

**CALIFORNIA ENERGY COMMISSION**

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August 5, 2011

**DOCKET****08-AFC-8**DATE AUG 05 2011RECD. AUG 05 2011

Mr. Aniekan Udobot  
Hydrogen Energy California  
One World Trade Center, Suite 1600  
Long Beach, CA 90831-1600

Dear Mr. Udobot:

Energy Commission staff has been informed that the Hydrogen Energy California project description is anticipated to change to include a urea production facility. In order to minimize the amount of delay potentially caused by this proposed change, staff is providing the attached list of outstanding information that should be contained or addressed in the applicant's supplemental filing to the extent feasible. Some of this information is a result of the anticipated project change (the urea production, storage and loading facilities) and some is outstanding information that staff was still waiting for with regard to the original configuration. This list is not intended to be final or comprehensive, but identifies the main missing areas of information staff has identified to date. Staff will likely have additional questions after the revised project description and the supplemental sections are filed.

These questions concern the following sections:

- Air Quality
- Biological Resources
- Cultural Resources
- Land Use
- Project Description
- Soil and Water
- Visual Resources
- Worker Safety/Fire Protection

Additionally, staff will have to perform a complete California Environmental Quality Act (CEQA) review and impact analysis associated with long-term maintenance and operation of Enhanced Oil Recovery/Carbon Capture and Sequestration activities at the adjacent Occidental Petroleum site. Please ensure that the supplemental filing contains sufficient information about the Occidental Petroleum site to enable staff to conduct an appropriate environmental review in all technical areas.

If you have any questions please call me at 916-653-8236.

Sincerely,

ALAN SOLOMON  
Project Manager

# OUTSTANDING INFORMATION NEEDS RELATED TO THE HYDROGEN ENERGY CALIFORNIA PROJECT (08-AFC-8)

## Air Quality

Staff requires the following information in order to prepare their analysis:

1. Revised process description and heat/energy balance that includes the urea manufacture (needed both for AQ/GHG and visible/thermal plume analysis). This should include revised AQ/GHG emission estimates that include all changes to project assumptions including urea trucking and any other new transportation (ammonia) needs and ammonia/other pollutant emissions from the urea production process.
2. Any revised assumptions regarding CO<sub>2</sub> transport/use/sequestration.
3. Explicit description/assumptions regarding compliance with or exemption from SB 1368 EPS (i.e. the project's annualized capacity factor including the urea facilities and oil field activities).
4. Best Available Control Technology( BACT) analysis for Air Quality and for greenhouse gases (GHG).

Additionally, since the HECA project is being modified, please work with the San Joaquin Valley Air Pollution Control District to determine when the revised air permits will be issued, addressing HECA as modified, the new facilities and oil field activities.

## Biological Resources

Staff believes the HECA Project would result in direct impacts, indirect impacts, habitat loss, and potentially cumulative impacts for certain species. Staff requires that the applicant calculate and submit habitat impacts for state and federally listed species and an overall conservation strategy including a proposal for compensatory mitigation for the HECA Project. Without a mitigation proposal, staff cannot make a determination whether the project would comply with laws, ordinances, regulations, or standards (LORS) including the federal and state Endangered Species Acts or that project impacts to sensitive biological resources would be reduced to less than significant levels. Staff requires the following information in order to prepare their analysis:

5. California Department of Fish and Game permit applications – staff requires the applicant prepare and submit a Lake or Streambed Alteration Agreement application per California Fish and Game Code Section 1600. In addition, staff requires the applicant prepare and submit to Energy Commission staff a 2081 Incidental Take Permit application inclusive of a compensatory habitat mitigation proposal and identification of mitigation lands. Staff cannot prepare the biological resources section of the Final Staff Assessment without these permit applications. Staff will use the provided information to prepare conditions of certifications for compensatory mitigation and project impact avoidance and minimization measures for state-listed species and state jurisdictional waters based on the Project's impacts to these habitats.

6. Compensatory habitat mitigation proposal – staff requires the applicant submit habitat impact acreages for San Joaquin kit fox, blunt-nosed leopard lizard, Swainson’s hawk, western burrowing owl, Tipton kangaroo rat, giant kangaroo rat, and San Joaquin antelope squirrel for the power plant site and linear facilities. The applicant must also provide additional information on whether the 223 acres in the 473-acre project site will be permanently fenced off for use by wildlife such as San Joaquin kit fox or not fenced and useable by wildlife by maintaining the 223 acres in agriculture or revegetating as grassland. Intersection improvements have been identified for two locations where an additional 12 feet would be required within the 60-foot road right-of-way, the intersection of Dairy Road and Stockdale Highway and the intersection of Dairy Road and Adohr Road. The applicant must also include these habitat acreages into the species’ habitat impact calculations. Based on the habitat impact acreages, staff requires that the applicant submit a compensatory habitat mitigation proposal for each species listed above to indicate how the project’s impacts to habitat loss would be mitigated.
7. Draft impact avoidance and minimization plans – as specified in staff’s proposed conditions of certification, staff requires the applicant submit draft impact avoidance plans for San Joaquin kit fox, blunt-nosed leopard lizard, western burrowing owl, a Small Mammal Relocation Plan, special-status plant species, and a Revegetation Plan in order to ensure a timely receipt of final agency-approved impact avoidance plans. Due to large traffic volumes projected throughout operation of the project, the San Joaquin Kit Fox Impact Avoidance and Minimization Plan should incorporate long-term monitoring for kit fox mortality from vehicle strikes attributable to the project during commercial operation. Submittal of these draft plans also requires the applicant consider maintenance plans for all linear facilities. If routine maintenance of the linear facilities would require consistent vehicle traffic along the facility roads for operation and maintenance, staff, CDFG, and the Service may consider this a permanent impact and permanent loss of habitat rather than temporary.
8. Clean Water Act Section 404 jurisdiction – staff requires the applicant perform a formal wetland delineation, submit a Waters of the U.S. map to the U.S. Army Corps of Engineers (Corps) for verification, and request a jurisdictional determination from the Corps on the occurrence of jurisdictional waters of the U.S. including wetlands in the project area.
9. Revised carbon dioxide pipeline alignment – staff requires that the applicant provide an alternative for the carbon dioxide pipeline alignment that would avoid land use conflicts with conservation lands. The current proposal for the carbon dioxide pipeline route would go through lands either under an existing conservation easement or proposed for conservation under the draft Occidental of Elk Hills Habitat Conservation Plan and CDFG is not able to grant a right-of-way permit for a pipeline proposed through conservation lands (Biological Resources Figure 1).
10. Golden eagle nest data – due to changes in the Service’s survey protocols and management of golden eagle nests (Pagel et al 2010) and observation of golden eagles in the project area, staff needs additional information on the occurrence of golden eagle nests within the project area. Staff needs the applicant to provide the results of a literature review, museum records search, and database search for golden eagle nests and territories to determine the project’s effects, if any, to

golden eagle nesting territories following the Service's 2010 survey protocol guidance for this species.

11. San Joaquin kit fox vehicle strike and road mortality analysis – staff requests that the applicant implement the Probabilistic Measure of Road Lethality paper by Waller et al (2005) using the Poisson model and project hourly traffic volumes or other agency approved method to identify the impacts that project construction and operation traffic may have on San Joaquin kit fox in the project area. This analysis should include an assessment of nighttime traffic and the potential for increased impacts to nocturnal wildlife, in order to appropriately determine the mitigation to offset project impacts of vehicle strikes to San Joaquin kit fox. This data will generate the project's San Joaquin kit fox incidental take estimate which will be used to calculate the acreage of mitigation lands needed for acquisition to offset the loss of carrying capacity from the project.
12. Additional survey data – given recent realignment of the natural gas pipeline, the applicant proposed to conduct protocol-level blunt-nosed leopard lizard surveys, special-status plant surveys, a formal field wetland delineation, and focused Swainson's hawk nest surveys during the appropriate survey windows during 2011 (URS 2010o). Staff agrees that the relocated natural gas pipeline alignment must be surveyed during the appropriate survey window for San Joaquin kit fox dens, blunt-nosed leopard lizard, special-status plant species, burrowing owl, Swainson's hawk, giant kangaroo rat, San Joaquin antelope squirrel, Tipton kangaroo rat, as well as potentially jurisdictional state and federal waters. Staff also requires that the applicant perform focused botanical surveys within all suitable habitat along linear facilities for special-status plant species and GPS all occurrences. This data would then be used in the preparation of the draft Special-status Plant Impact Avoidance and Minimization Plan and impact analysis to determine if the project's impacts to rare plants would be considered significant.

### **List of items to conduct CEQA review of the Occidental Petroleum Site**

Because Elk Hills supports several threatened and endangered species, staff needs to perform a complete CEQA review and impact analysis associated with long-term maintenance and operation of Enhanced Oil Recovery (EOR)/Carbon Sequestration activities. The applicant needs to submit detailed long-term O&M plans discussing how impacts to each species would be avoided and minimized.

13. Applicant to provide Oxy's historical wildlife data from long-term monitoring of NPR-1 and NPR-2 (several decades of data was collected during Naval Petroleum Reserve monitoring). Resource agencies have a good handle on which wildlife are present on Elk Hills. San Joaquin kit fox, San Joaquin antelope ground squirrel, giant kangaroo rat, blunt-nose leopard lizard are all threatened and endangered species and assumed present.
14. Applicant to map giant kangaroo rat precincts (individual territories) on direct impact areas of Elk Hills. Giant kangaroo rat are assumed present by resource agencies, but a current mapping would be useful. The resource agencies asked for current giant kangaroo rat precinct data for the carbon dioxide pipeline so the same request would likely be made here.

15. Applicant to perform focused surveys for Swainson's hawk nests. General survey timing: March – August.
16. Applicant to provide golden eagle nest data for Elk Hills and surrounding areas. Provide the results of a literature review, museum records search, database search, and check with local raptor groups for golden eagle nests and territories. Depending on this data, USFWS's Migratory Bird Office may request more detailed field surveys and/or helicopter surveys.
17. Applicant to conduct focused burrowing owl surveys (Phase I habitat assessment, Phase II burrow surveys, Phase III owl survey) on Oxy's direct impact areas. Timing: Phase I and II can be conducted any time of year, Phase III peak nesting season April 15 to July 15.
18. Applicant to conduct focused botanical surveys following CDFG 2009 survey guidelines over the direct impact area of Elk Hills. Staff is not sure how current the plant survey data is for Elk Hills although rare plants have been long-studied here. Survey timing is species-specific in the southern San Joaquin Valley, but generally, surveys should be spaced out between February through March/April for annuals. Perennials can be surveyed for later in the season. Consult with DFG on species-specific survey timing.
19. Applicant to provide mapping of potentially state jurisdictional waters following Section 1600 Fish and Game Codes on Elk Hills direct impact area.
20. Applicant to add Elk Hills direct impact area to Section 404 Waters of the U.S. study area map and re-submit to Corps for verification.
21. Applicant to assess whether Elk Hills direct impact area overlaps with any existing or proposed conservation lands owned by CDFG per the draft Occidental of Elk Hills Habitat Conservation Plan (HCP).

## **Cultural Resources**

Staff believes the HECA and related Oxy projects would result in direct and indirect impacts to CRHR-eligible cultural resources. However, staff requires additional information about cultural resources in order to complete their analysis. Without this information, staff cannot make a determination whether the Project would comply with LORS or that project impacts to sensitive cultural resources would be reduced to less than significant levels. Staff requires the following information in order to prepare their analysis:

22. Determine the nature of impacts to ethnographic resources through with local Native American groups. Staff has found that letters and emails to be ineffective in determining ethnographic impacts. Therefore, face to face consultation and site tours are strongly recommended.
23. Provide copies of formal government-to-government Section 106 consultation letters written by the DOE to local Native American groups.
24. Revisit site CA-Ker-5392, identify and map its full extent, and submit either a detailed site specific avoidance plan or data recovery plan to address impacts of the proposed CO2 line.

25. Revisit historic archaeological sites P-15-9738 and HECA 2010-2, update the site maps and site forms to include all of the structures and features shown on aerial photographs or described in previous site forms. Conduct archival research equivalent to that conducted for the built-environment resources by JRP.
26. Complete the pedestrian survey for all of the HECA linear alignments.
27. Conduct test excavations and evaluations of CRHR eligibility for all archaeological sites which staff has identified as having the potential to be directly impacted by HECA.
28. Conduct geoarchaeological field sampling as requested in Data Requests 78-79,143, and 172-173 (CEC 2009o, CEC 2010b, 2010w). Staff requests that the sampling be conducted prior to the completion of the FSA, otherwise staff may not be able to complete their analysis.

### **CEQA Review of the Occidental Petroleum Site**

For the Occidental Petroleum site, please provide all of the information required for cultural resources in the Energy Commission Siting Regulations, Appendix B, including but not limited to:

29. Provide a discussion of the existing site conditions, the expected direct, indirect and cumulative impacts due to the construction, operation and maintenance of the project, the measures proposed to mitigate adverse environmental impacts of the project, the effectiveness of the proposed measures, and any monitoring plans proposed to verify the effectiveness of the mitigation.
30. A summary of the ethnology, prehistory, and history of the region with emphasis on the area within no more than a 5-mile radius of the project location.
31. The results of a literature search to identify cultural resources within an area not less than a 1-mile radius around the project site and not less than one-quarter (0.25) mile on each side of the linear facilities.
32. Conduct all required pedestrian surveys of the CO2 linear route and any proposed facilities, staging areas or injection points and provide the results in a technical report.
33. Copies of all technical reports whose survey coverage is wholly or partly within .25 mile of the area surveyed for the project.
34. Copies of California Department of Parks and Recreation (DPR) 523 forms for all cultural resources identified in the literature search as being 45 years or older or of exceptional importance.
35. A copy of the USGS 7.5' quadrangle map of the literature search area delineating the areas of all past surveys.
36. A map at a scale of 1:24,000 U.S. Geological Survey quadrangle depicting the locations of all previously known and newly identified cultural resources compiled through the research required by Appendix B.

## **Land Use**

The proposed Hydrogen Energy (HECA) power generating facility would be located on real property in Kern County, California. The project area includes approximately 478 acres designated Intensive Agriculture (Map Code 8.1) as per the Kern County General Plan, and zoned Exclusive Agriculture (A), according to the Kern County Zoning Ordinance. The Exclusive Agriculture zoning district allows electric generating plants as a permitted use subject to approval of a Conditional Use Permit (Zoning Code Section 19.12.030G).

37. Please provide the existing zoning and general plan designations(s) for any new project parcels resulting from the HECA project modification, including linears and injection wells.
38. Please describe how the HECA project modification would be consistent with existing surrounding land uses.
39. Please state whether the project would contain new Williamson Act contracted lands a result of the HECA project modification.
40. Please work with the Kern County, Planning and Community Development Department regarding the modified HECA project, including the proposed urea production facility. The addition of this facility may require a zone change. Please discuss this modification with Kern County and let us know if the county would require a zone change and/or general plan change for the urea production facility.

## **Project Description**

41. Staff will have to perform a complete CEQA review and impact analysis associated with long-term maintenance and operation of both the urea facilities and EOR/Carbon Capture and Sequestration activities. Staff understands that the EOR/Carbon Capture and Sequestration (CCS) activities (e.g. the capture and compression, coupled with injection and recovery) will be operated to maximize enhanced oil recovery in the oilfield. Staff has not received a detailed description of these facilities over time or the acreage and locations on which the EOR/CCS facilities will be located throughout the life of EOR/CCS activities. Please provide a description of the urea production and EOR/CCS activities. Additionally, please provide a map and time line of the impacted areas for the life of the HECA and EOR/CCS projects.

## **Soil and Water**

### **Industrial Water Supply**

A fundamental requirement for a power plant licensed by the Energy Commission is to demonstrate that its water use is reasonable relative to current technology and regional and state water needs. In essence, a power plant should demonstrate that its design minimizes water use and that its source is not fresh water. The reasonableness of a power plant's water use is a function of local water conditions, recently permitted projects, and current technology.



The project's two most significant unresolved issues, in terms of industrial water supply, are its failure to demonstrate reasonable annual water use and its failure to identify a significantly degraded source in terms of quality. The project's preferred alternative should be evaluated against reasonable alternatives. For example, Buena Vista Water Storage District's Final Environmental Impact Report (FEIR) describes that the second phase of their proposed Brackish Groundwater Remediation Program (BGRP) could provide up to 4,500 Acre-Feet per year (AF/y) of brackish groundwater. The water source is shallow groundwater that is already problem water and is impacting crop yield. This alternative is especially worthy of consideration given that the plant's expected annual water use is less than 5,000 AF/y. This alternative source is worthy of consideration for industrial supply water for the HECA plant. In light of this potentially superior alternative, staff expects a more thorough analysis of its viability.

The project has made no effort to refine or better describe its need for a 7,500 AF/y water contract, even though expected annual use is less than 5,000 AF/y. For this reason the project seems significantly over-contracted. Therefore the resulting analysis of impacts from water use may be misleading. An updated water contract or water use analysis may help address these concerns.

A thorough description of proposed construction and operational water uses at the sequestration site was not submitted to Staff with the original AFC, but is required for a complete project analysis.

As proposed, the project's current industrial supply well field could potentially create three unmitigable significant impacts.

42. The project's pumping could exacerbate overdraft in the Kern County subbasin.
43. The project's pumping could also reverse local water level increases and increase the threat to the California Aqueduct from subsidence.
44. The project's pumping could potentially induce significant degraded water migration into the local water-supply aquifer, further degrading local water supplies.

### **Storm Water Management and Erosion Control**

The project's conceptual plans for storm water management and erosion control lacks sufficient detail and do not address the urea production facilities. Staff requires more information showing that the proposed project would not adversely impact surface or groundwater resources, and would not result in flooding or significant erosion offsite. Staff needs additional information to:

45. Specify how potentially contaminated runoff would not commingle with non-contact runoff, including potential contaminants that would most likely be found in each lined basin and sump, the type of lining proposed and reason(s) why, the method(s) of conveyance to the basin, and maintenance performed during the operational life of the proposed project.
46. Address how storm runoff in contact with the storage pile would be collected and conveyed and how this area would not contaminate the surrounding soil.
47. Demonstrate that no water runoff, during construction or post-construction, would leave the proposed HECA site.

48. Show how offsite storm runoff or offsite irrigation runoff would be diverted around the proposed site, to ensure that onsite drainage facilities, sized to completely contain only onsite runoff, would not become overwhelmed with offsite flows.
49. Address potential construction-related impacts of installing pipeline across existing water courses. The draft DESCP lists several Best Management Practices (BMPs) to implement during construction of the proposed linear facilities, but no information was provided to address pipeline installation across waterways such as irrigation ditches.
50. Specify the type, location, timing, and maintenance plan/schedule of all erosion-control BMPs, to show proper installation after construction is complete and proper maintenance during operation of the proposed project.

### **Sequestration/Enhanced Oil Recovery**

Most of the questions still outstanding are related to the response of the Occidental Petroleum fields to injection and storage pressures that approach, or may exceed, overburden pressures considering the volumes to be injected and time scale of the injection.

51. A storage rate or trapping ratio for CO<sub>2</sub> per pass is needed to evaluate the amounts of CO<sub>2</sub> stored with time. The original application assumed a ratio of 1:3, which seems to be unrealistic given that there is no basis from field data, especially when compared with many other documented injection projects that report an average recirculation rate of 100 percent of purchased CO<sub>2</sub> and thus a trapping ratio of zero. Staff is aware of the results of the study conducted at the University of Wyoming that indicates a trapping ratio on the order of 1:3 per pass, but cannot verify this ratio from pilot studies or reports.
52. Data needed to characterize the formation where the CO<sub>2</sub> will be injected and stored are still lacking. Of particular importance are data pertaining to the following:
  - a- pore space characteristics and oil distribution, which are necessary to judge the availability and ease of pumping the carbon dioxide (CO<sub>2</sub>);
  - b- information needed to characterize the rock formations that will help determine the response of the rocks to available and additional stresses;
  - c- pore pressure, which is needed to assess the pressure required for the injection of the CO<sub>2</sub> into the formation; and
  - d- formation stresses, which are needed to assess the behavior of any faults that may be present.
53. Rock-mechanics data and reservoir data are needed to demonstrate the feasibility of the EOR and CCS project. Also, in-situ stress measurements at multiple locations as a function of depth are needed. In addition, estimates of the bulk rock moduli, Poisson's ratios, and/or Young's moduli for the Stevens sandstone and the confining Reef Ridge shale are needed in order to characterize the rock formation in terms of maximum stressed that can be sustained and the induced deformations.

54. There are hundreds of wells that penetrate the Reef Ridge (RR) shale, but no information is available as to their integrity and keeping their casing and cement components from being corroded/eroded away by the combination of CO<sub>2</sub> and carbonic acid. This information will be necessary for staff's analysis.
55. The Oxy Hills field is characterized as a plunging anticline that forms a natural geologic trap for petroleum hydrocarbons. This anticline has formed as a result of faulting and folding of sedimentary rock in an active tectonic region of California. Staff is concerned that the faulting and folding remain active and that there is potential for future rupture of existing or new faults in or along the plunging anticline which would allow for leakage and failure of the short- and long-term CCS component of the project. There is a lack of information about the location of active and potentially active faults and time and magnitude of rupture along faults in the vicinity of the project site. Also, information is needed to analyze the potential for reactivating existing ruptures or creating new ones.

## Visual Resources

The original May 2009 application for certification included six key observation points (KOPs). Staff determined that four of those six KOPs would be carried forward and included in the visual resources analysis for the Energy Commission's staff assessment. The attached draft figure (**Visual Figure 1**) shows the four KOP locations.

Staff requires the following information to prepare their analysis:

The visual resources analysis for the supplemental filing must re-evaluate the original KOPs in light of the proposed changes to the project. Include a discussion of the suitability of the original KOPs to best represent views of the project site. Suggest new KOPs or modified views (e.g., altered view direction from an original KOP), as necessary, to adequately show the proposed project site and adjacent project facilities that would be visible from the KOPs. Staff requests submittal of any changes to the original KOPs for Staff's review and approval prior to submittal of the supplemental filing.

After confirming the appropriate KOP locations with Energy Commission staff, please prepare and submit new visual simulations to show the revised project layout and structures that would be visible from the selected KOPs. Include proposed off-site structures that would be visible from the KOPs, such as the transmission line and any prominent structures associated with the railroad spur. Discuss how the scope of the proposed project would be captured by the visual simulations. *Submittal of the visual simulations cannot occur until a decision is made to retain or modify the existing KOPs.*

The enhanced oil recovery and CO<sub>2</sub> sequestration facilities and operations would involve construction of new structures in the Elk Hills Oil Field. Although public access to the area is limited, new structures could be visible from distant public use areas. Staff requires the following information to prepare their analysis: Include an assessment of whether any impacts could occur from installation of new structures in the Elk Hills Oil Field. Identify and evaluate the potential impacts of installing tall and/or lighted facilities that would be visible from publicly accessible areas. Additionally, in January 2011, the project owner provided a conceptual landscape plan and associated visual simulations for the original HECA project. The primary purpose of

the plan is to show how landscape elements at the project site will contribute to screening views to the maximum extent feasible for the view from the original KOP 1. Staff requires the following information to prepare their analysis:

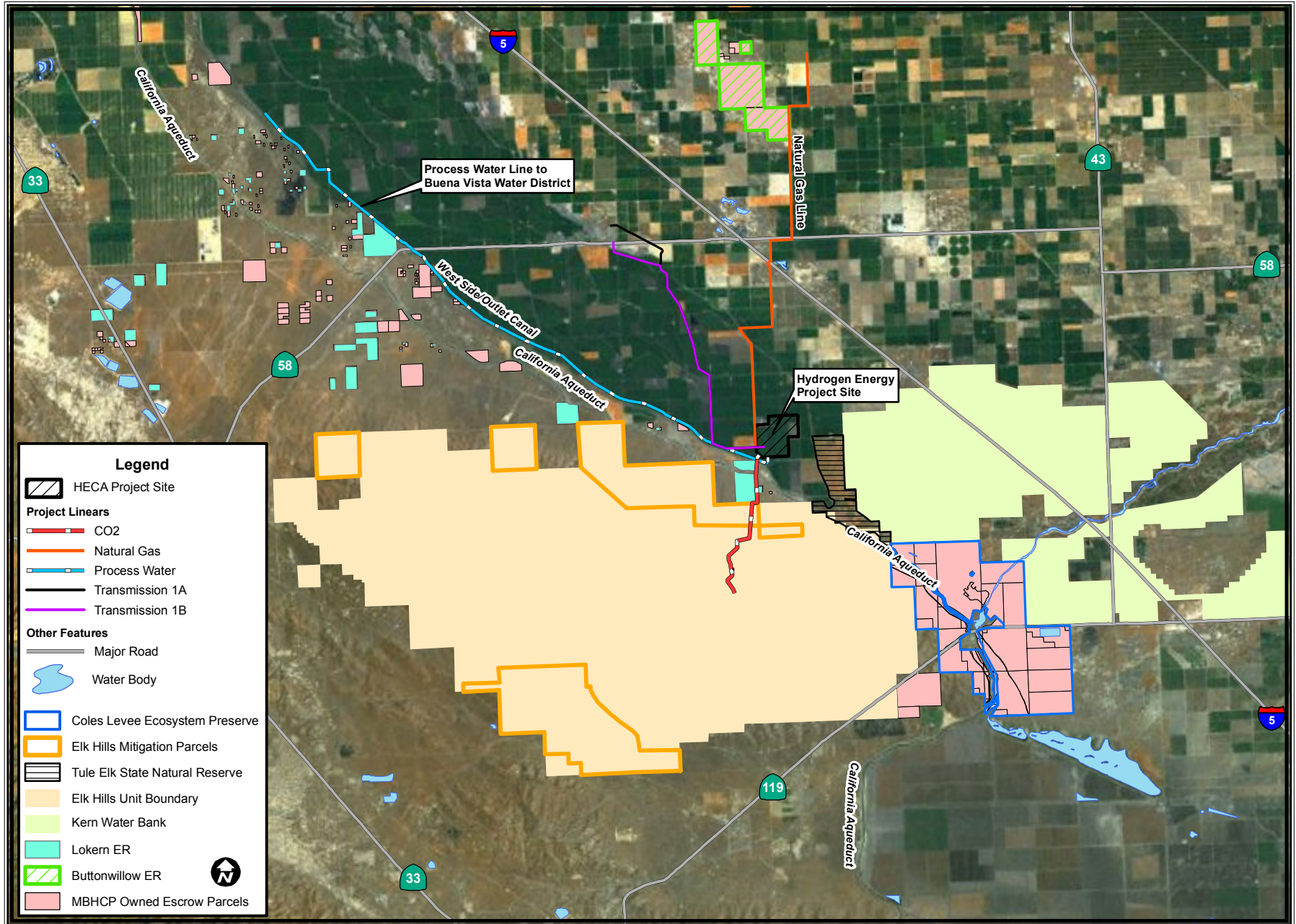
56. Please prepare and submit a revised conceptual landscape plan and visual simulations depicting the view of the landscape plantings, fencing or other structures along the site periphery, and modified plant structures and layout from KOP 1. Submittal of the revised conceptual landscape plan cannot occur until a decision is made to retain the existing viewpoint and direction for KOP 1. Include any visible off-site structures in the simulated view (e.g., proposed transmission line).
57. Sheets 1 and 2 of the January 2011 conceptual landscape plan show landscaped buffers along Tupman Road on the east side of the project site. The drawings show a relatively narrow buffer south of Station Road compared to the buffer north of the road. Please note that the view simulations in the plan for KOP 1 show no difference in the density of plant material in the site perimeter buffers north and south of Station Road. Assuming that the configuration of landscaped areas does not change under the modified project, please revise the visual simulation to reflect the difference between the densities of the two buffer areas as they would be viewed from KOP 1.

## **Worker Safety/Fire Protection**

58. It is unknown if the local Kern County Fire Department is adequately staffed and equipped to support the HECA facility, including the proposed urea facilities. Previously, the project was in discussions with the county and the fire department. What is the status of those negotiations?

# BIOLOGICAL RESOURCES - FIGURE 1

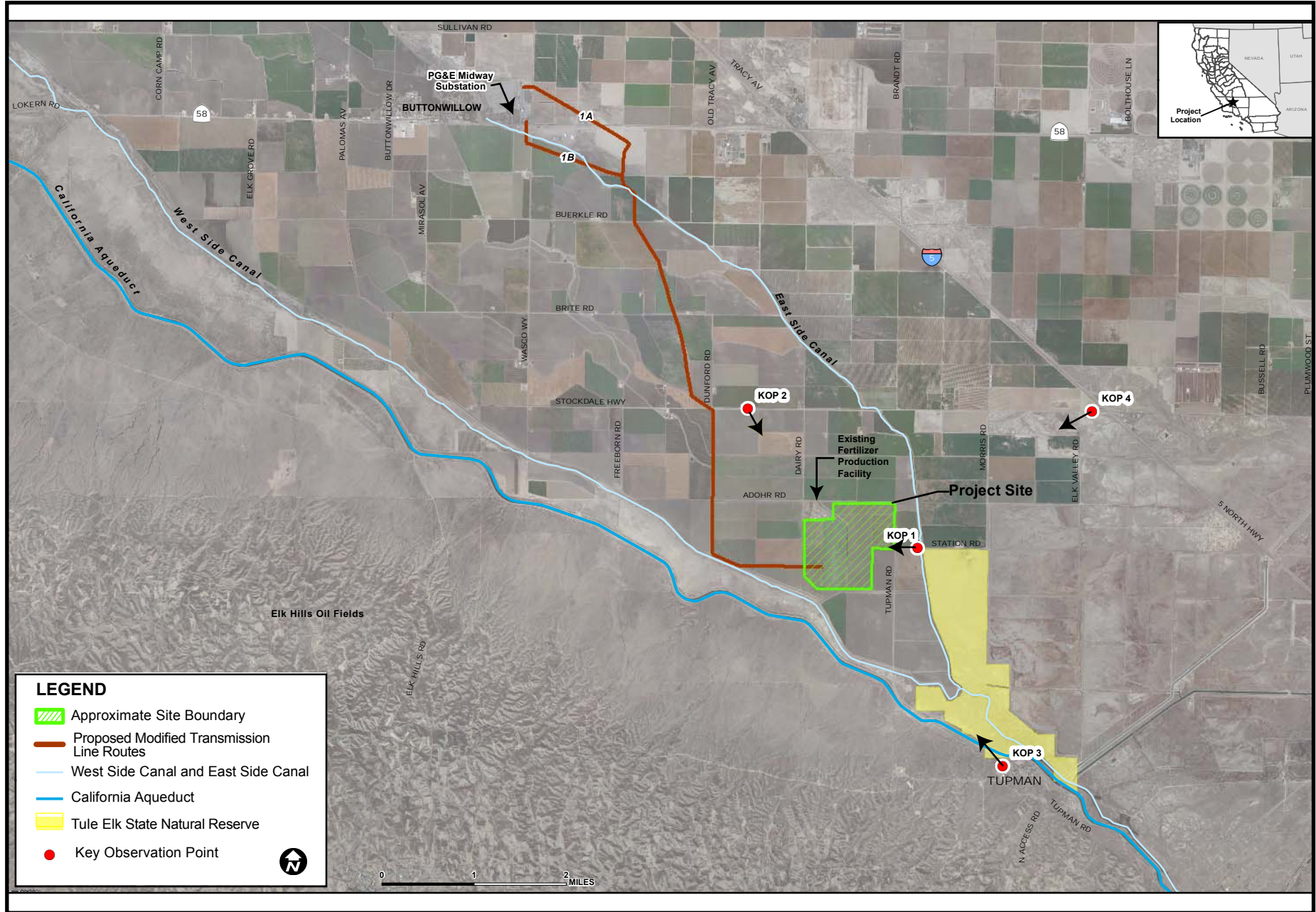
## Hydrogen Energy California - Natural Preserve Areas



BIOLOGICAL RESOURCES



**VISUAL RESOURCES - FIGURE 1**  
 Hydrogen Energy California - Project Vicinity and Locations of Key Observation Points



VISUAL RESOURCES