vehicles and the GET system operated when the vernal pool is dry (USFWS, 2011; USFWS, 2002)." We revised the text of Section 2.2.2.1 as follows: "The Subarea LF007C plume had migrated off-base, and the IRA GET system had not significantly reduced contaminant concentrations in the site monitoring wells. As described in the *Site LF007C Data Gaps Investigation Results Technical Memorandum* (CH2M HILL, 2012d), optimization measures were conducted in 2011-2012 to improve GET system performance. These measures included additional characterization to improve understanding of off-base contaminant distribution and groundwater flow directions. Additional optimization measures that will be conducted during 2013 include installing a higher-capacity solar-powered groundwater pump, installing larger solar panels, and rerouting the extraction well discharge pipeline. These modifications will improve the hydraulic capture of the plume, improve contaminant mass removal rates, and provide for more efficient beneficial reuse of treated groundwater in the on-base Duck Pond. The Subarea LF007C GET system includes a provision for GSR through the use of solar-powered groundwater extraction pumps. All Site LF007C GET optimization measures will be conducted in accordance with the U.S. Fish and Wildlife Service (USFWS) biological opinions (USFWS, 2011; USFWS, 2002)". Most of the contaminated groundwater at this site is located off-base and lies beneath a large vernal pool. In accordance with the USFWS biological opinions, the site will only be accessed by personnel or vehicles, and the GET system will be operated when the vernal pool is dry." We also added the following USFWS references to Section 4: "U.S. Fish and Wildlife Service (USFWS). 2011. *Reinitiation of the Biological Opinion for the Proposed Travis Air Force Base Groundwater Remedial Action at LF007 Area C Project, Solano County, California*. U.S. Fish and Wildlife Service File Number 81420-2002-F-0001-R001. August. U.S. Fish and Wildlife Service (USFWS). 2002. *Formal Consultation on the Proposed Groundwater Remedial Action at LF007 Area C, Travis Air Force Base, Solano County, California*. U.S. Fish and Wildlife Service File Number 1-1-02-F-0227. July."

No.	Comments	Responses
		Regarding Site LF008: Site LF008 is a WABOU site and is correctly listed on Page 2.2-4 and Table 2.2-2. We deleted the erroneous listings of Site LF008 in the first paragraph of Section 2.2.1 and under the bullet item for "Extraction, Treatment, and Discharge (GET)". The comment is correct in stating that "MNA Assessment" was not selected for Site LF008 in the WABOU Groundwater IROD. The selected IRA at the site was GET. However, Site LF008 is discussed in Section 2.2.5 – MNA Assessments and Studies in the context of a contaminant rebound study. The third bullet item on Page 2.2-8 (Rebound Studies) lists Site LF008 as one of the sites assessed for MNA after the IRA GET system was shut down during the period of interim remediation. To further clarify, we revised the text of Section 2.2.5.6 by adding the following introductory sentence: "A contaminant rebound study was conducted at Site LF008 after the IRA GET system was shut down during the period of interim remediation." Regarding Site ST027B: We deleted the last paragraph referenced in the comment and inserted a new tick under the "Natural Attenuation/Monitoring (i.e., MNA assessment) bullet item: "Addressed the entirety of the plume at Site ST027. The entirety of Site ST027 was formerly managed under the POCO program with MNA as the presumptive remedy for petroleum fuel contamination in groundwater. An IRA was not specified in the NEWIOU Groundwater IROD, because CERCLA contamination was not detected until after the IROD was finalized. In 1999, a portion of the plume found to be contaminated with TCE was designated Site ST027B and is now managed under the ERP. The Site ST027A portion of the plume, with only petroleum-fuel contamination, continues to be managed under the POCO program." We also revised the Site ST027B row in Table 2.2-2. We changed "MNA" in the IRA column to "MNA Assessment". We also revised the descriptive text in the table to state the following: "Site ST027B is located within the NEWIOU but is not included in the NEWIOU Groundwater IROD, and an IRA of MNA Assessment was not formally selected for the site. The entirety of Site ST027 was historically managed under the POCO program at Travis AFB because petroleum hydrocarbons were believed to be the only contaminants present at this site. The presumptive remedy for POCO sites with only petroleum fuel contamination is MNA. However, an investigation conducted in 2007 discovered TCE and several other chlorinated VOCs in groundwater in the southwestern part of the site. Therefore, the site was subsequently subdivided into two portions: Site ST027A (fuels contamination only) and Site ST027B (CERCLA contaminants). Groundwater contamination within Site ST027B has been routinely monitored under the GSAP and natural attenuation processes assessed in the NAAR (CH2M HILL, 2010b) even though these actions were not specified in the NEWIOU Groundwater IROD."
SUPPLEMENTAL SPECIFIC COMMENT 17 – Nadia Hollan Burke, EPA Region IX dated October 18, 2013		
17a	The response addresses the comment; however, in Table 2.2-2, Summary of Interim Remedial Action Performance and Status, regarding Site LF007C, the statement in the last column clarifying site access and groundwater extraction and treatment (GET) system operational constraints does not include the reference "(USFWS, 2011; USFWS, 2002)." Please revise the text in Table 2.2-2 to include the reference.	We added the cited refererence to the last sentence discussing Subarea LF007C site access and operational constraints as follows: "In accordance with the USFWS requirements, the site can only be accessed by personnel or vehicles and the GET system operated when the vernal pool is dry (USFWS, 2011; USFWS, 2002)."

No.	Comments	Responses
18.	**Section 2.2.5, MNA Assessments and Studies, Interim MNA Assessments, Page 2.2-8:** It is not clear from the introduction in Section 2.2.5 and description of Interim MNA Assessments, which does not specify specific Sites, whether the "Interim MNA Performance" discussed for Sites in the subsections are the same as "Interim MNA Assessments". It is also not clear whether MNA was to be assessed or actually selected as part of the interim response actions or were studies done to support the selection of the final remedial actions, or both. Please revise these sections to clarify this issue.	We revised the first paragraph of Section 2.2.5 as follows: "With the exception of Site LF006, for which an IRA of MNA was specified, the IRODs deferred formal selection of MNA as an interim remedy, at all or portions of groundwater sites, until assessments of the viability of natural attenuation processes were conducted. Consequently, MNA assessments and studies have been conducted on an ongoing basis for approximately a decade to evaluate the viability of natural attenuation processes and to support selection of final groundwater remedies. These assessments and studies included the following three (3) basic components or lines of evidence:" We revised the first bullet on page 2.2-8 as follows: • "**Interim MNA Assessments –** As described in the NAAR (CH2M HILL, 2010b) and the FFS, Appendix C – Lines of Evidence for MNA (CH2M HILL, 2011a), long-term groundwater sampling, laboratory analyses, and data evaluation were conducted at all or part of Sites FT004 and LF006; Subareas LF007B and LF007D; and Sites SS015, ST027B, SD031, SD033, SD034, SS035, SD036, SD037, and DP039 over the interim period leading up to this Groundwater ROD to assess the viability of using natural attenuation processes to remediate groundwater. Of these, only Site LF006 was specified for an IRA of MNA. MNA assessment over the interim period was specified for Site FT004; Subareas LF007B and LF007D; and Sites SS015, ST027B, SD031, SD033, SD034, SS035, SD036, SD037, and DP039. No IRA was established for NEWIOU Site ST027B, because the presence of chlorinated VOCs was unknown when the Groundwater IROD for the NEWIOU was finalized; however MNA assessment has been ongoing at this site since 2008. Data supporting the physical attenuation process of volatilization at Travis AFB were also provided by the Site DP039 phytoremediation treatability study (Parsons, 2010)." We revised the last paragraph on page 2.2-8 as follows: "Based on data collected from one or more of the assessments and studies listed above, the performance of natural attenuation over the interim period (referred to below as "Interim MNA Performance") at Sites FT004 and LF006, Subareas LF007B and LF007D, and Sites LF008, SS015, ST027B, SD031, SD033, SD034, SS035, SD036, SD037, DP039, and SD043 is summarized in the following subsections and in Table 2.2-3."
19.	**Section 2.2.5.5, Interim MNA Performance at Subarea LF007D, Page 2.2-10:** According to the second paragraph of Section 2.2.5.5, "after degradation of 1,4-DCB [1,4-dichlorobenzene] is complete, aquifer conditions near well MW261x07 are expected to gradually become aerobic and more conducive to the aerobic biodegradation of benzene;" however, the text does not indicate how this will be monitored or when the degradation of 1,4-DCB is anticipated to be complete (i.e., when will conditions become more conducive to the aerobic biodegradation of benzene). Please revise Section 2.2.5.5 to specify how the aquifer conditions will be monitored for the aerobic biodegradation of benzene and how long it will take for conditions to become more conducive to the aerobic biodegradation of benzene.	We revised paragraph 2 of Section 2.2.5.5 as follows: "The NAAR concluded that the portion of the plume where contaminants exceed MCLs is anaerobic and that anaerobic biodegradation of 1,4-DCB is occurring (CH2M HILL, 2010b). During this biodegradation process, 1,4-DCB degrades to chlorobenzene, and chlorobenzene degrades to benzene. This degradation pathway is likely contributing to the relatively constant concentrations of benzene observed in the site groundwater. In the portion of the plume where contaminant concentrations are below MCLs, geochemical data indicate aerobic conditions. After degradation of 1,4-DCB is complete (estimated to reach 5 µg/L in approximately 19 years), aquifer conditions near well MW261x07 are expected to gradually become aerobic and more conducive to the aerobic biodegradation of benzene. Oxygen reduction potential (ORP) and dissolved oxygen (DO) will continue to be monitored at this well to evaluate whether aquifer conditions are aerobic or anaerobic.

No.	Comments	Responses
		If conditions at well MW216x07 do change from anaerobic to aerobic once 1,4-DCB has been degraded, physical attenuation of benzene will occur. In the absence of biodegradation, benzene concentrations are estimated to reach 1 µg/L in approximately 4 years through physical attenuation processes only (CH2M HILL, 2012f)."
20.	**Section 2.2.5.8, Interim MNA Performance at Site ST027B, Page 2.2-12:** The last sentence of Section 2.2.5.8 states "the absence of a continuing source and a stable TCE [trichloroethene] plume indicate that Site ST027B is suitable for an MNA remedy;" however, there is insufficient evidence present to conclude that MNA is a suitable remedy. Specific aquifer conditions must be present at Site ST027B in order for MNA to be a suitable remedy. For example, multiple lines of evidence should demonstrate that MNA is occurring as listed in Table 2.3 in the Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Ground Water (US EPA 1998) or at a minimum, in Section 2.6 of Performance Monitoring of MNA Remedies for VOCs in Ground Water (US EPA 2004). Please provide multiple lines of evidence to demonstrate that MNA is occurring at Site ST027B or reference where this information can be found.	The detailed lines of evidence for Site ST027B, with references, are presented in Table 2.2-3 as has been done for the other sites included in Section 2.2.5 (FT004, LF006, LF007B, LF007D, LF008, SS015, ST027B, SD031, SD033, SD034, SS035, SD036, SD037, DP039, and SD043). We have added the following text to the first paragraph in Section 2.2.5.8 "In addition, a TCE bulk attenuation rate constant of 1.1 per year has been calculated for the Site ST027B TCE plume. The positive bulk attenuation rate constant indicates that attenuation of TCE is occurring (CH2M HILL, 2011a)."
21.	**Section 2.2.5.9, Interim MNA Performance at Sites SD033, SD034, SS035, SD036, SD037, and SD043, Page 2.2-12:** Section 2.2.5.9 only discusses the plume at Sites SD036 and SD037. It is understood that the plumes at Sites SD033, SD034, SS035, SD036, SD037, and SD043 are commingled to form the WIOU plume, but MNA performance at each individual Site should be discussed. Please expand Section 2.2.5.9 to include discussion for Sites SD033, SD034, SS035, and SD043.	We revised the last paragraph of Section 2.2.5.9 as follows: "Portions of the Site SD036 and SD037 plumes with the highest concentrations of residual contamination are being addressed by the ongoing demonstrations of ERD treatment via EVO injection. Groundwater COCs at Sites SS035 and SD043 are now below MCLs (CH2M HILL, 2010d and 2012a). At Site SD034, the presence of hydrocarbons (Stoddard solvent) may enhance biodegradation; in 2011 the only volatile COCs to exceed MCLs at this site were TCE and vinyl chloride. The maximum detections of both COCs only slightly exceeded the MCLs. TCE was detected at a maximum concentration of 5.8 µg/L (the MCL is 5 µg/L) and vinyl chloride was detected at a maximum concentration of 1.6 µg/L (the MCL is 0.5 µg/L) (CH2M HILL, 2012a). Residual groundwater contamination at Site SS033 is co-mingled with groundwater contamination from Sites SD036 and SD037; monitoring wells from all three of these sites are used to monitor the distal portion of the plume. Stable and decreasing contaminant concentrations in most of the distal plume wells at Sites SS033, SD036, and SD037 over the rebound study period indicate that MNA is a suitable component of the remedy for the plume."
22.	**Section 2.2.6, Site SS016/SS029 RPO Study, Page 2.2-13:** According to Section 2.2.6, "a supplemental study was conducted to evaluate options to optimize or change the current GET IRA;" however, a report providing the findings of this study has not yet been produced, so it is unclear whether the results would impact the effectiveness of the alternatives selected in this ROD for SS016 and SS029. Please discuss whether the findings of the supplemental study could impact the effectiveness of the alternatives selected for SS016 and SS029, and the AF plans to address whether modifications may be needed to the ROD as a result of these studies.	We deleted Section 2.2.6.

No.	Comments	Responses
23.	**Section 2.2.7, Vapor Intrusion Assessment, Page 2.2-13:** Section 2.2.7 does not identify which Sites and/or buildings were evaluated during the 2008-2009 vapor intrusion assessment and the 2012 update. Please revise Section 2.2.7 to specify which Sites and/or buildings were evaluated for vapor intrusion.	We revised Section 2.2.6 Vapor Intrusion Assessment (formerly Section 2.2.7) as follows: "During 2008-2009, Travis AFB conducted a vapor intrusion assessment to evaluate whether inhalation of VOCs migrating from groundwater into indoor air pose a risk to human health based on current and future site conditions at Sites FT004, FT005, LF006, LF007 (inclusive of Subareas LF007B, LF007C, and LF007D), LF008, SS015, SS016, ST027B, SS029, SS030, SD031, ST032 (now a POCO site), SD033, SD034, SS035, SD036, SD037, DP039, and SD043. Investigations, including monitoring of shallow soil gas, soil vapor under building floor subslabs, building indoor air, and outdoor air, were conducted in accordance with the *Vapor Intrusion Assessment Work Plan* (CH2M HILL, 2008b), and the findings of the assessment are provided in the *Vapor Intrusion Assessment Report* (CH2M HILL, 2010a). An update to the 2010 *Vapor Intrusion Assessment Report* was developed in 2012 because toxicity values for several of the chemicals evaluated, including TCE and PCE, had changed. This update included all of the sites previously assessed, and the results are provided in the *Vapor Intrusion Assessment Report Update* (CH2M HILL, 2013a)."
SUPPLEMENTAL SPECIFIC COMMENT 23 – Nadia Hollan Burke, EPA Region IX dated August 29, 2013		
23a	The response addresses the comment; however, please also add the 2013 update to the 2010 Vapor Intrusion Assessment Report because toxicity values for several chemicals previously evaluated, including trichloroethene (TCE) and tetrachloroethene (PCE), have changed since the vapor intrusion assessment was performed in 2008–2010.	We revised the second paragraph of the response as follows: "An update to the *Vapor Intrusion Assessment Report* (CH2M HILL, 2010a) was completed in 2013 because the toxicity values for several of the chemicals evaluated, including TCE and PCE, had changed since the vapor intrusion assessment was performed during 2008-2010.This 2013 update included all of the sites previously assessed. The results are provided in the final *Vapor Intrusion Assessment Update* (CH2M HILL, 2013a)."
24.	**Table 2.2-1, Chronology of Key Events, Pages 2.2-14 and 2.2-15:** Table 2.2-1 shows the Annual Report on the Status of LUCs on Restoration Sites in 2011 was completed in February 2012 and the Final 2011 Annual Remedial Process Optimization (RPO) Report was completed in October 2012; however, these are annual reports and it is not clear why previous years' reports have not been included in the table. Please revise Table 2.2-1 to include previous years' annual reports or explain why these have not been included.	We revised Table 2.2-1 to include the annual Reports on the Status of Land Use Controls for the period 2003 through 2012, and annual O&M/RPO reports from 2006 through 2012, inclusive. We also added these reports to Section 4 - References.
25.	**Figures 2.2-3 through 2.2-10 Historical and Current TCE Groundwater Contamination:** The figures showing the remedial progress over time with historical and current groundwater contamination plumes are extremely useful to illustrate remedial progress over time, and EPA appreciates the significant effort to provide this information. However, they do not include the direction of groundwater flow or groundwater elevation contours, and don't show cross sections to illustrate changes to the vertical extent of contamination over time. Please add this information to the ROD to support the Conceptual Site Model.	We added direction of groundwater flow arrows and groundwater elevation contours to the current groundwater contamination shown on Figures 2.2-3 through 2.2-10. Groundwater elevation contours were also added to Figure 2.2-2 Groundwater Sites and Contaminant Plumes. We added a new Appendix A – Conceptual Site Models, including additional plan view and cross section figures of each site. We also added text references to Appendix A where appropriate, and reordered the appendices.

No.	Comments	Responses
SUPPLEMENTAL SPECIFIC COMMENT 25 – Nadia Hollan Burke, EPA Region IX dated October 18, 2013		
25a	The response addresses the comment; however, the groundwater flow arrow in Figure 2.2-8, Historical and Current TCE Groundwater Contamination Site SS015, does not clearly define the groundwater flow direction in the area of concern. Please revise Figure 2.2-8 to include additional groundwater flow arrows in closer proximity to the plume.	We revised Figure 2.2-8 to include additional groundwater flow arrows in closer proximity to the Site SS015 plume.
26.	**Figure 2.2-3, Historical and Current TCE Groundwater Contamination - Sites FT004/SD031/LF006/LF007:** Please revise Figure 2.2-3 to display the extent of hydraulic capture and the location of extraction wells for the LF007C GET system selected as part of the IRA.	We revised Figure 2.2-3 to include the modeled extent of hydraulic capture. The location of the proposed extraction well for the optimized Site LF007C GET system is shown on conceptual design Figure 2.12-2.
27.	**Figure 2.2-3, Historical and Current TCE Groundwater Contamination – Site SS016:** This figure shows groundwater contamination in the lower-left hand corner of the map, which is assumed to be associated with another Site, ST027B. Please label this area and provide a reference to the other associated Site figures.	We labeled the groundwater contamination in the lower-left corner of Figure 2.2-5 Historical and Current TCE Groundwater Contamination – Site SS016 and Site ST027B as being associated with "Site ST027B" and the label "REFERENCE: Final, Remedial Action Report POCO Sites ST027 and ST028; August, 2008." We also added the cited document to Section 4 – References as follows: "CH2M HILL. 2008. Remedial Action Report POCO Sites ST027 and ST028. Prepared for Travis Air Force Base, California. Final. August"
SUPPLEMENTAL SPECIFIC COMMENT 27 – Nadia Hollan Burke, EPA Region IX dated October 18, 2013		
27a	The response addresses the comment; however, the document cited in the lower-left corner of Figure 2.2-5, Historical and Current TCE Groundwater Contamination Site SS016 and Site ST027B, is not cited in Section 4, References. Please revise Section 4 of the Revised ROD to include the reference, "CH2M HILL. 2008. Remedial Action Report POCO Sites ST027 and ST028. Prepared for Travis Air Force Base, California. Final. August."	We added the following reference to Section 4 – References: "CH2MHILL. 2008b. *Remedial Action Report POCO Sites ST027 and ST028*. Prepared for Travis Air Force Base, California. Final. August." We also changed the date of the document referenced on Figure 2.2-5 to "2008b".
28.	**Figure 2.2-10, Historical and Current TCE Groundwater Contamination - Sites FT005/SS029/SS030 and Figure 2.12-3, Conceptual Design Alternative 3 – GET at Sites FT005, SS029, and SS030:** The extent of the FT005 plume on Figure 2.12-3 does not match the plume extent presented on Figure 2.2-10. Figure 2.2-10 shows a small plume around a single well at the northern portion of the Site and shows a larger extent for the portion of the plume just south of the base boundary relative to Figure 2.12-3. Please resolve the discrepancies regarding the current extent of the groundwater plumes at FT005.	We revised Figure 2.2-10 to present data from the final 2010- 2011 Annual GSAP Report. We also revised Figure 2.12-3 for consistency with the updated Figure 2.2-10, which included revisions to the Site FT005 TCE plume to address any discrepancies.
29.	**Section 2.3, Community Participation, Page 2.3-1:** The first sentence of the second paragraph states "the RIs [remedial investigations], FSs [feasibility studies], and Proposed Plan were made available to the public on October 10, 2012;" however, it is not clear why the RIs and FSs were not made available to the public prior to this date, since they were all finalized at least a year or more before October 10, 2012. Please clarify this statement.	We revised the second paragraph of Section 2.3 as follows: "The Proposed Plan was made available to the public on October 10, 2012. The Proposed Plan and other relevant supporting documents, including RI reports and FSs, can be found in the Administrative Record file and the Information Repository maintained at the Vacaville Cultural Center Library in Vacaville, California. The Administrative Record file and the Information Repository are updated regularly as documents are finalized so that they are available to the public. The notice of the availability for the Proposed Plan was published in the *Fairfield Daily Republic* and *Vacaville Reporter*, newspapers of general circulation on October 12, 2012. Another notice of availability was published in the *Travis AFB Tailwind* on October 12, 2012. Appendix B contains copies of these three (3) notices."

No.	Comments	Responses
30.	**Section 2.3, Community Participation, Page 2.3-1:** The third paragraph of Section 2.3 states that a public meeting was held on October 18, 2012, but does not indicate whether this meeting was advertised in any way other than in the Proposed Plan. The Proposed Plan was mailed to community members on October 11 and 12, 2012, which means the public only received notice of the meeting a few days before it was to take place unless there was additional advertisement. Please indicate whether the public meeting information was advertised in any way other than the Proposed Plan and include this information in Section 2.3.	We revised the second, third, and fourth paragraphs of Section 2.3 as follows: "The Proposed Plan was made available to the public on October 10, 2012. The Proposed Plan and other relevant supporting documents, including RI reports and FSs, can be found in the Administrative Record file and the Information Repository maintained at the Vacaville Cultural Center Library in Vacaville, California. The Administrative Record file and the Information Repository are updated regularly as documents are finalized so that they are available to the public. The notice of the availability for the Proposed Plan was published in the Fairfield Daily Republic and Vacaville Reporter, newspapers of general circulation on October 12, 2012. Another notice of availability was published in the Travis AFB Tailwind on October 12, 2012. Appendix B contains copies of these three (3) notices. In addition, the September 2012 edition of the Travis AFB environmental newsletter (the *Guardian*) summarized the purpose of the Proposed Plan, promoted public involvement in the remedy selection process, and advertised the public comment period and public meeting. The *Guardian* was distributed by electronic mail to approximately 50 government and public addresses on October 11, 2012 and by regular mail to approximately 680 government and public addresses in the Travis AFB environmental community involvement mailing list on October 12, 2012. Finally, the Travis AFB environmental public website advertised the availability of the Proposed Plan, the opportunity to provide public comments on the proposed groundwater remedies, and the invitation to attend the public meeting."
31.	**Section 2.3, Community Participation, Page 2.3-2:** According to page 2.3-2, "a mailing list of all interested parties in the community is maintained by Travis AFB and updated regularly," but the text does not define or explain how often this update occurs nor does the text indicate when the last updated was completed. Please revise Section 2.3 to specify the frequency of updates to the mailing list and indicate the last time the mailing list was updated.	The mailing list of interested parties is updated as needed. For example, we update the list after our quarterly newsletter is published, because that is usually when the base learns that an addressee has moved or passed away. However, we update the list any time upon request. We revised the Mailing List bullet of Section 2.3 as follows: "Travis AFB maintains a mailing list of all interested government representatives and community members for the distribution of its environmental community involvement products. The mailing list is typically updated after the publication of an environmental quarterly newsletter and on-request. The list was last updated in July 2013 and contains approximately 680 postal addresses and 50 electronic addresses."

No.	Comments	Responses
32.	**Section 2.4, Scope and Role of Operable Unit or Response Action, Page 2.4-1:** This section includes several elements in the ROD guidance but does not include statement regarding planned or previous Site actions related to soil or surface water contamination or if the ROD is the final action proposed for the Site. Please revise this section to meet the requirements in Section 6.3.4 Scope and Role of Operable Unit or Response Action of the ROD Guidance.	We added the following text as the new last paragraphs in Section 2.4: "To address the residual contamination in groundwater that remains after approximately a decade of interim remediation, the overall cleanup strategy for Travis AFB groundwater is to transition from the current interim actions to final remedies. This ROD presents the final response actions for groundwater. Changes, if they occur, to the remedies described in this ROD will be documented using a technical memorandum in the Administrative Record, an Explanation of Significant Differences (ESD), or ROD amendment. Other environmental media at Travis AFB have previously been addressed in separate decision documents. Final remedies for soil, sediment, and surface water contamination at Travis AFB have been previously selected in the final *Soil ROD for the WABOU* (Travis AFB, 2002b) and the final *NEWIOU Soil, Sediment, and Surface Water ROD* (Travis AFB, 2006a)."
33.	**Section 2.5, Site Characteristics:** Please add graphical information to support the Conceptual Site Model for each groundwater Site, such as contaminant cross section maps to illustrate the vertical extent of contamination and groundwater flow.	We added a new Appendix A – Conceptual Site Models that includes cross-section maps for each site.
34.	**Section 2.5.3, Hydrogeology, Page 2.5-2:** The ROD does not state the Groundwater (GW) Classification based on the 1986 Classification Guidelines or an EPA-endorsed Comprehensive State Ground Water Protection Program (CSGWPP). Please revise the ROD to discuss the GW classification for the Site aquifer, specifically whether the Federal or State GW classification is more stringent and identify the GW classification which is applicable to the Site.	We revised Section 2.5.3 by adding the following new fourth paragraph: "In accordance with the *Guidelines for Ground-Water Classification under the EPA Ground-Water Protection Strategy*), the groundwater at Travis AFB is appropriately categorized as Class IIB – groundwater that is potentially a source for drinking water (EPA, 1986). However, Travis AFB does not currently use the groundwater and has no plans to do so in the future because of the low groundwater quality and low aquifer yields." No CSGWPP exists in California. We also added the cited document to Section 4 – References: "EPA. 1986. *Guidelines for Ground-Water Classification under the EPA Ground-Water Protection Strategy*. EPA/440/6-86-007. Final Draft. December."
35.	**Section 2.5.3.4, Current and Anticipated Future Groundwater Use, Page 2.5-3:** The text states that DWSET1x30 (privately owned domestic water well located at the southern extent of Site SS030) "is routinely sampled under the Travis AFB GSAP," but does not specify the frequency or when the last sampling event occurred. Please revise the text to specify the frequency of groundwater monitoring at DWSET1x30 and to indicate when the well was last sampled.	We revised the third paragraph of Section 2.5.3.4 as follows: "No on-base wells are currently used for potable water production at Travis AFB, and none are planned for the future. Currently, one (1) privately owned domestic water well (DWSET1x30) is located at the southern extent of Site SS030. No COCs originating from Travis AFB have been detected in this well. It has been sampled semiannually for VOCs under the Travis AFB GSAP (now GRIP). The amount and rate of groundwater production from this privately owned well is unknown, because no flow meter is installed."

No.	Comments	Responses
36.	**Section 2.5.7, Nature and Extent of Contamination, Page 2.5-7:** The second paragraph of Section 2.5.7 states "DNAPLs [dense non-aqueous phase liquids] are probably present in the portions of the Sites SS015, SS016, SD036, SD037, and DP039 plumes with the highest concentrations of residual contamination," but the text does not discuss the basis for this statement. In addition, is it not clear whether the selected alternatives for Sites SS015, SS016, SD036, SD037, and DP039 will address any DNAPL that may be present. Please revise the ROD to describe the data that suggests the presence of DNAPL at Sites SS015, SS016, SD036, SD037, and DP039 and indicate whether the selected alternatives for these Sites will address any DNAPL that may be present, and if so, ensure that source control RAOs are included in the ROD.	We revised the second paragraph of Section 2.5.7 as follows: "Potential secondary sources of groundwater contamination at Travis AFB include DNAPLs and a LNAPL. Relatively high dissolved-phase contaminant concentrations indicate that DNAPLs are probably present in portions of the plumes at Sites SS015, SS016, SD036, SD037, and DP039. Free-phase Stoddard solvent, a LNAPL containing dissolved COCs, is intermittently observed floating on the groundwater table at Site SD034. Additional information on the distribution of groundwater contamination at each site is provided in Appendix A – Conceptual Site Models. It is difficult to verify the presence of DNAPLs through direct observation. Generally, their presence is indirectly estimated. One approach to evaluating the possible presence of DNAPL is based on groundwater concentration data and the "1 percent of solubility" rule-of-thumb (EPA 1992). Under this approach, DNAPL is suspected to be present when the concentration of a chemical in ground water is greater than 1 percent of its pure-phase solubility. For example, if the concentration of TCE is greater than 14,720 micrograms per liter (µg/L) in the dissolved phase (i.e., 1 percent of its pure-phase solubility of 1,472,000 µg/L), then TCE is inferred to be present as a DNAPL (EPA, 2004). Another rule-of-thumb proposes a value of 10 percent of pure-phase solubility (Feenstra and Cherry, 1988). Taking these rules-of-thumb together, the likelihood of DNAPL contributing to the dissolved-phase plume can be summarized as follows: In cases where the maximum concentration of a COC exceeds 10 percent of its solubility, then DNAPL may be assumed to be contributing to the plume. If the maximum concentrations fall between 1 and 10 percent, then DNAPL may possibly be contributing to the plume. But, if the maximum concentration is less than 1 percent of solubility, then DNAP can be assumed not to be present or not contributing to the plume. However, in addition to these rules-of-thumb, it must be considered that DNAPL can remain as a residual liquid within the aquifer's soil pore spaces or it can diffuse into low permeability clays and silts. This diffused DNAPL can then act as a residual source of contamination to groundwater, even though the resultant groundwater concentrations may be lower than typically expected near the source (Cherry, 1996).These aqueous concentrations may be from 1,000 µg/L or greater. At Travis AFB, the aquifer is dominated by fine-grained silts and clays, and DNAPL has likely diffused into the finer-grained soils (Travis AFB, 1998). Therefore, a more appropriate and conservative rule-of-thumb under the conditions that exist at Travis AFB is to assume DNAPLs are contributing to a plume when the concentration of a COC is 1,000 µg/L or greater. During the period of interim remediation, these concentrations existed at Sites SS015, SS016, SD036, SD037, and DP039. Long-term operation of interim GET systems and/or the ERD treatment demonstrations implemented since 2008 using bioreactors and/or EVO injections at these sites have already reduced the highest concentrations of contaminants. Summaries of the historical and current maximum concentrations of COCs at each site are provided in Table 2.5-2 and in Appendix A."

No.	Comments	Responses
		We added the documents cited in the new Section 2.5.7 text to Section 4 – References as follows: "Cherry. 1996. *Conceptual Models for Chlorinated Solvent Plumes and their Relevance to Intrinsic Remediation*. Symposium on Natural Attenuation of Chlorinated Organics in Groundwater. EPA/540/R-96/509, pages 29-30. September." "Feenstra, S. and Cherry, J.A. 1988. *Subsurface Contamination by Dense Non-Aqueous Phase Liquid (DNAPL) Chemicals*. Proceedings of International Groundwater Symposium, International Association of Hydrogeologists, May 1-4, Halifax, Nova Scotia, 62-69." "U.S. Environmental Protection Agency (EPA). 1992. Estimating Potential for Occurrence of DNAPL at Superfund Sites. OSWER Publication 9355.4-07FS. NTIS Order Number PB92963338CDH." "U.S. Environmental Protection Agency (EPA). 2004. *DNAPL Remediation: Selected Projects Approaching Regulatory Closure – Status Update.* EPA 542-R-04-016. December." We also added the following text as the last paragraphs in Section 2.5.7.1 High-concentration Portions of Plumes: "There are a number of challenges associated with the treatment of DNAPLs. These include the effectiveness of partial source removal; uncertainties in the location and quantity of DNAPL in the subsurface; and uncertainties about the long-term effectiveness of DNAPL source reduction. There is an ongoing debate within the remediation community regarding the utility of partial source removal or reduction, where some, but not all, of the DNAPL source is removed or destroyed. Although EPA policy generally supports active attention to sources (EPA 1993, 1999, 2002), the published results of modeling and/or laboratory-scale column studies suggest that almost all DNAPL must be removed before site risks are significantly reduced, at least in the short term (Freeze and McWhorter 1997; Sale and McWhorter 2001) (EPA, 2004). LNAPL is present within the higher concentration portion of Site SD034. Stoddard solvent free product is intermittently detected floating on the groundwater table in one (1) site monitoring well. During the second quarter of 2011, Stoddard solvent was measured in only one (1) well at a thickness of 0.44 foot (CH2M HILL, 2012a). Stoddard solvent (aka PD-680) is a petroleum distillate mixture (i.e., a mineral spirit) of 15 percent trimethylbenzene and 85 percent n-nonane with boiling point characteristics between those of common gasoline and common diesel fuels (CH2M HILL, 1999b). Neither of the main constituent compounds of pure Stoddard solvent have a primary California or federal MCL. However, the Stoddard solvent at Site SD034 is a non-aqueous medium also containing dissolved-phase COCs at concentrations above MCLs. Previous characterization of the floating Stoddard solvent detected a cis-1,2-DCE concentration of 7,200 µg/L (CH2M HILL, 1999). The chlorinated VOCs, such as cis-1,2-DCE; and other chemicals contained in the free product matrix will dissolve into the surrounding groundwater over time and pose a continuing source of dissolved-phase groundwater contamination."

No.	Comments	Responses
		We added the documents cited in the new Section 2.5.7.1 text to Section 4 – References as follows: "CH2M HILL. 1999b. *SD034 Interim Groundwater Remedial Design/Remedial Action Work Plan.* Prepared for Travis Air Force Base, California. Final. March." "EPA. 2002. *Handbook of Groundwater Protection and Cleanup Policies for RCRA Corrective Action.* EPA 530 F-01-021." "EPA. 1999. *Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites*. Office of Solid Waste and Emergency Response (OSWER) Directive 9200.4-17P." "EPA. 1993. *Guidance for Evaluating the Technical Impracticability of Ground Water Restoration.* OSWER Directive 9234.2-25." "Freeze, Allan R., and David B. McWhorter. 1997. *A Framework for Assessing Risk Reduction Due to DNAPL Mass Removal from Low-Permeability Soils*. Ground Water. Vol. 35, No. 1." "Sale, Tom C., and David B. McWhorter. 2001. *Steady State Mass Transfer from Single-Component Dense Nonaqueous Phase Liquids in Uniform Flow Fields.* Water Resources Research. Vol. 37, No. 2. Pages 393-404." We added the following source control RAO to Section 2.8 - Remedial Action Objectives as a qualitative criterion for DNAPL cleanup using a modified version of the examples provided on page 4 of *DNAPL Remediation: Selected Projects Approaching Regulatory Closure – Status Update* (EPA, 2004): "Prevent or minimize further migration of contaminants from the portions of the plumes with the highest concentrations of dissolved groundwater contaminants resulting from the dissolution of residual DNAPLs to hydraulically downgradient portions of plumes. Includes cleanup of groundwater, to the extent practicable, within the highest concentration portions of the Sites SS015, SS016, SD036, SD037, and DP039 contaminant plumes followed by natural attenuation at Sites SS015, SD036, SD037, and DP039; and hydraulic control and removal at Site SS016." In Section 2.9 - Description of Alternatives, new Table 2.9-2 – Summary of Sites and Alternatives includes language to state that Alternative 4, 5, and 6 will address the highest concentrations of contaminants resulting from the dissolution of DNAPLs into the surrounding groundwater at Sites SS015, SS016, SD036, SD037, and DP039. In the summary of rationale column, we added statements for Sites SS015, SD036, SD037, and DP039 as follows: "…ERD treatment via EVO injection to address residual DNAPL principal threat wastes and the higher concentration portion of the plume…" Similarly, for Sites SS016 and DP039, we added the following statement: "…ERD treatment via a bioreactor was successfully demonstrated as being effective for addressing the residual DNAPL principal threat wastes and the highest concentration portions of the [Site SS016][DP039] plume." Similar statements are also provided for Sites SS015, SS016, SD036, SD037, and DP039 in new Table 2.12-1 – Basis of Remedy Summary. New Tables 2.9-2 and 2.12-1 also state that Alternative 7 will address COCs dissolving out of Stoddard solvent (LNAPL) and into the underlying groundwater at Site SD034. In the summary of rationale and basis for remedy selection columns, we added the following statement: "…the processes of passive skimming and natural attenuation have been demonstrated to be effective at removing the residual LNAPL principal threat waste (i.e., free-phase Stoddard solvent containing dissolved COCs) and remediating the dissolved site plume…"

No.	Comments	Responses
37.	**Section 2.5.7.2, Downgradient Plumes, Page 2.5-8:** The second paragraph of Section 2.5.7.2 describes the Travis AFB groundwater plumes as either "downgradient, dissolved-phase plumes" or as a "high concentration plume component associated with a lower concentration downgradient plume component;" however, the plumes at SS029 and SS030 are not included under either category. Please revise the second paragraph of Section 2.5.7.2 to include the plumes at SS029 and SS030.	We revised the second paragraph of Section 2.5.7.2 to include the plumes at Site SS029 and SS030 as follows: "Most of the plumes at Travis AFB are best described as downgradient, dissolved-phase plumes, including those at Sites FT004, FT005, and LF006; Subareas LF007B, LF007C, and LF007D; and Sites LF008, ST027B, SS029, SS030, SD031, SD033, SS035, SS041, and SD043."
38.	**Section 2.5.8, Conceptual Exposure Model, Page 2.5-10 and Figure 2.5-1:** Conceptual Exposure Model is defined in this section but this is not a term typically used in CERCLA documents. Please revise this section to use accepted CERCLA terminology.	We added a new second paragraph to Section 2.5 – Site Characteristics as follows: "More complete descriptions of the individual ERP site characteristics are provided in Appendix A. This appendix includes site-specific descriptions of geology, groundwater characteristics, contaminant types and distribution, the nature and status of the IRA, plan view figures, and cross sections." We changed the term "Conceptual Exposure Model" used in Section 2.5.8 to "Conceptual Site Model".
39.	**Section 2.5.8, Conceptual Exposure Model, Page 2.5-10:** This section does not discuss off-site exposure pathways. Please revise the text to discuss off-site exposure pathways.	We revised the second paragraph 2 of Section 2.5-8 as follows: "An exposure pathway describes the means by which a receptor can be exposed to contaminants in environmental media. These pathways are based on current and potential future land uses and potential beneficial uses of groundwater at Travis AFB. Based on currently available information, the most plausible current or future human receptor populations that may contact COCs in groundwater consist of an on-base or hypothetical off-base industrial worker and a hypothetical on-base or off-base resident. Although future residential land use at Travis AFB is unlikely, a hypothetical future residential land use was also evaluated to support risk management decisions. Contaminated groundwater does not currently underlie any on-base residential areas. Based on current and potential future land uses at Travis AFB and in the area immediately surrounding it, the following potentially complete human exposure pathways and routes were considered for characterizing human health risks from groundwater on- and off-base: • **Future Industrial Worker:** Inhalation of volatiles migrating from groundwater into ambient and indoor air. • **Hypothetical Future Resident:** Ingestion of groundwater, dermal contact with groundwater, inhalation of volatiles during showering or other household activities, and inhalation of volatiles migrating from groundwater into indoor air."
40.	**Table 2.5-2, Summary of Nature and Extent of Contamination, Page 2.5-17:** The comment column of Table 2.5-2 for SS015 states "monitoring data over approximately 10 years of MNA assessment indicated some local plume migration," but does not specify which portions of the plume are migrating. Please revise Table 2.5-2 to specify which part of the SS015 plume has migrated.	We revised the Comments for Site SS015 in Table 2.5-2 as follows: "Monitoring data over approximately 10 years of MNA assessment indicated some local plume migration in the direction of local groundwater flow towards the northeast. Trends indicate increasing TCE concentration at MW625x15 and decreasing TCE concentration at MW216x15 as discussed in the GSAP 2010-2011 Annual Report (CH2M HILL, 2012a). The plume has moved and increased in size primarily along the northeast-southwest axis as seen on Figure 2.2-8."

No.	Comments	Responses
41.	**Table 2.5-2, Summary of Nature and Extent of Contamination, Page 2.5-17 and 2.5-21:** Some of the current maximum concentrations are higher than the historical maximum concentrations at Site SS016/SS029 (e.g., 1,4-DCB, 1,2-dichloroethane [1,2-DCA], tetrachloroethene [PCE]) and at Site SD036 (e.g., vinyl chloride and 1,1-dichloroethene [1,1-DCE]). This is not consistent with plume stability. Please explain why some current maximum concentrations are higher than the historical maximum concentrations at Sites SS016/SS029 and SD036 if the plumes are thought to be stable.	Demonstrations of in situ ERD treatment are ongoing within the highest concentration portions of the Site SS016 and SD036 plumes. The processes of ERD, resulting from an in situ bioreactor installed within the Site SS016 plume and EVO injections within the Site SD036 plume, have caused the concentrations of some COCs to increase to levels greater than historical maximums. These transitional changes are typically encountered during the anaerobic degradation of chlorinated VOC parent compounds through to unregulated end-products. We added the following additional information to the Comments column of Table 2.5-2 for Sites SS016 and SD036: For Site SS016: "In October 2010, a maximum 1,4-DCB concentration of 710 µg/L was detected in MW2020Ax16. This concentration exceeded the historical maximum concentration of 1,4-DCB at the site. Monitoring well MW2020Ax16 was installed in 2010 within the higher concentration portion of the plume to support monitoring of the bioreactor. After initiation of the bioreactor, 1,4-DCB concentrations declined from 710 to 57.6 µg/L by May 2011. In October 2010 the maximum 1,2-DCA (13.4 J µg/L) concentration detected at Site SS016 slightly exceeded the historical maximum detection at source area extraction well TPE-Wx16. However, after initiation of the source area bioreactor, 1,2-DCA concentrations at this well decreased to non-detect by May 2011. In February 2011 the maximum PCE concentration detected at Site SS016 slightly exceeded the historical maximum detection at new source area well MW2112Ax16. After initiation of the source area bioreactor, PCE concentrations at this well declined to 97.8 J µg/L by May 2011 (the historical maximum concentration was 105 µg/L)." For Site SD036: "In June 2011 the maximum vinyl chloride concentration detected at Site SD036 (1,100 µg/L) exceeded the historical maximum detection at ERD performance monitoring well EW594x36. The reason for this increase in vinyl chloride concentrations is that vinyl chloride is a daughter product of ERD. Elevated vinyl chloride concentrations are restricted to the EVO treatment area. The presence of ethane, ethene, and methane within the treatment area indicates ERD is going to completion and vinyl chloride is being destroyed. The maximum 1,1-DCE concentration detected at Site SD036 (12.5 J- µg/L) also exceeded the historical maximum detection at ERD performance monitoring well MW2033Ax36. The reason for this increase in 1,1-DCE concentrations within Site SD036 is that 1,1-DCE is also a daughter product of ERD. Elevated 1,1-DCE concentrations are also restricted to the EVO treatment area. The presence of ethane, ethene, and methane within the treatment area indicates ERD is going to completion and 1,1-DCE is being destroyed."
42.	**Section 2.6.2, Groundwater Beneficial Uses, Page 2.6-2:** This section states that Travis AFB is impacted by several "naturally occurring constituents at concentrations exceeding primary MCLs" but does not provide a reference for this information or summarize information from a background study. Please provide a reference for information and summarize background studies regarding the source of naturally occurring constituents which exceed the MCLs.	We added a reference to the Technical and Economic Feasibility Analysis (TEFA) to the end of the sentence introducing the bullet list, as follows: "Section 3.6 of the TEFA presents the groundwater quality data that is summarized in the following list (CH2M HILL, 2012g)."

No.	Comments	Responses
43.	**Section 2.7.1.2 Summary of Risk Estimates, Page 2.7-2, Section 2.7.2 Vapor Intrusion Assessments, Page 2.7-3, Table 2.7-1 Summary of Human Health Risks for Direct Contact with Groundwater, Pages 2.7-6, and Table 2.7-2, Summary of Human Health Risks for Indoor Air Vapor Intrusion, Page 2.7-7:** These tables provide cleanup levels but do not appear to follow the format listed in Section 6.3.12 of the ROD guidance. The risk tables do not clearly specify the COC, the pathways, and cumulative risk for each Site. Further, the summary of risk information does not include off-base Sites. Please revise the tables to follow the format listed in the ROD guidance and include a summary of the results for all of the risk assessments for each pathway at each Site, both on- and off-base, to support the basis for action.	Consistent with guidance (see Section 6.3.7), the Summary of Site Risks section of the ROD provides (1) the basis for taking action at the site and (2) a brief summary of the relevant portions of the human health risk assessment. This section should focus on the information that is driving the need for the specific response action and support the decision to take the remedial action. Although guidance provides an example table format and a suggested level of detail, guidance also allows for modification of this recommended structure, where appropriate, on a site-specific basis. As indicated in the text, the human health risk assessments (HHRAs) were performed prior to implementation of the IRAs, and provided the basis for interim actions. This ROD addresses the concentrations of COCs remaining in groundwater at concentrations above cleanup levels; therefore, inclusion of a greater level of detail is considered unnecessary and not relevant to support the basis for taking further action. Tables 2.7-1 and -2 are consistent with the general format and content presented in guidance.
44.	**Section 2.7.2.1, Vapor Intrusion Assessment, Page 2.7-3:** According to the text, Sites FT004, SS029, SD033, SD034, SS035, SD036, SD037, and DP039 were assessed during Phase 1 and Sites SS016, SD033, SD034, SS035, SD036, and SD037 were assessed during Phase 3; however, there are additional Sites that may warrant a vapor intrusion assessment due to the location of buildings above or near groundwater plumes. These Sites include: • LF007B – there is a building located east of the plume; • LF007D – there is a building located east of the plume; • LF006/SD031 – there is a grouping of buildings located between the two plumes (southeast of LF006 and northwest of SD031); • SD043 – there is a building located northwest of the plume; • SS015 – there are buildings located above the plume (Building 554), northwest of the plume (Building 549) and northeast of the plume (Building 574). Please discuss the potential for vapor intrusion concerns at LF007B, LF007D, LF006/SD031, SD043, and SS015 and provide any information from previous vapor intrusion assessments. If no vapor intrusion assessments have been completed, please explain why these Sites were not assessed.	Sites LF007B, LF007D, LF006, SD031, SD043, and SS015 were included in the 2008-2009 vapor intrusion assessment. Concentrations of COCs in groundwater at Sites LF007B, LF007D, LF006, SD031, and SD043 are below site specific risk-based groundwater screening levels, and therefore no additional data collection was needed to support the vapor intrusion assessment at these sites. At Site SS015, existing data indicated potential for vapor intrusion risk, which had been addressed by the installation of a passive vent system beneath Building 554. This site was identified in the vapor intrusion assessment as a site with potential vapor intrusion risk that will be addressed by LUCs. We revised the first paragraph of Section 2.7.2.1 as follows: "During 2008-2009, Travis AFB conducted a vapor intrusion assessment to evaluate whether inhalation of VOCs migrating from groundwater into indoor air pose a risk to human health based on current and future site conditions at Sites FT004, FT005, LF007 (inclusive of Subareas LF007B, LF007C, and LF007D), LF008, SS015, SS016, SS029, SS030, SD031, ST032 (now a POCO site), SD033, SD034, SS035, SD036, SD037, DP039, and SD043. This assessment was conducted in accordance with the final *Vapor Intrusion Assessment Work Plan* (CH2M HILL, 2008b). Potential preferential pathways under current (commercial/industrial land use) and potential future (hypothetical residential use) conditions were evaluated. Sufficient historical data were available for Sites FT005, LF007 (inclusive of Subareas LF007B, LF007C, and LF007D), LF008, SS015, SS030, SD031, ST032 (now a POCO site), and SD043 to perform a vapor intrusion assessment. However, the need for additional data to support the assessment was identified at Sites FT004, SS016, SS029, SD033, SD034, SS035, SD036, SD037, and DP039. Therefore additional investigation was performed at these sites in the following three (3) phases:"
45.	**Section 2.7.2.1, Vapor Intrusion Assessment, Page 2.7-3:** The second bullet point of Section 2.7.2.1 describes Phase 2 of the vapor intrusion assessment, but does not identify which Sites and/or buildings were evaluated during this phase. Please revise the second bullet of Section 2.7.2.1 to specify which Sites and/or buildings were evaluated during Phase 2 of the vapor intrusion assessment.	We revised the second bullet item as follows: "Phase 2 consisted of building surveys in areas where the soil gas or groundwater data indicated a potential for vapor intrusion. The building surveys were conducted at Facilities 16 (Site SS016), 18 (Site SS016), 22 (Site SS016), 755 (Site DP039), 811(Site SD034), 836 (Site SD037), 864 (Site SD037), and 919 (Site SD037) to confirm the current building usage; identify potential soil vapor migration routes, confirm building heating, ventilation, and air conditioning operation; and identify potential sources of other chemicals within the buildings."

No.	Comments	Responses
46.	**Section 2.7.3 Basis for Action:** Stoddard solvent at Site SD034 is not clearly associated with a specific COC, and it is not clear if the risk assessment included the COCs associated with Stoddard solvent. Please identify the COCs and risk associated with Stoddard solvent, and modify the basis for action and associated remedial action objectives to be based on the risk associated with Stoddard solvent accordingly.	We revised Section 2.7.3 to clarify the basis for action for Stoddard solvent at Site SD034 as follows: "Stoddard solvent free product (LNAPL) is floating on the groundwater table at Site SD034 and potentially impacts designated beneficial uses. Stoddard solvent (aka PD-680) is a petroleum distillate mixture of 15 percent trimethylbenzene and 85 percent n-nonane. Neither of these constituent compounds have a primary California or federal MCL. However, the Stoddard solvent is a non-aqueous medium also containing dissolved-phase COCs (primarily cis-1,2-DCE) at concentrations above MCLs. The COCs contained in the free product will dissolve into the surrounding groundwater over time. Therefore, action is warranted to remove the free product that acts as a source of contamination to the groundwater. The free product will be removed to the maximum extent practicable, in a manner that minimizes the spread of contamination into previously uncontaminated zones by using recovery and disposal techniques appropriate to the hydrogeologic conditions at the site."
47.	**Section 2.8, Remedial Action Objectives, Page 2.8-1:** The remedial action objectives reference Federal or California MCLs, but not all of the COCs have MCLs. Examples of RAOs are provided in Section 9.4 *Documenting Ground-water Remedy Decisions* of the ROD Guidance. Please revise the RAOs to omit references to Federal and California MCLs so that they apply to all COCs, regardless of whether an MCL has been established.	Consistent with the responses to General Comment 4 and Specific Comments 36, 48, 49, 50, and 52, we revised the Remedial Action Objectives. We omitted references to Federal and California MCLs and incorporated language more consistent with Section 9.4 of the ROD guidance and qualitative criterion for DNAPL cleanup using a modified version of the examples provided on page 4 of *DNAPL Remediation: Selected Projects Approaching Regulatory Closure – Status Update* (EPA, 2004), as follows: "The RAOs for groundwater at Travis AFB provide for protection of human health and include the following: • Restrict human ingestion and direct dermal contact with contaminated groundwater and reduce concentrations of COCs in groundwater to restore designated beneficial uses. Refer to Table 2.8-1. • Restrict inhalation of COCs that are volatilizing from groundwater into indoor air until those levels do not pose unacceptable risk to human health. Refer to Table 2.8-2. • Prevent or minimize further migration of the contaminant plume that is above the cleanup levels referenced in Table 2.8-1. • Prevent or minimize further migration of contaminants from the portions of the plumes with the highest concentrations of dissolved groundwater contaminants resulting from the dissolution of residual DNAPLs to hydraulically downgradient portions of plumes. Includes cleanup of groundwater, to the extent practicable, within the highest concentration portions of the Sites SS015, SS016, SD036, SD037, and DP039 contaminant plumes followed by natural attenuation at Sites SS015, SD036, SD037, and DP039; and hydraulic control and removal at Site SS016. • Remove Stoddard solvent, containing dissolved COCs, floating on the groundwater table at Site SD034 and potentially impacting designated beneficial uses to the maximum extent practicable." This response also incorporates the responses to Specific Comments 36, 48, 49, 50, and 52.

No.	Comments	Responses
48.	**Section 2.8, Remedial Action Objectives, Page 2.8-1, RAOs for Environmental Protection:** RAOs for environmental protection are listed but no ecological risks for groundwater were identified in the ROD. The RAO's listed are associated with protection of human health i.e., by restoring or minimizing impacts to groundwater beneficial uses, and preventing plume migration. Please combine the RAOs and clarify that they are associated with protection of human health.	We combined the first bullet item under the RAOs for Environmental Protection into the first bullet item of the revised list of RAOs. We provided an introduction for the list of RAOs that states: "The RAOs for groundwater at Travis AFB provide for protection of human health and include the following:" We deleted the bullet item and list of "RAOs for Environmental Protection". (see response to Specific Comment 47) We also added the following sentence to Section 2.14: "Also, RAOs for Environmental Protection are listed in the Proposed Plan, but not in Section 2.8, because no ecological risks for groundwater are identified in this ROD."
49.	**Section 2.8, Remedial Action Objectives, Page 2.8-1, RAOs for Environmental Protection:** The third RAO is to "maintain existing water quality," but it is not clear the meaning and purpose of this RAO. If it is intended to address the potential increase in risk due to changes in water quality as a result of the remedial actions put in place, this may be better addressed as a requirement to the monitoring and maintenance program to ensure the risk levels in groundwater do not increase during remedial action. A contingency action may be needed to ensure the RAO for prevent human exposure are met during the implementation of the remedial action if it is expected for risks to increase, such as a result of accumulating degradation by-products.	We deleted the list of "RAOs for Environmental Protection", including the third bullet item referenced in the comment. All RAOs are now grouped for protection of human health. (see response to Specific Comment 47)
50.	**Section 2.8, Remedial Action Objectives, Page 2.8-1, RAOs for Environmental Protection:** EPA understands that the fourth RAO "Take no actions that could expose protected plants or animals to contaminated groundwater" was included to ensure the activities taken during the remedial actions do not expose plants or animals to contaminated groundwater. However, actions associated with protection of human health and the environment during execution of the remedial actions may be better categorized as mitigating measures in the descriptions of the remedy, and should be removed RAOs themselves.	We deleted the list of "RAOs for Environmental Protection", including the fourth bullet item referenced in the comment. All RAOs are now grouped for protection of human health. (see response to Specific Comment 47)
51.	**Section 2.8, Remedial Action Objectives, Page 2.8-1, last paragraph:** MCLs for the COCs should be assessed to confirm the values are protective of human health and if MCL values are not protective, then additional cleanup levels should be selected. In addition, there are several COCs at the Site (aldrin, acetone, naphthalene, and chloromethane) that do not have MCLs, and risk based clean-up goals may need to be developed for these COCs, if they pose a risk for groundwater ingestion, dermal contact, and/or inhalation from volatilization.	It is the position of the Air Force is that federal and California Primary MCLs are protective of human health for direct contact with groundwater and are therefore the primary basis for the groundwater cleanup levels identified in the ROD. Aldrin, acetone, naphthalene, and chloromethane do not have either a federal or California Primary MCL. Therefore, for these four COCs, risk-based cleanup levels based on EPA's Regional Screening Levels (RSLs) have been adopted as the groundwater cleanup levels. Accordingly, we revised Table 2.8-1 to include aldrin, acetone, naphthalene, and chloromethane as COCs and provided their risk-based groundwater cleanup levels. Concentrations of COCs in groundwater that would trigger implementation of LUCs and mitigation measures for protection against vapor intrusion are listed in Table 2.8-2 – Groundwater Concentrations Requiring Vapor Intrusion Land Use Controls and Mitigation Measures (retitled). We included aldrin, acetone, naphthalene, and chloromethane in Table 2.8-2 (retitled in response to Specific Comment 52).

No.	Comments	Responses
52.	**Section 2.8, Remedial Action Objectives, Page 2.8-1, last paragraph, and Table 2.8-2:** "Groundwater cleanup levels for protection of indoor air" are provided but it is not clear whether protection of indoor air is an additional objective associated with restoration of groundwater, or is only intended to be a trigger for managing the vapor intrusion exposure pathway remedies (i.e., LUCs and vapor mitigation systems). Please revise the RAOs and associated tables to clarify this issue.	As shown in the response to Specific Comment 47, the second RAO bullet now read as follows: "Restrict inhalation of COCs that are volatilizing from groundwater into indoor air until those levels do not pose unacceptable risk to human health." This RAO addresses inhalation of COCs that are volatilizing from groundwater into indoor air at Sites FT004, SS015, SS016, SS029, SD033, SS035, SD036, SD037, and DP039 until concentrations of COCs in groundwater posing a potential indoor air risk at these sites are at such levels that VOCs emanating from groundwater to indoor air do not pose unacceptable risk to human health. Groundwater concentrations that will trigger implementation of land use for controls and mitigation measures for vapor intrusion are provided in retitled Table 2.8-2 - Groundwater Concentrations Requiring Vapor Intrusion Land Use Controls and Mitigation Measures. We therefore revised the last paragraph on Page 2.8-1 as follows: "Cleanup levels to achieve the RAOs of restoring designated beneficial uses of groundwater are provided in Table 2.8-1. Groundwater concentrations that will trigger implementation of land use controls and mitigation measures for vapor intrusion are provided in Table 2.8-2." We also changed the title of Table 2.8-2 from "Groundwater Cleanup Levels for Protection of Indoor Air" to "Groundwater Concentrations Requiring Vapor Intrusion Land Use Controls and Mitigation Measures". We also changed the column header in Table 2.8-2 from "Groundwater Cleanup Level for Protection of Indoor Air (µg/L)" to "Groundwater Concentrations Requiring Vapor Intrusion Land Use Controls and Mitigation Measures (µg/L)".
53.	**Table 2.8-1, Groundwater Cleanup Levels for Direct Contact, Page 2.8-2 and Table 2.8-2, Groundwater Cleanup Levels for Protection of Indoor Air, Page 2.8-3:** Table 2.8-1 includes 1,1,2-trichloroethane (1,1,2-TCA), but this COC is not included in Table 2.8-2. Please revise Table 2.8-2 to include a cleanup level for the protection of indoor air for 1,1,2-TCA or explain why no value has been provided.	We added the following footnote to retitled Table 2.8-2 - Groundwater Concentrations Requiring Vapor Intrusion Land Use Controls and Mitigation Measures: "The vapor intrusion assessment developed indoor air cleanup levels for all VOCs detected in groundwater at Travis AFB from August 2006 through June 2007. The groundwater COC 1,1,2-TCA was not detected in groundwater at Travis AFB over this time period, therefore no groundwater cleanup level protective of the indoor air pathway was developed for 1,1,2-TCA (CH2M HILL, 2008c)."
54.	**Table 2.8-1, Groundwater Cleanup Levels for Direct Contact, Page 2.8-2 and Table 2.8-2, Groundwater Cleanup Levels for Protection of Indoor Air, Page 2.8-3:** Table 2.8.1 does not include aldrin, acetone, naphthalene, and chloromethane or their risk-based clean-up levels but these chemicals are COCs. Please revise the tables to include these COCS and their risk based clean-up goals.	We added risk-based cleanup levels for aldrin, acetone, chloromethane, and naphthalene to Table 2.8-1 consistent with EPA Region 9 Regional Screening Levels (RSLs). We also added these COCs to Table 2.8-2 - Groundwater Concentrations Requiring Vapor Intrusion Land Use Controls and Mitigation Measures (retitled in response to Specific Comment 52).
55.	**Section 2.9, Description of Alternatives, Page 2.9-1:** This section provides a description of remedial alternatives but does not summarize the rationale for each alternative on a site-specific basis. It is not clear why a particular set of alternatives were evaluated for each site versus other available alternatives. Please provide summarize the rationale for the selection of each remedial alternative selected on a site-specific basis in this section.	We added new Table 2.9-2 – Summary of Sites and Alternatives, organized by site, to supplement Table 2.9-1 which is organized by alternative. We also added the following introductory text following the first paragraph of Section 2.9: "The overall cleanup strategy described in the ROD for Travis AFB groundwater is to transition from the current interim actions to final remedies. This transition includes incorporating successfully performing components of the existing interim actions, incorporation of successful treatment demonstrations, actions based on the results of supporting studies, and actions following GSR practices. Summaries of the Travis AFB groundwater sites, interim remedies, remedial alternatives, and the rationale for the transition from the interim remedies are provided in Tables 2.9-1 and 2.9-2.

No.	Comments	Responses
		Following placement on the NPL in 1989, Travis AFB followed the requirements of CERCLA to investigate site contamination and design and implement appropriate measures. Travis AFB successfully implemented the 6-step CERCLA process of (1) PA/SI, (2) RI, (3) FS, (4) remedy selection, (5) RD/RA, and (6) performance monitoring and five-year reviews. The process was modified at the remedy selection step to take an interim approach to groundwater remediation, but otherwise all the requirements of CERCLA were followed throughout the process. Travis AFB began evaluations of potential groundwater remedial technologies with the development of two (2) CERCLA FS, including the final *NEWIOU FS* (Radian, 1996) and the final *WABOU FS* (CH2M HILL, 1998). Two basic approaches to Travis AFB groundwater remediation resulted from the evaluations conducted in these feasibility studies: GET and MNA assessments. These interim remediation technologies were then implemented at each site, either singly or in combination, in accordance with the *Groundwater IROD for the NEWIOU* (Travis AFB, 1998) and the *Groundwater IROD for the WABOU* (Travis AFB, 1999). The performance of the interim remedy selected for each site has been monitored and evaluated during the period of interim remediation since the late 1990s. As the period of interim remediation using GET and MNA assessment concluded, Travis AFB developed the FFS to re-evaluate remediation technologies that had matured since the initial feasibility studies were finalized in 1996 and 1998 (CH2M HILL, 2011a). Three basic remedy transitions resulted from the evaluations conducted in the FFS: 1. Continue the interim remedy 2. Modify the interim remedy 3. Discontinue the interim remedy and implement one or more different technologies Included in the CERCLA FS criteria evaluations, the FFS re-evaluations included consideration of the following factors: • Past completion of the CERCLA process at Travis AFB • The long-term performance of GET systems implemented under the IRODs • The results of long-term MNA assessments implemented under the IRODs • Ongoing optimizations of GET systems • The performance of in situ treatment demonstrations began in 2008 (i.e., ERD treatment using bioreactors and EVO injections) • The results of supplemental studies (e.g., phytoremediation treatability study, aerobic chlorinated cometabolism enzymes study) • Preference for GSR practices (e.g., using solar-powered GET systems) Accordingly, the FFS assembled seven (7) remedial alternatives from technology processes that best satisfied the CERCLA FS threshold and primary balancing evaluation criteria and represented the most reasonable value for the money. ”

No.	Comments	Responses
56.	**Section 2.9.2, Common Elements and Distinguishing Features of Each Alternative:** The ROD describes common elements and distinguishing features for each alternative; however, the source of some information provided is uncertain. Please revise the ROD to identify the source of information used to describe common elements and distinguishing features for each alternative. For example, the following issues are noted: • Table 2.9-2 compares and contrasts Alternatives 2 and 3 for FT004, but there is no cost information for Alternative 3 presented for this Site in Appendix E of the Final Basewide Groundwater Focused Feasibility Study (the FFS). • The estimated time to reach remediation goals for LF007D presented in Table 2.9-7 has changed from 100 years in the FFS to 23-49 years; however, it is not clear where the information can be found supporting the reduction in time required to reach remediation goals. Please revise Table 2.9-7 to reference the location of the documentation supporting the decreased time required to reach remediation goals or include the FFS estimate of 100 years. • Table 2.9-9 compares and contrasts Alternatives 2 and 5 for SS015, however, there is no cost information for Alternative 2 at SS015 presented in Appendix E of the FFS. • The estimated time to reach remediation goals for SS029 presented in Table 2.9-12 has changed from 62 years (Table 8-6 of the FFS) to 100-140 years but no documentation is referenced to support this change. In addition, this increase in estimated time to achieve remediation goals should have also resulted in a higher cost estimate; however, the estimated total cost has not changed from the FFS ($339,851). Please provide supporting information for these issues.	Table E-4B of the FFS includes the cost estimate for operation of the GET system at Site FT004. Table E-7G of the FFS includes the cost estimate for MNA at Site SS015. In general, the cost estimates in the FFS are grouped by site under the selected remedy for that site so that they can be directly compared. Information discussing the revised estimated time to reach remediation goals for LF007D is included in the final *2012 GSAP Technical Memorandum* (CH2M HILL, 2012f). We revised the footnote attached to the time to cleanup in Table 2.9-7 as follows: "Revised from the FFS (CH2M HILL, 2011a) value of greater than 100 years after re-evaluation of contaminant-specific degradation rates. The basis for this revision is provided in the final *2012 GSAP Technical Memorandum* (CH2M HILL, 2012f)." We revised the cleanup time for SS029 presented in Table 2.9-12 to 62 years. A cleanup time of 62 years is also consistent with the FFS cost estimate.
57.	**Section 2.10.4, Reduction of Toxicity, Mobility, or Volume through Treatment, Page 2.10-4:** GET with carbon recycling is not necessarily a treatment technology. Treatment requires the destruction of contaminants, but carbon recycling may not result in the destruction of contaminants. For example, one way of recycling carbon is to flush the contaminants out with water, which dilutes and does not destroy contaminants and is not the equivalent of contaminant destruction**.** Please provide information regarding how the carbon will be recycled to support the statement that GET is a treatment technology.	We revised the second paragraph of Section 2.10.4 to include the following information regarding off-site transfer and treatment of contaminated carbon and the Off-Site Rule: "Alternative 3 – GET and Alternative 4 – Bioreactor and GET involve the off-base transfer and treatment/recycling of activated carbon that is laden with contaminants adsorbed from extracted groundwater. For Site FT005, Subarea LF007C, and Sites SS029 and SS030, Alternative 3 – GET uses onsite LGAC treatment of groundwater extracted from plumes with low-level threat wastes to provide permanent reductions in the toxicity and volume of contaminants. Spent carbon containing adsorbed contaminants is then regenerated by an EPA-approved off-base vendor."
58.	**Section 2.10.4, Reduction of Toxicity, Mobility, or Volume Through Treatment, Page 2.10-4:** According to Section 2.10.4, Alternatives 2 and 7 "will reduce the toxicity and volume of COCs in groundwater;" however, reducing toxicity and volume without treatment does not qualify for reduction of toxicity, mobility, or volume by treatment. Treatment is required and Alternatives 2 and 7 do not satisfy this criterion. Please revise Section 2.10.4 to clarify that Alternatives 2 and 7 do not qualify for reduction of toxicity, mobility, or volume by treatment.	We revised the first two sentences of the new second paragraph of Section 2.10.4 as follows: "Alternative 2 - MNA does not directly result in the reduction of toxicity, mobility, or volume of COCs in groundwater through treatment. Naturally occurring physical, chemical, and biological processes will be monitored at each site as reductions are achieved." We also revised the new last paragraph as follows: "Alternative 7 – Passive Skimming and EA provides for physical removal of the free-phase Stoddard solvent (LNAPL containing dissolved COCs) principal threat waste that poses an ongoing source of contamination to the underlying groundwater at Site SD034. Removal of the Stoddard solvent will result in a reduction of the volume of COCs dissolving into the groundwater from the Stoddard solvent source material. The Stoddard solvent removed by passive skimming will be treated or recycled by an EPA-approved off-base vendor.

No.	Comments	Responses
59.	**Section 2.10.4, Reduction of Toxicity, Mobility, or Volume Through Treatment, Page 2.10-4 and Section 2.13.5 Preference for Treatment as a Principal Element, Page 2.13-4:** Even though groundwater by definition is not a principal threat waste, we still have the expectation to consider treatment, but the ROD only considers treatment as it relates to principal threat. Further, source materials (such as the NAPL) are a principal threat and are not clearly discussed in the ROD.	We revised Section 2.10.4 as follows: "For Site FT005, Subarea LF007C, and Sites SS029 and SS030, Alternative 3 – GET uses onsite LGAC treatment of groundwater extracted from plumes with low-level threat wastes to provide permanent reductions in the toxicity and volume of contaminants. Spent carbon containing adsorbed contaminants is then regenerated by an EPA-approved off-base vendor. Alternative 4 – EVO and GET (Site SS016), Alternative 5 – EVO and EA (Sites SS015, SD036, and SD037); and Alternative 6 – Bioreactor, Phytoremediation, EVO PRB, and EA (Site DP039) provide for in situ treatment of the principal threat wastes and the highest concentration portions of the site plumes to permanently reduce the toxicity and volume of contaminants. Alternative 7 – Passive Skimming and EA provides for physical removal of the free-phase Stoddard solvent (LNAPL containing dissolved COCs) principal threat waste that poses an ongoing source of contamination to the underlying groundwater at Site SD034. Removal of the Stoddard solvent will result in a reduction of the volume of COCs dissolving into the groundwater from the Stoddard solvent source material. The Stoddard solvent removed by passive skimming will be treated or recycled by an EPA-approved off-base vendor. Site SD034 is the only site with free-phase Stoddard solvent contamination and the only site for which Alternative 7 is applicable. Alternatives 3 and 7 were evaluated for Site SD034." We also revised the first paragraph of Section 2.13.5 as follows: "The NCP establishes the expectation that treatment will be used to address the principal threats posed by a site wherever practicable (40 CFR 300.430[a][1][iii][A]). The selected remedies for Site FT005, Subarea LF007C, and Sites SS029 and SS030 (Alternative 3 – GET) use onsite treatment of groundwater extracted from plumes with low-level threat wastes. The selected remedies for Site SS016 (Alternative 4 – EVO and GET); Sites SS015, SD036, and SD037 (Alternative 5 – EVO and EA); and Site DP039 (Alternative 6 – Bioreactor, Phytoremediation, EVO PRB, and EA) are focused on treatment of the principal threat wastes and the highest concentration portions of these site plumes. Treatment of these principal threat wastes and the highest concentrations of contaminated groundwater thereby satisfy the statutory preference for treatment as a principal element of the remedies. More complete summaries of the use of treatment to satisfy the statutory preference are provided in the following list: • The selected remedies for Site FT005, Subarea LF007C, and Sites SS029 and SS030 (Alternative 3 – GET) satisfy the statutory preference for treatment as a principal element of the remedy through offbase destructive treatment of contaminant-laden LGAC by an EPA-approved vendor. This treatment will permanently and significantly reduce the volume and toxicity of groundwater contaminants extracted from plumes with low-level threat wastes. • At Site SS016 (Alternative 4 – Bioreactor and GET), in situ ERD treatment of the highest concentration portion of the plume with a bioreactor satisfies the statutory preference for treatment as a principal element of the remedy at this site. Residual DNAPL likely exists at the site and constitutes the principal threat waste. The remedy will treat contaminants via ERD processes as they dissolve into the groundwater from the DNAPL source material. The ERD treatment processes will permanently and significantly reduce the volume and toxicity of the principal threat wastes and the highest concentrations of contaminants dissolved in groundwater. Offbase destructive treatment of contaminant-laden LGAC by an EPA-approved vendor also satisfies the statutory preference for treatment as a principal element of the remedy at this site.

No.	Comments	Responses
		• At Sites SS015, SD036, and SD037 (Alternative 5 – EVO and EA), in situ ERD treatment of the highest concentration portions of the plume using EVO injection satisfies the statutory preference for treatment as a principal element of the remedies at these sites. Residual DNAPL likely exists at these sites and constitutes the principal threat wastes. The remedy will treat contaminants via ERD processes as they dissolve into the groundwater from the DNAPL source material. The ERD treatment processes will thereby permanently and significantly reduce the volume and toxicity of the principal threat wastes and the highest concentrations of contaminants dissolved in groundwater. • In situ treatment of the highest concentration portions of the Site DP039 plume using the combination of a bioreactor, phytoremediation, and EVO PRB satisfies the statutory preference for treatment as a principal element of the remedy at this site. Residual DNAPL likely exists at the site and constitutes the principal threat waste. The remedy will treat contaminants via ERD (bioreactor and EVO PRB) and biological (phytoremediation) processes as they dissolve into the groundwater from the DNAPL source material. The ERD and biological treatment processes will thereby permanently and significantly reduce the volume and toxicity of the principal threat wastes and the highest concentrations of contaminants dissolved in groundwater. At Site SD034, Alternative 7 – Passive Skimming and EA satisfies the statutory preference for treatment as a principal element of the remedy. Residual Stoddard solvent (LNAPL containing dissolved COCs) exists at the site and constitutes the principal threat waste that poses an ongoing source of groundwater contamination. The remedy will entail the physical removal of free-phase Stoddard solvent by passive skimming followed by offbase recycling by an EPA-approved vendor."
60.	**Section 2.10.8, State/Support Agency Acceptance, Page 2.10-8:** Please revise Section 2.10.8 to include SS035 and the alternative selected for this Site.	We added Site SS035 to Section 2.10.8 and Section 2.10.9 and stated that the remedy selected for the site is Alternative 2 – MNA.
61.	**Section 2.12, Selected Remedies, Page 2.12-1:** Please revise Section 2.12 to include SS035 and the alternative selected for this Site.	We added Site SS035 to Section 2.12 and stated that the remedy selected for the site is Alternative 2 – MNA.
62.	**Section 2.12.2, Performance Monitoring, Page 2.12-6:** This section discusses performance monitoring but does specify how many years of performance monitoring are projected for each site. In addition, it is unclear how long verification monitoring will be conducted after RAOs have been achieved. Please provide a table or discussion for each site which specifies the number or years that performance monitoring and the number of years of verification monitoring projected for each site.	We added new Table 2.12-2 -- Summary of Performance Monitoring to clarify the duration of performance monitoring for each site. We also revised Section 2.12.2.9 Performance Monitoring (formerly Section 2.12.2.2) as follows: "For each of the remedies, except Alternative 1 – No Further Action, a period of long-term operation (LTO) will be conducted after the remedial action has been installed and the remedy is fully in-place. Monitoring data obtained during the period of LTO will be used to assess if the remedy is performing as intended. The LTO monitoring will continue until groundwater cleanup levels have been achieved for the entirety of a site plume. When that is achieved, the response will be complete and then a period of long-term monitoring (LTM) will begin. The LTM will be conducted semiannually for an additional two years to verify that the concentrations of contaminants have been permanently reduced to cleanup levels or below. At the conclusion of the period of LTM, a site closeout report will be developed to document that cleanup levels have been achieved. Estimates for the periods of LTO and LTM for each site are summarized in Table 2.12-2 – Summary of Performance Monitoring.

No.	Comments	Responses
		Performance monitoring will be conducted under the Travis AFB GRIP and in accordance with applicable EPA guidance documents, including the *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater* (EPA, 1998) and *Performance Monitoring of MNA Remedies for VOCs in Groundwater* (EPA, 2004). Existing Travis AFB documents, groundwater data, and assessments of interim remedial action performance will also be used in the development of the sampling requirements identified in the GRIP and GRISRs. Laboratory analyses of samples will be conducted in accordance with the *RD/RA Quality Assurance Project Plan (RD/RA QAPP)* (CH2M HILL, 2009a). Monitoring results will be provided in annual GRISRs. As remediation of the contaminant plumes progresses under each site remedy, it is expected that the distribution of groundwater contamination will change over time. Different portions of some plumes will achieve cleanup levels more rapidly than others. For example, under Alternative 5 – EVO and EA, the portions of the plumes at Sites SS015, SD036, and SD037 undergoing active ERD treatment will likely achieve cleanup levels more quickly than the portions of the plumes where the processes of natural attenuation are employed. A summary of the estimated cleanup times for the entirety of the site plumes is provided in Table 2.12-2 – Summary of Performance Monitoring. The performance monitoring well network for each site and remedy will be initially developed during the RD phase. However, as the plumes change over time, the monitoring networks will evolve appropriately for the future conditions. As the plumes change in shape and concentration, some monitoring wells may no longer be necessary and/or new wells may be required to adequately monitor the progress of remediation. It is also possible that the frequency of monitoring may increase or decrease under future conditions or that the required list of analytes may increase or decrease. Corrective actions to remedies potentially resulting from deficiencies identified in five-year reviews may also trigger changes to the monitoring schemes. Potential changes to the performance monitoring will be specified in the annual GRISRs and implemented under the GRIP.“
63.	**Section 2.12.3.3, Alternative 3 – GET, Page 2.12-7:** The second paragraph of Section 2.12.3.3 states “after a period of active remediation under Alternative 3, continued progress toward RAOs at Site FT005, Subarea LF007C, Site SS029, and Site SS030 may be achieved by transitioning from the active GET remedy to an effective program of MNA under Alternative 2;” however, it is not clear how it will be determined if and when this transition to MNA would occur. In addition, it is not clear whether an explanation of significant difference (ESD) or ROD amendment will be necessary, since this would constitute a change in the selected remedy, or if this transition is intended to be the selected remedy. Please revise Section 2.12.3.3 to explain how it will be determined if and when the transition to MNA would occur, and indicate whether an ESD or ROD amendment will be needed to document the change to MNA	We revised the second paragraph of Section 2.12.2.3 Alternative 3 – GET (formerly Section 2.12.3.3) as follows: “After a period of active remediation under Alternative 3, continued progress toward RAOs at Site FT005, Subarea LF007C, and Sites SS029 and SS030 may be achieved by transitioning from the active GET remedy to an effective program of MNA under Alternative 2. This potential remedy transition will be based on the performance monitoring data and cost data obtained during the period of LTO. Over long-term GET system operation, it is possible that the plume contaminant concentrations will decline at an ever decreasing rate and the cost-effectiveness of the remedy will become relatively low. That is, high costs will be incurred to achieve increasingly modest reductions in the plume concentrations above cleanup levels. In this event, site-specific contaminant rebound studies will be conducted to demonstrate plume stability and continued reductions in concentrations towards cleanup levels using natural physical, chemical, and biological processes. The Air Force will prepare an ESD to document the change of the remedy from Alternative 3 – GET to Alternative 2 – MNA.”

No.	Comments	Responses
64.	**Section 2.12.3.3, Alternative 3 – GET, Page 2.12-9:** According to the second to last paragraph of Section 2.12.3.3, "if the modified operation of the Site SS030 extraction wells does not work and the eastern boundary of the Site SS030 plume remains unclear, then an investigation of the eastern side of the plume will be conducted to verify its boundaries;" however, this boundary should be verified prior to or during remedial design (RD). In addition, the text does not specify the criteria that will be used to determine whether the extraction system has operated sufficiently nor how long the extraction system will be allowed to operate before an investigation of the eastern side of the plume is conducted. Please explain why the eastern boundary of SS030 will not be verified prior to or during RD. In addition, please revise Section 2.12.3.3 to specify the criteria that will be used to determine whether the extraction system has operated sufficiently and how long the extraction system will be allowed to operate before an investigation of the eastern side of the plume is conducted.	We revised the SS030 text in Section 2.12.2.3 Alternative 3 – GET (formerly Section 2.12.3.3) as follows: "Operation of the Site SS030 interim GET system was modified in 2011 to improve the hydraulic capture of the off-base plume. As described in Section 8.3 of the 2011 Annual RPO Report (CH2M HILL, 2012b), operational changes (i.e., RPO) to the existing GET system were made to maintain hydraulic capture for the entirety of the plume by increasing the rate of groundwater extraction. Groundwater monitoring data obtained under the GSAP and GRIP demonstrated that hydraulic capture of the plume was achieved and that TCE concentrations within the eastern side of the plume are declining (CH2M HILL, 2012b). Further optimization of the GET system involves the installation of an additional extraction well to further improve hydraulic capture of the off-base plume and reduce the wear on the existing extraction well pumps resulting from sustained high-speed operation. The ability of the Site SS030 GET system to maintain progress towards RAOs and achieve cleanup levels for the entirety of the plume will be verified prior to and during the RD phase under the Travis AFB GRIP and reported in annual GRISRs. If groundwater performance monitoring during the period of LTO indicates that hydraulic capture is not being maintained (e.g., increasing well concentrations), then further investigation of the eastern side of the plume will be conducted to verify hydraulic capture and remediation of that portion of the plume. Following evaluation of the characterization data, operation of the existing extraction wells may be modified and/or additional extraction wells may be installed to more fully achieve hydraulic capture of the off-base portion of the plume. All such optimizations will be incorporated into Alternative 3 as RPO activities."
65.	**Section 2.12.3.4, Alternative 4 – Bioreactor and GET, Page 2.12-10:** The first paragraph on page 2.12-10 states "after a period of active remediation under Alternative 4, continued progress toward RAOs may be achieved by transitioning from the combination of a bioreactor and GET to an effective program of MNA under Alternative 2;" however, it is not clear how it will be determined if and when to transition to MNA. Clarity is needed in this section regarding how the remedy is expected to transition. This will reduce the likelihood that an ESD or ROD Amendment would be needed in the future to ensure the remedial action is being implemented as intended.	We revised the first paragraph on page 2.12-10 as follows: "After a period of active remediation under Alternative 4, continued progress toward RAOs at Site SS016 may be achieved by transitioning from the active Bioreactor and GET remedy to an effective program of MNA under Alternative 2. This potential remedy transition will be based on the performance monitoring data and cost data obtained during the period of LTO. Over long-term Bioreactor and GET system operation, it is possible that the plume contaminant concentrations will decline at an ever decreasing rate and the cost-effectiveness of the remedy will become relatively low. That is, high costs will be incurred to achieve only modest reductions in the plume concentrations above cleanup levels. In this event, a site-specific contaminant rebound study will be conducted to demonstrate plume stability and continued reductions in concentrations towards cleanup levels using natural physical, chemical, and biological processes. The Air Force will prepare an ESD to document the change of the remedy from Alternative 4 – Bioreactor and GET to Alternative 2 – MNA."
66.	**Section 2.12.3.7, Alternative 7 – Passive Skimming and EA, Page 2.12-17:** There does not appear to be an active remedy component for the free-phase area after passive skimming is completed. Enhanced attenuation (EA) is only discussed for the distal sections of the plume and is proposed for the free-phase area only if passive skimming is not effective. There is no active remedy proposed for the period after passive skimming ceases (when it has been effective in reducing the free-phase thickness). An active remedy may be necessary to reduce dissolved-phase contaminant concentrations in the free-phase area. Please determine whether EA (or some other remedy) will be implemented in the free-phase area for the period after passive skimming ceases to reduce dissolved-phase contaminant concentrations.	We revised the second paragraph of Section 2.12.2.7 Alternative 7 – Passive Skimming and EA (formerly Section 2.12.3.7) to clarify that groundwater monitoring of the free-phase area and distal portions of the plume will occur both during passive skimming and after the time at which passive skimming is discontinued. "When removal of free-phase Stoddard solvent (NAPL) floating on the groundwater table is considered complete (i.e., maximum thickness of 0.01 foot is achieved), then passive skimming will be discontinued. The low concentrations of dissolved COCs at Site SD034 do not warrant an active treatment component for the remedy. As reported in the 2010-2011 Annual GSAP Report, the COCs dissolved in the groundwater at Site SD034 include TCE and vinyl chloride at maximum concentrations of 5.8 µg/L and 2.1 µg/L (MW02x34). Therefore, groundwater monitoring will continue throughout the WIOU plume, including Site SD034, as part of the EA component of the remedy."

No.	Comments	Responses
67.	**Section 2.12.3.7, Alternative 7 – Passive Skimming and EA, Page 2.12-17:** The second to last paragraph of Section 2.12.3.7 states if after five years of passive skimming free-phase Stoddard solvent is still measured at a thickness of 0.01 foot, then alternate technologies will be evaluated, including resuming GET system operation, in situ chemical oxidation, air sparging, and excavation; however, this would require a formal Feasibility Study evaluation and change in the selected remedy with an ESD or ROD amendment. Either provide a complete evaluation to provide the basis for selection of the contingency and include it in the ROD, or remove the contingency language. If the remedial action objectives and description of the goals of the remedial action are clear, the process for further evaluation can be triggered if the goals aren't met as expected.	We removed the contingency language in Section 2.12.3.7, as recommended in the comment.
68.	**Section 2.12.4, Summary of Estimated Remedy Costs, Page 2.12-18:** Please revise the ROD to include a cost estimate table for SS035.	We added Table D-20 Site SS035 Cost Estimate for MNA to provide the cost estimate for Site SS035.
69.	**Section 2.13.2, Compliance with ARARs:** Please add to the text discussion at the end of the 2nd full paragraph discussing TBCs "Once a TBC is selected in a Record of Decision as a requirement, it becomes a binding performance standard with which the chosen remedy must comply."	We added the quoted text to the end of Section 2.13.2 as follows: "Once a TBC is selected in a Record of Decision as a requirement, it becomes a binding performance standard with which the chosen remedy must comply."
70.	**Section 2.13.6, Five-Year Review Requirements, Page 2.13-6:** Section 2.13.6 does not specify the date of the five-year review. The previous five-year review was submitted in 2008 and the Interim ROD (IROD) will continue to trigger the five-year review. Please revise Section 2.13.6 to specify the due date of the next five-year review and if the five-year reviews will continue to be triggered by the IROD.	We revised the third paragraph of Section 2.13.6 as follows: "Five-year reviews will be conducted until concentrations of hazardous substances, pollutants, or contaminants remaining onsite are reduced to levels that allow for designated beneficial uses of groundwater (domestic, municipal, agricultural, and industrial supply) as well as unlimited use and unrestricted exposure and until concentrations of volatile COCs in groundwater posing a potential indoor air risk are at such levels that VOCs emanating from groundwater to indoor air do not pose unacceptable risk to human health. The last Five-Year Review was finalized in 2013 (Endpoint, 2013).".
71.	**Section 3, Responsiveness Summary, Page 3-1:** The first sentence references the Proposed Plan but does not include the specific reference notation until mentioned in the second paragraph. The second sentence refers to the AF "selection" of Alternatives, however the AF proposed preferred alternatives, but did not "select" them. Finally, this section does not state whether any written comments were received, and if so, does not provide the responses. Please revise the introduction to address these issues.	We revised the first sentence of the first paragraph as follows: "This section provides a summary of the public comments regarding the Proposed Plan (Travis AFB, 2012b) for groundwater at Travis AFB, and includes the AF response to comments." We also changed the second sentence of the first paragraph as follows: "At the time of the public review period, the AF had proposed Alternatives 1 through 7 as the preferred alternatives for the sites." We added the following text to the second paragraph of Section 3: "No written comments were received on the Proposed Plan during the public review period."
72.	**Appendix B, Summary of ARARs and TBCs, Comments:** Please include the EPA position on the various ARARs in the column entitled "Comments", as specified in Attachment 2, EPA Comments on Travis AFB Draft ROD – Appendix B – ARARs, dated March 8, 2013. Please note that these are EPA Region 9 positions, and do not necessarily reflect the positions of EPA HQ or other EPA Regional Offices.	We added the EPA position language to the reformatted tables provided in Appendix C of the ROD.
73.	**Appendix B, Action Specific ARARs, Table B-3: The** Table lists the substantive regulations but does not specify which portion of the regulation that is the substantive standard. Please revise the table to include this information.	We agree the reference to 40 CFR Part 122 alone is too broad and listed the following specific regulatory citations in the table as applicable substantive provisions: 122.41(d) and (e), 122.41(j)(1),(3) and (4), 122.41(l)(6), 122.44(d),122.44(i), 122.45(d),122.45(f), 122.48(a) and 122.48(b).

No.	Comments	Responses
SUPPLEMENTAL SPECIFIC COMMENT 73 – Nadia Hollan Burke, EPA Region IX dated October 23, 2013		
73a	EPA agrees with the AF that only the substantive (not procedural or administrative provisions) are applicable ARARs. However, in being so specific is the danger of accidentally missing an applicable substantive ARAR or adding in a procedural one. Sometimes it is a fine line between procedural and substantive provisions, and we would want to err on the side of being inclusive versus exclusive. If the actual provision ends up not applying to the site specific conditions (i.e., it prescribes discharge methods/levels for metals but there are no metals being discharged) than it just wouldn't come into play in that instance. Given the considerable amount of good work the AF did in culling out the specific substantive provisions that apply, we have gone through and evaluated whether any subsections left out might possibly be substantive. Regarding 40 CFR Subpart C – Permit Conditions (Sections 122.41-122.50) we suggest the AF add these specific provisions: 122.44(a), (b), (e); 122.45(a), (c), (e), (g), (h), (i); and 122.50. We are ok with all of the other specific provisions identified by the AF. Alternatively, we would prefer to generally cite the substantive provisions of 40 CFR Subpart C - Permit Conditions (§§ 122.41-122.50) or even cite to specific Sections 122.41, 122.44, 122.45, 122.48 and 122.50, to err on the site of inclusiveness. If the AF doesn't want to be this general, and still cite the specific subsections, but does not agree with our suggestions to add the additional subsections, please provide us with a little more explanation as why the provisions we suggest to add would not conceivably apply to this site and we can take that under consideration. The AF also should modify the Table "comment" as follows: "Only the substantive portions from Subpart C, 40 CFR §§ 122.41 -50, including the listed provisions in this table, are ARARs; reporting requirements and other procedural or administrative requirements are not ARARs	We disagree with citing to Sections 122.41, 122.44, 122.45, 122.48 and 122.50, generally, as such would include provisions that are not site-specific ARARs. We agree with listing 40 CFR Sections 122.44(a) and (b)(1) and (e) and 40 CFR Section 122.45(a), which concern technology-based effluent limitations for toxic pollutants. We disagree with listing 40 CFR Section 122.44(b)(2) and (3) which describe standards for sewage sludge use and disposal under section 405(d) of the CWA, and requirements applicable to cooling water intake structures under section 316(b) of the CWA, as inapplicable to any specific GW sites at Travis AFB. We disagree with listing 40 CFR Section 122.45(c) as an ARAR. This section describes effluent limitations for metals. ARARs are site-specific, and none of the GW sites on Travis have metals as COCs. We disagree with listing 40 CFR Section 122.45(e) as an ARAR. This section describes effluent limitations for "non-continuous discharges" as defined in Section 122.2. That section actually just defines a "continuous discharge" as a "discharge" which occurs without interruption throughout the operating hours of the facility, except for infrequent shutdowns for maintenance, process changes, or other similar activities. GET systems at Travis AFB engage in continuous discharges, so this section is not an ARAR at any GW site at Travis AFB. We disagree with listing 40 CFR Section 122.45(g). That section indicates that technology based effluent limitations shall be adjusted to reflect credits for pollutants in the discharger's intake water, but (g)(4) indicates the credit shall be granted only if the discharger demonstrates that the intake water is drawn from the same body of water into which the discharge is made. The latter is not occurring at Travis AFB. The intake water in Travis' restoration program is drawn from groundwater and discharged after treatment to surface water, thus this section is not an ARAR at any GW site at Travis AFB. We disagree with listing 40 CFR Section 122.45(h). There are no internal waste streams involved in the GW treatment systems at Travis AFB, and the discharge limitations at the point of discharge haven't proven to be either impracticable or infeasible. We disagree with listing 40 CFR Section 122.45(i) and 122.50. These sections describe limitations and standards for disposal of pollutants into wells, POTWs or to land. Treated GW at Travis is discharged to surface water, thus these sections are not ARARs at any GW site on Travis AFB. We agree to modify the Table C-3 "comment" as follows: "Only the substantive portions from Subpart C, 40 CFR §§ 122.41-48, including the listed provisions in this table, are ARARs; reporting requirements and other procedural or administrative requirements are not ARARs."

No.	Comments	Responses
SUPPLEMENTAL SPECIFIC COMMENTS re: Updated Travis AFB Groundwater ROD ARARs tables – Nadia Hollan Burke, EPA Region IX – e-mail dated December 18, 2013		
1	Formatting for Table C-1: We suggest adding page numbers to the pages for "Joint AF/State, AF, State, EPA Position Comments" (Joint Comments), and also reference these page numbers in the Comments column of the table, instead of indicating "below".	We numbered each of the joint position comments and added the applicable position comment number reference to the “Comments” column.
2	Formatting for Table C-1: The heading for the table should change when it transitions to the Joint Comments Section, and the heading for the Joint Comments should appear on the same pages that the joint comments appear. Also suggest to modify the Joint Comments heading to include more a label for the first column.	We deleted the repeated column headers in the joint comments section of Table C-1. We then added another header row with descriptive column headings for the “Citation” and the “Position Comment”.
3	Editing for Table C-1: We have added "EPA" in two of places in the Comments column as well as in two places in the Joint Comments section, for SWRCB Resolution No. 68-16.	We retained the additional “EPA” revisions.
4	Editing for Table C-1: The citation and requirements cited in the Joint Comments are inconsistent; for some ARARs the first column cites the Table "Citation" and other ARARs cites "Requirements". Please make this consistent and either include both the Citation and Requirement, or choose one category to use as a reference back to the main table.	We referenced the position comments to the “Citation” provided in the main body of the table.
5	Formatting for Table C-3: Please include page numbers on all pages; the last two pages are missing page numbers.	We included the Table C-3 page numbers.
6	Editing for Table C-3, page 2 of 3, Institutional Controls: Please add the following statement in the Comments column for this ARAR "It is EPA's position that only 22 CCR 67391.1(a), (d) and (e) are substantive provisions that are potentially relevant and appropriate."	We revised the Comments column to state: "It is EPA's position that only 22 CCR 67391.1(a), (d) and (e) are substantive provisions that are potentially relevant and appropriate."
7	Editing for Table C-3, second to last page, last row: The Citation ends in a comma, please correct.	We deleted the comma.
8	Editing for Table C-3, last page, Notes: If this list is intended to capture all of the acronyms, it would be useful to also add the abbreviations for the remedial components, such as GET, EVO, MNA, EA, PRB, etc.	We added definitions for all the acronyms used in the body of Table C-3.
SUPPLEMENTAL SPECIFIC COMMENTS – E-mail record of teleconference between Glenn Anderson, AFCEC and Nadia Hollan Burke, EPA Region IX – dated December 18, 2013		
1	Nadia compared the COC column in Table 2.12-1 (Basis for Remedy Summary) with the COCs listed in Section 4 of the final 2010-2011 GSAP report. Vinyl chloride was detected at Site DP039 (MW778x39 – 48 µg/L). Please add vinyl chloride to this column under Site DP039 and confirm that this is the highest concentration found at this site. During our conversation, I thought that the COC column for Site SD033 was also missing vinyl chloride, but I may have confused SD033 with SD034 (that is what happens when one flips through electronic pages too quickly). So, please confirm the analyte list for Site SD033 and correct any omissions.	We added vinyl chloride to the COC column in Table 2.12-1 for Site DP039. Vinyl chloride was not historically identified as a COC as this site. The cited concentration of 48 µg/L reported in the 2010–2011 GSAP is likely because of the ongoing ERD treatment demonsrations at the site. We did not add vinyl chloride as a COC for Site SD033 in Table 2.12-1. Vinyl chloride was not historically identified as a COC at this site and was not detected during the 2010–2011 GSAP above the groundwater cleanup level.

No.	Comments	Responses
2	Over the last couple of months, we have finalized several documents, so it makes sense for the draft ROD to catch up before becoming a draft final document. In our response to Specific Comment #70, please revise the last sentence to read: "The LAST Five-Year Review was finalized in 2013 (Endpoint, 2013)." Then, please make this revision to Section 2.13.6 of the draft ROD and change the reference to the Third Five-Year Review in Section 4 of the ROD from CH2M HILL, 2013b to Endpoint, 2013.	We revised the response to Specific Comment 70 and Section 2.13.6 as follows: "The last Five-Year Review was finalized in 2013 (Endpoint, 2013)." We also changed the reference cited in Section 4 from "CH2M HILL, 2013b" to "Endpoint, 2013".
3	In the last paragraph of our response to Specific Comment #3 for Appendix A (Conceptual Site Models), we state that we will not use TriHydro data because "…this document has not yet been finalized and…" Please delete this phrase and the word "Draft" so that it now reads: "Regarding using the cross sections from the Trihydro Corporation, Pre-Design Site Characterization of SS029 Remedial Process Optimization South Base Boundary Treatment Plant Report -- Data from the Trihydro report will not be included in the ROD appendix because the information is not critical for the purpose of remedy selection in the ROD." Then, please update the reference to this document in Section 4 accordingly.	We revised the last paragraph of our response as follows: "Regarding using the cross sections from the Trihydro Corporation, Pre-Design Site Characterization of SS029 Remedial Process Optimization South Base Boundary Treatment Plant Report -- Data from the Trihydro report will not be included in the ROD appendix because the information is not critical for the purpose of remedy selection in the ROD." We also revised the Trihydro report reference cited in Section 4 to address the final document.
4	Our response to Specific Comment #72 states "We added the EPA position language to the reformatted tables provided in Attachment B." This is not wrong, but it makes sense to refer to the reformatted Appendix C in the ROD that contains the ARARs tables, so please revise this response as follows: "We added the EPA position language to the reformatted tables provided in Appendix C of the ROD."	We revised the response to Specific Comment 72 as follows: "We added the EPA position language to the reformatted tables provided in Appendix C of the ROD."
5	Finally, we completed the negotiations on the ARAR issue that was described in EPA Specific Comment #73, and now we just need to add the follow-on comment and response to the RTC table as Comment #73a. I attached the message to Nadia that contains the follow-on comment and response in a Word table as well as the EPA reply message. The follow-on comment is shown in italics, and the follow-on response is shown in regular font.	We added the supplemental comment and response as referenced in the comment. Refer to Supplemental Specific Comment 73a above.
MINOR COMMENTS		
1.	**Page ix, Acronyms and Abbreviations:** Code of Federal Regulations is italicized, however other similar documents are not; please ensure consistency of formatting.	We removed the italics for consistency of formatting.
2.	**Section 1.3, Assessment of the Sites, Page 1-5:** Please remove the last paragraph about the AF commitment to continue remedial actions at the Site, as it does not seem to be appropriate in this section.	We deleted the last paragraph, as recommended in the comment.
3.	**Section 2.2.3.1, Bioreactors, Page 2.2-6:** According to the last paragraph of Section 2.2.3.1, "performance monitoring results indicate that in situ ERD [enhanced reductive dechlorination] processes are achieving a high rate of VOC removal efficiency;" however, the text does not cite references where performance monitoring results are documented. Please revise the text to include a reference to the document containing the performance monitoring results for SS016 and DP039.	We added a reference to the 2011 Annual RPO Report (CH2M HILL, 2012b).

No.	Comments	Responses
4.	**Section 2.2.5.1, Interim MNA Performance at Sites FT004 and SD031, Page 2.2-9:** The second paragraph of 2.2.5.1 states that "a rebound study began in 2007, when the Site FT004 and Site SD031 GET systems were shut down," but does not indicate the length of the rebound study at these Sites. Please revise Section 2.2.5.1 to include the length of the rebound study at FT004 and SD031.	We revised the second paragraph of Section 2.2.5.1 as follows: "A rebound study began in 2007 and lasted for 1 year, when select Site FT004 and all of the Site SD031 extraction wells were shut down (CH2M HILL, 2012b). No significant rebound occurred over the 1-year period and it was determined that the rebound study would continue during the interim period and include all of the Site FT004 and Site SD031 extraction wells. As a whole, the groundwater plume has remained stable. TCE concentrations have remained stable or continued to decline in 74 percent of the wells monitored (CH2M HILL, 2012b). Similarly, 1,1-DCE concentrations have been stable or continued to decline in 100 percent of the wells monitored. In addition, continued decreasing concentrations in the portions of the Site FT004 plume with the highest concentrations of residual contamination indicate that these portions of the plume have been effectively addressed by groundwater extraction (CH2M HILL, 2012b). The rebound study at Sites FT004 and SD031 is ongoing."
5.	**Figure 2.2-3, Historical and Current TCE Groundwater Contamination - Sites FT004/SD031/LF006/LF007:** Surface water covers most of the area of the LF007C plume in the historical portion (1999) of Figure 2.2-3, but is not displayed on the current portion (2010) of the figure. Please explain why the surface water body shown in 1999 is not present in 2010.	We added the surface water shown in the historical portion of the figure to the current portion of the figure for consistency.
6.	**Figure 2.2-3, Historical and Current TCE Groundwater Contamination – Sites FT005/SS029/SS030:** The historical presentation of the SS029 plume shows closed contours near the upgradient portion of the plume for the 100ppb and 1,000ppb lines from 1999-2004, and the 100ppb line in 2010, however, it does not appear there is enough upgradient monitoring wells to support closing the contours as shown on the figure. Please verify whether these contours are supported with monitoring well locations that are not shown on the map, and either change the contours to use dashed lines if not supported, or indicate by notation the support for closed contours is not shown on this figure, and perhaps reference the location or another figure that may show this information.	We revised the contour for the upgradient portion of the current Site SS029 plume shown on Figure 2.2-10 using dashed lines to indicate that it is approximate.
7.	**Section 2.3, Community Participation, Page 2.3-1:** Section 2.3 states "the notice of the availability of these two (2) documents was published in the Fairfield Daily Republic and Vacaville Reporter;" however, three documents (the RIs, FSs, and Proposed Plan) were made available to the public. Please resolve this discrepancy.	We revised the text to state the following: "…the notice of the availability of these three (3) documents was published in the Fairfield Daily Republic and Vacaville Reporter;…"

No.	Comments	Responses
SUPPLEMENTAL MINOR COMMENT 7 – Nadia Hollan Burke, EPA Region IX dated October 18, 2013		
7a	The response does not address the comment. The response indicates the text in Section 2.3, Community Participation, was revised to state, "…the notice of the availability of *these three (3) documents was* published in the Fairfield Daily Republic and Vacaville Reporter…" However, the text states, "The *notice of the availability for the Proposed Plan* was published in the Fairfield Daily Republic and Vacaville Reporter,…" Please clarify this discrepancy.	We revised the fourth sentence in the second paragraph of Section 2.3 as follows: "The notice of the availability for the Proposed Plan was published in the Fairfield Daily Republic and Vacaville Reporter, newspapers of general circulation on October 12, 2012." The Notice of Availability is provided as Appendix B of the ROD. As published in the Fairfield Daily Republic and Vacaville Reporter, only the availability of the Proposed Plan for public review is discussed. Other supporting documents, including RIs and FSs, are not specifically mentioned in the Notice of Availability. The text in the second paragraph of Section 2.3 correctly states that "The Proposed Plan was made available to the public on October 10, 2012. The Proposed Plan and other relevant supporting documents, including RI reports and FSs, can be found in the Administrative Record file and the Information Repository maintained at the Vacaville Cultural Center Library in Vacaville, California. The Administrative Record file and the Information Repository are updated regularly as documents are finalized so that they are available to the public."
8.	**Section 2.5.3.3, Horizontal and Vertical Gradients, Page 2.5-3:** The last sentence states "in one well pair, the vertical gradient was approximately 0 ft/ft," but it is not clear whether there are numbers missing after a decimal point. Please clarify whether the vertical gradient is correct.	Well pair MW2060Bx39 and MW2060Ax39 had a vertical gradient of 0.000 ft/ft in 2Q11 as shown in Table 2-3 of the *2010-2011 Annual GSAP Report*. We revised the text as follows: "In one well pair, the vertical gradient was approximately 0.00 ft/ft."
9.	**Table 2.5-2, Summary of Nature and Extent of Contamination, Page 2.5-15 through 2.5-23:** Table 2.5-2 does not clearly indicate when GET systems were turned off for each Site. Please revise Table 2.5-2 to specify when each GET system was turned off.	We added dates to Table 2.5-2 to clarify when the site GET systems were turned off.
10.	**Section 2.10.9, Community Acceptance, Page 2.10-8, and Section 3.0, Responsiveness Summary, Page 3-1:** Please clarify in Section 2.10.9 that the referenced Section 3.0 is the Responsiveness Summary, and include how the community provided support of the remedial actions selected, such as how the comments were received (written, verbal, etc.), and how many were received, etc.	We revised the second paragraph of Section 2.10.9 as follows: "Travis AFB received comments during the public meeting on October 18, 2012, regarding clarification of the preferred alternatives described therein. Three verbal comments were received at the public meeting and are discussed in the Responsiveness Summary (see Section 3.0)."
11.	**Section 2.12.3.4, Alternative 4 – Bioreactor and GET, Page 2.12-11:** The last sentence of Section 2.12.3.4 state "the TEFA [technical and economic feasibility analysis] concluded that implementation of an alternative remedial approach such as combining EVO injections and EA was not technically feasible at Site SS016 primarily because of the presence of the airfield and the large size of the plume;" however, this sentence is about Alternative 5 and the ROD does not consider Alternative 5 for SS016. Please remove the sentence from the text.	We deleted the sentence from Section 2.12.3.4, as recommended in the comment.
12.	**Figure 2.12-2, Conceptual Design Alternative 3 – GET at Site LF007C:** Figure 2.12-2 does not show the direction of groundwater flow at LF007C or the piping associated with the GET system. Please revise Figure 2.12-2 to show the direction of groundwater flow at LF007C as well as the piping associated with the GET system.	We revised Figure 2.12-2 to show the Site LF007C GET system piping and the direction of groundwater flow at the site.

No.	Comments	Responses
13.	**Figure 2.12-3, Conceptual Design Alternative 3 – GET at Sites FT005, SS029, and SS030:** The eastern boundary of the SS030 plume should be dashed to indicate this boundary is estimated. Please revise Figure 2.12-3 to dash the eastern boundary of the SS030 plume.	We revised Figure 2.12-3 using a dashed line for the eastern boundary of the Site SS030 plume.
SUPPLEMENTAL MINOR COMMENT 13 – Nadia Hollan Burke, EPA Region IX dated October 18, 2013		
13a	The response does not address the comment. The comment requested that Figure 2.12-3, Conceptual Design Alternative 3 – GET at Sites FT005, SS029, and SS030 be revised such that the eastern boundary of the SS030 plume is dashed to indicate that the boundary is estimated. However, the eastern plume boundary is not dashed in the Revised ROD. Please revise Figure 2.12-3 so that the eastern boundary of the SS030 is dashed.	We revised Figure 2.12-3 to use a dashed line for the eastern boundary of the Site SS030 plume.
GENERAL COMMENTS (APPENDIX A – Conceptual Site Models) – Nadia Hollan Burke, EPA Region IX dated August 29, 2013		
1.	Appendix A, Conceptual Site Models, does not clearly define the locations where groundwater discharges to surface water (i.e., the second bullet point under the seventh item of Part 2, Section E of the Recommended Outline and Checklist for a Record of Decision (the ROD Checklist) from the Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents (the ROD Guidance), dated July 1999 and whether the groundwater to surface water pathway has been or should be evaluated. For example, the third bullet point in Section A.2.5 states that groundwater discharges to Union Creek due to typical upward vertical gradients measured at piezometer pair PZ01Sx29/PZ01Dx2 (latter piezometer assumed to be PZ01Dx29). Review of Figure A-8 indicates these piezometers are located within the Site SS029 plume, but further information for this groundwater to surface water pathway is not provided. As another example, Section A.8.3 discusses contaminated groundwater of the West Industrial Operable Unit (WIOU) that discharges to the West Branch of the Upper Creek, where concentrations of trichloroethylene (TCE) were detected. Current TCE concentrations in surface water are low, but it is unclear if this potential exposure pathway has been previously considered and evaluated, as it is not discussed in Section 2.7, Summary of Site Risks, of the Draft Final Groundwater Record of Decision, Travis Air Force Base, Fairfield, California (the ROD). Please revise Appendix A to include a statement that the groundwater to surface water pathway was addressed and a discussion is included in the North/East/West Industrial Operable Unit (NEWIOU) Soil, Sediment, and Surface Water Record of Decision (NEWIOU SSSW ROD). The North/East/West Industrial Operable Unit (NEWIOU) Soil, Sediment, and Surface Water Record of Decision (NEWIOU SSSW ROD) selected remedies for Storm Sewer Systems A and C, Union Creek surface water and Storm Sewer B (West Branch of Union Creek, Facilities 810 and 1917, and South Gate Area (SD033) were No Action for surface water and although not specifically addressed, the groundwater to surface water pathway can be inferred since groundwater chemicals of ecological concern (COECs) were not found at the sites SS029, SS030, FT005 and SD0033. More detailed information on the evaluation of surface water within the NEWIOU is found in the NEWIOU Travis AFB Final Ecological Technical Memorandum dated September 2005.	• Consistent with our response to General Comment 1A, we revised Appendix A to include a "Surface Water" subsection for each site. These new subsections describe the surface water feature(s) present within each site, if any. At those sites with surface water features, including the sites referenced in the comment, we also provided a statement to address the issue of contaminant migration from groundwater to surface water consistent with Section 5.1 of the final Soil, Sediment, and Surface Water (SSSW) ROD (Travis AFB, 2006). This section of the SSSW ROD states that extraction of groundwater (i.e., interim remedial action) has reduced levels of TCE in both branches of Union Creek to levels that do not pose risks to human health or the environment. Therefore, we added the following typical statement for sites with surface water features: "No physical or administrative action is required for surface water at this site. The surface water at the site does not pose an unacceptable risk to ecological or human receptors (Travis AFB, 2006)." We also added the following new last paragraph to Section 2.7 Summary of Site Risks: "The groundwater to surface water pathway is addressed in Section 5.1 of the final Soil, Sediment, and Surface Water (SSSW) ROD. This section of the SSSW ROD states that extraction of groundwater has reduced levels of TCE in surface water to levels that do not pose risks to human health or the environment. Accordingly, SSSW ROD Alternative 10 – No Action for Surface Water was the selected remedial action at all sites with surface water features (Travis AFB, 2006)."

No.	Comments	Responses
2.	Appendix A identifies several sites as landfills, but the extent of the fill material (i.e., subsurface features in the third bullet point under the second item of Part 2, Section E of the ROD Checklist) does not appear to be discussed or illustrated on the associated figures. It is noted that the depths and thicknesses of fill material are discussed, but the text does not state whether the areal extent of the fill is known. Please revise the site descriptions for the landfills to indicate whether the areal extent of the fill is known, and if so, to identify the area (e.g., on the site figures) and estimated volume of the material.	We provided additional basic information on the historical landfills, including depths and thicknesses of fill material. We also revised Figures A-2, A-14 (formerly A-13), and A-16 (formerly A-15) to show the approximate areas of soil disturbance and soil remedial activities (where applicable) that occurred at the landfill sites. Soil remedial actions have been completed at all of the Travis AFB landfill sites discussed in Appendix A in accordance with the final *NEWIOU Soil, Sediment, and Surface Water ROD* (Travis AFB, 2006) and the final *Soil ROD for the WABOU* (Travis AFB, 2002). Historical conditions are therefore not representative of the current status of each site and therefore not relevant to the development of the groundwater ROD. Therefore, Appendix A does not include detailed information regarding other environmental media (i.e., soil, sediment, and surface water) at the sites discussed, except where that information supports the discussion of groundwater contamination and groundwater remedial actions. We revised the second paragraph on page A-1 to provide the references related to historical Travis AFB landfill Sites LF006, LF007, and LF008, as follows: "Additional information about Travis AFB historical landfill Sites LF006 and LF007 can be found in the final *NEWIOU Soil, Sediment, and Surface Water ROD* (Travis AFB, 2006) and the final *RI Report for the North Operable Unit* (Radian, 1995). Information about historical landfill Site LF008 can be found in the final *Soil ROD for the WABOU* (Travis AFB, 2002) and final *WABOU RI Report* (CH2M HILL, 1997). More detailed information about historical landfill Site LF006 can be found in the final *Site LF006 Natural Attenuation Assessment Work Plan* (CH2M HILL, 1999a). For Site LF007, more extensive and detailed information regarding the historical landfill and Corrective Action Management Unit (CAMU) is provided in the final L*F007 Soil Remediation Design Report and Post-Construction Maintenance Plan* (CH2M HILL, 2002), the final *NEWIOU and WABOU Soil Remedial Action Report for Sites SD045, FT003, FT004, FT005, Union Creek SD001 and SD003, and LF007 Area E* (Shaw, 2008), the final *Project Summary Report for the Site LF007 Phase 2 Soil Remedial Action* (Shaw, 2004a), and the final *Project Summary Report for the LF007 Soil Remedial Action Phase 1, Landfill Cap, Corrective Action Management Unit Subgrade, Wetlands Mitigation* (Shaw, 2003). Additional information regarding the historical Site LF008 landfill can be found in the final *Remedial Action Report for WABOU Soil Remedial Action at Site LF008* (Shaw, 2004a)." For Site LF007 (Landfill 2), we added the following figure reference to Section A.1.2, paragraph 1: "The approximate areal extent of the trenching activities at Site LF007 is shown on Figure A-2." For Site LF006 (Landfill 1), we added the following sentence to Section A.3.1, paragraph 1: "A No Further Action determination for soil at Site LF006 was made at the conclusion of a remedial investigation of the site and is documented in the *North Industrial Operable Unit Remedial Investigation* (Radian, 1995)." We also added a new third paragraph to Section A.3.2 as follows: "In the Site LF006 area, surface soil and alluvium have been disturbed or removed during the placement of landfill and backfill material. At Site LF006, landfill and backfill material encountered in soil borings ranged between 2 and 13.5 feet bgs (Radian, 1995). Waste was disposed of using trench and fill techniques over an area covering approximately 17 acres, as shown on Figure A-14. These trenches were identified during a review of historical aerial photographs and are no longer visible at the site (CH2M HILL, 1999b)."

No.	Comments	Responses
		In regards to Site LF008, we added the following sentence to Section A.4.1, paragraph 3: "After the completion of the soil remedial action at Site LF008, the *Remedial Action Summary Report* (Shaw, 2004b) concluded that the resulting site condition was protective of human health and the environment and that land use controls (LUCs) are no longer required at the site for soil." We also added a new second paragraph to Section A.4.2 as follows: "At Site LF008 the native soil has been disturbed or removed during the placement of landfill and backfill material. Approximately 3,370 cubic yards of soil (1,984 cubic yards of pesticide-contaminated soil plus additional volume for benching) was removed from seven (7) primary excavation areas, from an approximately 6,000 square feet area during remedial activities conducted in 2003 and 2004 (Shaw, 2004b). The extent of the primary excavation areas are shown on Figure A-17. The maximum depth of the excavations was 12 feet below ground surface. Clean overburden from Site LF008 and approximately 2,000 cubic yards of fill material from the Travis AFB Clean Soil Holding Area was used to backfill the excavations (Shaw, 2004b)."
3.	The site descriptions do not always provide the same information for each site. Potential surface water features, site acreage, and site topography are not always discussed in the site description sections (e.g., for Sites SS030, LF008, WIOU, etc.). Also, the acreage of each site is not provided for Sites FT005, SS029, SS030, LF008, the WIOU sites, and DP039. Please revise Appendix A to consistently present the site description information for each site, including the site acreage, topography, and whether any surface water features are present.	We revised Appendix A to provide greater consistency in the information presented between sites. Revisions typical throughout Appendix A include: • Updated site acreage information. • New surface water sections for all sites to distinguish where surface water is present and where groundwater connectivity exists. • Reorganization of the groundwater characteristics listed for each site for parallelism and to include statements about unique geologic features, groundwater to surface water connectivity, and aquifer testing. • New vapor intrusion pathways sections for all sites to summarize the results of the final *Vapor Intrusion Assessment Update* (CH2M HILL, 2013).
4.	The concentration data presented on the cross sections does not always support the discussion in the text describing the vertical extent of the plumes for Sites SD031/Figure A-7, LF006/Figure A-14, and ST027B/Figure A-26. The figures show the extent of the TCE plumes as reaching depths almost ten feet above the bedrock, but no concentration data is present at depth to support this delineation. It is unclear how the vertical extent was determined for this cross section, since the text in Sections A.1.4; A.3.2 and A.7.2 indicate contamination extends through the moist to saturated zone to bedrock. Please revise Appendix A to ensure that the vertical extent of contamination depicted on the cross sections is supported by the data included on the cross section or discussed in the text.	We revised the cross sections in Figures A-7 and A-15 (formerly A-14) so that the vertical portion of the TCE plumes extend to alluvium-bedrock interface to coincide with the text that indicates that contamination extends through the wet to saturated zone in the alluvium to bedrock. For Figures A-7 and A-15 we used the alluvium-bedrock contact as a conservative boundary for the vertical plume boundary, because the bedrock generally is not carrying groundwater. Please note that lithologic units with the moisture content description of "moist" do not contain groundwater as described in the second paragraph of Section A.1.7. Figure A-27 (formerly A-26), which is associated with Site ST027B, does not need to be revised as the figure shows that the vertical distribution of TCE is bounded by dry and moist alluvium in the lower portion of the aquifer as described in first paragraph of Section A.7.6. In boring SB801x27 the vertical boundary of the TCE plume was identified to be at the interface of the silt and clay units. This boundary was chosen because the boring log for SB800x27, which is located in close proximity to SB801x27, showed that a clay unit (low permeability) extended 10 feet below the total depth of the SB801x27.

No.	Comments	Responses
SUPPLEMENTAL GENERAL COMMENTS (APPENDIX A – Conceptual Site Models) – Nadia Hollan Burke, EPA Region IX dated September 19, 2013		
4a.	The response partially addresses the comment; however, the response does not indicate that text in Section A.7.2 (Site ST027B Geology) was revised to provide a description of the vertical boundary of the TCE plume that is consistent with Figure A-26 (Site ST027B Cross Section A–A'). In addition, while the response and Section A.7.6 indicate that the TCE is bounded at Site ST027B by dry and moist alluvium in the lower portion of the aquifer, Figure A-26 shows the deepest alluvium sample in boring SB800x27 with a "wet" designation. Based on the available geologic information, it appears the extent of TCE contamination may extend to bedrock. Please ensure that the description of the vertical extent of TCE text of Section A.7.2 is consistent with Figure A-26 and clarify the rationale for the extent of the TCE plume shown on Figure A-26, based on the geologic data.	We revised the first paragraph of Section A.7.6 as follows: "Vertical distribution of TCE at Site ST027B is controlled by the water table in the upper portion of the aquifer and dry and moist alluvium in the lower portion of the aquifer. Historical data also suggest that TCE contamination may extend to bedrock as shown on Figure A-27." (Figure A-27 was formerly Figure A-26). We also revised the approximate 5 μg/L TCE isoconcentration contour for consistency with the estimated extent of TCE contamination as described in Section A.7.2 and A.7.6. We did not revise the text of Section A.7.2, which is consistent with what has been observed of the geology of the site. Due to flightline restrictions, soil data is limited outside of the Site ST027 boundary and has been collected primarily from unpaved areas to the southeast of the site. At Site ST027 and in the unpaved area nearby, refusal has occurred during drilling activities at anywhere from 5 to 50 feet below ground surface and the depth to bedrock appears highly variable across the site. We believe the data are sufficient to support remedy selection. However, the Air Force will evaluate the need for additional characterization data during the remedial design phase.
5.	The subareas of Site LF007 are not depicted on the figures associated with this site (e.g., Figures A-2 and A-3). Section A.1.2, Site LF007 Description, indicates that the site was divided into three study areas designated as LF007B, LF007C, LF007D, and later discussions of the geology (Section A.1.4) and groundwater contamination (Section A.1.6) refer to these designations. For clarity, please label the three subareas on Figures A-2 and A-3.	We revised Figures A-2 and A-3 to show the locations of the designated Subareas LF007B, LF007C, and LF007D.
SPECIFIC COMMENTS (APPENDIX A – Conceptual Site Models) – Nadia Hollan Burke, EPA Region IX dated August 29, 2013		
1.	**Section A.1.6, Sites FT004, LF007, and SD031 Groundwater Contamination, Page A-5:** A plume of 1,4-dichlorobenzene and benzene is discussed for Site LF007D and indicated to have a volume of 248,000 cubic feet (ft3), but the extent of the plume is not shown on a figure or in the cross section for LF007D (Figure A-6). Please include a statement explaining why a figure was not included for LF007D, such as the figure was not provided for LF007 D because contamination was detected in only one well and contaminant concentrations were non-detections in the area surrounding the well.	We revised Figure A-6 to show the 1,4-dichlorobenzene and benzene detections at MW261x07. We also revised Section A.1.7, paragraph 3, sentence 8 as follows: "The contaminant plume at Subarea LF007D currently has an estimated volume of 248,000 ft^3 based on data collected from a single well (MW261x07), which is the only location where contaminant concentrations were detected during the 2010-2011 GSAP (CH2M HILL, 2012a). The plume volume was estimated based on a 100-foot plume radius around that well and the horizontal extent has not been provided in plan view because detections only occurred at a single location."

No.	Comments	Responses
2.	**Section A.5.1, Site SS015 Site Description, Pages A-15 to A-16:** The source areas discussed in this section (Facilities 550, 552, and Solvent Spill Area) are not depicted on Figure A-17. As both buildings were demolished to make room for a new fuel truck parking and maintenance facility and are not longer present. No figure was included because it might be confusing to overlay demolished building on a figure that contains new infrastructure. For consistency, please include a statement in the text for SS015 that the buildings are no longer present and were not overlain on a figure that contains new infrastructure to avoid confusion. For more information please refer to the NEWIOU Soil, Sediment and Surface Water ROD page II-3-19.	We revised the second paragraph of Section A.5.1 to further clarify the status of former Facilities 550, 552, and Solvent Spill Area as follows: "Three (3) potential sources of historical groundwater contamination have existed at Site SS015: • Former Facility 550 • Former Facility 552 (including the area at Facility 1832) • Solvent Spill Area (SSA) east of former Facility 550 Of these, the primary source area is currently considered to be the SSA. Facilities 550 and 552 were demolished in 2004. The current infrastructure present at the site is shown on Figure A-18 (formerly A-17). Additional information about the locations of former Facilities 500 and 552 is provided in the *EIOU Remedial Investigation* (Weston, 1995)." We also revised the headings of Sections A.5.1.1 and A.5.1.2 to preceed the facility names with "Former" for additional clarity.
3.	**Figure A-8, TCE Distribution at Sites FT005/SS029/SS030, 2Q11 and Figure A-9, 1,2-DCA Distribution at Sites FT005/SS029/SS030, 2Q11:** The location of the cross section for Site FT005 as shown on Figure A-8 is slightly west of the plumes of 1,2-dichloroethane (DCA) as shown in Figure A-9, so the vertical extent of the plumes is not captured. It is unclear if the vertical extent of the plumes is known, since Section A.2.6 (page A-10) indicates the contamination may extend into the bedrock. It appears that cross-sections may not have been prepared for these areas because they are off-base, however the most recent document put together by Trihydro Corporation, Draft Pre-Design Site Characterization of SS029 Remedial Process Optimization South Base Boundary Treatment Plant dated August 6, 2013 provides more information on the vertical extent of TCE plumes. Please provide a statement that explains why being off-base is impeding completion of vertical profiles, and the plan for completing the characterization of these plumes, or include the new information (if this report is anticipated to be finalized before ROD finalization).	We added a new cross section at Site FT005 to the east of cross section A-A' and renumbered the subsequent figures. The cross section is AA-AA' (Figure A-11) and its location is shown on Figure A-8. The cross section runs generally north-south through the remaining hot spots at Site FT005. Based on the production of the new cross section we were able to conclude that the 1,2-DCA hot spots remaining at Site FT005 are vertically controlled by the moist bedrock in the lower aquifer. We revised the second sentence of the fourth paragraph of Section A.2.7 as follows: "Vertical distribution of 1,2-DCA is controlled by the water table in the upper portion of the aquifer and by moist bedrock in the lower portion of the aquifer." We have not found that being off-base is an impediment to the completion of vertical profiles and cross section Figures A-10 and A-11 effectively depict the vertical extent of the plumes at Site FT005. Regarding the use of cross sections from the Trihydro Corporation, Pre-Design Site Characterization of SS029 Remedial Process Optimization South Base Boundary Treatment Plant Report -- Data from the Trihydro report will not be included in the ROD appendix because the information is not critical for the purpose of remedy selection in the ROD.
4.	**Figure A-13, TCE Distribution at Site LF006, 2Q11:** The location of cross section A to A' does not appear to be complete on this figure. Figure A-14, Site LF006 Cross Section A–A', indicates A' is located near to monitoring well MW02SX06/MW02DX06, but this monitoring well is not shown on Figure A-13. Please revise this figure to provide the full extent of the cross section for LF006.	We revised Figure A-14 (formerly A-13) to extend the cross section line and include all locations shown on Figure A-15 (formerly A-14).
5.	**Figure A-15, Alpha Chlordane Distribution at Site LF008, 2Q11 and Figure A-16, Site LF008 Cross Section A–A':** The alpha chlordane concentrations listed for certain monitoring wells in Figures A-15 and A-16 are inconsistent (e.g., for MW712X08 and MW717X08). Please revise these figures as necessary to present consistent concentrations.	We revised the Site LF008 cross section Figure A-17 (formerly A-16) for consistency with the concentration data as shown on Figure A-16 (formerly A-15).

No.	Comments	Responses
ADDITIONAL EPA COMMENTS – Sara Goldsmith, EPA Region IX dated March 21, 2014		
1.	**Page 1-1**: Please change the first sentence in the second paragraph of Section 1.2 to read as follows: "The Record of Decision (ROD) is issued by the U.S. Environmental Protection Agency (EPA) and the U.S. Air Force, the lead agency."	We revised the first sentence of the second paragraph of the Statement of Basis and Purpose (Section 1.2) as follows: "This Record of Decision (ROD) is issued by the U.S. Air Force (AF) as the lead agency and contains the final remedy that was jointly selected by EPA and the AF consistent with CERCLA Section 120(e)(4)."
2.	**CL # 6:** Please add the following language "LUCs for vapor intrusion will be maintained until concentrations of volatile COCs in groundwater positing a potential indoor air risk are at such levels that VOCs emanating from groundwater to indoor air do not pose unacceptable risk to human health and are at levels that allow for unlimited use and unrestricted exposure." This sentence is found twice on page 2.12-15.	We revised the second paragraph of the Duration of LUCs subsection on page 2.12-15 as follows: "LUCs for vapor intrusion will be maintained until concentrations of volatile COCs in groundwater posing a potential indoor air risk are at such levels that the VOCs emanating from groundwater to indoor air are at levels that allow for unlimited use of and unrestricted exposure to indoor air (refer to Table 2.8-2)."

References:

EPA. 1998. Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Ground Water. EPA/600/R-98/128.

EPA. 1999. Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents. EPA 540-R-98-031 http://www.epa.gov/superfund/policy/remedy/rods/pdfs/guide_decision_documents_071999.pdf

EPA. 2004. Performance Monitoring of MNA Remedies for VOCs in Ground Water EPA/600/R-04/027.

EPA. 2009. Summary of Key Existing EPA CERCLA Policies for Groundwater Restoration.

EPA. 2013. Sample Federal Facility Land Use Control ROD Checklist with Suggested Language. OSWER Directive 9355.6-12

Responses to Comments on the Draft Groundwater Record of Decision, Travis Air Force Base, California

Department of Toxic Substances Control

No.	Comments	Responses
REVIEW COMMENTS – Jose Salcedo, P.E., Department of Toxic Substances Control dated April 17, 2013		
GENERAL COMMENTS		
1.	The Department of Toxic Substances Control (DTSC) has reviewed the Draft Basewide Groundwater ROD, dated January 2013. The ROD summarizes the proposed remedies for 19 groundwater sites on the base. Overall, the ROD is well written and easy to follow. We have also reviewed the comments issued by the San Francisco Bay Regional Water Control Board (Water Board) and the US Environmental Protection Agency. We have one additional general comment to the ROD. The ROD should make a distinction as to when it is referring to the State of California in general and when the reference of "State" or "State of California" is to DTSC and the Water Board.	We clarified the ROD text to make the distinction between general references to the State of California and specific references to the DTSC and Water Board.

Responses to Comments on the Draft Groundwater Record of Decision, Travis Air Force Base, California

Regional Water Quality Control Board

No.	Comments	Responses
REVIEW COMMENTS – Adriana Constantinescu, P.G., Regional Water Quality Control Board dated March 14, 2013		
GENERAL COMMENTS		
1.	Background The January 3, 2013, ROD presents the selected remedies for 19 groundwater cleanup sites at Travis AFB, Fairfield, California. The ROD will be used to define the groundwater remedial action endpoints and will describe the land use controls associated with each remedy and site. The U.S. Air Force (AF) manages the remediation of groundwater contamination originating from releases associated with 19 sites in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act. The AF and U.S. EPA evaluated and selected the remedies for contaminated groundwater. The California Department of Substances Control and San Francisco Bay Regional Water Quality Control Board (Regional Water Board) concurred with the selected remedies by providing comments and concurrence from 1996 through 2013 for the 19 groundwater cleanup sites.	No response required.
SPECIFIC COMMENTS		
1.	Comments Table B-1 *Chemical Specific Applicable or Relevant and Appropriate Requirements* (ARARs) summarizes the chemical-specific, location-specific, and action-specific ARARs and the *to be considered* (TBC) requirements for the selected remedies. Table B-1 also describes how the selected remedies perform at historically agreed-upon points of compliance. However, Table B-1 does not reference the Water Board's ARARs Table that was attached to the September 30, 2010, *Resource Document*, issued by State Water Resources Control Board (SWRCB) as a result of 18 months of collaboration with the AF. A copy of the *September 30, 2010, Resource Document was provided to the AF on February 20, 2013. The Resource Document* contains joint comments (language that was agreed upon by the AF and the State Water Board). These joint comments should have been included in the ARAR Table B-1 attached to the ROD, rather than just the AF comments. Based on a review of the September 20, 2010 Resource Document, the Regional Water Board does not agree with the following determinations that were presented in Table B-1: Table B-1 presents the Water Quality Control Plan, San Francisco Bay Basin (Basin Plan) as a TBC requirement. Based on your definition from page 2.13-3, TBC materials are non promulgated advisories, guidance, or proposed standards issued by federal or state government that are not legally binding, but that may provide useful information or recommended procedures. This definition does not apply to the	The Air Force's determination of the Basin Plan as TBC was not changed in Table C-1 – Chemical-specific ARARs (formerly Table B-1). However, we revised the Comments column of the table as follows: "See Joint AF/State, AF, State, EPA position comments 2 below." We also added the Air Force/State, Air Force, State, and EPA position comments on the Basin Plan to the bottom of the table. Please note that Site ST018 is not addressed in this groundwater ROD; it is separately managed under the Travis AFB Petroleum Only Contaminated (POCO) program as a site with only petroleum fuel hydrocarbon contamination.

No.	Comments	Responses
	Basin Plan. The Basin Plan is the master policy document adopted by the Regional Water Board and approved by the Office of Administrative Law and the U.S. Environmental Protection Agency. In addition, discharge of treated groundwater from site ST0018 is subject to prohibitions included in Order No. R2-2012-0012 issued under the authority of the Basin Plan and the Porter Cologne Water Quality Control Act. In our opinion the Basin Plan is an *applicable requirement* for the discharge of treated groundwater;	
2.	Table B-1 presents SWRCB Resolution No. 92-49 (Res. 92-49) as a TBC requirement. We consider that Res. 92-49 is an applicable ARAR because according to CERCLA, state ARARs can be those that are more stringent than federal law. In addition, Res. 92-49 has language nearly identical to federal regulations that are also ARARs for groundwater cleanups;	The Air Force's determination of SWRCB Resolution No. 92-49 as TBC was not changed in Table C-1 – Chemical-specific ARARs (formerly Table B-1). However, we revised the Comments column of the table as follows: "See Joint AF/State, AF, State, EPA position comments 1 below." We also added the Air Force/State, Air Force, State, and EPA position comments on SWRCB Resolution No. 92-49 to the bottom of the table.
3.	Table B-1 does not include SWRCB Resolution No. 68-16 (*Antidegradation Policy*) as an ARAR. Regional Water Board considers State Resolution 68-16 as an applicable ARAR because reinjection or discharge of treated effluent into surface water and groundwater takes place at the Travis AFB project. In addition, a U.S. EPA decision resolving a dispute between the AF and the State at Mather/George AFBs, where discharge of treated effluent took place, concluded that State Resolution 68-16 should be an ARAR;	The Air Force's determination of SWRCB Resolution No. 68-16 as TBC was not changed in Table C-1 – Chemical-specific ARARs (formerly Table B-1). However, we revised the Comments column of the table as follows: "See Joint AF/EPA/State, AF, State position comments 4 below." We also added the Air Force/EPA/State, Air Force, and State position comments on SWRCB Resolution No. 68-16 to the bottom of the table.
4.	Table B-1 presents SWRCB Resolution 88-63 (*Sources of Drinking Water Policy*) as a TBC requirement. The Regional Water Board considers Resolution 88-63 as an applicable ARAR because the beneficial use designations in the Basin Plan apply to restoration actions at Travis AFB.	The Air Force's determination of SWRCB Resolution No. 88-63 as TBC was not changed in Table C-1 – Chemical-specific ARARs (formerly Table B-1). However, we revised the Comments column of the table as follows: "See Joint AF/State, AF, State, EPA position comments 3 below." We also added the Air Force/State, Air Force, State, and EPA position comments on SWRCB Resolution No. 88-63 to the bottom of the table.
5.	Table B-1 should have in the *Notes* section an explanation for the acronym TBC.	We added the following to the Notes section: "TBC = To Be Considered".