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Mr. Aaron Yue
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Ms. Kris Doebller
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Denver, Colorado 80225

Subject: Responses to Comments on the Work Plan for East Ravine Groundwater Investigation, PG&E Topock Compressor Station, Needles, California

Dear Mr. Yue and Ms. Doebller:

Per your request, this letter provides responses from Pacific Gas and Electric Company (PG&E) to comments contained in the following documents:

- I. Letter from United States Department of the Interior (DOI) dated January 8, 2008 to PG&E entitled "PG&E Topock Compressor Station Remediation Site - Transmittal of DOI's Comments on the Work Plan for East Ravine Groundwater Investigation."
- II. Letter from the California Department of Toxic Substances Control (DTSC) dated January 7, 2008 to PG&E entitled "Comments on the East Ravine Groundwater Investigation Work Plan, Pacific Gas and Electric Company (PG&E), Topock Compressor Station, Needles, California (EPA ID No. CAT080011729)."
- III. Email from the Metropolitan Water District of Southern California (MWD) dated December 21, 2007 to DTSC (contains forwarded email from Geopentech dated December 20, 2007 to MWD).
- IV. Letter from Hargis + Associates on behalf of the Fort Mojave Indian Tribe (FMIT) dated December 28, 2007 to DTSC entitled "Fort Mojave Indian Tribe Comments on Pacific Gas

& Electric Co. December 11, 2007, document titled 'Work Plan for East Ravine Groundwater Investigation, PG&E Topock Compressor Station, Needles, California.'

- V. Letter with two attachments from Colorado River Indian Tribes (CRIT), Office of the Attorney General letter dated December 28, 2007 to DTSC entitled "Comments on Work Plan for East Ravine Groundwater Investigation PG&E Topock Compressor Station, Needles, California."

The comments provided in each document are reprinted below for reference and assigned a consecutive comment number, immediately followed by PG&E's response in italics.

I. Response to DOI January 8, 2008 Comment Letter

1. **Comment:** General: The document provides a brief summary of the investigation objectives but still does not present a process that resembles the Data Quality Objectives (DQOs). What are the Goals of the Study and what decisions are to be made? What are the necessary inputs to these decisions that will allow the decision-makers to accept the results? There have been many discussions on the use of the DQO process for investigations at the Topock Site. Why were the DQOs eliminated from this effort?

Response: *This Work Plan was submitted by PG&E at the request of DTSC for a streamlined, reconnaissance-level investigation to provide an initial assessment to determine if a possible contaminant source in AOC-10 (East Ravine) has affected the groundwater. DTSC emphasized that the Work Plan should be brief and submitted as soon as possible. Further, given the lack of empirical lithologic and hydrogeologic data in this area, the Work Plan was to be presented in a manner that allows the technical experts to use good judgment in the field and not be locked into a specific course of action. Based on this guidance, it is PG&E's view that any benefit realized from a more formalized DQO process at this stage of the investigation is limited, and will adversely affect the RFI schedule. Therefore, the decision to use the DQO process to identify successive phases of this investigation should be deferred until it is determined through this initial investigation if additional investigations in this area are required. No changes to the work plan are proposed in response to this comment.*

2. **Comment:** General: Please note throughout the document that DOI and the Havasu National Wildlife Refuge (NWR) deal with wildlife issues that are outside the legal requirements of the endangered species act. There appears to be a general lumping of all wildlife issues into endangered species, but the NWR is concerned with the potential degradation of all wildlife habitat value.

Response: *Comment noted. No changes to the work plan are proposed in response to this comment. Please advise PG&E if specific language changes are required to respond fully to this comment.*

3. **Comment:** Regarding Section 1.2, Investigation Background: This study is being performed to assess the potential for groundwater flow paths in bedrock in the vicinity of the East Ravine and should address the possibility of flow in the uppermost bedrock interval just beneath the alluvium/bedrock contact. The collective understanding is that

the GW contamination is bounded by the Miocene Conglomerate and older crystalline bedrock; however, current GW data suggest that there may be some impact to these units in the East Ravine area as indicated by the unsuspected concentrations of CR+6 noted during some recent GW sampling events. Existing data are insufficient to support a site conceptual model showing that the hexavalent chromium plume is confined to the alluvial aquifer, or that the top of the Miocene Conglomerate bedrock bounds the plume. Why wasn't this noted earlier? This could impact the validity of the current CSM. How will this be handled in the GW RFI/FI?

Response: *As detailed in Section 1.2.2 of the Work Plan (Chromium Sampling Results at Well MW-23), anomalously high hexavalent chromium results were observed in MW-23 during the December 2006 and March 2007 sampling events. These results were inconsistent with previous and subsequent samples from this well. To further investigate the anomalously high concentrations, a special 3-day sampling effort, developed in consultation with DTSC, was conducted in June 2007. The results of this 3 day sampling effort, which evaluated the effects of various purge conditions on chromium concentrations in groundwater, did not reveal any conditions under which elevated concentrations could be obtained. As stated in DTSC's October 29, 2007 letter, this particular issue was previously presented and discussed at the August and October 2007 Geo/Hydro Technical Work Group Meetings, the August 2007 Consultative Work Group Meeting, and in other meetings with PG&E representatives.*

PG&E acknowledges that DOI is interested in the characterization of groundwater that may be found in the uppermost portion of bedrock. As presented in the Work Plan, single-screen monitoring wells will be constructed in boreholes terminated at the interface of bedrock and the alluvium at drilling Sites A and B. As illustrated in the cross-sections (Figure 3), the bedrock-alluvium interface is anticipated to be of a higher elevation than the groundwater table; therefore, the purpose of the alluvial monitoring wells at these locations is to monitor groundwater that may become temporarily perched at the alluvium/bedrock interface during groundwater recharge events. Because groundwater follows the path of least resistance, and based on field observation the alluvium is more permeable than the bedrock, as groundwater moves downward through the vadose zone it may become temporarily perched at the interface of alluvium and bedrock. If the wells were screened across the alluvium and down into the bedrock, this perched water could accumulate in the bedrock section of the borehole and infiltrate into bedrock where it might otherwise not have access. It is PG&E's view that cross connecting the potentially contaminated alluvium and likely uncontaminated bedrock with a common screen would not be good practice and could result in contaminants being introduced to a previously uncontaminated bedrock unit.

PG&E believes that the current CSM is based on a solid, peer-reviewed analysis of the current data, and that it has served as a valid, useful tool for overall management of the site. A CSM is based on all available data, and PG&E looks forward to refinement of the CSM with DOI and DTSC in the future as additional data is collected.

No changes to the work plan are proposed in response to this comment.

4. **Comment:** Regarding Section 1.2.1, Investigation Background: The property is Bureau of Reclamation property managed by the USFWS/Havasui National Wildlife Refuge.

Comment: *Concur. The third sentence in the first paragraph of Section 1.2.1 of the Work Plan (Investigation Area Overview) will be revised as follows:*

"Portions of the East Ravine are on PG&E property outside the compressor station fence line and other portions of the ravine are located on property owned by the United States Bureau of Reclamation (BOR) and managed by United States Fish and Wildlife Service (USFWS)/Havas National Wildlife Refuge (HNWR)."

5. **Comment:** Regarding Section 2.1, Investigation Overview: The two cross-sections present a conceptual representation of the subsurface geology. There is limited lithologic data in this area to have a lot of confidence that the two cross sections are truly accurate. Suggest stating that these two cross-sections conceptually represent the lithology in the area.

Response: *Concur. Figure 3 will be annotated as "conceptual" and empirical data presented in the section will be cited.*

6. **Comment:** Regarding Section 2.1, Investigation Overview: It would be useful to see flow path oriented cross sections with the contingency locations plotted along potential NE and E flow paths toward the river, which are the basis for Site B and contingency well locations C and E.

Response: *As noted in the comment above, there is limited geologic data from which to draw cross sections in this area. There is also limited information about the direction of groundwater flow. It is PG&E's view that the additional cross sections would be highly speculative and of limited use for the Work Plan. Following installation of the new wells, there will be additional hydrogeologic information for the East Ravine area and additional cross sections could be included in the interim results technical memorandum. No changes to the work plan are proposed in response to this comment.*

7. **Comment:** Regarding Section 2.1.1, Primary Drilling Site A: Is one purpose of this drilling to identify the depth of the fault? If the fault is encountered at a depth shallower than 180 feet will the boring be terminated at the fault intercept?

Response: *As stated in DTSC's October 29, 2007 letter, the primary objective of this investigation is to determine if a contaminant source in AOC-10 has impacted the groundwater in bedrock, and if impact is detected, then the general nature and extent of the contamination should be determined. In response to comments received on the draft Work Plan, target drilling depths will be deepened to 225 feet to increase the chances that the Chemehuevi Detachment Fault or Fault Zone may be encountered; however, evaluation of the fault is not a required objective of the investigation. All borings will be drilled to the depths indicated in the Work Plan regardless of the lithology encountered. Specifically, if the fault is encountered at a depth shallower than 180 feet, the boring will not be terminated at the fault intercept.*

No changes to the work plan are proposed in response to this comment.

8. **Comment:** Regarding Sections 2.1.1, 2.1.2, and 2.1.3, Primary Drilling Site A, Primary Drilling Site B, and Contingency Drilling Sites: These sections should discuss the basis for the primary and alternative locations in terms of the potential flow paths being assessed. These locations were discussed several times and there was limited discussion on whether the sites were feasible or not, other than their accessibility. What are the potential groundwater migration pathways for surface soil contaminants? Is there a chance that the locations will have to be moved due to various constraints not identified in the plan? If so then provide decision logic for locating the wells other than where shown on the figures. This presentation is the beginning of the If/then statements used in the DQOs.

Response: *Due to the relatively small scale of the study area and the difficult terrain, the number of potential drilling locations that are accessible by the required drilling equipment is limited, without significant terrain modification. The most feasible drilling locations are presented in the Work Plan and are not anticipated to be moved. The lack of subsurface data in the study area precludes answering the questions posed in this comment regarding potential flow paths or drilling site feasibility without significant speculation; however, it is anticipated that data obtained from this investigation will assist in answering these questions. No changes to the work plan are proposed in response to this comment.*

9. **Comment:** Regarding Section 2.1.3, Contingency Drilling Sites: Site C Alternate-1 location is within an area of exposed crystalline bedrock; presumably below the fault plane (the work plan assumes the ground surface in this area is the expression of the fault plane). Because there is very little likelihood of encountering contaminated groundwater in a well installed at this location, DOI believes the Site C location is more useful for addressing the project objectives.

Response: *All drilling locations in the study area that are accessible by the required drilling equipment without significant terrain modification have been included in the Work Plan. Based on the available data, likelihood of encountering contaminated groundwater in bedrock beneath Site C Alternate-1 is unclear. DTSC suggested this location could provide a bound on the southern extent if contamination was detected at Sites to the north. As stated in the Work Plan, the drilling of contingency sites will be based on the data obtained from Sites A and B. No changes to the work plan are proposed in response to this comment.*

It should be noted that the geologic conditions beneath Site F, which will be added to the Work Plan as a contingency location based on the response to DTSC comment 3, are anticipated to be similar to that encountered beneath Site C Alternate-1.

10. **Comment:** Regarding Section 2.1.3, Contingency Drilling Sites: Explain the basis for the Cr+6 concentrations of 100 µg/L and 50 µg/L as the criteria for installation of the contingency wells.

Response: *The trigger concentrations referenced in this comment were suggested by DTSC. The Work Plan text will be revised to explain that contingency wells will be installed if trigger levels*

are exceeded but may be installed based on discussion with and direction from DTSC and DOI if Cr(VI) is present at concentrations less than trigger levels in primary wells.

11. **Comment:** Regarding Section 2.1.3, Contingency Drilling Sites: Criteria of 50 or 100 µg/L have not been established elsewhere at the site as basis for site-related plume delineation and DOI does not think they are not appropriate for this purpose at the East Ravine. DOI requests that these criteria be removed from the work plan and that decisions about installation of contingency wells be made jointly by PG&E, CA DTSC and DOI technical experts once data from the primary sites becomes available.

Response: *Please review the response to DOI comment 10.*

12. **Comment:** Regarding Section 2.1.3 (paragraph 1), Contingency Drilling Sites: This paragraph should state that access routes and drilling sites have been identified (see Figure 2) and will be clearly delineated prior to any mobilization. If modifications to the access routes are needed, the approving agency will be contacted for approval prior to any activity. Further describe and quantify any grading activity and quantify the area of disturbance.

Response: *Section 2.2 (rather than Section 2.1.3) states that the proposed access routes and drilling sites will be clearly delineated prior to mobilization. Drilling locations identified in the Work Plan were proposed because they require minimal terrain modification for equipment access. However, please review the response to DTSC comment 2 regarding grading that would be associated with the addition of a potential additional drilling location near the impoundment of AOC-10c. This potential additional drilling location was not identified by PG&E in the Work Plan.*

13. **Comment:** Regarding Section 2.3 and 2.5.1, Borehole Drilling Requirements, Alluvial Monitoring Well Design and Specifications: DOI recommends that the shallow well in each pair be designed to monitor a vertical interval across the alluvium bedrock contact and extend downward at least 5 feet into the Miocene bedrock.

Response: *Please review the response to DOI comment 3. PG&E considers cross connecting alluvium and bedrock not to be good practice. No changes to the work plan are proposed in response to this comment.*

14. **Comment:** Regarding Section 2.3.1 (paragraph 3), Drilling Methods: The text states that the drilling used for coring is typically water with no additives. Is this the approach that PG&E will use for collecting the core? Are any additives planned for the coring fluids? What is the plan if circulation is lost? Will the volume of water introduced into the formation be recorded so it can be removed during the development process?

Response: *Coring activities will be initiated using water with no additives. If the driller deems it necessary to add bentonite to the drilling fluid to remove cuttings from the borehole then it will be added; however, given the low yield that is anticipated in bedrock at these locations, the addition of bentonite to the drilling fluid will be minimized to ease borehole development.*

The volume of water introduced into the formation will be recorded as noted in the response to DTSC comment 17.

15. **Comment:** Regarding Section 2.3.2, Core Logging: The volume of water introduced as lost to the formation during any drilling or coring activities should be recorded and managed during the development process.

Response: *Please review Sections 2.3.2 and 2.4.1 of the Work Plan (Core Logging, Borehole Development and Geophysical Logging) and the response to DTSC comment 17.*

16. **Comment:** Regarding Section 2.4.1, Borehole Development and Geophysical Logging: What are the criteria for acceptable development? What constitutes a developed well? Is there a requirement for removing a multiple of the volume of the water introduced during the drilling or sampling? Need to provide some additional detail on the development process.

Response: *Please review the response to DTSC comment 6 for additional information regarding the difference between borehole development and well development for this scope of work. For this investigation, the borehole will be considered developed once groundwater that exhibits water quality measurements indicative of bedrock conditions (e.g., elevated specific conductance) as compared to the water used for drilling. The volume of water lost to the formation during drilling is considered in the borehole development process; however, the simple application of a multiple to the volume of water lost to the formation during drilling to indicate the completion of development activities may not be applicable to the hydrogeologic conditions encountered.*

17. **Comment:** Regarding Section 2.4.2, Permeability Testing: The text states that permeability testing may be conducted...What will trigger the permeability testing? Are all four methods of permeability testing described in this section being proposed? How will the decision be made as to which method to use?

Response: *DTSC comment #15 has directed that permeability testing will be conducted. The second paragraph of Section 2.4.2 of the Work Plan (Permeability Testing) will be revised for clarity as follows:*

"The effectiveness of permeability testing methods is dependent on the yield of the interval tested. Four different permeability testing methods are proposed in the following subsections, in no particular order. Each of these has advantages and disadvantages and different limitations. One method will be chosen based on observations during drilling, borehole development, and geophysical testing."

In addition, please review the response to DTSC comment 15.

18. **Comment:** General: Need to include DOI in the decision process since they are the landowner for the property outside the PG&E plant.

Response: *PG&E concurs. PG&E will notify DOI of conference calls scheduled with DTSC regarding field data collected and the "next step" decisions to be made based on the data.*

Please see the response to DTSC comments 5, 8, 15, and 18, which include revisions to the Work Plan.

19. **Comment:** Regarding Section 2.4.3, Hydraulic Testing: How will the decision be made regarding whether or not to conduct hydraulic testing?

Response: *For clarity, the following sentence will be added to the end of the first paragraph of Section 2.4.3 of the Work Plan (Hydraulic Testing):*

"The decision to conduct hydraulic testing will be based on data obtained during borehole drilling, geophysical logging, borehole development and permeability testing, and will be made in consultation with DTSC and DOI."

20. **Comment:** Regarding Section 2.5.1.1, Alluvial Well Casing and Screen: How will PG&E ensure that the casings will be straight and plumb? Will centralizers be used for wells deeper than 50 feet?

Response: *A bullet will be added to Section 2.5.1.1 (Well Casing and Screen) to explicitly state that centralizers will be used. The bullet will be inserted as follows:*

"Centralizers will be installed approximately every 50 feet to keep the well centered in the borehole."

21. **Comment:** Regarding Section 2.5, Monitoring Well Installation: The section discusses the potential well designs and construction materials for the alluvial and bedrock wells. What are the possible conditions that would change these designs and what would trigger a change?

Response: *It should be noted that only one well design is proposed for the alluvial monitoring wells. There are many variables that must be factored into the final bedrock well design, should a well construction be determined necessary. The intention of this Work Plan is to provide several installation options that may be applicable depending on the data obtained during drilling and subsequent hydraulic and water quality testing. Because there is minimal data available regarding bedrock hydraulics in the study area, flexibility was intentionally designed into the Work Plan to allow the technical experts to use good judgment in the field and not be locked into a specific course of action by the Work Plan. No changes to the work plan are proposed in response to this comment.*

22. **Comment:** Regarding Section 2.5.1.2, Alluvial Well Borehole Completion Materials: What is the thickness of the filter pack planned? Typically a 2-inch annular space is desired around the well screen. Will the sand and grout be tremied into place? If not how will voids be avoided?

Response: *A sentence will be added to the end of the second paragraph in Section 2.3.1 of the Work Plan (Drilling Methods) for clarity. The sentence will read as follows:*

"Rotasonic boreholes drilled for well construction within the alluvium will be a minimum of six inches in diameter to provide adequate annular space for annular well construction materials."

It should be noted that filter pack sand does not need to be tremied into place when constructing a monitoring well at the depths anticipated during this investigation. The wells casings and annular materials are installed within the rotonsonic drive casing and the drive casing is vibrated out in phases, which prevents the formation of voids within the annular materials. Further, because grouting will be conducted in the vadose zone, the use of a tremie pipe is not required.

23. **Comment:** Regarding Section 2.5.2, Bedrock Monitoring Well Design and Specifications: Would it make the process easier for the installation of bedrock monitoring wells if a larger core were collected? Does NQ core give a borehole larger than 4 inches in diameter?

Response: *Please review the response to DTSC comment 11, which presents a revision to the Work Plan.*

24. **Comment:** Regarding Section 2.5.3, Monitoring Well Surface Completion: Provide the total square footage that will be covered by the wellhead monuments.

Response: *As stated in Section 2.5.3 of the Work Plan (Surface Completion), each above ground completion will be installed with a 4-foot by 4-foot by 4-inch-thick concrete pad; therefore, the total square footage that will be covered by each above-ground wellhead monument will be approximately 16 square feet. For clarity, the third sentence in Section 2.5.3 of the Work Plan will be revised to include the concrete pad dimensions for subsurface well vaults as follows:*

"The subsurface well vault will be set in a 4-foot by 4-foot by 4-inch-thick concrete pad and equipped with an appropriate cover or lid."

It should be noted that the total square footage covered by well completions for the East Ravine Groundwater Investigation will depend on the total number of wells installed.

25. **Comment:** Regarding Section 2.5.4, Well Development: For development of wells it will be necessary to be sure that adequate volume of water is removed from the well to allow for an accurate representation of the ground water quality. Is there a SOP for well development that specifies what is considered acceptable development?

Response: *Well development procedures for wells constructed within the alluvium are defined in SOP-B1 of the Topock Field Procedures Manual, which has been approved by DTSC; however, the use of this SOP for this scope of work may be limited. It is PG&E's view that the development of vadose zone wells that may contain perched water or the development of specialized bedrock monitoring wells is an uncommon activity, and therefore does not require a specific standard operating procedure (SOP).*

In addition, please review the response to DOI comment 16 and DTSC comment 6, which includes revisions to the Work Plan.

26. **Comment:** Regarding Section 4.1 (paragraph 3), Anticipated Approvals: Revise the following sentence as shown: "...the proposed work plan activities will be conducted consistent with the PBA 2007".

Response: *The first sentence of the third paragraph of Section 4.1 of the Work Plan (Anticipated Approvals) will be revised as follows:*

"As discussed further in Section 4.2 (Biological Evaluation) below, the proposed work plan activities will be conducted in a manner consistent with the PBA (CH2M HILL, 2007c), and therefore in compliance with ESA requirements."

27. **Comment:** Regarding Section 4.2 (paragraph 1), Biological Evaluation: Revise the following sentence as shown: "...are addressed in Section 3.3.1 of the PBA 2007 as a Category 1 activity..."

Response: *The third sentence of the third paragraph of Section 4.2 of the Work Plan (Biological Evaluation) will be revised as follows:*

"Groundwater characterization activities, such as those proposed at the East Ravine, are addressed in Section 3.3.1 of the PBA (CH2M HILL, 2007c) as a Category 1 activity (i.e., well installation, maintenance, and operation)."

28. **Comment:** Regarding Section 4.2.1 (paragraph 1), Project Timing: This section is important to evaluate the timing of activities in relationship to sensitive migratory bird and SW Flycatcher seasons. Provide more definitive timeframes.

Response: *As noted in the Work Plan, field activities are anticipated to commence in early May and the primary drilling sites field investigation is expected to last approximately 5 weeks. The precise dates are contingent upon receipt of necessary approvals and authorizations. Once the Work Plan is finalized, project planning and permitting activities will begin. The implementation dates and schedule will be finalized during the planning and permitting activities. A pre- and post-construction survey will be conducted by a qualified biologist, in part, to identify sensitive migratory bird species that may be in the study area. For clarity, the first sentence of Section 2.2 (Site Preparation, Access, and Equipment Staging) will be revised as follows:*

"The proposed access routes and drilling sites will be field-checked and clearly delineated by a qualified biologist prior to drilling equipment mobilization and following the completion of all investigation activities."

29. **Comment:** Regarding Section 4.2.2, Project Location and Habitat Sensitivity: Revise the following sentences as shown: "...activity at these sites will be limited to existing roadways..."; "Well Site E is within 200 feet of the Colorado River floodplain, including identified sensitive avian habitat..."

Response: *The fourth sentence of Section 4.2.2 of the Work Plan (Project Location and Habitat Sensitivity) will be revised as follows:*

"Project activity at these sites will be limited to the existing roadways and immediately adjacent areas."

The fifth sentence of Section 4.2.2 of the Work Plan (Project Location and Habitat Sensitivity) will be revised as follows:

"Well Site E (including alternative sites) is within 200 feet of the Colorado River floodplain, including potentially sensitive avian habitat and designated critical habitat for the bonytail chub."

30. **Comment:** Regarding Section 4.2.3, Habitat Loss: This section is important to quantify the amount of vegetation removed and the amount of square footage or acreage of habitat lost or impacted. Provide a clear description of the amount of habitat that will be lost and how it will be recorded.

Response: *Section 4.2.3 of the Work Plan (Habitat Loss) has been revised to indicate quantities of vegetation that may be removed during this investigation. However, it should be noted that drilling locations were sited in previously cleared areas in order to avoid the removal of vegetation. The text will read as follows:*

"No habitat loss will occur during well installation activities at well Sites A and D; these sites are located on previously disturbed areas within the Topock Compressor Station. Well installation activities at Sites B and C may require limited vegetation removal (less than 0.25 acres), but are expected to be sited primarily within or adjacent to existing access roads. Installation activity at well Site E (including alternative sites) could result in floodplain habitat loss, defined as "the removal of trees and perennial shrubs" in the PBA. However, the maximum total habitat loss resulting from the work plan activities is estimated to be less than 0.25 acre. Therefore, the proposed work plan activities described herein would conform to the cumulative limits of 2.5 acres of floodplain habitat loss and 3.0 acres of upland habitat loss prescribed in the PBA. Additional conservation measures applicable to the work plan activities are described below."

31. **Comment:** Regarding Section 4.2.5, Listed Species Determinations: Southwest Willow Flycatcher. Project activities may be occurring during the March 15th Migratory Bird season and the May 1st Southwestern Willow Flycatcher nesting season. Site E is within 200 feet of the floodplain and sensitive habitat. Conservation measures consistent with the PBA 2007 must be implemented to minimize any impacts. How long are drilling activities anticipated to last at this location.

The statement "Also, there is no expected habitat loss as a result of the work plan investigative activities" is inconsistent with Section 4.2.3 Habitat Loss. Provide clarification.

Response: *The schedule for the contingent sites drilling investigation is included in Table 4 in the Work Plan. As noted, the number of days for drilling, characterization, and well installation is not yet defined.*

The fourth sentence of the Mojave desert tortoise subsection of Section 4.2.5 of the Work Plan (Listed Species Determinations) will be deleted as the potential for habitat loss is discussed in Section 4.2.3.

32. **Comment:** Regarding Section 4.2.6, Biological Evaluation Conclusion: "...within the context and boundaries outlined in the PBA 2007, including the general management measures, mitigation measures, BLM Lake Havasu Field Office. Therefore..."

Response: *The first sentence of Section 4.2.6 of the Work Plan (Biological Evaluation Conclusion) will be revised as follows:*

"The activities proposed in this work plan are within the context and boundaries outlined in the PBA (CH2M HILL, 2007c), including the general management measures, mitigation measures, and BLM Lake Havasu Field Office."

33. **Comment:** Regarding Section 5.2, Reporting: The results of geophysical logging, and permeability and hydraulic testing should also be presented in the interim results technical memorandum.

Response: *To add clarity, a sentence will be added to the first paragraph of Section 5.2 of the Work Plan (Reporting), so that the second and third sentences of the first paragraph read as follows:*

"The interim results technical memorandum will include the core logs for the borings, initial groundwater characterization data, well construction logs, and the groundwater sampling data and validated analytical results. In addition, the memorandum will include a summary of geophysical logging, permeability testing, and hydraulic testing that may have been conducted."

34. **Comment:** Regarding Section 5.2, Reporting: There should be a detailed data quality assessment (DQA) outlining the validation process and a discussion of the PARCC requirements and sensitivity issues and how these criteria affect the decisions being made.

Response: *To add clarity, another sentence will be added to the first paragraph in Section 5.2 of the Work Plan (Reporting), as follows:*

"The interim results technical memorandum will include an analytical data quality review summarizing the independent review of the laboratory analytical data by project chemists to assess data quality and to identify deviations from analytical requirements."

35. **Comment:** Regarding Table 1, Approvals Drilling, Characterization, and Well Installation Plan: There should be some discussion either in the table or text that identifies what possible criteria would make the drilling of planned wells infeasible.

Response: *Please review the response to DOI comments 1 and 8.*

36. **Comment:** Regarding Table 1, Approvals Drilling, Characterization, and Well Installation Plan: Additional information on the potential flow path being addressed by well should be added to the objective.

Response: *Please review the response to DOI comment 8.*

37. **Comment:** Regarding Table 1, Approvals Drilling, Characterization, and Well Installation Plan: Increase the depth of the shallow well to allow for monitoring potential flow within weathered fractured Miocene bedrock contact to a depth of at least 5 feet below the contact.

Response: *Please review the response to DOI comment 3.*

38. **Comment:** Regarding Table 3, Approvals and Authorizations for Drilling and Well Installation: Change USFWS to USBLM

Response: *The fourth entry in the "Agency/Organization" column on this table will be changed from "U.S. Fish and Wildlife Service" to "U.S. Bureau of Land Management".*

39. **Comment:** Regarding Table 3, Approvals and Authorizations for Drilling and Well Installation: Should read "...DOI lead with Section 7 ESA requirements. Guides work plan compliance within the scope of the PBA 2007 and conducts associated Section 7 consultation."

Response: *The fourth entry in the "Approvals and Authorizations" column on this table will be revised to read as follows:*

"DOI lead with Section 7 ESA requirements. Guides work plan compliance within the scope of the PBA 2007 and conducts associated Section 7 consultation."

40. **Comment:** Regarding Figure 2, Proposed Locations for Groundwater Investigations at East Ravine: Add contingency well Site D to the Site A cross section. Reorient the Site B cross section along the anticipated NE flow path, or add another cross section along the anticipated NE flow path. Add an eastward cross section from AOC 10d through contingency Site C.

Response: *Please review the response to DOI comment 6. In addition, it is PG&E's view that the projection of Site D onto the Site A cross section for the work planning does not add significant value to the reader because there is no data associated with this location, and Site D may not be drilled.*

41. **Comment:** Regarding Figure 2, Proposed Locations for Groundwater Investigations at East Ravine: There should be some indication of the direction of the groundwater flow on these two figures. This will provide the reader with a clearer understanding of whether the proposed wells are down gradient from the suspected source.

Response: *Wells have been located to be down-dip on the bedrock surface to intercept potential perched water flow from the suspected source area and downstream from the source area to intercept any potential flow along the axis of the ravine.*

42. **Comment:** Regarding Figure 4, Proposed Well Construction Schematic: Increase the depth of the shallow well to allow for monitoring potential flow within weathered fractured Miocene bedrock contact to a depth of at least 5 feet below the contact.

Response: Please review the response to DOI comment 3. In addition, Figure 4 will be revised to illustrate the bottom of the alluvial well screen at the interface of the alluvium and bedrock.

II. Response to DTSC January 8, 2008 Comment Letter

1. **Comment:** Regarding Section 2.1, Investigation Overview: An alluvial monitoring well at Site A may be unwarranted if bedrock is encountered at shallow depths above the base of the former impoundment/ AOC 10c area. Conceptually, the alluvial wells are designed to determine if perched water or transient subflow along the top of the bedrock/base of the alluvium occurs away from suspected source areas (e.g., AOC 10c). PG&E should consult with DTSC after the deeper Site A exploration borehole is drilled and logged to determine if the Site A alluvial well should be installed. A similar strategy should be applied to the proposed alluvial wells at contingent Sites C and D.

Response: Concur. It is anticipated that all borehole drilling in the alluvium will be conducted using rotosonic methods and subsequent borehole drilling into bedrock will be conducted using rotary coring methods. To minimize drilling rig mobilization costs, all rotosonic drilling will be conducted initially to install conductor casings for bedrock coring and install wells in the alluvium, as necessary. Consistent with practices developed during previous well installation efforts at Topock, PG&E will provide field schedule updates to DTSC and arrange consultation conference calls as lithologic data is collected so well designs can be determined based on input from all interested stakeholders. Lithologic data collected during drilling may indicate that an alluvial monitoring well at Site A may be unwarranted; however, for planning purposes, this well will remain in the Work Plan. No changes to the work plan are proposed in response to this comment.

2. **Comment:** Regarding Section 2.1, Investigation Overview: EMC believes that more initial drilling locations, including drilling immediately next to the impoundment, are required (EMC, 2007). The GSU understands that drilling adjacent to the impoundment was not considered by PG&E due to physical constraints posed by the ravine topography. However, PG&E should further evaluate completing wells within or immediately adjacent to the former impoundment as installing wells adjacent to potential source areas is generally beneficial in evaluating if a former unit has impacted the environment. If it is feasible to install a well in or adjacent to the former impoundment, it is recommended that the well be included in the Work Plan as an initial well.

Response: PG&E understands that, in response to this comment, DTSC is requesting that PG&E provide additional information about the technical feasibility of accessing this location for installation of a well group within the former impoundment (AOC -10c). Grading and filling will be required to gain access to the former impoundment with the required drilling equipment.

The proposed equipment access pathway would parallel the southern side of the paved roadway from the AOC-10d sub area to the impoundment east of the AOC-10c sub area. Approximate areas requiring modification, which are depicted on Figure RTC-1, include the following:

- *Grading and filling of a depressed area with moderately steep slopes to the northwest of sample location AOC-10d. The area requiring modification is approximately 50 feet long by 20 feet wide.*
- *Cutting and grading of a pathway down the western side (northwest to southeast) of the impoundment immediately east of the AOC-10c sub area. The area requiring modification is approximately 75 feet long by 20 feet wide.*

With the exception of grass that appears to persist in the AOC-10c low area during times of surface water retention, this proposed equipment access route does not impact vegetation.

This proposed equipment access route is the same as that proposed to facilitate "mini-rotasonic" rig access for soil sample collection as part of the Soil Sampling Part A, Phase 1 project, which is expected to be conducted prior to the East Ravine Groundwater Investigation. Prior to coring rig mobilization, the pathway established for the soil sampling project will be evaluated for safe rig access; however, because the coring rig may be larger, the pathway may have to be modified.

3. **Comment:** Regarding Section 2.1.3, Contingency Drilling Sites: An additional drilling site, Site F, is recommended in the event elevated chromium is detected at contingent Sites D or C. The purpose of Site F would be to bound contamination, if detected, to the south. It is desired that Site F be located along the existing east-west pipeline road pictured at the base of Figure 2 in the Work Plan and somewhere south of the AOC 10d area.

Response: *PG&E concurs that including additional potential drilling sites in the Work Plan will provide flexibility in the event elevated chromium is detected at other locations and that the addition of Site F may be beneficial to evaluate groundwater quality south of contingent Sites D or C. Contingent Site F will be added to all applicable sections of the Work Plan.*

4. **Comment:** Regarding Section 2.1.3, Contingency Drilling Sites: Both DOI and EMC identified concerns with the rationale for the 50 and 100 ug/L chromium concentration levels from Site A and Site B groundwater wells that would trigger installation of the contingency wells (DOI, 2008; EMC, 2007). DTSC understood that the contingency trigger levels would be used to identify the majority of the plume extent, if a plume exists, in the East Ravine area. Characterization would not necessarily be complete, but a general understanding of plume configuration would be provided through implementation of the Work Plan. As there are circumstances in which installation of contingency wells might be warranted below the proposed trigger levels, it is recommended that further evaluation of contingent well locations be conducted by the PG&E Topock Technical Workgroup (TWG) for wells that yield trigger values below those proposed in the Work Plan. The TWG could meet via conference call and discuss the well data and potential contingent well installation in a manner similar to that conducted for screen calls during previous well installations. The Work Plan should also accommodate installing additional contingent wells at an alternate Site C and/or Site E location if warranted by groundwater results from initial Site C and E wells.

Response: *The Work Plan text will be revised to explain that contingency wells will be installed if trigger levels are exceeded but may be installed based on discussion with and direction from DTSC and DOI if Cr(VI) is present at concentrations less than trigger levels in primary wells.*

5. **Comment:** Regarding Section 2.1.3, Contingency Drilling Sites: The second paragraph on page 2-3 of the Work Plan indicates that the decision to proceed with contingent well locations would occur after two rounds of sampling data had been completed at Sites A and B per the schedule discussed in Section 5 of the Work Plan. It is also conceivable that field data (e.g., discolored groundwater, significantly elevated hexavalent chromium in groundwater samples) would negate the necessity to obtain two rounds of data from Sites A and B. Therefore, it is recommended that DTSC reserve the right to direct PG&E to proceed with the contingent well installations on an expedited schedule if warranted.

Hexavalent chromium concentrations greater than 1,000 ug/L were only detected in December 2006 and March 2007 in bedrock well MW-23 during low river stage. Therefore, as seasonal effects and/or low river stage might affect groundwater sampling results in the area, the time needed to assess data from Site A and B wells might need to be extended from that proposed in the Work Plan depending on when the Work Plan is actually implemented. In the event that hexavalent chromium concentrations are not detected above contingency trigger levels in Site A and B wells, data collected between December and March from Site A and B wells should also be evaluated before a final decision is made to not install contingency wells. Reporting should follow that as outlined in the Work Plan with the understanding that the December to March data might invoke the contingency well installation.

Response: *PG&E concurs that significantly elevated hexavalent chromium in groundwater samples would negate the necessity to obtain two rounds of data from Site A, B, or any other location and trigger an expedited contingency site drilling schedule, at the direction of DTSC. In the event that discolored groundwater is observed during well installation activities, a sample will be collected if possible and analyzed on an expedited schedule to evaluate if the discoloration is a result of an elevated chromium concentration.*

As presented in this comment, DTSC's direction to extend the decision point for contingency groundwater investigation beyond two rounds of sampling at Sites A and B until the time of year associated with low river stage could significantly extend the East Ravine Groundwater Investigation schedule, and subsequent decision documents such as the RCRA Facility Investigation/Remedial Investigation report.

The final paragraph of Section 2.1.3 of the Work Plan will be revised as follows:

"The decision to proceed with contingency groundwater investigation will be made after a minimum of two rounds of sample results are available from wells installed at the primary Sites A and B. However, in the event that significantly elevated hexavalent chromium concentrations (i.e., greater than the thresholds identified previously in this section) are detected in samples collected during the groundwater investigation or the initial round of groundwater sampling, at the direction of DTSC and in consultation with DOI, contingency groundwater investigation

will proceed. Refer to Section 5 for further discussion of the project implementation schedule and the proposed interim reporting plan regarding the contingency groundwater investigations."

In addition, the following note has been added to Table 4 (Planning and Implementation Schedule):

"The sequence of tasks and estimated durations may be revised if contingency groundwater investigation is required based on data collected during the groundwater investigation or initial round of groundwater sampling."

6. **Comment:** Regarding Section 2.6, Groundwater Sample Collection: It is anticipated that the bedrock aquifer encountered will result in monitoring wells with low yield. Therefore, it is recommended that additional purge and sample events be conducted in addition to that described in the Work Plan. The additional purging events are requested to ensure that any introduced fluids or mixed aquifer waters are removed from the low yield wells in an expedited manner. The additional purging and sampling events may utilize a modified analyte list consisting of, at a minimum, chromium (and related analyses such as specific conductance) utilizing the Interim Measures 3 laboratory and the standard field parameter measurements.

Response: *PG&E concurs that fluids introduced to the formation during drilling and water from different aquifer zones mixed during drilling and well installation must be removed before groundwater samples representative of the targeted aquifer zones are collected. The borehole development and groundwater sampling procedures proposed in the Work Plan were developed to accomplish the task of obtaining a representative groundwater sample. As requested in this comment, PG&E will collect groundwater samples during borehole development for the analysis of chromium and specific conductance using the Interim Measures 3 laboratory. Further, if depth-discrete screens are installed additional well development will be conducted.*

The first paragraph of Section 2.4.1 of the Work Plan (Borehole Development and Geophysical Logging) will be revised as follows:

"Immediately following drilling activities, each borehole drilled into bedrock will be developed to remove drilling fluids from the borehole and obtain an estimate of borehole capacity. Borehole development will be accomplished by pumping. During development pumping, temperature, pH, specific conductance, and turbidity will be measured using field instruments. In addition, groundwater samples for hexavalent chromium and specific conductance analysis by the Interim Measures 3 laboratory will be collected during borehole development. Because the bedrock portion of the borehole will be uncased, at least initially, to facilitate geophysical logging as described below, mechanical surging of the borehole will not be conducted. Should the borehole not produce sufficient groundwater recharge, potable water may be added to the borehole to facilitate pumping for removal of fines."

In addition, Section 2.5.4 of the Work Plan (Well Development) will be revised as follows:

"Unless perched water is encountered, monitoring wells installed in the alluvium to monitor for perched groundwater will not undergo development. If perched water is encountered,

development of alluvial wells will be accomplished through a combination of surging, bailing, and possibly pumping depending on the yield of the wells.

Boreholes installed into bedrock will be developed to remove drilling fluids immediately once drilling is complete, as discussed in Section 2.4.1. Although single- or multiple-screen monitoring wells that may be installed in the bedrock will not be installed using fluids and will not be constructed with a filter pack, each depth-discrete well will be developed to remove groundwater from different aquifer zones mixed during installation. Groundwater samples for hexavalent chromium and specific conductance analysis by the Interim Measures 3 laboratory will be collected during additional well development purge events."

7. **Comment:** Regarding Miocene Conglomerate Orientation Data: MWD's comments (MWD, 2007 - Eric Fordham Comments 1 and 3) recommended that data regarding the orientation and character of the Miocene Conglomerate and its discontinuities be provided to adequately evaluate whether the proposed borings are optimally positioned. Information regarding characteristics of the Chemehuevi Detachment Fault was also requested. Therefore, it is recommended that PG&E obtain the necessary information to address this concern. Available data should be utilized. If not already conducted, mapping of Miocene Conglomerate bedding and structures (e.g., fracture analysis) in the immediate area is suggested. Based on the information amassed, the proposed borings should be evaluated to ensure appropriate locations, angles, and depths have been selected.

Response: *The Work Plan will be revised to summarize the available information from published literature on the Chemehuevi detachment fault (CDF). PG&E is not aware of any published information about the fracture orientation in the Miocene conglomerate. However, based on the published geologic mapping, the projected CDF underlying the East Ravine is inferred to be a low-angle (15 to 20 degree) northeast-dipping fault that has displaced Pre-Tertiary metamorphic bedrock and Miocene sedimentary rocks (up-thrown fault block) across underlying, lower place crystalline bedrock (down-thrown fault block) in a general northeast direction. The Miocene conglomerate outcrop at the bottom of the East Ravine is on the up-thrown side of the detachment fault. Fractures in this outcrop range from near vertical to sub horizontal, with bedding that dips at approximately 40 degrees to the northwest. The area where the initial boreholes will be drilled is on the down-thrown side of the fault. There are no Miocene outcrops visible on the down-thrown block anywhere near the Topock site. It is likely that some rotation has occurred on the down-thrown fault block. Therefore fracture and bedding orientation in the visible outcrop on the up-thrown block would likely be different than on the down-thrown block where the initial boreholes would be drilled. PG&E believes mapping fractures in the Miocene conglomerate outcrop would not provide useful data for siting boreholes or determining appropriate angles for boreholes, and could result in a significant delay to Work Plan implementation. PG&E proposes that the core logs and acoustic televiwer logs be reviewed from the initial boreholes and if fracture patterns appear to be primarily vertical, consideration be given to the installation of angle borings in any future contingency borings.*

8. **Comment:** Soil sampling should be conducted during Site B drilling activities for the shallow alluvial monitoring well. DTSC had previously requested that soil samples of

the dam be collected since potential exists for the dams to contain contaminated materials or have buried contaminated soils or wastes (See page 24 of the July 2007 GSU memorandum attached to DTSC's August 10, 2007 letter to PG&E). This will require that the monitoring well borehole be drilled through the dam and completed beneath the East Ravine wash. Three soils samples are recommended: two from within the dam materials and one from the alluvium at the contact between the dam and the wash. The soil samples should be analyzed for the constituents of potential concern identified for AOC 10 in the Part A Work Plan (CH2M HILL, 2006). This will eliminate redundant activity and reduce the number of incursions into the area.

Response: *The collection of three soil samples from one of the boreholes drilled at Site B will be added to the Work Plan. Specifically, a subsection will be added to Section 2.3 of the Work Plan (Borehole Drilling and Requirements) to present the procedures for soil sample collection and laboratory analytical methods. The soil samples will be analyzed for the constituents of potential concern identified in the "RCRA Facility Investigation/Remedial Investigation, Soil Investigation Work Plan, Part A, PG&E Topock Compressor Station, Needles, California", which include the following:*

- *Hexavalent Chromium (7199/3060A)*
- *Title 22 Metals (6010B/7471A)*
- *VOCs (8260B)*
- *TPH-Extractable (8015ME) and TPH-Purgable (8015MP)*
- *PAHs (8270Sim)*

In the event that soil sample data collected at AOC-10 during the Soil Part A Investigation is available before the East Ravine Groundwater Investigation is conducted, the need for these or additional samples will be evaluated with DTSC and DOI in effort to eliminate redundant activity and reduce the number of incursions into the area.

9. **Comment:** Regarding Section 1.2.2, Chromium Sampling Results at Well MW-23: It is significant to also note that the oxidation reduction potential (ORP) for bedrock well MW-23 has changed over time from more reducing to oxidizing conditions providing a geochemical environment where hexavalent chromium can better persist. During sampling events in 2002 and 2003 ORP measurements were consistently negative and averaged -152 mV. Since 2005, positive ORP values up to 199 mV have been documented in the site wide groundwater monitoring data base. Additionally, hexavalent chromium concentrations were not detected above 10 ug/L in well MW-23 from 1998 through 2005 except during one sampling event in 2004 in which the reported value was 10.1 ug/L. Since March 2006, hexavalent chromium has consistently exceeded 10 ug/L (CH2M HILL, 2007c and 2007d) and has resulted in DTSC's heightened attention to data from this well.

Response: *Comment noted. As DTSC states, the sampling history for MW-23 does indicate variation in ORP field measurements from the sampling period 2002 through 2007 with a generally increasing trend. Review of the chromium concentrations detected in groundwater samples analyzed during the same sampling period indicate two samples (December 2006 and March 2007) with anomalously high chromium concentrations. However, positive ORP measurements are not consistently correlatable with elevated chromium concentrations in groundwater. No changes to the Work Plan are proposed in response to this comment.*

10. **Comment:** Regarding Section 2.1.1, Primary Drilling Site A: EMC commented that there was too close a margin of error between the proposed maximum drilling depth of 200 feet for Site A and the anticipated depth of 180 feet to reach the detachment fault (EMC, 2007). Therefore, it is recommended that the maximum depth be extended to 225 feet (a 25 percent margin of error). Information obtained in response to General Comment 7 could also modify the maximum depth.

Response: *The text in Section 2.1.1 of the Work Plan (Primary Drilling Site A) will be revised to indicate a maximum drilling depth of 225 feet below ground surface (bgs). Similarly, Table 1 of the Work Plan (Drilling, Characterization, and Well Installation Plan) will be revised.*

11. **Comment:** Regarding Section 2.3.1, Drilling Methods: MWD recommended that a PQ-size, triple tube core barrel be considered for the diamond-bit core drilling proposed for the site (MWD, 2007). This size core barrel should be considered for the initial drilling as should larger or smaller diameters depending on the drilling conditions encountered at the site.

Response: *PG&E evaluated NQ-size (2.98-inch borehole), HQ-size (3.78-inch borehole), and PQ-size (4.83-inch borehole) diamond-bit core tools before submitting the Work Plan. HQ tooling was chosen as a compromise between the minimization of borehole diameter and investigation flexibility. Larger diameter boreholes (PQ) will take longer to drill and will introduce more drilling fluid to the formation, thus increasing the time required for borehole development as well. In addition, larger diameter boreholes are typically more prone to collapse due to expansion when the core is removed. The smaller diameter boreholes (NQ and HQ) will minimize the amount of time in the field, and therefore, the overall footprint of the investigation. However, an NQ size borehole will significantly limit the type of testing (i.e., pump sizes and down-hole testing tools) and well construction options that can be utilized in the borehole.*

To maximize Work Plan flexibility based on observed subsurface conditions, references to HQ-size core tools will be revised throughout the Work Plan to indicate that the maximum diameter of the borehole will not exceed eight inches (maximum anticipated diameter of the roto sonic drive casing used to drill the alluvium). However, it is anticipated that HQ-size core tools will be used to install the initial borings into bedrock.

The Work Plan text will be revised to indicate that a triple-tube core system will be used as determined necessary. The triple-tube system utilizes the same tools specified in the Work Plan, but includes an inner sleeve to maximize core recovery in especially fractured conditions.

12. **Comment:** Regarding Section 2.3.2, Core Logging: In addition to the items listed under Rock Core Logging the following features, at a minimum, should also be documented and reported: lithologic description, alteration/weathering, structures and orientation, texture, foliation/bedding, grain size, hardness/strength, moisture conditions, percent core recovery, and photographs.

Response: *Section 2.3.2 of the Work Plan (Core Logging, Rock Core Logging) will be revised to explicitly state that lithologic description, alteration/weathering, structures, texture, foliation/bedding, grain size, hardness, and percent core recovery will be included in the core log and that photographs will be taken of the core. It is assumed that laboratory strength testing of the rock core is not required by DTSC. Bedrock core moisture conditions will not be recorded as the borehole will be drilled using water.*

An acoustic televiewer log is included as part of the proposed suite of down-hole geophysical tests. The acoustic televiewer obtains a continuous, oriented survey of the borehole wall using the travel time of sound waves. Obtaining oriented rock core during drilling is more time consuming and problematic than collecting unoriented core. The acoustic televiewer log will provide information on the strike and dip of any major fractures that can be correlated with the physical rock core; therefore the information obtained from the collection of oriented core would result in delays in completing the boreholes but provide no additional information of value.

13. **Comment:** Regarding Section 2.4.1, Borehole Development and Geophysical Logging: ORP field measurements should also be measured during development purging.

Response: *ORP measurements will be added to the list of field measurements collected during borehole and well development. However, to provide accurate measurements, the ORP instrument must be used within an in-line flow cell with constant flux such that the instrument has time to stabilize. If the borehole does not yield enough water to maintain flow for the requisite time, ORP data may not be collected.*

See response to DTSC comment 14, which addresses the same section, for revised Work Plan text.

14. **Comment:** Regarding Section 2.4.1, Borehole Development and Geophysical Logging: Mechanical surging of the borehole may eventually be necessary especially if drilling mud is used during drilling of the bedrock boreholes.

Response: *The first paragraph of Section 2.4.1 of the Work Plan (Borehole Development and Geophysical Logging) will be revised to provide additional investigation flexibility as follows:*

"Immediately following drilling activities, each borehole drilled into bedrock will be developed to remove drilling fluids from the borehole and obtain an estimate of borehole capacity. Borehole development will be accomplished by pumping. During development pumping, temperature, pH, specific conductance, ORP, and turbidity will be measured using field instruments. Because the bedrock portion of the borehole will be uncased, at least initially, to facilitate geophysical logging as described below, mechanical surging of the borehole is not preferred; however, if mechanical surging is determined to be necessary, the borehole condition must be evaluated to prevent the loss of borehole or tools. If determined necessary, a temporary three-inch PVC screen may be

installed across the entire bedrock portion of the well to maintain borehole integrity during mechanical surging with the understanding that it may not be retrievable if the borehole collapses on the screen. Should the borehole not produce sufficient groundwater recharge, water may be added to the borehole to facilitate pumping for removal of fines."

15. **Comment:** Regarding Section 2.4.2, Permeability Testing: The section indicates that permeability testing may be conducted in each bedrock borehole. The GSU anticipates that flow testing will be conducted on at least some of the new wells and that the method(s) ultimately proposed by PG&E for the site conditions encountered will require DTSC approval.

Response: *The first paragraph of Section 2.4.2 of the Work Plan (Permeability Testing) will be revised for clarity as follows:*

"Based on data collected during borehole development and geophysical logging, relative permeability testing will be conducted to obtain a flow profile in each borehole drilled into the bedrock, as applicable. The purpose of this testing will be to qualitatively assess the relative permeability of individual fractures or zones of fractures within the borehole. Upon completion of borehole development, PG&E will consult with DTSC and DOI to evaluate if the borehole yield is high enough to effectively conduct permeability testing, and if so, which method should be chosen. Results of the relative permeability testing will aid in the determination of whether additional hydraulic testing, as described in Section 2.4.3, is applicable."

16. **Comment:** Regarding Section 2.4.4, Initial Bedrock Groundwater Characterization: Depth discrete groundwater sampling is recommended regardless of the reasons cited in the Work Plan as the potential for chemical stratification within the bedrock aquifer will still exist.

Response: *The following sentence will be added to the final paragraph of Section 2.4.4 of the Work Plan (Initial Bedrock Groundwater Characterization) for clarity:*

"PG&E will consult with DTSC to review lithologic and hydraulic data collected during previous phases of the investigation to evaluate if depth-discrete sampling is warranted, and if so, which sample collection method should be used."

17. **Comment:** Regarding Section 2.5.1.2, Borehole Completion Materials: The volume of any potable water added to the borehole should be documented.

Response: *The last paragraph of Section 2.5.1.2 of the Work Plan (Borehole Completion Materials, Filter Pack) will be revised for clarity as follows:*

"The contractor will record the volume of filter pack emplaced in the well. Water may be used, with the approval of the field geologist, to emplace the filter pack, as long as no contaminants are introduced to the subsurface. The volume of water added to the borehole will be documented and considered along with the volume of water lost to the formation during drilling to be removed during borehole development."

18. **Comment:** Regarding Section 2.5.2, Bedrock Monitoring Well Design and Specifications: The type of well completion ultimately proposed by PG&E for the site conditions encountered will require DTSC approval. DTSC would accept other well designs not identified in the Work Plan (e.g., Barcad® type sampling systems) if the need arises. Please note that the well design proposed should be able to accommodate transducers and data loggers.

Response: *As stated in the last sentence of the first paragraph of Section 2.5.2 of the Work Plan (Bedrock Monitoring Well Design and Specifications), to ensure that future water quality data collected at these locations are appropriate to meet the objectives of this Work Plan, final well design will be chosen in consultation with DTSC prior to implementation.*

Based on this comment, PG&E understands that DTSC expects to employ pressure transducers to monitor water levels in each well. PG&E will work with DTSC and DOI to identify the most appropriate well construction based on the data collected during this investigation, in which transducers can be reliably deployed. If multiple zones (i.e., more than three) are required for water level monitoring with pressure transducers, additional boreholes may be required due to space constraints within the well. No changes the Work Plan are proposed in response to this comment.

19. **Comment:** Regarding Section 2.5.2.2, Multiple-Completion Bedrock Monitoring Well: The section discusses volatile organic compound (VOC) sampling and suggests that VOC sampling data could be compromised when using the Solinst® Continuous Multilevel Tubing (CMT). The section concludes that VOCs are not a concern in the East Ravine. The GSU recommends that VOCs be added to the sampling list in Table 2 of the Work Plan for the initial wells for the two sampling rounds. This is requested since: PG&E documents in the Work Plan that the impoundment in the East Ravine contained liquids of unknown composition during several years in the 1960s; VOCs have been used at the compressor station; and VOC data are lacking in the East Ravine area. The GSU does not believe that the CMT well design will necessarily adversely affect VOC data since the CMT channel port will be purged prior to sampling, dense nonaqueous phase liquids are not anticipated, and the CMT technique has been used successfully at other VOC sites.

Response: *In response to this comment, Table 2 will be modified to include VOC analysis in the first two sampling events.*

20. **Comment:** Regarding Section 2.5.5, Well Survey and Completion Diagram: The well completion diagrams should also include the diameter of the well and borehole in addition to the other items identified in the section.

Response: *Section 2.5.5 will be revised to explicitly state that the diameter of the borehole and casings that may be installed in the borehole will be included on the well completion diagram.*

21. **Comment:** Regarding Section 2.6, Groundwater Sample Collection: MWD wanted to know what would happen if pumping at Site A and B did not yield water (MWD, 2007).

DTSC does not anticipate that the bedrock wells will not yield water as based on known production from all the other bedrock monitoring wells installed at the site. However, if such an occurrence was to occur, PG&E and DTSC would consider such actions as more aggressive well development, modifying the well design, reaming the borehole, or drilling a new borehole at the same site area or possibly at a contingent location.

Response: *It should be noted that all of the wells screened exclusively within the bedrock at the site yield water; however, well yields observed in these wells are typically extremely low, with some wells requiring a week or more to fully recover after a purge event. PG&E concurs with DTSC that if a Site A or Site B bedrock well did not yield water more aggressive borehole development techniques should be implemented.*

It is PG&E's view that reaming the borehole is not preferred because this must be conducted using mud rotary or air rotary drilling methods. Air rotary drilling methods cannot be employed at the site due to health and safety constraints and mud rotary is not preferred for bedrock drilling because bentonite-based muds must be used to convey the drill cuttings out of the borehole. The use of bentonite-based drilling fluids (in the concentrations required for mud rotary drilling) will present significant impediments to well development if the borehole has a low yield or is prone to collapse.

PG&E acknowledges that DTSC may require the installation of additional boreholes if initial boreholes do not yield sufficient water for sampling.

No changes to the Work Plan are proposed in response to this comment.

22. **Comment:** Regarding Table 1: Target boring depths for contingent sites may need to be modified pending the results of the initial investigations. Site C investigations should be implemented if contamination is confirmed at neighboring Site B, not Site A.

Response: *The following note will be added to Table 1 for clarity:*

"Target boring depths listed for contingency drilling sites are estimated and will be based on data collected from the initial Site A and Site B boreholes".

In addition, the implementation logic for the contingency drilling sites will be removed from Table 1. The implementation logic for contingency drilling sites is addressed in the response to DTSC comment 4.

III. Response to MWD December 21, 2007 comment email.

1. **Comment:** What are the plans if the pumping at Site A and B do not yield water?

Response: *Please review the response to DTSC comment 21.*

2. **Comment:** In Section 2.5 and 2.5.1 it references Figures 4A and 4B, which are not included. Should the reference be Figure 4?

Response: *Yes. The figure references will be revised.*

3. **Comment:** The potential for CrVI transport in groundwater through the bedrock towards and possibly into the Colorado River is controlled by the characteristic of the Miocene Conglomerate's lithology, the orientation of its bedding, and the location, frequency of occurrence, orientation, and characteristic of the joint, shear and/or fault discontinuities within the conglomerate. The potential for CrVI transport in groundwater through the bedrock to the river is also controlled by the characteristics of the "Detachment Fault" at the base of the Miocene Conglomerate; any "halo" zone of increased fracturing of the rock mass above or below the fault, and any potentially permeable discontinuities in the metamorphic and igneous rocks below the "Detachment Fault", as shown on CH2M HILL's Figure 3.

Currently, none of this important and needed information regarding these rock mass conditions is provided with the "Plan" other than as shown on the simplified hydrogeologic sections "A" and "B" in Figure 3 of the "Plan". These simplified sections only illustrate CH2MHill's hypothesized orientation and position of the "Detachment Fault" relative to the river in a north-south direction rather than in an east-west direction, which would be the shorter and more direct path of potential communication with the river. In addition these sections and the aerial photo base map shown in Figure 2 do not provide orientation data with regards to the orientation and character of the Miocene Conglomerate and its discontinuities. Without this information it is not possible to adequately evaluate whether the proposed scheme for the investigation borings (i.e., their optimal location, angle and depth) is suitable to investigate the groundwater occurrence and possible CrVI transport through the rock mass towards the River.

Response: *Please review the response to DTSC comment 7.*

4. **Comment:** Rather than coring the bedrock holes with an HQ core barrel, CH2MHill should consider using a PQ-size, triple-tub-core-barrel. This larger diameter core barrel and the triple tube setup would provide a larger diameter hole and better quality recovered rock core that would better reflect the hydrogeologic properties of the investigated rock mass.

Response: *Please review the response to DTSC comment 11.*

5. **Comment:** The use of angled holes rather than vertical holes may also provide a better characterization of the rock mass hydrogeologic properties, dependant on the characteristics and orientations of the rock mass lithology and discontinuities as discussed above under Item #1.

Response: *Please review the response to DTSC comment 7.*

6. **Comment:** With regard to "Rock Core Logging", "RQD" is a simplified rock mass classification method used in the tunneling industry; however it is not useful in assessing the hydrogeologic properties of the rock or the rock mass discontinuities. We suggest recording the % core recovery and providing graphic as well as text descriptions

of the type, orientation, distribution and aperture characteristics of the rock mass discontinuities. This information is important to overcome some of the limitations of the indirect down-hole logging methods proposed by CH2MHill in developing an adequate hydrogeologic understanding of the potential groundwater flow through the rock mass toward the river.

Response: *Please review the response to DTSC comment 12.*

IV. Response to FMIT December 28, 2007 Comment Letter.

The comments presented by FMIT were not presented as discrete comments, but in letter format. PG&E has separated the letter into discrete comments for ease of preparing responses.

1. **Comment:** First and foremost, the Tribe asserts that it is opposed to the drilling of the new monitor wells proposed in the work plan. Specifically, the plan calls for the drilling of groundwater monitor wells at two new "primary" sites identified as "A" and "B," with the possibility of subsequent drilling and well construction at three other "contingency" sites ("C," "D." and "E"). As the Tribe has expressed many times in the past, each of these wells is an intrusion within the larger geographic area PG&E acknowledges as "sacred" to the Tribe. Each time the Tribe has expressed such concerns in the past, both PG&E and DTSC have accepted the Tribe's concerns and pledged to do whatever possible to avoid or otherwise minimize future drilling. On at least one occasion, the Tribe was told that once the drilling of wells on the Arizona side of the Colorado River was completed, there would be no further need for drilling for characterization purposes. Yet it seems like this was never the intention of DTSC, and that the prospect for continued intrusion is virtually open-ended.

Response: *FMIT opposition to this drilling is noted. FMIT concerns here, as for other projects, are carefully and considerably weighed along with the other comments and need for specific data. Other stakeholders commenting on this project have indicated that they believe the proposed drilling is necessary, and DTSC has directed PG&E to proceed with this Work Plan. PG&E continues to pledge to do everything possible to avoid or minimize drilling when possible. In regard to FMIT concern about statements made that no further drilling will be necessary once the Arizona drilling is accomplished, based on recent project developments, DTSC has determined that more investigation is now necessary to adequately characterize the plume. FMIT comments along with all other comments which have been received and data which are available will be considered, and form the basis for decisions on this and any future work, if required.*

2. **Comment:** Another concern is the apparent perception that the location of such intrusions can mitigate such concerns. For example, on numerous occasions it has been suggested that if drilling (or other types of intrusions such as borings, soil excavations, etc.) were limited to areas of previous disturbance, the Tribe's concerns would be lessened. The Tribe wishes to emphasize that this is not the case. Every intrusion into this sacred area poses a concern, and taken together, pose adverse, cumulative impacts to the sacred area.

Response: *It is not the intent of PG&E, nor does PG&E consider the placement of the various drilling locations as a form of mitigation. Given the need to perform necessary investigations, PG&E looks to previously disturbed areas first. In the past, the agencies and other stakeholders have preferred that work be conducted in areas previously disturbed over undisturbed land. PG&E understands that working in previously disturbed areas does not take the place of no intrusion.*

3. **Comment:** Moreover, the Tribe understands that part of the project area is potentially within the Havasu National Wildlife Refuge, and feels that, in addition to minimizing impacts to the sacred area, every effort should be made to avoid impacts to refuge areas.

Response: *PG&E is working closely with DTSC and the Havasu National Wildlife Refuge (HNWR) to avoid and minimize impacts within the Refuge.*

4. **Comment:** With this said, the Tribe is fully aware of both the nature of the technical investigation as well as the requirements of the regulatory process that forms the template for activities at this site. That is why, in commenting on past work plans, the Tribe has endeavored to offer potential technical alternatives and at times suggested refocusing priorities and needs of certain actions (such as the proposed drilling at Arizona Site 1). It seems that in many instances, such suggestions/comments by the Tribe have been rather summarily dismissed on grounds that appear to reflect convenience as opposed to serious reflection on the underlying technical merit. This leads to the Tribe to conclude that when there is a potential for conflict between technical curiosity and cultural or religious values the former is more often than not accorded the greater weight.

Response: *The concerns of FMIT are valued and are carefully and considerably weighed along with other comments and data available to us. This work is not driven by technical curiosity. The necessity to fully and accurately characterize the plume to the satisfaction of regulatory agency requirements during this investigative phase is accorded the greatest weight of consideration; as it is PG&E's view that it is essential to accomplish the proposed characterization so that we can move on to the next steps of formulating and gaining concurrence on the final remedy.*

5. **Comment:** The Tribe has also questioned why such large areas are called out for each of the primary sites and contingency sites as indicated on Figure 2. It would seem that the actual drilling and construction activities would only disturb much smaller areas. While these large delineations were possibly intended to represent general locations areas within which much smaller disturbances would occur, this is not explained in the work plan.

Response: *For clarity, the following sentence will be added after the second sentence of Section 2.1 (Investigation Overview):*

"The area actually affected by field activities at each location will be smaller than that indicated on Figure 2. The areas are shown larger than the actual drill sites to accommodate minor shifting of well locations and equipment within the identified areas at the time of drilling."

V. Response to CRIT December 28, 2007 Comment Letter.

Comments 1 through 8 were prepared for CRIT by the Envirometrix Corporation. The comments prepared by Dr. Michael Tsosie (CRIT Museum Director) for CRIT were not presented as discrete comments, but in letter format. PG&E has separated the letter into discrete comments 9 and 10, below.

1. **Comment:** The October 29th DTSC letter states "DTSC has separated the groundwater from the soil media due to the timing difference in completing their respective investigations. Currently the public notice for the final groundwater remedy selection is slated for December 2009, while the Resource Conservation and Recovery Act (RCRA) Facility Investigation Report for the soil is not anticipated to be finalized until November 2, 2010". It is further stated that "several months ago, during a recent aerial photo review of the site for soil investigation purposes, DTSC noted an impoundment that contained liquids of unknown composition for several years in the 1960s within AOC-10. Additionally, historic soil sampling data correlates that finding and found some of the highest chromium concentrations for the site in AOC-10 despite the lack of historic record of past discharges by PG&E".

We are concerned over the continued delays in completing the groundwater and soil investigations to a level that provides reasonable, sufficient and adequate information to select a groundwater and soil remedy. While DTSC states the public notice for the final groundwater remedy selection is slated for December 2009, the updated PG&E schedule dated December 12, 2007 lists the actual operational start of the groundwater remedy as November 24, 2011. It is EMC's understanding that the original remedy selection date proposed by DTSC may have been March 2008. While DTSC's decision to separate the groundwater from the soil media is based on PG&E timing differences, we see from this example that AOC-10 may be a significant potential source of contamination impacting groundwater. Without the recent aerial photographic review by DTSC for soil investigations purposes, this concern would have not been identified. The importance of the soil investigation in support of the groundwater investigation in order to fully characterize the nature and extent of groundwater contamination is therefore mutually related and beneficial. It was EMC's understanding that while on separate tracks, the soil and groundwater remedies were previously scheduled to converge, in parallel, with the completion of the Environmental Impact Report (FIR). Rather than DTSC supporting PG&E's continued plan to delay and minimize additional soil investigations, it would seem appropriate that DTSC would require PG&E to expedite the required soil investigations. Further we are concerned that over 1.5 years has past since the selection of the EIR contractor and no significant progress has occurred related to the EIR and any initial discussion with the Tribes, resulting in further delays to the selection of the final remedy.

Response: *It is inaccurate to state that PG&E has a "plan to delay and minimize additional soil investigations." The remaining comments are noted. No changes to the Work Plan are proposed in response to this comment.*

2. **Comment:** The impoundment that contained liquids in AOC-10 could not be identified in Figure 2. Therefore, it is difficult to evaluate if any of the proposed monitoring well locations are immediately adjacent to and down gradient of the previously identified impoundment. While Site B appears to be adjacent to AOC-10d, we do not observe any drilling locations near AOC-10b and AOC-10c. DTSC states that "The main objective of the investigation is to determine if a contaminant source in AOC-10 has impacted the groundwater in bedrock. If an impact is detected, then the general nature and extent of the contamination should be determined". We do not believe that the proposed limited activities of only two initial drilling locations (Sites A and B) will accomplish this objective. In addition, it is not clear why appropriate drilling locations were not proposed immediately adjacent to AOC-10.

Response: *For clarity, the fourth sentence of Section 1.2 of the Work Plan (Investigation Background) has been revised as follows:*

"Historical aerial photographs of this portion of the site show the presence of an impoundment (immediately east of the AOC-10c area) within the East Ravine that contained liquids of unknown composition during several years in the 1960s (CH2M HILL, 2007a)."

In addition, please review the response to DTSC comment 2.

3. **Comment:** EMC suggests that DTSC provide specific direction to PG&E regarding what is considered impacted groundwater, in Section 2.1.3 PG&E states that if Cr(VI) is present in the groundwater at greater than 100 ug/L at Sites A and B, additional drilling at Site C and D could be initiated. For site E, it is 50 ug/L. PG&E does not discuss the basis or the rationale for this decision process. EMC suggests that DTSC provide clear direction to PG&E and specify if DTSC desires characterization to background levels or will accept elevated characterization levels.

It is further stated that the decision to proceed with the contingency groundwater investigation would be made after the groundwater investigation and two rounds of sampling have been completed at the primary sites A and B. The contingency groundwater investigation as proposed by PG&E will create further delays in the process and may not fully evaluate the potential impacts from AOC-10. We suggest that DTSC consider and implement a process that is more aggressive to complete the initial characterization. We also suggest that DTSC not add further delays by taking a more proactive directed approach to completing the groundwater investigation considering the history, subsurface variability and lessons learned from previous delays in site investigation activities. It is EMC's opinion and recommendation that DTSC consider requiring more than Site A and B as initial drilling locations so that the full nature and extent of contamination can be evaluated and the project can move forward toward a remedy selection.

Response: *Please review the response to DOI comment 1, and DTSC comments 2 and 4.*

4. **Comment:** The maximum depth of drilling is stated to be 200 feet. For Site A, the detachment fault is anticipated to be at 180 feet. A 20 foot margin of error is very small. It would be helpful to explain the rationale for terminating the drilling at 200 feet. If the rationale provided references the limited capability of the drilling equipment that was scheduled by PG&E, it may also be helpful to explain why alternative drilling equipment is not being considered.

Response: *Please review the response to DTSC comment 10.*

5. **Comment:** Considering the variability of previous groundwater sampling results from MW-23, it may be appropriate for DTSC to consider requiring multiple samples during groundwater sample collection, that begins at the start of the initial groundwater purge and obtaining successive samples during the purge cycle, or the placement of the pump intakes at the bottom of the wells rather than in the middle of the well screens. As was determined with the floodplain wells, low volume initial purge and sampling methods did not yield representative groundwater samples. In addition, HydraSleeve samples placed in MW-23 at 64, 72 and 80 feet determined there was a significant concentration gradient within the screen interval. For all bedrock wells, DTSC should evaluate and determine the appropriate methods and procedures that will yield representative groundwater samples from each monitoring well. It would also be useful to know if DTSC has conducted a recent RCRA groundwater compliance audit for PG&E groundwater sampling activities.

Response: *Comment noted. The appropriate groundwater sample collection methodologies will be chosen in consultation with DTSC, based on the data obtained during drilling and subsequent testing and may vary depending on borehole condition or well construction. Please review the response to DTSC comments 16 and 18.*

6. **Comment:** During the previous sampling of MW-23 anomalously high results were "discounted" and the high result was flagged as "rejected" during the data validation process because a high result was only reported in one of the two duplicate samples collected on the same day. This elevated result was later found to be correct. EMC suggests that DTSC take a more active role in the data validation process and not be so quick to agree that anomalous results can be rejected, as evidenced by this example.

Further, EMC would be interested to know if any other wells or surface water samples reported similar anomalous results for Cr or Cr (VI) and were later "rejected".

Response: *Comment noted. In addition, it should be noted that the elevated chromium concentration detected in groundwater from MW-23 was not later found to be "correct"; rather, there has been one other sample from this well (March 2007) which also showed an anomalously elevated concentration. Similar concentrations have neither been reproduced in subsequent samples nor through an effort to replicate the unusual sampling conditions associated with the March 2007 sample.*

Data validation procedures are specified in the Quality Assurance Project Plan, PG&E Topock Program, dated March 31, 2005, and are consistent with standard industry practice. Data may be flagged as "rejected" for numerous reasons; however, the March 2007 sample was rejected because of the relative percent difference (RPD) between the chromium concentrations detected in the primary (1,800 micrograms per liter [ppb]) and duplicate (non-detect) sample aliquots. Among all the samples in the entire Topock Project Database of over five thousand results, only one other hexavalent chromium sample is flagged as "rejected" due to RPD exceedance. The other sample was MW-33-090 from the same December 2006 sampling round, where the original sample was reported at 17.8 ppb and the field duplicate at 2.3 ppb. The fact that both of these rejected samples occurred in the same sampling round suggested at the time and still suggests that there may have been some problem with the laboratory results at this time.

7. **Comment:** Considering the elevated concentrations reported in MW-23, the convergence, narrowing, funneling, and upward groundwater flow as it approaches the Topock Gorge, EMC suggests that DTSC reevaluate the locations of the surface water monitoring locations in the Colorado River. Further, we would like to bring to DTSC's attention the potential of an additional significant data gap. EMC and the Tribes are concerned about the foundations and footings for the various bridges that cross or may have historically crossed the Colorado River. Some of these footings were driven deep into the subsurface and punctured the groundwater table as they attempt to be terminated into bedrock. With the convergence of groundwater coupled with the anticipated upward groundwater flow, we would be interested to know if DTSC has evaluated the construction properties and placement of the current and historical bridge footings. In addition, we would be interested to know if the footings could act as a possible conduit or preferential pathway for contamination migration, considering the groundwater convergence and upward groundwater flow in this area. PG&E has previously advocated that a blanket of natural subsurface reducing conditions exists across the area, so that any upward migration of Cr (VI) contamination would be reduced, become non-mobile and not enter the Colorado River. However, this logic does not appear to apply in areas where the aquifer has been punctured and conduits or preferential groundwater migration pathways may exist. We would appreciate DTSC's evaluation of this issue and the consideration of the placement of additional surface water sampling locations immediately adjacent to and downstream of current or historical footings that were constructed or abandoned on the Colorado River.

If a timely response to this request is not received by the Tribes, EMC recommends that the Tribes consider collecting and analyzing independent surface water samples from the Colorado River to evaluate potential impacts.

Response: *Comment noted. No changes to the Work Plan are proposed in response to this comment.*

8. **Comment:** In Section 4.3, Archaeological Surveys, Reviews and Consultation it is stated that "The PG&E FCR will be responsible for providing archeology sensitivity training to the workers implementing this work plan and for ensuring compliance with all

applicable archeological measures during drilling activities. We understand that DTSC previously required PG&E to prepare and initiate a sensitivity training plan in conjunction with input from the various tribes. The Tribes would appreciate if DTSC could please identify and forward a copy of the final approved sensitivity training plan to the Tribes. In addition, the Tribes would like to be notified, in advance, of any scheduled sensitivity training.

In this section it also states that "PG&E will make arrangements for monitoring of field activities, if acceptable to the landowner". This seems to imply that Tribal monitors may not be welcome or will not be allowed. The Tribes have previously requested to be contacted and may choose to provide Tribal Monitors. However, PG&E has not been consistent in their notification procedures and follow-up with the Tribes. EMC suggests that PG&E determine who the actual landowners are and if Tribal Monitors will be welcome or allowed.

Response: *It is correct that DTSC has previously required PG&E to prepare a sensitivity training plan as part of past project initiation meetings. As discussed in the response to CRIT comment 10, the Tribes in the past have been invited and notified in advance the project initiation meetings. The Tribes will again be notified in advance and invited to participate in the project initiation meeting for this project.*

Also discussed in the response to CRIT comment 10, the Tribes have and will again be invited to monitor work. Efforts will be made to clarify the notification procedure to ensure adequate time for a Tribe that wishes to send monitors. Both PG&E and the HNWR are the landowners for the various portions of this project, as described in the Work Plan. PG&E has indicated that they will again welcome Tribal monitors. The HNWR has in the past welcomed tribal monitors and is expected to do so again.

No changes to the Work Plan are proposed in response to this comment.

9. **Comment:** There is language in the work plan regarding tribal monitoring activities being acceptable to the landowner. This language requires immediate clarification so as to determine whether or not we will be allowed to monitor activities.

Response: *The intent of this section was to indicate that it would be necessary to coordinate with the landowners prior to this investigation. PG&E and HNWR are the landowners for this project and have allowed and encouraged tribal monitors in the past. No changes to the Work Plan are proposed in response to this comment.*

10. **Comment:** Reference was made regarding a "sensitivity training." We need to request a copy and also find out what was the developed curriculum and how this was implemented.

Response: *The sensitivity training includes the workplace guidelines that PG&E establishes for all workers on the site. It includes protection of biological resources, cultural resources, and awareness that the area is considered sacred by some tribes. It also contains the site standards for safety, communications, and logistics management. All of these things are covered during the project initiation meetings for every key project, and subsequent orientation sessions for the*

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workers that are not available on the day of the initiation meeting. The key agencies and tribes have been invited to past project initiation meetings and will continue to be invited to all future project initiation meetings. All agencies and tribes are given opportunities to speak at these meetings.

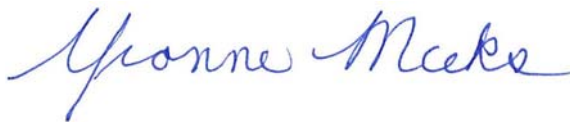
The training is conducted using an outline of topics – it has never been developed as a written text. Here are a few of the topics typically covered with respect to cultural and sacred resources:

- *Archaeological/historical sensitivity of the area*
- *The amount and types of archaeological/historical sites recorded (no site locations revealed)*
- *A brief discussion of laws protecting archaeological/historical sites*
- *A discussion on the need to stay within specified project areas*
- *The need for all workers to understand that their behavior needs to be professional and respectful of the fact that some tribes consider this area to be sacred.*
- *A description of the role of tribal monitors*

Sensitivity training has typically been provided by Curt Russell, Glenn Caruso, or by other knowledgeable site employees of PG&E in the past and is always tailored to the audience and situation/project (e.g., area of work, extent of previous crew training). Additional sensitivity training has been provided to the larger PG&E Topock Remediation team annually for the last two years.

Thank you for the opportunity to respond to these comments. If you have any questions concerning our response, please do not hesitate to contact me.

Sincerely,



Yvonne J. Meeks
Topock Project Manager

cc: Karen Baker/DTSC
Chris Guerre/DTSC
John Earle/HNWR
Cathy Wolff-White/BLM

