Topock Project Executive Abstract

Document Title: *Implementation Plan for Evaluation of Alternative Freshwater Sources in the Topock Remediation Project Area, Pacific Gas and Electric Company, Topock Compressor Station, Needles, California*

Submitting Agency: DTSC, DOI

Final Document? ☒ Yes ☐ No

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Who Created this Document?: (i.e. PG&E, DTSC, DOI, Other)

PG&E

Priority Status: ☒ HIGH ☐ MED ☐ LOW

Is this time critical? ☒ Yes ☐ No

Action Required:

☐ Information Only ☒ Review & Input

Type of Document:

☐ Draft ☐ Report ☐ Letter ☒ Memo

☐ Other / Explain:

☐ Other / Explain:

What does this information pertain to?

☐ Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA)/Preliminary Assessment (PA)

☐ RCRA Facility Investigation (RFI)/Remedial Investigation (RI) (including Risk Assessment)

☐ Corrective Measures Study (CMS)/Feasibility Study (FS)

☒ Corrective Measures Implementation (CMI)/Remedial Action (RA)

☐ California Environmental Quality Act (CEQA)/Environmental Impact Report (EIR)

☐ Interim Measures

☐ Other / Explain:

Is this a Regulatory Requirement?

☒ Yes

☐ No

If no, why is the document needed?

What is the consequence of NOT doing this item? What is the consequence of DOING this item?

This technical memorandum is required for obtaining agencies approval to conduct field activities in an effort to find location(s) for new well(s) that could supply an adequate quantity of water and not require treatment prior to use for groundwater remedy operation.

Other Justification/s:

☐ Permit ☐ Other / Explain:

Brief Summary of attached document:

As an element of the final groundwater remedy design, freshwater sources including groundwater supply wells and the Colorado River have been considered for use during remedy operation. The minimum volume of freshwater required for remedy operation is estimated to be 600 gallons per minute (gpm). In the *Draft Basis of Design Report/Preliminary (30 Percent) Design Submittal for the Final Groundwater Remedy* (CH2M HILL, 2011), PG&E presented a plan to obtain freshwater from a well on the Havasu National Wildlife Refuge (HNWR)—well HNWR-1; however, the California Regional Water Quality Control Board, Colorado River Basin Region (RWQCB) has preliminarily indicated that the HNWR-1 water should be treated to remove naturally occurring arsenic prior to injection. With the RWQCB's consent, PG&E has opened discussions of the need to treat for arsenic with the State Water Resources Control Board (State Board). Because no decision from the State Board has as yet been forthcoming, PG&E continues to evaluate other options for freshwater supply in an effort to find location(s) for new well(s) that could supply an adequate quantity of water and not require treatment prior to use for remedy operation. This technical memorandum presents the plans to evaluate the potential for additional fresh groundwater sources in the Topock Remediation Project area.

Written by: Pacific Gas and Electric Company

Recommendations:

Provide input to PG&E.

How is this information related to the Final Remedy or Regulatory Requirements:

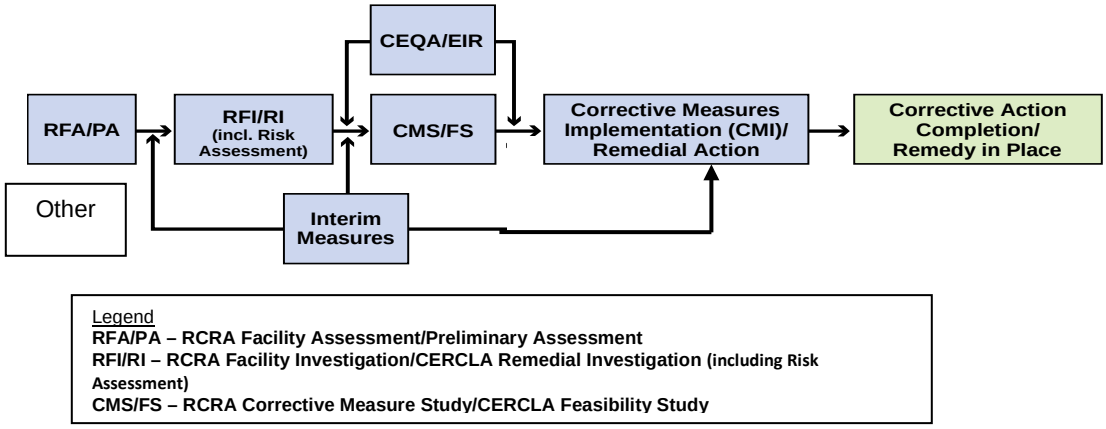
This technical memorandum is required to implementation field activities to find location(s) for new well(s) that could supply an adequate quantity of water and not require treatment prior to use for groundwater remedy operation.

Other requirements of this information?

None.

Related Reports and Documents:

Click any boxes in the Regulatory Road Map (below) to be linked to the Documents Library on the DTSC Topock Web Site (www.dtsc-topock.com).



Legend

RFA/PA – RCRA Facility Assessment/Preliminary Assessment

RFI/RI – RCRA Facility Investigation/CERCLA Remedial Investigation (including Risk Assessment)

CMS/FS – RCRA Corrective Measure Study/CERCLA Feasibility Study

Implementation Plan for Evaluation of Alternative Freshwater Sources in the Topock Remediation Project Area, Pacific Gas and Electric Company, Topock Compressor Station, Needles, California

DOCUMENT ID: PGE20121116A

PREPARED FOR Pacific Gas and Electric Company

PREPARED BY: CH2M HILL

DATE: November 20, 2012

Pacific Gas and Electric Company (PG&E) is implementing the selected groundwater remedy for chromium in groundwater at the PG&E Topock Compressor Station (TCS, or the Compressor Station) in San Bernardino County, California. The existing chromium contamination in groundwater is largely attributable to historical wastewater discharge from TCS operations to Bat Cave Wash, designated as Solid Waste Management Unit (SWMU) 1/Area of Concern (AOC) 1, and within the East Ravine, designated as AOC 10. Remedial activities at the Topock site are being performed in conformance with the requirements of the Resource Conservation and Recovery Act (RCRA) Corrective Action pursuant to a Corrective Action Consent Agreement (CACA) entered into by PG&E and the California Department of Toxic Substances Control (DTSC) in 1996, as well as the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) pursuant to the Administrative Consent Agreement entered into between PG&E and the federal agencies (U.S. Department of the Interior [DOI], Bureaus of Land Management [BLM] and Reclamation [Reclamation] and the U.S. Fish and Wildlife Service [USFWS]) in 2005. A Consent Decree between the United States and PG&E under CERCLA is forthcoming.

As an element of the final groundwater remedy design, freshwater sources including groundwater supply wells and the Colorado River have been considered for use during remedy operation. The minimum volume of freshwater required for remedy operation is estimated to be 600 gallons per minute (gpm). In the *Draft Basis of Design Report/Preliminary (30 Percent) Design Submittal for the Final Groundwater Remedy* (CH2M HILL, 2011), PG&E presented a plan to obtain freshwater from a well on the Havasu National Wildlife Refuge (HNWR)—well HNWR-1; however, the California Regional Water Quality Control Board, Colorado River Basin Region (RWQCB) has preliminarily indicated that the HNWR-1 water should be treated to remove naturally occurring arsenic prior to injection. With the RWQCB's consent, PG&E has opened discussions of the need to treat for arsenic with the State Water Resources Control Board (State Board). Because no decision from the State Board has as yet been forthcoming, PG&E continues to evaluate other options for freshwater supply in an effort to find location(s) for new well(s) that could supply an adequate quantity of water and not require treatment prior to use for remedy operation.

This technical memorandum presents the plans to evaluate the potential for additional fresh groundwater sources in the Topock Remediation Project area and is organized to include the following key details:

- Section 1.0 Locations for Freshwater Source Evaluation
- Section 2.0 Summary of Geophysical Survey
- Section 3.0 Freshwater Source Evaluation
- Section 4.0 Permitting and Approvals
- Section 5.0 Schedule and Reporting

1. Locations for Freshwater Source Evaluation

In *Geohydrology of the Needles Area, Arizona, California, and Nevada*, Metzger and Loeltz (USGS, 1973a) note that most of the higher-producing wells in the Needles area are completed in river gravels that were deposited since the end of the last ice age, in the geologic epoch known as the Holocene. Generally, these higher-producing wells

are located on the Colorado River floodplain. Near the Topock site, there were no potential well locations located on the river floodplain in areas away from the elevated arsenic concentrations in groundwater near HNWR-1. The channels in the major washes near the river likely were incised during the last ice age and have subsequently been filled with alluvium as the basin has aggraded during the Holocene epoch. The depth of Holocene deposition in the Colorado River channel is estimated to be between 130 and 260 feet in the Parker area (USGS, 1973b). The thickness of fluvial sediments in wells near the Topock site indicate up to 150 feet of Holocene sediment above the older Tertiary alluvium, which is consistent with Metzger's observations near Parker (USGS, 1973b). Therefore, the likely targets for constructing wells capable of producing sufficient water for the final remedy would be Holocene gravel deposits in the wash channels in the range of 150 feet in depth or shallower. Deeper gravel deposits would likely be Tertiary in age and might produce lesser amounts of water and water of lesser quality.

Two general areas—both located within the channels of relatively large desert washes—have been identified where hydrogeologic conditions might be favorable for developing a well capable of 600 gpm or more. One of these locations is in Sacramento Wash, in Arizona, and the other is in an unnamed wash in California about 1.75 miles north of Moabi Regional Park. Within these two general areas, three specific locations have been identified for evaluation (see Figure 1):

- **Site A.** This site is located in Arizona on HNWR property approximately 1,800 feet east of Arizona County Highway 10 (Oatman-Topock Highway) within the surface channel of Sacramento Wash. Site A is accessed from Highway 10 either using an unpaved road that originates from Highway 10 and follows the railroad or up the axis of Sacramento Wash. Some trimming of the tamarisk might be required to provide sufficient space for drilling activities. Road grading is not required for access, though minor leveling of uneven ground with hand tools or a backhoe at select locations at the work site or along the access pathway may be required.
- **Site B.** This site is located in Arizona on HNWR property adjacent on the west-bound shoulder of Arizona County Highway 10. This site is located just north of the surface expression of the Sacramento Wash, near its confluence with the Colorado River. Access to this location is directly off of Highway 10. The site is flat, and there is sufficient space to conduct exploratory drilling and testing; however, if a supply well is installed at this location, some earthwork might be required to create enough space for the drilling equipment.
- **Site C.** This site is located in California on either private or Reclamation land approximately 1.75 miles northwest of Moabi Regional Park, adjacent a well-graded gravel road. The gravel road is accessed from the park and the site is to the northeast of the gravel road. Minor grading with hand tools or a backhoe will be required to provide access from the gravel road down to the base of the wash where the work area is located, which is several feet lower than the road. Once at the base of the wash, minor leveling might be required in select areas along the access pathway or in the work area. Access from the gravel road to the west would require crossing private property. PG&E is currently seeking permission from the property owner to use this route. Alternatively, an access route might be established across Reclamation land from the southeast, which would require the trimming of some vegetation.

In addition to these three locations, one of two contingency locations (Sites A-alt and C-alt) might be evaluated near either Site A or C. As presented in the next section, the surface resistivity data collected at these locations indicate that a second area of interest might be present at each location. However, because interpretations of the resistivity survey must be verified through drilling and testing, the decision to evaluate a fourth location will be made based on the field data collected from Sites A and C.

2. Summary of Geophysical Survey

The surface expression of the wash channels in the area of Sites A and C are between 0.25 and 0.5 mile wide. In order to maximize a well's yield, the well should be located in the thickest sequence and/or coarsest facies of recent alluvial gravel. With a surface channel width greater than 0.25 mile, it is not certain that the deepest portion of the underlying paleochannel, or the portion with the coarsest alluvial sediments, would be beneath the center of the present day channel. Therefore, during the week of October 22, 2012, a geophysical survey (surface resistivity logging) was conducted across the wash channels near Sites A and C as a means to locate the most

favorable portion of the subsurface channel before drilling exploratory borings. Surface resistivity logging was not conducted around Site B because there is not sufficient flexibility in where this exploratory borehole can be drilled to warrant using a geophysical survey. Tribal monitors observed the geophysical survey.

Figure 2 presents the location of the surface resistivity survey lines and cross-sections providing the color-coded results of the survey. Surface resistivity cannot distinguish between the sediment and groundwater resistivities. Freshwater has much higher resistivity than salty water, and gravel has higher resistivity than clay or silt. As such, the blue areas on the resistivity plots can represent fresher water and/or coarser grained sediments. Dry sediments and most types of bedrock also have high resistivity and would also be expected to show up as blue on the resistivity plot.

The current interpretation based on the basin's geologic history suggests that shallow areas of higher resistivity are the best target for exploratory drilling and testing. Deeper areas of higher resistivity identified at both Sites A and C are unlikely to represent Holocene gravels that have been proven to provide the best freshwater sources in this basin. In addition, the quality of the resistivity data in the deeper portions of a surveyed section is lower, making interpreting deeper features less certain than shallower features. Empirical data that will be collected from the Site A and C exploratory boreholes might lead to an alternative interpretation of the resistivity results, thereby requiring that one of these deeper intervals be evaluated.

There is evidence from existing wells in both Arizona and California indicating that the salinity increases with depth. The Topock-3 water supply well[1], located approximately 0.75 mile from the southern end of the Site A survey line, was originally screened to a depth of 250 feet below ground surface (bgs), but it produced saline water. The bottom 100 feet of Topock-3 was subsequently sealed, and water quality improved substantially. Saline water is also present in the deeper part of the aquifer near TCS. Therefore, the current interpretation suggests that the best opportunity of finding freshwater is likely from shallower depths, and Sites A-alt and C-alt have been identified as contingency sites for exploratory drilling.

The Site A resistivity results indicate a relatively large interval of higher resistivity (blue) in the target depth range near the southern end of the survey line. This area is in the depth range where Holocene-age sediments are expected and has a shape consistent with a buried stream channel. There is a larger area of higher resistivity identified in the middle of the survey line, however the depth of this area (from 200 to 400 feet bgs) suggests that it is likely Tertiary in age and, therefore, might not produce as much water as the shallower target. Therefore, the shallower area of higher resistivity near the southern end of the line has been identified as the best target for exploration drilling.

Surface resistivity results from the Site C survey line indicate only one area of higher resistivity in the depth range of interest (less than 150 feet), which is located about 500 feet from the northwest end of the survey line. This feature is smaller than the target area identified on the Site A line, and in general, the resistivity of the entire profile at Site C is lower than Site A, potentially indicating lower permeability and/or more saline water. There is a deeper zone of higher resistivity present near the southeast end of the survey line; however, for the same reasons cited above regarding deeper features, this area is not considered an ideal target for exploratory drilling. The primary target for exploratory drilling at Site C is the shallower area of higher resistivity.

3. Freshwater Source Evaluation

Exploratory boreholes will be drilled and tested at up to four locations to assess groundwater quality in the three general areas, and qualitatively assess groundwater quantity. A true estimate of the quantity of available groundwater, however, can only be obtained by testing a properly constructed supply well. Exploratory boreholes at three locations—Sites A, B, and C—will be drilled initially. One additional borehole, either Site A-alt or C-alt, might be drilled depending on the data obtained from Sites A and C, respectively.

[1] The Topock-2 and Topock-3 wells were evaluated by PG&E as a potential freshwater source; however, the wells do not offer any advantages over HNWR-1 because there are not currently significant differences in the water quality, and there is greater uncertainty about the future water quality as well as the quantity of water available (CH2M HILL, 2012).

Based on the data collected during exploratory drilling and testing, up to two new groundwater supply wells might be installed near Sites A, B, or C (including alternate locations). Each newly installed supply well will be tested following installation and development. Implementation details specific to conducting the exploratory borehole drilling and testing, installing and testing the freshwater supply wells, and managing all wastes generated during these activities are discussed in the following subsections.

3.1 Exploratory Borehole Drilling and Testing

Exploratory boreholes will be drilled using a rotary drilling method with casing advance capabilities using air and potentially freshwater as the drilling fluid (using water conditioning additives might be needed, but using bentonite-based drilling mud is not anticipated). This drilling method is commonly used for groundwater exploration and water supply well installation, and it will allow depth-specific lithologic and groundwater samples to be collected. The equipment required to conduct the exploratory drilling will include a drilling rig (likely track-mounted but potentially truck-mounted), rig support truck (highway-rated), water truck (highway-rated), forklift and/or backhoe (rubber tire), and crew vehicles (highway-rated). Examples of additional miscellaneous equipment that might be required to conduct the work include, but are not limited to, storage tanks and bins, auxiliary compressors, pumps, and generators. Potentially 1 acre of upland habitat is expected to be disturbed for each exploratory borehole.

The exploratory boreholes will be drilled to a total depth of up to 400 feet bgs and have a diameter of up to 8 inches (nominal). Borehole lithology will be logged from drill cuttings at the surface; the drill cuttings, which due to the high up-borehole velocity of the compressed air used for drilling, are observed in near real-time with the depth of the drill bit. Once the water table is reached, zone-specific groundwater samples will be collected from the borehole approximately every 50 feet to assess changes in water quality with depth and qualitative changes in borehole capacity. These samples will be collected by pumping from within the drill casing (using either an air-lift or electric submersible pump) and monitoring water quality at the surface. All groundwater samples will be analyzed for total and hexavalent chromium, arsenic, iron, manganese, silica, fluoride, and nitrate. A subset of samples (approximately half of those collected) will be analyzed for a longer list of water quality parameters, including petroleum hydrocarbons, pesticides, herbicides, chloride, sulfate, nitrate, nitrite, fluoride, bromide, phosphate, general minerals, total organic carbon, pH, and stable oxygen isotopes.

Based on review of existing hydrogeologic information in the area, the exploratory boreholes are expected to be advanced within one aquifer unit, and individual aquifers separated by confining units are not expected to be encountered. Therefore, each exploratory borehole will be decommissioned by backfilling from total depth to 20 feet bgs with either bentonite grout or clean granular material. The upper 20 feet of each borehole will be sealed using bentonite. All granular backfilling and sealing materials will be installed using the drill casing as a tremie pipe. As determined necessary, an additional tremie pipe installed within the drill casing will be used to install fluid materials used for backfilling and sealing (e.g., grout) so that the material is introduced near the bottom of the borehole and standing water is displaced upward. If multiple aquifers are encountered, then additional intervals of sealing material might be required to properly decommission the borehole. Using granular materials rather than grout to backfill the exploratory boreholes allows the future option of later reaming the same borehole to construct a supply well, thereby minimizing the number of boreholes drilled.

3.2 Freshwater Supply Well Installation and Testing

Based on the data collected during exploratory drilling and testing, up to two new groundwater supply wells might be installed near Sites A, B, or C (including alternate locations). Ideally, boreholes for supply well construction will be drilled over the backfilled exploratory borehole at a given location to minimize the total number of boreholes installed; however, if the exploratory borehole were to be backfilled with sealing material near the target-screened interval for the supply well, then this approach might not be practicable because the sealing material could interfere with groundwater production from the formation. In this case, a new borehole would be drilled near the exploratory borehole. As described above, 1 acre of upland habitat is expected to be disturbed for each exploratory borehole, and this same 1 acre area will be further disturbed by the freshwater supply well installation.

Boreholes for supply well construction will be drilled using drilling methods similar to the exploratory boreholes (i.e., casing advance), but these wells will be larger (up to 42 inches in diameter nominal). Therefore, supply well drilling will require a larger drill rig and associated support equipment. Well construction details will be determined based on the lithologic, water quality, and hydraulic data collected from the exploratory borehole. Final design of the wellhead protection and associated instrumentation and control equipment, as necessary, will be included in the forthcoming *Basis of Design Report/Intermediate (60 Percent) Design Submittal for the Final Groundwater Remedy* (CH2M HILL, 2013 in progress); however, because the well(s) will be installed in the active wash flow channel(s), temporary wellhead protection measures must be considered at the time of construction. Newly installed supply wells will be constructed so that they are sealed to prevent surface water inundation or so that the well seal is above the 100-year floodplain level. In addition, the wellhead will be completed with a steel monument casing within a concrete foundation with steel bollards at the foundation perimeter to resist damage from surface flow, and a temporary perimeter fence will be installed to secure the location until the groundwater remedy design is finalized. Following construction, a combination of bailing, surging, and pumping will be used to remove fluids introduced during drilling and develop the hydraulic connection between the well screen, gravel envelope, and the formation.

Hydraulic tests—including step-rate and constant-rate extraction tests—will be conducted at each newly installed supply well to collect data about both well and aquifer performance and changes water quality when pumped over a period of multiple days. A step-rate extraction test likely will require 1 to 2 days, and a constant-rate extraction test likely will require up to 96 hours of continuous pumping; however, the duration of these tests might need to be adjusted shorter or longer depending on the data collected and/or as discharge constraints are identified. Data collected from these tests will be incorporated into design of the final groundwater remedy.

In addition to the testing for potential new supply wells, a constant-rate extraction test might be conducted at the existing well HNWR-1 (see Figure 1). The test purpose and implementation details would be similar to that mentioned above for the potential new supply wells. Based on the well operation data obtained from HNWR and the samples collected during well sampling events, this test would be conducted by pumping the well near its maximum yield (approximately 800 to 1,000 gpm) for approximately 96 continuous hours. Assuming a flow rate of 1,000 gpm, the total estimated discharge is over 5.5 million gallons. The test duration might need to be adjusted shorter or longer depending on the data collected and/or as discharge constraints are identified. Ideally, the test will be conducted using the pump that is currently installed in the well; however, depending on the final design of irrigation pipe layout, a temporary test pump might need to be installed.

3.3 Management of Material Generated During Investigation

Three types of materials will be generated during the activities outlined for the freshwater source evaluation: drill cuttings, purged groundwater, and trash. Drill cuttings and purged groundwater will be managed in accordance with site-specific and regulatory practice for groundwater supply well drilling. Note that, because this freshwater source evaluation is part of a CERCLA response action, implementation plan activities conducted onsite are covered under the permit exemption codified in Section 121(e)(1) of CERCLA. While the permit exemption applies to the administrative or procedural elements (e.g., preparing and submitting permit applications and obtaining permits), the substantive requirements of the applicable laws remain. Groundwater discharge and drill cuttings that are presumed clean will be managed in compliance with the substantive requirements of Aquifer Protection General Permit 1.04, as authorized by Arizona Administrative Code Section R18-9-B301(D). Discharge of these materials in California will comply with the substantive requirements of the statewide Water Quality Order No. 2003-0003-DWQ, Statewide General Waste Discharge Requirements (WDRs) for Discharges to Land with a Low Threat to Water Quality (General WDRs).The approach to managing each of these waste types is presented as follows:

- **Drill cuttings** will comprise a combination of dry and saturated unconsolidated materials. This material will be contained at the ground surface using a cyclone that is attached to the cuttings return pipe and empties into a hopper. Cuttings will then be spread on the ground near the drilling site in a manner consistent with land owner approval and applicable requirements.

- **Purged groundwater** will be generated during drilling, sampling, well development, and well testing activities. All purged groundwater will be discharged to the ground surface in a manner consistent with land owner approval and applicable requirements. Purged groundwater will be discharged directly to the ground surface using a discharge pipe or surface irrigation system. The discharge area will flow down the existing channels in the wash where the well is located and likely extend beyond the 1 acre work area. Under no conditions will the surface discharge be allowed to reach the Colorado River. As previously discussed with HWNR, groundwater purged during HWNR-1 well testing will be used for irrigation in an area identified by HNWR for future revegetation.
- **Trash** associated with normal work operations, which might include well material packaging, plastic sheeting, and food waste, will be removed from the work site daily and transferred to a dumpster located on PG&E property. Dumpster contents are disposed at an offsite landfill.

4. Anticipated Approvals and Authorizations

Implementing the activities presented in this implementation plan will require prior approval from DTSC and DOI pursuant to their authority under RCRA and CERCLA, respectively. As discussed further in Section 4.1, BLM is currently requesting that USFWS extend the 2007 Programmatic Biological Assessment (PBA), which expires on December 31, 2012, for an additional 5 years, and is also requesting certain other revisions to the PBA. If BLM's request for a PBA extension and revision is granted, then all proposed activities will be conducted in a manner consistent with the PBA and, therefore, will comply with requirements of the federal Endangered Species Act (ESA). Compliance with Section 106 of the National Historic Preservation Act will involve complying with the requirements and mitigation measures contained in the Programmatic Agreement (BLM, 2010) and the *Cultural and Historic Properties Management Plan* (BLM, 2012) and BLM's consultation with the Tribes, other signatories, and invited signatories to the Programmatic Agreement pursuant to the requirements of the Programmatic Agreement's consultation protocol.

Approval from the DTSC is subject to review pursuant to the California Environmental Quality Act to determine whether the activities presented in this implementation plan present any new or substantially more severe significant impacts compared to the impacts evaluated in the certified Final Environmental Impact Report (EIR) for the remedy. In carrying out the activities presented in this implementation plan, PG&E will comply with applicable mitigation measures set forth in the adopted Mitigation Monitoring and Reporting Plan (DTSC, 2011b) for the project.

Portions of the plan activities are within the jurisdiction of the California Department of Fish and Game (CDFG), pursuant to Section 1600 et seq. of the Fish and Game Code. Compliance with Section 1600 requirements has been previously provided via the existing CDFG Streambed Alteration Agreement (SAA) No. 1600-2005—0140-R6, as amended in January 2007. Subsequent to the termination of this SAA in December 2012, work plan activities will be performed in compliance with the substantive requirements of California Fish and Game Code Section 1602.

Coordination with the affected pipeline company will occur as needed to obtain prior approval and comply with applicable requirements. In addition, before subject activities are implemented, underground service alert notifications will be made so that utility companies can locate and mark the locations of their underground facilities.

4.1 Biological Evaluation

The current PBA expires in December 2012; BLM is going to reinitiate consultation with USFWS to extend the coverage period of the PBA for an additional 5 years. This request for reinitiation includes a request to modify the 2007 PBA Action Area along the boundaries for investigative activities and include up to four test borings and up to two potential additional wells to accommodate freshwater source investigation work prior to final remedy construction. Upland habitat loss threshold of 8 acres would cover the disturbance from the installation of up to four test borings and up to two potential additional wells (of which up to 4 acres of disturbance would be attributable to the test borings and wells), in the reinitiation of the PBA.

The current PBA addresses a variety of PG&E Topock remedial and investigative actions, including those identified in the implementation plan for evaluation of alternate freshwater sources, and the modified Action Area in the PBA reinitiation would encompass the geographic scope of these activities. The intent of the PBA is to provide programmatic coverage of these actions up to the final remedy and avoid the need for individual project-specific consultations under ESA. The purpose of this biological evaluation is to outline the freshwater source evaluation activities as they relate to federally listed species in the area and to determine whether the actions are within the context and boundaries of the PBA as will be reinitiated by BLM. Sections below discuss project timing, project location and habitat sensitivity, habitat loss, conservation measures, listed species determinations, and conclusion, respectively. The federally listed species being considered and evaluated include the southwestern willow flycatcher (*Empidonax traillii extimus*), Yuma clapper rail (*Rallus longirostris yumanensis*), Mojave desert tortoise (*Gopherus agassizii*), bonytail chub (*Gila elegans*), and razorback sucker (*Xyrauchen texanus*).

4.1.1 Project Timing

The fresh water source evaluation activities are anticipated to be conducted between mid-January and mid-May 2013. The start date is dependent upon receipt of necessary approvals and authorizations. The anticipated avian nesting season is defined as March 15 to September 30 in the PBA. Development of the alternate access for Site C through the tamarisk thicket and mesquite stands should be completed prior to March 15 because this is sensitive habitat for protected bird species, including southwestern willow flycatcher. Should the activities occur within the avian migration or nesting season, the required work windows and buffers outlined in the PBA will be implemented for any migratory or nesting birds that may be affected.

4.1.2 Project Location and Habitat Sensitivity

The freshwater source evaluation sites are mostly in upland areas from the Colorado River floodplain and consist of either creosote bush scrub or Mojave wash scrub habitats. The proposed alternate route for Site C may encroach minimally into the floodplain. Suitable habitat for birds and other wildlife, including the federally listed southwestern willow flycatcher as well as other migratory bird species protected by the Migratory Bird Treaty Act, is found within the tamarisk thicket and mesquite stand where the alternate route is proposed. Because southwestern willow flycatcher may use the tamarisk and mesquite trees for roosting and foraging during the spring and fall migration seasons, it is possible that operational activities and loss of tamarisk and mesquite could alter the behavior of migrating birds. The freshwater source evaluation may involve cutting an access road up to 15 feet wide within the tamarisk thicket and mesquite stand but will disturb less than 2.5 acres of floodplain habitat and will be below the threshold disturbance established in the PBA. In addition, only trimming of trees will occur, and if needed, a nominal amount of tamarisk trees may be pruned at ground level to clear access.

The desert tortoise is the only federally listed species that may occur within the creosote bush scrub or Mojave wash scrub habitats at the proposed freshwater source evaluation activities. The desert tortoise critical habitat does not exist within the Action Area; however, the project is within the known range for desert tortoise. The habitat in the area is considered marginal due to limited suitable plants and soils for forage and cover sites, past habitat disturbance and fragmentation, and natural and constructed barriers that deter this species from entering the site.

Other listed species that may potentially occur or are known to occur within the Action Area include the Yuma clapper rail, bonytail chub, and razorback sucker. Project activities will not occur within the Topock Marsh or Colorado River, where these species reside.

4.1.3 Habitat Loss

Loss of habitat will be minimized to the greatest extent possible. Freshwater source evaluation activities are anticipated to disturb up to 1 acre per site location and are proposed in upland locations. Up to four locations are currently proposed (Sites A, B, and C and either Alt-A or Alt-C), which equates to 4 acres of potential disturbance to upland habitat. Where possible, activities will be limited to previously disturbed areas, thereby reducing the impact to upland habitat vegetation; it is anticipated that actual disturbance to upland habitat will be less than 4 acres. Where possible, vegetation will be trimmed or crushed for equipment to access sites. The trimming or crushing of vegetation is not considered habitat loss as defined in the PBA. Any vegetation removal will be coordinated with the project biologist and documented as outlined in the PBA. Impacts to the floodplain caused

by the construction of the potential alternate route for Site C will be limited by selecting the least vegetated path through the tamarisk thicket and mesquite stands. Several tamarisk trees may need to be stumped to ground level to gain access through the thicket. The biologist will ensure that the 8-acre upland vegetation loss threshold and that the 2.5-acre threshold for disturbance in floodplain is not exceeded.

4.1.4 Conservation Measures

The conservation measures identified in the PBA for listed species and habitat will be implemented. Any habitat loss is expected to be below the 8-acre upland threshold and the 2.5-acre disturbance threshold for floodplain in the PBA reinitiation. The project biologist will perform pre- and post-activity surveys to document any habitat loss and to ensure that the sites are clear of desert tortoises and any nesting birds as deemed necessary. Areas with vegetation removal that are only temporarily disturbed will be revegetated with native plants after construction activities are complete.

4.1.5 Listed Species Determinations

Annual surveys conducted since 2005 have not identified nesting pairs of the southwestern flycatchers within the Action Area, either in California and Arizona. A single western yellow-billed cuckoo has been observed three years in a row, indicating they may be breeding in the area. In 2012, solitary southwestern flycatchers were identified at the mouth of Bat Cave wash in California, as well as in the Topock Marsh. Yuma clapper rails were detected during surveys conducted in 2012 along the Arizona side in the emergent habitat near the marina.

Southwestern willow flycatcher. This action may have a minimal indirect affect upon this species based on marginal disturbance of habitat for the potential alternate route for Site C. Development of the alternate access for Site C through the tamarisk thicket and mesquite stand would be completed prior to March 15 if possible to avoid impacting this species. The temporary habitat loss (removal of Tamarisk at ground level and trimming of native trees) at Site C as a result of the freshwater source evaluation activities in the floodplain, would stay below the 2.5-acre disturbance threshold. However, should any proposed freshwater source evaluation activities occur after May 1 near suitable habitat for this species, a “may affect, but is not likely to adversely affect” determination for this species could be made. The rationale for this determination accounts for the species expected arrival in the area in May. The behavior of this species during the spring migration may be affected by project-related activities. In addition, USFWS protocol surveys were performed from 2005 through 2010 and again in 2012; these surveys resulted in no positive confirmation of species nesting within the Action Area. Therefore, any potential direct and indirect effects during the nesting season will not be adverse.

Yuma clapper rail. This action will have no effect upon this species. The project will not occur within the emergent marsh habitat or near this habitat; therefore, any potential direct and indirect effects to this species will be avoided.

Desert tortoise. This action will have no direct effect upon this species based on the implementation of the measures identified in the PBA. Additionally, USFWS protocol surveys were performed from 2004 through 2009 that resulted in no recent evidence of species presence within the Action Area; therefore, any potential direct effects will be avoided. The habitat within the Action Area is considered marginal, and any loss would be minor and well below the 8-acre upload threshold requested in the PBA re-initiation). Therefore, this action will have no indirect effects upon this species.

Razorback sucker. This action will have no effect upon this species. The project will not occur within the Colorado River or affect the bed and bank of the river; therefore, any potential direct and indirect effects to this species will be avoided.

Bonytail chub. This action will have no effect upon this species. The project will not occur within the Colorado River or affect the bed and bank of the river; therefore, any potential direct and indirect effects to this species will be avoided.

4.2 Archeological Surveys and Reviews

The three general areas subject to activities described in this plan were included in archaeological surveys conducted from August to November 2012, during which tribal monitors were invited to observe and were

variously present. Twenty archaeological and historical sites were located within these areas. All archaeological and historical sites will be avoided during plan implementation, and this work will comply with all applicable cultural resource mitigation measures included in the *Programmatic Agreement, Cultural and Historic Properties Management Plan and* the adopted *Mitigation Monitoring and Reporting Plan* (DTSC, 2011b) for the project. Prior to any ground-disturbing activities, work areas will be reexamined to ensure that no resources are disturbed. Cultural resource-related documents generated during activities associated with this implementation plan will be made available for review by interested Tribes and the agencies.

The archaeological and historical sites will be protected from work activities and will be monitored during the course of work. The PG&E representative will be responsible for providing cultural sensitivity training to the workers implementing this plan and for ensuring compliance with all applicable archaeological measures during drilling activities. PG&E will invite participation from the Tribes, archaeological monitors, and agency staff, as appropriate, in this training.

Site orientation will stress that all site activities will be conducted in a respectful manner. Applied Earthworks, a professional cultural resources consulting firm, was retained by PG&E with DTSC approval. Applied Earthworks will observe ground-disturbing activities and will have the authority to temporarily divert or halt any activities in the event that previously unidentified potentially significant cultural resources are discovered. Specific steps to evaluate and safeguard any previously unidentified potentially significant cultural resources will follow the steps described in the EIR (DTSC, 2011a).

In addition, PG&E will invite the Tribes to arrange for tribal monitors to observe the activities in this plan. PG&E will work closely with tribal monitors to ensure that monitoring activity is consistent with security and health and safety considerations.

5. Schedule and Reporting

Figure 3 presents the estimated implementation schedule for the freshwater source evaluation. As illustrated, the target date for receipt of DOI approval is the end of December 2012, and for receipt of DTSC approval is mid-January 2013. Following approval, field mobilization is estimated to occur within the next three weeks. Exploratory drilling and testing is estimated to require one month, extending into mid-February 2013, followed by installing and testing up to two new supply wells. All field work is estimated to be complete by the end of April 2013. Once all approvals and authorizations are obtained, and subcontractor availability is finalized, a more detailed implementation schedule will be provided to DOI and DTSC.

The results of all activities conducted as part of this evaluation will be included in a technical memorandum that will supplement the basis of design for the groundwater remedy. This technical memorandum will summarize field activities conducted, evaluate the data collected, and discuss associated conclusions and recommendations as they relate to the design objectives for the groundwater remedy. This technical memorandum will be submitted to DOI and DTSC approximately 8 weeks after all field activities have ended and all validated groundwater analytical data have been received from the laboratory.

6. References

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USGS. 1973b. *Geohydrology of the Parker-Blythe-Cibola area, Arizona and California.* U.S. Geological Survey Professional Paper 486-G. 130 p. Prepared by D.G. Metzger, O.J. Loeltz, and B. Irelan. Prepared for the U.S. Geological Survey.

Figures

Approximate 1-acre area for primary work activities

- Freshwater Source Evaluation Locations
- Contingency Freshwater Source Evaluation Locations
- Existing Supply Wells
- Surface Resistivity Survey
- Access Routes (excluding paved areas)

Note
Groundwater source evaluation sites (including contingency sites) and access routes are not precisely located, and will be adjusted as necessary to minimze disturbance of biological and cultural resources.

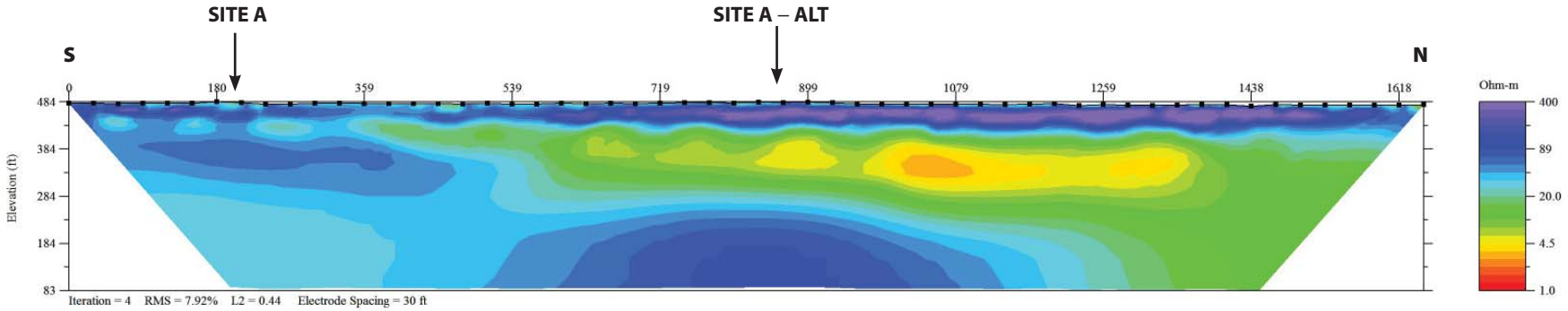
FIGURE 1
SITE MAP

IMPLEMENTATION PLAN FOR EVALUATION OF ALTERNATIVE FRESHWATER SOURCES IN THE TOPOCK REMEDIATION PROJECT AREA
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

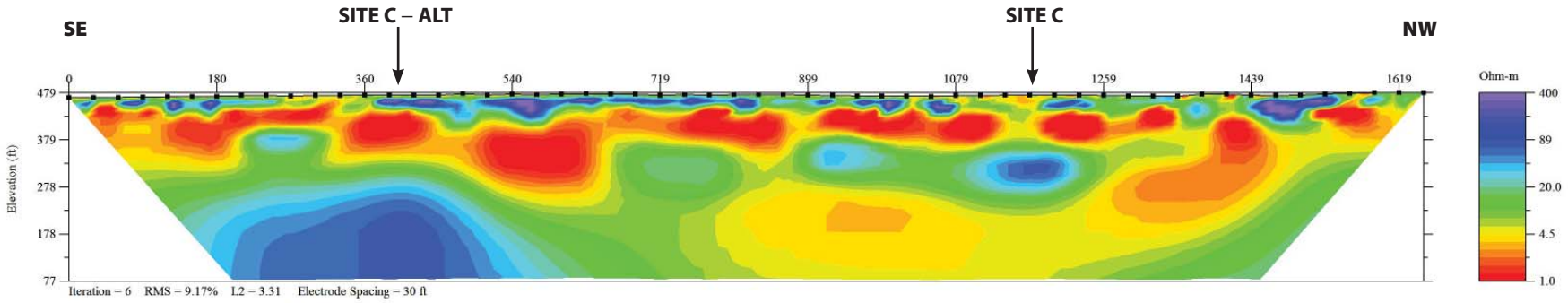
Path: D:\Projects\Topock\MapFiles\2012\PBA\ReInitiation\ActionArea_Reinitiation.mxd Date Saved: 11/15/2012 3:34:13 PM

ARIZONA – SITE A AREA



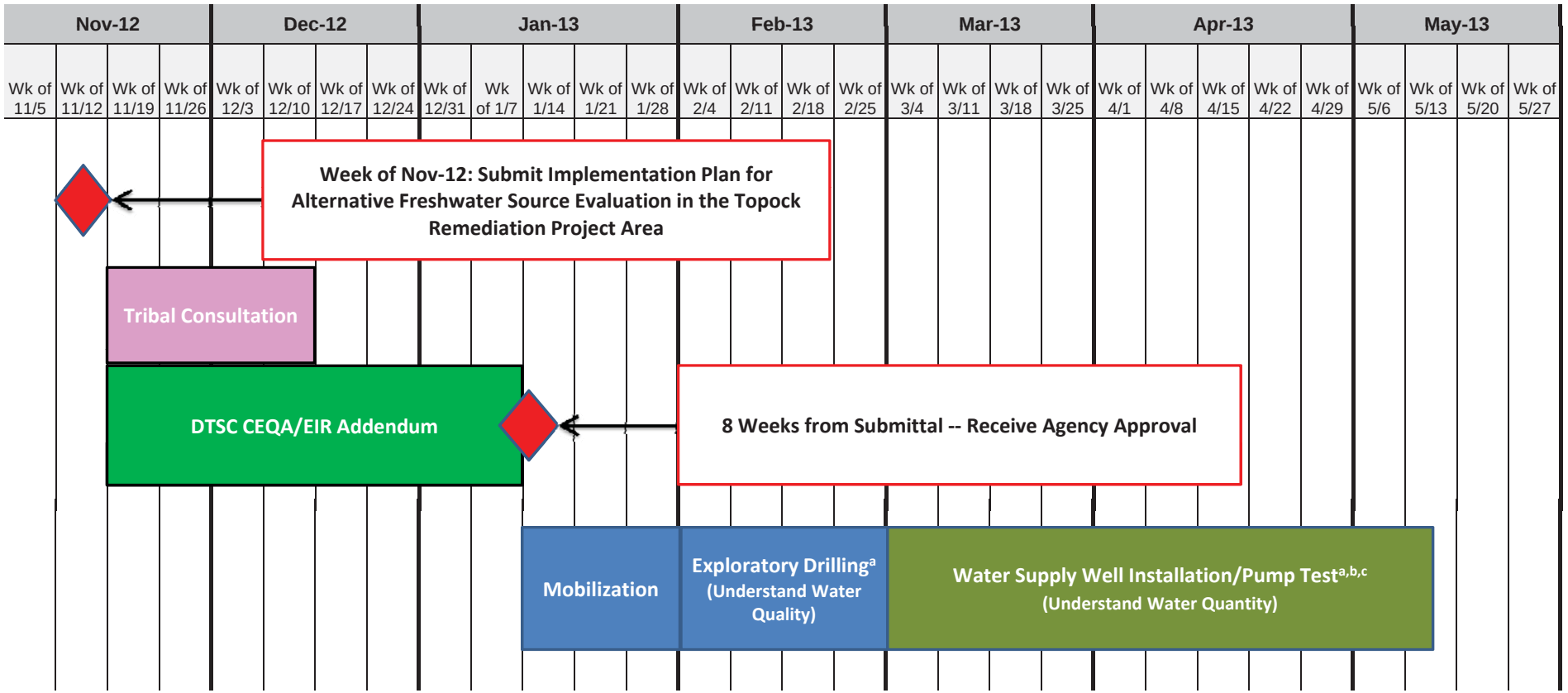
INVERTED RESISTIVITY SECTION

CALIFORNIA – SITE C AREA



INVERTED RESISTIVITY SECTION

FIGURE 2
Draft Summary of Surface Resistivity Data – Sites A and C
Implementation Plan for Evaluation of Alternative Freshwater Sources in the Topock Remediation Project Area
PG&E Topock Compressor Station, Needles, California



[a] Subject to driller/equipment availability. Assume 4 exploratory drilling holes.

[b] Assume a normal water supply well install project (similar to HNWR), able to discharge test water to land.

[c] Assume 2 wells.

FIGURE 3

Forecasted Implementation Schedule

Implementation Plan for Evaluation of Alternative Freshwater Sources in the Topock Remediation Project Area

PG&E Topock Compressor Station, Needles, California