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5.11 VISUAL RESOURCES

Hydrogen Energy International LLC (HEI or Applicant) is jointly owned by BP Alternative Energy North America Inc., and Rio Tinto Hydrogen Energy LLC. HEI is proposing to build an Integrated Gasification Combined Cycle (IGCC) power generating facility called Hydrogen Energy California (HECA or the “Project”) in Kern County, California. The Project will produce electricity while substantially reducing greenhouse gas emissions by capturing carbon dioxide (CO₂) and transporting it for enhanced oil recovery (EOR) and sequestration.

The 315-acre Project Site is located approximately 6.5 miles west of the outermost edge of the city of Bakersfield and 2 miles northwest of the unincorporated community of Tupman in western Kern County, California, as shown in Figure 2-1, Project Vicinity Map. The Project Site is adjacent to an oil producing area known as the Elk Hills Oil Field Unit. The Project Site is currently undeveloped. Existing surface elevations vary from about 445 feet above mean sea level (msl) in the southwest corner to about 310 feet above msl in the northeast corner.

The Project will gasify petroleum coke (or blends of petroleum coke and coal, as needed) to produce hydrogen to fuel a combustion turbine operating in combined cycle mode. The gasification component feeds a 390 gross megawatt (MW) combined cycle plant. The net electrical generation output from the Project will provide California with approximately 250 MW of low-carbon baseload power to the grid. The gasification component will also capture approximately 90 percent of the carbon dioxide from the syngas at steady-state operation, which will be transported and used for EOR and sequestration (storage) in the Elk Hills Oil Field Unit. In addition, approximately 100 MW of natural gas generated peaking power will be available from the Project.

The Project Site and linear facilities comprise the affected study area and are entirely located in Kern County, California. These Project components are described below.

Major on-site Project components will include, as shown on Figure 2-4, Plot Plan:

- Solids Handling, Gasification, and Gas Treatment
 - Feedstock delivery, handling and storage
 - Gasification
 - Sour shift/gas cooling
 - Mercury removal
 - Acid gas removal
- Power Generation
 - Combined-cycle power generation
 - Auxiliary combustion turbine generator
 - Electrical switching facilities
- Supporting Process Systems
 - Natural gas fuel systems

- Air separation unit (ASU)
- Sulfur recovery unit
- Zero liquid discharge
- Carbon dioxide compression
- Wastewater injection wells
- Raw water treatment plant
- Other plant systems

The Project also includes the following off-site facilities, as shown on Figure 2-5, Project Location Map:

- **Electrical Transmission Line** – An electrical transmission line will interconnect the Project to Pacific Gas & Electric’s (PG&E) Midway Substation. The interconnection voltage is expected to be 230 kilovolts (kV). The Project is considering two alternative transmission routes, both of which extend from the western edge of the Project Site to the north, and west to the north side of the substation. Transmission Alternative 1 is approximately 9 miles long and Transmission Alternative 2 is approximately 9.5 miles long.
- **Natural Gas Supply** – A natural gas interconnection will be made with either PG&E or Southern California Gas Company natural gas pipelines, both of which are located southeast of the Project Site. The natural gas pipeline will be approximately 7 miles in length. The interconnect will consist of one tap off the existing natural gas line, one meter set, one service pipeline service connection, and a pressure limiting station located on the Project Site.
- **Water Supply Pipelines** – The Project will utilize brackish groundwater supplied from the Buena Vista Water Storage District (BVWSD) located to the northwest. The raw water supply pipeline will be approximately 18 miles in length. Potable water for drinking and sanitary use will be supplied by West Kern Water District located near the State Route 119 (SR 119)/Tupman Road intersection (southeast of the Project Site). The potable water supply pipeline will be approximately 5.5 miles in length.
- **Carbon Dioxide Pipeline** – The carbon dioxide pipeline will transfer the carbon dioxide captured during gasification from the Project Site southwest to the custody transfer point. The Project is considering two alternative pipeline routes. Alternative 1 is approximately 2 miles in length, while Alternative 2 is approximately 2.5 miles in length.

The Project components described above are shown on Figure 2-5, Project Location Map, which depicts the region, the vicinity, the Project Site and its immediate surroundings for Project components.

All temporary construction equipment laydown and parking, including construction parking, offices, and construction laydown areas, will be located on the Project Site.

The disturbed acreage associated with the Project is summarized in Table 5.11-1, Project Disturbed Acreage.

**Table 5.11-1
Project Disturbed Acreage**

Project Component	Temporary Disturbance	Permanent Disturbance
Project Site	315 acres	315 acres
Electrical transmission line	Alternative 1 – 15 acres Alternative 2 – 15 acres	Alternative 1 – 2 acres Alternative 2 – 2 acres
Natural gas line	PG&E – 2 acres Southern California Gas Company – 2 acres	PG&E – previously disturbed Southern California Gas Company – previously disturbed
Water supply line	BVWSD – 15 acres	BVWSD – previously disturbed
CO ₂ line	Alternative 1 – 1 acre Alternative 2 – 1 acre	Alternative 1 – previously disturbed Alternative 2 – previously disturbed
Temporary Construction Areas	Included in Project Site	None
Total Project Disturbance	348 acres	317 acres

Source: HECA Project

Notes:

BVWSD = Buena Vista Water Storage District

CO₂ = carbon dioxide

This section discusses the potential for the construction, operation, and maintenance of the Project to cause significant impacts to aesthetic values within the Project vicinity. The section addresses the inventory of existing visual resources of the affected environment, the assessment of the environmental consequences of the Project on visual resources, and the laws, ordinances, regulations, and standards (LORS) pertaining to the aesthetic effects of the Project.

This visual resource analysis was conducted in conformance with California Energy Commission (CEC) guidelines for the inventory and assessment of visual impacts for an Application for Certification (AFC). The CEC guidelines, in turn, comply with the California Environmental Quality Act of 1970 (CEQA) documentation requirements (summarized in Section 5.11.2, Environmental Consequences). The study methods used (described in more detail in the inventory and impact assessment sections below) were based upon those established by the Bureau of Land Management (BLM) Visual Resource Management Inventory and Contrast Rating System (BLM 1986), the Federal Highway Administration (FHWA) Visual Impact Assessment (FHWA 1981), U.S. Forest Service (USFS) Visual Management System (USFS 1974, 1995), and previous methodologies used in other CEC studies and other energy-related projects. Additionally, the methodology has been tailored to meet the specific issues and regulatory requirements associated with the Project.

5.11.1 Affected Environment

This section contains an inventory of visual resources within the vicinity of the Project, a description of the regional landscape setting, the visual sphere of influence (VSOI) of the Project, and the inventory methods and results.

5.11.1.1 Regional Landscape Setting

The county has a large agricultural and industrial base and the key agricultural commodities include grapes, almonds, milk, citrus, cotton, carrots, pistachios, hay, potatoes, and cattle. The county is also a significant producer of oil, natural gas, hydro-electric power, and wind-turbine and geothermal power. Kern remains California's top oil-producing county, with over 85 percent of the state's 43,000 oil wells. The county accounts for one-tenth of overall U.S. oil production, and three of the five largest U.S. oil fields are in Kern County. The Project Site is located adjacent to the Elk Hills Oil Fields. The land surrounding the Project Site, while zoned for agricultural use, is primarily used for oil extraction, industrial, other similar land uses and farmland to the north of the Project vicinity.

The 315-acre Project Site (Figures 5.11-1a and 5.11-1b, Sensitive Visual Resources Visual Sphere of Influence Map, and Figure 5.11-2, Aerial of Immediate Project Vicinity) is located approximately 3 miles south of Stockdale Highway, and 4 miles southwest of Interstate 5 (I-5) at its closest point to the Project Site. The property is zoned A-1 (Limited Agriculture).

Main access to the site will be provided from Tupman Road east of the Project Site. The new access road will be approximately 2,000 feet long to the east of the site and constructed on an unpaved road. The access road will provide access to the main Project as well as truck access.

Both alternatives for the transmission line route (see Figure 5.11-2, Aerial of Immediate Project Vicinity) begin at the western edge of the Project Site; proceed west and move north towards Adohr Road. At Adohr Road, Alternative 1 continues northward along portions of Dunford Road and crosses various roads including Stockdale Highway and Buerkle Road. At Buerkle Road, Alternative 1 heads northwest crossing State Route 58 (SR 58) and connects to the existing PG&E Midway Substation in the unincorporated community of Buttonwillow. The transmission line route identified as Alternative 2, moves westward at Adohr Road towards Freeborn Road. At Freeborn Road, Alternative 2 continues north along Freeborn Road crossing Stockdale Highway and Buerkle Road. Alternative 2 then heads northwest crossing SR 58 and connects to the existing PG&E Midway Substation.

The Project Site is vacant and supports sparse growth of ruderal weeds, grasses, and low-lying shrubs. Currently, other than an existing perimeter fence, there are no existing on-site structures. Adjacent land uses include an existing industrial storage tank/structure located to the southwest, an abandoned farmhouse structure located to the south, and agricultural farmlands to the north and east of the Project Site along Tupman Road.

The Project Site lies within the southwestern portion of San Joaquin Valley, which stretches from the Sacramento-San Joaquin Delta in the north to the Tehachapi Mountains to the south. Various California coastal ranges line the valley to the west (including the Diablo and Santa Ynez) and the Sierra Nevada act as the eastern valley boundary. The climate is dry with hot summers and mild winters, and there is a persistent haze, generally characteristic of the air quality in the area that impairs clarity of distant views. The general area is characterized as relatively flat with extensive current and previous soil disturbance associated with farming activities and ongoing oil field operations. The Project Site itself is generally flat, allowing for open, expansive views of the valley to the north, northwest and east. The Project Site also has middleground/distant views of the hills that make up the Elk Hills Oil Fields to the west and southwest.

The California State Water Project runs in a northwest to southeast orientation just east of the Project Site boundary and is the dominant water feature in the Project area. Other water features in the region include the Kern River, which runs approximately 4.5 miles southeast of the Project Site and the Buena Vista Aquatic Recreation Area/Lake Webb located approximately 7 miles to the southeast.

The Tule Elk State Reserve, an approximately 955-acre reserve area, is located approximately 0.25 mile east of the Project Site (closest point to the Project Site). Management of the Tule Elk State Reserve is under the jurisdiction of the California Department of Parks and Recreation and they oversee more than 270 unit parks throughout the state of California. The Tule Elk State Reserve is a refuge to the Tule Elk, a rare species of elk that was once nearly hunted to the point of extinction. The reserve contains the Tule Elk Reserve State Park that includes a visitor center, small park with shaded picnic tables, and a viewing platform/observation deck). The observation deck allows visitors to look over the reserve area as well as observing the Tule Elk in their habitat.

There are no existing recreational trails of local importance, nor are there plans for future trail routes or bike paths identified within the Visual Sphere of Influence (VSOI). The two closest areas that will be considered as recreational areas are the Elk Hills Elementary School playground, located within the unincorporated community of Tupman southeast of the Project Site, and the Tule Elk State Reserve located to the northeast. Additionally, as the site is adjacent to the Elk Hills Oil Fields there are a few patches of BLM lands within the area; however, these lands are not utilized for recreation, nor are they considered sensitive.

In general, the Project area is comprised of oilfield extraction activities/industrial facilities, agricultural lands/farming activities, the unincorporated community of Tupman, and roadways. One census tract covers the entire Project vicinity, and contains approximately 5,095 residents. This tract encompasses many different land uses; the Elk Hills Oil Fields (formerly known as the Naval Petroleum Reserve No. 1), the Tule Elk State Reserve, as well as Tupman. Tupman, an unincorporated suburban town in close proximity to the Project Site, is a Census Designated Place (CDP) and has a total population of approximately 227 residents according to the 2000 census. In addition, several other semi-urban/urban areas surround the Project region, although each is located over 5 miles away from the Project Site. Those nearest include: the communities of McKittrick, Buttonwillow, and the city of Taft, and are all approximately 8 to 15 miles from the Project Site but have no views to the Project Site. The nearest large incorporated city in the area is Bakersfield, which lies approximately 6.5 miles east of the Project area and contains the largest population in the nearby region, approximately 308,400 according to the latest 2006 census.

As stated, the Project includes interconnection to the PG&E Midway Substation. The substation is located within the unincorporated community of Buttonwillow and is a dominant structure located on the east side of the community. There are a few residential neighborhoods located to the west of the substation, including a small park, and various commercial establishments. East of the substation is largely vacant with industrial land uses (such as railroad and industrial warehouses). Also, a number of existing large transmission towers/lines extend from the south and north to connect to the existing substation. Buttonwillow is included within one census tract, and contains approximately 1,266 residents.

5.11.1.2 Visual Sphere of Influence

The VSOI for the Project (Figures 5.11-1a and 5.11-1 b, VSOI Map) represents the area within which the Project could be seen and potentially result in significant impacts to visual resources. The furthest distance at which potentially significant visual impacts could occur was identified as 5 miles. This distance was based primarily on the Project description regarding the potential visibility of major Project components (e.g., carbon dioxide vent, cooling towers, feedstock conveyors and storage silos, combustion turbine electric-generator units/heat recovery steam generators [HRSG], elevated flare, transmission towers, and other ancillary equipment for the Project) from sensitive viewing areas (see Figure 2-4, Plot Plan, in Section 2.0, Project Description) for a general layout of the Project components). The Project was reviewed for sensitive resources within the following view ranges:

Foreground – 0 to 0.5 mile from the observer’s position. At this distance, the observer can view details of trees, shrubs, wildflowers, and animals.

Middleground – 0.5 to 5 miles from the observer’s position. At this distance, the observer can see forest stands, natural openings, masses of shrubs, and rock outcrops.

Background – 5 miles to horizon from the observer’s position. At this distance, the observer can view mountain peaks, ridgelines, and patterns of forest stands and openings.

Based on a 5 mile distance limit, the VSOI boundary was refined to account for local viewing conditions, primarily topographic and vegetative screening. Computer viewshed analyses were conducted (using 30-meter-grid cell resolution, generated from 1:24,000 Digital Elevation Model [DEM] data from the USGS) to map the boundaries of the VSOI within the 5 mile limit. USGS DEM files were imported into an ArcView 9.2-based geographical information system (GIS) using the spatial analysis extension. Once in GIS, the DEMs were mosaicked. The combined DEM was used to run viewshed analyses in Universal Transverse Mercator, Zone 11, Units Meters, North American Datum 83 (UTM 83).

The Project’s tallest structure, the carbon dioxide vent at a height of 288 feet, as well as the 110 foot tall transmission pole heights for both transmission line route alternatives (Alternative 1 and Alternative 2), and a vertical observer off-set of 6 feet, were input into the viewshed model. The results represent a “typical” viewshed for the Project area.

Overall, the Project Site is clearly visible to the north and east with sporadic visibility to areas located to the southeast (within the identified 5 mile radius). The hills comprising the Elk Hills Oil Fields block virtually all views from the south/southwest to the Project Site. Beyond the mapped VSOI, the Project Site will either not be visible due to topography/screening, or be of such a small size in the background field of view that significant visual impacts will not be expected.

The VSOI also takes into account the visibility of the existing development (large transmission lines and existing buildings), as well as the visibility of the Project facilities (carbon dioxide vents and cooling towers). Other variables affecting potential visibility of a project include: orientation of the viewer, duration of view, atmospheric conditions, lighting (daylight versus nighttime), and visual absorption capability (VAC). VAC is defined as the extent to which the complexity of the landscape can absorb new elements without changing the overall visual character of the area.

The VSOI is mapped to identify the maximum potential area for significant impacts of a project in views from visually sensitive areas. Within the VSOI, varying levels of Project visibility have been identified. The highest level of Project visibility exists when the viewer is immediately adjacent to the Project, is a permanent stationary viewer, and there is no screening. Conversely, the lowest level of visibility exists, for example, when the viewer is located at greater distances from a project, and the viewer is traveling at a high rate of speed and in partial to fully screened conditions.

Sensitive viewing areas were identified after discussions with CEC visual staff and inventoried within the 5 mile radius of the Project Site. The identification of sensitive viewing areas within the VSOI was conducted through review of existing land use data, agency contacts, and during field surveys. The results of the viewshed analysis and the field photo survey indicated that most sensitive viewing areas within the VSOI were from those areas with middleground/background views to the Project. The following is a representative list of sensitive viewing areas that were considered during the inventory:

- Residential areas (e.g., the residences located closest to the Project Site and residences located closest to the substation interconnection)
- Travel routes such as major roads or highways used primarily by origin/destination travelers (e.g., local residents, workers, and commuter travelers along Tupman Road, I-5, SR 58, and Stockdale Highway)
- Schools, parks, recreation areas, wildlife areas, visitors centers; or areas used for camping, picnicking, bicycling, or other recreational activities (e.g., Elk Hills Elementary School playground and Tule Elk State Reserve).

During field surveys conducted within the Project vicinity, it was identified that the Elk Hills Elementary School playground, located approximately 1.3 miles southeast of the Project Site, is the closest recreational view to the Project Site (See Figure 5.11-12, Existing View of HECA from KOP No. 1). The Elk Hills Elementary School playground will have direct/unobstructed views to the Project.

In addition, during field surveys, it was noted that a single-family home, located approximately 1 mile north of the Project Site along Tupman Road, will have the most direct/unobstructed views of the Project Site (See Figure 5.11-15, Existing View of HECA from KOP No. 2). This residence has middleground views to the Project Site. While there are residences within the unincorporated community of Tupman that may also have middleground views to the Project, the single-family home north of the site was identified as having the nearest and most direct view to the site.

Travelers along the intersection of Stockdale Highway and I-5, located approximately 4 miles northeast of the site (at the closest point), have both indirect and direct views of the Project Site (See Figure 5.11-18, Simulated View of HECA from KOP No.3 [Transmission Route Alternative 1]). Topography and cultural modifications create often screened and sporadic views of the Project Site. However, for areas where the topography gives a more direct view to the Project Site (e.g., near the intersection of Stockdale Highway and I-5), travelers will have a clear, albeit distant, view of the larger on-site structures (carbon dioxide vent and other highly visible features of the Project). Traffic flow/road counts along I-5 indicate that approximately 32,500

travelers/average daily trips (ADT) utilize the freeway near the Stockdale Highway/I-5 interchange.

In addition to the Elk Hills Elementary School playground, the Tule Elk State Reserve is located approximately 0.25 mile east of the Project Site (at the closest point); however, the Tule Elk Reserve State Park (only portion accessible to visitors) is located along Station Road, approximately 2 miles northeast of the Project Site (See Figure 5.11-2, Aerial of Immediate Project Vicinity). The park has an elevated observation deck that allows visitors to overlook the reserve area and provides for direct middleground views to the Project vicinity. While recreational users within the park have views to the Project Site, it is located at a distance of approximately 2 miles, and therefore is not considered the nearest or most impacted recreational user view. In addition, as shown in Photo Location 5 (See Figure 5.11-5, Character Photos of Project Area), while it is farther away, the recreational viewer angle is similar to that of the nearest resident to the north (KOP No.1). Therefore, Project views from the Tule Elk Reserve State Park are considered similar, yet less significant than those associated with the residential viewer to the north (as the park is much farther from the Project Site). Therefore, per CEC direction (correspondence with Mark Hamblin), the Tule Elk State Reserve Park was not included as a representative key observation point (KOP).

During surveys for the interconnection at the PG&E Midway Substation, it was noted that a single-family residential area is located adjacent to the existing substation. The nearest resident to the interconnection is located approximately 0.25 mile west of the substation across from a small park (Button Wood Park). This residence has foreground partially obstructed views (due to full grown trees within the park) to the existing substation and is representative of the most impacted residential view of the interconnection (See Figure 5.11-21, Simulated View of HECA from KOP No.4).

Levels of potential impact on sensitive viewing areas were established through an analysis of the following two primary components:

- Impact susceptibility – The degree to which a sensitive viewpoint would be impacted by changes within its viewshed
- Impact severity – The degree of change to the landscape created within a specific viewshed

Character photos of the areas surrounding the Project Site (Figures 5.11-3 through 5.11-7, Character Photos of the Project Area) show neighboring land uses to help the reader visualize the immediate Project vicinity, as well as sensitive viewing areas and sensitive visual resources within the surrounding Project area. Some of these character photos do not have views to the Project; however have been included to help identify potentially-sensitive visual resources within the region. These photos also help the reader understand the general visual character of the surrounding area and the land uses within the region.

5.11.1.3 Visual Study Inventory Components

The following sections detail the visual study inventory components used in the assessment of potential impacts. Three primary components that were inventoried include (1) an evaluation of scenic attractiveness, (2) consideration of Existing Scenic Integrity Levels (ESILs), and (3) the identification of sensitive viewing areas.

Scenic Attractiveness

When evaluating scenic attractiveness, both natural and man-made components within the VSOI were considered as they either add to or detract from the overall landscape character within a specific setting. Scenic attractiveness levels are established by evaluating the distinctiveness and diversity of a particular landscape setting in relation to the following elements:

- Landform
- Vegetation
- Water
- Color
- Effects of adjacent scenery
- Scarcity of the landscape
- Cultural modifications

The inventory and evaluation of the above elements assist with the characterization of scenic attractiveness within the VSOI. In general, landscapes are characterized by three levels: A through C.

Class A – Areas have outstanding diversity or interest: characteristic features of landform, water, and vegetation are distinctive or unique in relation to the surrounding region. These areas contain considerable variety in form, line, color, and texture.

Class B – Areas have above-average diversity or interest, providing some variety in form, line, color, and texture. The natural features are not considered rare in the surrounding region but provide adequate visual diversity to be considered fairly unique.

Class C – Areas have minimal diversity or interest where representative natural features have limited variation in form, line, color, or texture in the context of the surrounding region.

The VSOI for the Project area was characterized at the Class C level for scenic attractiveness. No landscapes were considered to have distinctive characteristics as defined for Class A levels. Most landscapes within the VSOI were identified as Class C or as landscapes lacking significant natural amenities.

Scenic Attractiveness Classification Evaluation Forms (Figures 5.11-8 through 5.11-11, Scenic Attractiveness Evaluation Form for Sensitive View Area and KOP No. 1 through KOP No. 4) were developed for key view areas within the VSOI. The values underlined in the scenic attractiveness rating box on the forms illustrate the assigned values (H – high, M – moderate, L – low) for each natural feature (e.g., landform, vegetation, water, etc.) or negative/positive cultural modification. The combined value of these elements is used to determine in which class the landscape should be characterized. The Visual Resource Management (VRM) system is designed to separate the existing landscape and the project into their features and elements and to compare each part to the other to identify parts that are incompatible (BLM 1986). The outcome of this process is VRM classes, and the following is a summary of the VRM classes:

Class I – Objective: preserve the existing character of the landscape. Changes to the landscape character should not be evident.

Class II – Objective: retain the existing character of the landscape. Changes to the landscape character may attract slight attention but should be subordinate to the visual setting.

Class III – Objective: partially retain the existing character of the landscape. Changes to the landscape character may begin to attract attention but should not dominate the visual setting.

Class IV – Objective: allow for activities that modify the existing character of the landscape. Changes to the landscape character may attract attention and dominate the visual setting. However, these activities should minimize changes to the landscape where possible.

Existing Scenic Integrity Levels

The ESILs of a specific landscape setting can be defined as the extent to which natural features have been modified by human actions to the point of degrading the natural setting. An inventory of the ESILs within the VSOI was conducted and varying cultural modifications were documented. Varying cultural modifications included, but were not limited to, the unincorporated community of Tupman, cultivated farmlands, existing power/telephone transmission lines, oilfield activities, and associated structure (storage tanks, etc.), abandoned structures, miscellaneous industrial storage tanks, property fencing, and Tupman Road and other roadways. The following ESIL criteria were used to evaluate degrees of modifications:

- **High** – landscape character appears intact. Deviations are present but repeat form, line, color, texture, and patterns common to the landscape character so completely and at such a scale that they are not evident.
- **Moderate** – landscape character appears slightly altered. Noticeable deviations remain visually subordinate to the landscape character being viewed.
- **Low** – landscape character appears heavily altered. Deviations strongly dominate the landscape character. Deviations do not borrow from attributes such as size, shape, edge effects, vegetative type changes, or architectural styles within or outside the landscape being viewed.

Most areas within the VSOI were classified as retaining low existing scenic integrity.

Viewer Sensitivity and Sensitive Viewing Areas

Viewer Sensitivity

While conducting this study, no attempt was made to model for varying levels of viewer concern of change within their landscape. Because of the difficulty in inventorying for every individual's sensitivity level, it was determined that all viewers may have a high level of concern related to changes occurring in landscapes within the VSOI. Generally, a viewer's concern level is associated with, but not limited to, the following factors:

- Viewing location, orientation of view, and duration of view
- Activity in which the viewer may be engaged (e.g., water-related recreation activities, bird-watching)
- Visual acuity related to the intensity of visual detail within a landscape setting
- State of mind or attitude

- Preconceived expectations related to scenic quality
- Inherent values related to scenic quality and familiarity within specific landscape settings

Sensitive Viewing Areas

After discussions with CEC visual staff, and a review of surrounding land uses, it was determined that sensitive viewing areas within the VSOI consisted primarily of recreational users at the Elk Hills Elementary School playground, located approximately 1.3 miles southeast of the Project Site in the unincorporated community of Tupman; the closest residence to the Project, located approximately 1 mile north of the Project Site on Tupman Road; travelers along I-5 at the intersection of Stockdale Highway and I-5; and the closest residence to the transmission line interconnection at the existing PG&E Midway Substation in the unincorporated community of Buttonwillow.

The Elk Hills Elementary School playground, located approximately 1.3 miles to the southeast, is the closest recreational area to the Project Site. Due to the elevated position of the school and its playground; users within the school playground will have direct middleground views to the Project Site.

The nearest residence to the Project Site is located approximately 1 mile north of the site. Due to topography of the area, this residence has middleground-direct, unobstructed views to the Project Site.

Stockdale Highway is not considered a Designated Scenic Highway by federal (FHWA), state (Caltrans) or local standards. No travel routes within the VSOI are designated as federal, state, or county scenic highways or travel routes subject to aesthetic management goals or objectives. Although the current Kern County General Plan does not indicate any of the roadways and highways within this Project's vicinity as designated scenic routes, the Tupman Rural Community Specific Plan (dated October, 1984) and the Buttonwillow Community Development Plan (dated April, 1974) does indicate a proposed County Scenic Route 11 within the Project vicinity. However, Kern County's Planning department was contacted to verify whether there were any designated scenic routes within the Project vicinity. According to Shawn Beyeler (a Planner at Kern County), Kern County currently has a list of 20 proposed scenic routes; however none of them have been officially designated as scenic routes by Kern County or are located within the Project area. In addition, Mr. Beyeler also stated that a proposed project near a proposed scenic route within Kern County would not require any mitigating measures at this time.

The nearest residence to the interconnection at the PG&E Midway Substation is located approximately 0.25 mile west of the substation across from Button Wood Park. This residence has foreground partially obstructed views (due to full grown trees within the park) to the existing substation and is representative of the most impacted residential view of the interconnection (see Figure 5.11-18, Simulated View of HECA from KOP No.3 [Transmission Route Option 1]).

5.11.1.4 Inventory Results

Scenic Attractiveness

The VSOI is composed of Class C landscapes, or as an area with minimal diversity or interest where representative natural features have limited variation in form, line, color, or texture in the

context of the surrounding region, (Figures 5.11-8 through 5.11-11, Scenic Attractiveness Evaluation Form for Sensitive View Area and KOP No. 1 through KOP No. 4). This is because of the degree of human modifications present within the VSOI and the absence of distinctive natural amenities (e.g., diverse and distinctive natural elements). Within the VSOI, views of mountainous areas add variety within the background-viewing threshold. Additionally, because of the limited elevations in topography, this allows for large expansive views of the valley. However, a persistent haze, generally characteristic of the air quality in the area impairs clarity of distant views.

Existing Scenic Integrity Levels

Most landscapes inventoried within the VSOI can be classified as retaining primarily low ESILs because of the presence of man-made development including: farming activities and facilities, oilfield activities and associated structures, telephone/transmission line systems, other industrial facilities, storage tanks, the large PG&E Midway Substation, residential developments, fencing and roadways within 5 miles surrounding the Project Site and interconnection. Areas adjacent to the Project Site were also identified as having low ESILs because of the existing oilfield activities, industrial storage tank and abandoned structures to the south of the site, existing fencing, and telephone/transmission lines along Tupman Road and large agricultural activities that characterize the area.

Sensitive Viewing Areas and Key Observation Points

KOPs are viewing locations chosen to be representative of the most visually sensitive areas that will view the Project. The inventory of KOPs included three components: (1) identification and photo-documentation of viewing areas and potential KOPs, (2) classification of visual sensitivity of KOPs, and (3) description of Project Site visibility from KOPs. KOPs were identified based on review of available land use data, field inspection, and discussion with CEC staff responsible for the evaluation of visual resources.

Viewer sensitivity is a measure of the degree of concern for change in the visual character of a landscape. Viewer sensitivity considers type of use, user attitude, volume of use, adjacent land use, visual quality, and special classifications. Three levels of viewer sensitivity (high, moderate, and low) were used to describe the sensitivity of viewers within the study area. High-sensitivity viewpoints identified in the study area include existing residences and recreation areas. Moderate-sensitivity viewers identified in the study area consist of existing area roadways. Low-sensitivity viewers include industrial areas and are not evaluated in detail for this study because these are considered to be a compatible use with the facility, and therefore will not result in significant visual impacts.

Visibility determines how the Project will be seen from a particular viewing area or KOP. The inventory of Project visibility documented the distance from the viewpoint to the Project. Perception of details (e.g., form, line, color, and texture) diminishes with increasing distance. The distance zones were: foreground (0 to 0.5 mile), middleground (0.5 to 5 miles), and background (beyond 5 miles). In addition, the inventory evaluated if views were open, partially screened (filtered), or screened (e.g., presence of hillside terrain, vegetation, and/or buildings).

Four sensitive viewing areas were identified as representative of viewers who will be most susceptible to visual impact within their viewshed as a result of the Project. A brief characterization of these areas follows.

Sensitive Viewing Area and Key Observation Point No. 1

This image was taken from the nearest recreational – the Elk Hills Elementary School playground (See Figure 5.11-12, Existing View of HECA from KOP No. 1. See also Figures 5.11-1a and 5.11-1b, VSOI Map, for KOP location) located approximately 1.3 miles southeast of the Project Site. This location represents the “worst-case” recreation view of the Project Site. The Elk Hills Elementary School playground was selected due to its elevated view and close proximity to the Project Site (See Figure 5.11-3, Character Photos of Project Area – [Figure 1 of 5]) for a character photo of the school playground).

Topographic relief across the setting consists of a broad horizontal composition varying from relatively flat terrain to rolling hills, adding to the panoramic visual appeal to form and line characteristics of the area. The only water source within view from this KOP is the California State Water Project, which runs in a northwest to southeast orientation east of the Project Site. A variety of cultural modifications (including California State Water Project, existing power/telephone transmission lines, miscellaneous industrial storage tanks, property fencing, Tupman Road) are visible in middleground and distant range views. The area is characterized by little color variations (mainly from patches of sparse low-lying vegetation), and low contrast of generally mute tones. However, in the distant view to the northeast, cultivated farmlands add color to the distant background landscape. This landscape is mildly interesting within its setting, but fairly common within the region. The ESIL from this area can be characterized as low.

Sensitive Viewing Area and Key Observation Point No. 2

This image was taken from the closest residence to the north of the Project Site along Tupman Road (See Figure 5.11-15, Character Photos of Project Area – [Figure 3 of 5]. See also Figures 5.11-1a and 5.11-1b, VSOI Map, for KOP location), this KOP is located approximately 1 mile north of the Project Site. The photo from this location represents the closest and “worst-case” residential views to the Project Site. There are other residential areas within the 5 mile radius (southeast in the unincorporated community of Tupman) with views to the Project area. However, these residences in this area are partially screened from view by topography, existing mature vegetation, and existing structures. The residence at this KOP has the most unobstructed view to the Project Site, and therefore was chosen as a representative KOP (See Figure 5.11-4, Character Photos of Project Area – [Figure 2 of 5]), for a character photo of this residence. This view is also consistent with longer viewing durations (i.e., from residential views).

Topographic relief across the setting consists of generally flat terrain in the foreground, middle ground, and hilly terrain in the distant background. There are no water sources within view from this KOP. The California State Water Project is located in the middleground, however, as it is below surface grade, is not visible from this residence. A variety of cultural modifications (including cultivated farmlands, existing power/telephone transmission lines, oilfield activities and associated structures, abandoned structures, miscellaneous industrial storage tanks, property fencing, and Tupman Road) are visible in middleground and distant range views. The Elk Hills Oil Fields can be seen in the distant background providing a distant visual backdrop. What little color variation exists is created mainly from cultivated farmlands. The main visual interest and/or draw to this area is essentially created by the open expanses of land. While this landscape is mildly interesting within its setting, it is fairly common within the region. The ESIL from this area can be characterized as low.

Sensitive Viewing Area and Key Observation Point No. 3

This image was taken from I-5 southbound lane near the I-5/Stockdale Highway interchange (See Figure 5.11-18, Simulated View of HECA from KOP No.3 [Transmission Route Option 1]. See also Figures 5.11-1a and 5.11-1b, VSOI Map, for KOP location) located approximately 4 miles northeast of the Project Site. As stated, I-5 and Stockdale Highway are not considered Scenic Highways by federal (FHWA), state (Caltrans), or local standards. However, as approximately 32,500 travelers/(ADT) utilize the freeway along the corridor south of Stockdale Highway, views near I-5/Stockdale Highway have therefore been considered to have moderate sensitivity and are included as a KOP for this Project. The KOP photo is taken from an area with flat terrain adjacent to the freeway to help represent “worst-case” views to the Project Site. This location represents the closest unscreened view to the Project Site near the I-5/Stockdale Highway interchange.

A variety of cultural modifications (including the Stockdale Highway and I-5 interchange, existing power/telephone transmission lines, oilfield activities and associated structure, miscellaneous industrial storage tanks, property fencing, other roadways) limit visual appeal to form and line characteristics of the area. All significant contrasts to form and line are created from cultural modifications. Vegetation and color within the area is sparse (tan barren landscape with dried weeds and grasses line the highway). No water sources are visible within this area. This view is consistent with sporadic short viewing durations (i.e., from traveler views focusing on the road) and are considered to have a low degree of severity. The ESIL from this area can be characterized as low.

Sensitive Viewing Area and Key Observation Point No. 4

This image was taken from the side yard of the nearest residence to the interconnection to the existing PG&E Midway Substation located at the intersection of Sudan Avenue and Meadows Street in the community of Buttonwillow (See Figure 5.11-21, Simulated View of HECA from KOP No. 4. See also Figures 5.11-1a and 5.11-1b, VSOI Map, for KOP location). The interconnection to the substation is located approximately 8 miles north of the Project Site. This KOP was chosen as a representative KOP because of its close proximity and as it will have the most unobstructed residential view of the interconnection to the existing substation (See Figure 5.11-7, Character Photos of Project Area – [Figure 5 of 5], for a character photo of this residence). This view is also consistent with longer viewing durations (i.e., from residential views).

A variety of cultural modifications (including the PG&E Midway Substation and associated structures, Button Wood Park, existing power/telephone transmission lines, a residential neighborhood, property fencing, other roadways) are visible in the foreground and middleground views. The grass field and other amenities within Button Wood Park serve as a slight buffer between the existing substation and this residential neighborhood; however, the substation is the dominant visual feature within the viewshed. Button Wood Park consists of two baseball fields and additional trees planted; obstructing some residences’ view of the existing substation. Color variations within the area are provided by the vegetation within the park, residences within the area, and the existing substation. The ESIL from this area can be characterized as low.

5.11.2 Environmental Consequences

5.11.2.1 Significance Criteria and Assessment Methodology

The visual resources study included the assessment of impacts on scenic attractiveness and sensitive viewing areas within the VSOI related to the construction, operation, maintenance, and long-term presence of the Project.

The consideration of significant visual impacts was based predominantly on the requirements of CEQA. Appendix G of the CEQA Guidelines states that potential impacts to visual resources would be significant if a proposed project results in:

- A substantial adverse effect on a scenic vista
- Substantial damage of scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings
- Substantial degradation of the existing visual character or quality of the site and its surroundings
- Creation of a new source of substantial light or glare that would adversely affect day or nighttime views in the area

Additionally, the CEC requires that consideration be given to the following:

- Compliance with LORS
- Level of viewshed alteration and ground form manipulation
- Regional effects to visual resources
- Magnitude of impact related to light and glare
- Magnitude of back-light scatter during nighttime hours
- Level of sunlight reduction or increase in shadows in areas used by the public

Additionally, the matrix presented in Table 5.11-2, Visual Impact Significance Matrix – Sensitive Viewing Areas, aids in the assessment of visual impact significance. The significance of the potential visual impact is based upon the evaluation of the susceptibility and the severity of the visual change in viewsheds. In addition, Table 5.11-3, Visual Impact Susceptibility – Sensitive Viewing Areas, and Table 5.11-5, Visual Impact Severity – Sensitive Viewing Areas, further describes the methodology to evaluate potential visual impact..

**Table 5.11-2
Visual Impact Significance Matrix – Sensitive Viewing Areas**

Visual Impact Severity	High Susceptibility	Moderate Susceptibility	Low Susceptibility
High Impact Severity	Significant	Less Than Significant	Less Than Significant
Moderate Impact Severity	Less Than Significant	Less Than Significant	Less Than Significant
Low Impact Severity	Less Than Significant	Less Than Significant	No Impact

Visual Simulations

A comparison of existing views with visual simulations, depicted in Figures 5.11-8 through 5.11-11, Scenic Attractiveness Evaluation Form for Sensitive View Area and KOP No. 1 through No. 4, aided in verifying Project-related impacts. The simulations served to present a representative sample of the existing landscape settings contained within the VSOI, as well as an illustration of how the Project may look from specific key viewing locations.

To ensure a high degree of visual accuracy in the visual simulations, computer-aided design (CAD) equipment, GIS, and the use of global positioning systems (GPS) allow for life-size modeling within the computer. This translates to using real-world scale and coordinates to locate facilities, other site data, and the actual camera locations corresponding to three-dimensional (3D) simulation viewpoints.

A GIS site map is imported as a background reference. CAD drawings of facilities are placed on top of the site map in GIS. GPS locations of sensitive viewing areas are also input into GIS. The GPS camera positioning information is then referenced to the 3D data set. The 3D massing models of both the Project and all ancillary facilities are generated in real world coordinates and scaled and input into GIS.

An electronic camera lens matches the camera lens that was actually used in the field. A Nikon 6.1 megapixels digital camera set to take a 19.2-mm lens image was used consistently throughout the process. This lens setting selection allows for viewing of the computer-generated model in a similar way that the Project will be viewed in the field.

Next, the photograph is imported into the 3D database and loaded as an environment within which the view of the 3D model is generated. To generate the correct view relative to the actual photograph, the electronic camera is placed at a location (within the computer) from where the photograph was taken. This is supported by the GPS location. From there, the 3D wire frame model is displayed on top of the existing photo so that proper alignment, scale, angle, and distance can be verified. When all lines of the wire frame model exactly match the photograph, the camera target position is confirmed.

It should be noted that final simulations were created using CAD files to remain consistent with general power plant development engineering. Once field KOP location photos and GPS coordinates for photo locations were gathered in the field, these were incorporated into the final simulation production. The processes described above relate to general simulation construction and are included for reader understanding of the procedures.

The visual simulations developed for the Project have been designed to be viewed 10 inches from the viewer's eye. This distance will portray the most realistic life-size image from the location of the sensitive viewing area.

Assessing Visual Impact Susceptibility on Sensitive Viewing Areas

As stated previously, in Section 5.11.1.2, Visual Sphere of Influence, visual impact susceptibility is the degree to which a sensitive viewpoint would be impacted by changes within its viewshed. Following the identification of the four most sensitive viewing areas within the VSOI, the degree of impact on each area was determined through the analysis of the following components:

- ESIL – The degree of existing disturbance within the natural setting

- Viewer Sensitivity – All residential viewers were considered high sensitivity viewers, while recreational and motorists are less sensitive (in this instance)
- Project Visibility – An assessment of the viewing angle, potential screening, lighting conditions, and time of day
- Viewer Exposure – An assessment of the distance from the Project, number of viewers, and duration of views

Table 5.11-3, Visual Impact Susceptibility – Sensitive Viewing Areas, illustrates the level of visual impact susceptibility anticipated for each sensitive viewing area based on an evaluation of the previously stated factors.

**Table 5.11-3
Visual Impact Susceptibility – Sensitive Viewing Areas**

Viewing Areas	Existing Scenic Integrity Level	Viewer Sensitivity	Project Visibility	Viewer Exposure	Visual Impact Susceptibility
Sensitive Viewing Area and KOP No. 1 (Figure 5.11-12, see also Figure 5.11-1 for KOP location) – partially obstructed Elk Hills Elementary School playground view to the southeast.	Low	Moderate	High	Moderate	Moderate
Sensitive Viewing Area and KOP No. 2 (Figure 5.11-15, see also Figure 5.11-1 for KOP location) – from largely unobstructed front yard view of closest residence to the north (along Tupman Road).	Low	High	Moderate	High	High/ Moderate
Sensitive Viewing Area and KOP No. 3 (Figure 5.11-18, see also Figure 5.11-1 for KOP location) – traveler view from intersection of I-5 and Stockdale Highway.	Low	Moderate	Low	Moderate	Moderate/ Low
Sensitive Viewing Area and KOP No. 4 (Figure 5.11-21, see also Figure 5.11-1 for KOP location) – from largely unobstructed side yard view of closest residence to the PG&E substation interconnection.	Low	Moderate	Low	Moderate	Low

Source: HECA Project

Note:

KOP = key observation point

Assessing Visual Impact Severity on Sensitive Viewers

The severity of the impact (high to low) on sensitive viewers was assigned a severity level proportionate to the amount of anticipated change to the landscape created within a specific viewshed. The primary criteria for project impacts include:

- The degree of project contrast (e.g., form, line, color, and texture)
- Scale and spatial dominance
- Extent of view blockage/screening (i.e., topographic and/or vegetative) and night lighting

Table 5.11-5, Visual Impact Severity – Sensitive Viewing Areas, (which appears further below in this analysis) describes levels designated to each variable above as they relate to the degree of visual impact severity anticipated on representative sensitive viewing areas.

The final evaluation conducted in the impact assessment was the assignment of potential impact levels on representative sensitive viewing areas by combining viewer susceptibility and severity levels at key and characteristic viewing locations.

5.11.2.2 Visual Impact Assessment Results

This section discusses the affected visual resources for the Project. A description of the potential impacts on scenic attractiveness and on sensitive viewers is provided. A detailed description of the Project is in Section 2.0, Project Description. Due to height/size, the following Project elements are some of the more important Project features related to the visual impact assessment:

- Combustion turbine generator (CTG); GE (7 FB) w/ IGCC Combustor, a steam turbine generator (STG), a heat recovery steam generator (HRSG) and a natural gas fueled auxiliary simple cycle CTG; GE LMS100[®].
- ASU cooling tower.
- Gasification cooling towers.
- Water treatment plant including the raw, treated and firewater tanks.
- 230 kilovolt (kV) switchyard at the western end of the Project Site.
- Feedstock conveyor area and active storage silos.
- New transmission line (two alternatives) corridor will extend northwest from the Project Site to connect with the existing PG&E substation north of the site.
- Buildings include a control room, a laboratory, administration area, warehouse and maintenance building, an emergency dispatch center, and medical service facility east side of the Project Site.
- Table 5.11-4, Major Component Design Characteristics, provides the dimensions (height, length and width, or diameter) and color/materials of each major component visible from off the Project Site, including any Project-related electrical transmission line and/or offsite pipelines and metering stations.
- Temporary visible plumes may occur (please see discussion on Visible Plumes provided below).

- New access road to be constructed extending southeast from the Project Site to Tupman Road to accommodate deliveries of heavy equipment and general site access.
- A security fence will enclose the entire 315-acre Project Site and access gates will be provided, as required.

**Table 5.11-4
Major Component Design Characteristics**

Component	Height (feet)	Diameter (feet)	Color/Materials¹
Carbon Dioxide Vent	288	--	Steel; Gray
AGR Methanol Wash Column	235	--	Steel; Gray
HRSG Stack	213	--	Steel; Gray
Elevated Flare	213	--	Steel; Gray
Air Separation Column Can	205	--	Steel; Gray
Gasification Structure	200	--	Steel; Gray
Feedstock Storage Silos	175	--	Steel; Gray
Slurry Preparation Building	165	--	Steel; Gray
Tail Gas Thermal Oxidizer	165	--	Steel; Gray
Heat Recovery Steam Generator	90	--	Steel; Gray
Ground Flare	80	--	Steel; Gray
Raw Water Tank	48	120	Steel; Gray
Treated Water Tank	48	110	Steel; Gray
Firewater Storage Tank	48	110	Steel; Gray
Methanol Storage Tanks	40	40	Steel; Gray
Demineralized Water Storage Tank	40	40	Steel; Gray
Transmission Poles	110	--	Steel; Gray

Source: HECA Project

Notes:

¹Steel will be treated to minimize glare.

HRSG = heat recovery steam generator

SECTION FIVE

Environmental Information

**Table 5.11-5
Visual Impact Severity – Sensitive Viewing Areas**

Viewing Areas	View							Visual Impact Severity
	Form Contrast	Line Contrast	Color Contrast	Texture Contrast	Scale Dominance	Spatial Dominance	Blockage Night Lighting	
Sensitive Viewing Area and KOP No. 1 (Figure 5.11-12, see also Figure 5.11-1 for KOP location) – partially obstructed Elk Hills Elementary School playground view to the southeast.	Moderate/High	Moderate/High	Moderate/Low	Moderate	Moderate	Moderate	Moderate/High	Moderate
Sensitive Viewing Area and KOP No. 2 (Figure 5.11-15, see also Figure 5.11-1 for KOP location) – from largely unobstructed front yard view of closest residence to the north (along Tupman Road).	High	High	Moderate	Moderate	Moderate/High	Moderate/High	Moderate/High	Moderate/High
Sensitive Viewing Area and KOP No. 3 (Figure 5.11-18, see also Figure 5.11-1 for KOP location) – traveler view from intersection of I-5 and Stockdale Highway.	Moderate/Low	Moderate/Low	Low	Low	Low	Low	Low	Low
Sensitive Viewing Area and KOP No. 4 (Figure 5.11-21, see also Figure 5.11-1 for KOP location) – from largely unobstructed side yard view of closest residence to the PG&E substation interconnection.	Low	Low	Low	Low	Low	Low	Low	Low

Source: HECA Project

Note:

KOP = key observation point

Direct Impacts

The following sections describe direct impacts related to the Project.

Visual Impact Significance on Scenic Attractiveness*Project Site*

The Project will be clearly visible to the north and east with sporadic visibility to areas located to the southeast (within the identified 5 mile radius). Given the large scale of the Project (315 acres), and the height of some of the structures on site (tallest structure 288 feet), potentially significant impacts on scenic attractiveness will be expected. However, the hills comprising the Elk Hills Oil Fields will block all views from the south/southwest to the Project Site. In addition, landscapes inventoried within the VSOI are classified as retaining primarily low ESILs and the Project Site is located within areas retaining low distinctive or diverse natural amenities or lacking substantial positive cultural modifications. There are a number of existing cultural modifications (e.g., cultivated farmlands, industrial facilities, existing power transmission lines, oilfield activities and associated structures/storage tanks, etc.) within the VSOI. While the Project will change the existing character of the site, significant impacts to the scenic attractiveness of the VSOI as a whole are not anticipated. Therefore, less than significant impacts will occur relative to existing scenic attractiveness.

Project Interconnection with PG&E Midway Substation

The Project will connect to the existing PG&E Midway Substation located approximately 8 miles northwest of the Project Site. Both transmission line route alternatives are anticipated to enter the PG&E Midway Substation on its north side. The anticipated pole spacing along the transmission line route is approximately 700 feet with a total of approximately 75 poles between the on-site switchyard and the PG&E Midway Substation. The transmission line will be placed in an approximately 150-foot wide right-of-way. The Project transmission line configuration is described in more detail in Section 2.1.8.1, Electricity and Transmission Line, in the Project Description.

As discussed above, a large number of transmission systems transverse the area surrounding the PG&E Midway Substation (see Figure 5.11-6, Character Photos of Project Area – [Figure 4 of 5]). In addition, transmission systems are generally found along Stockdale Highway, Tupman Road, and other roads within the VSOI.

Given the number of existing transmission systems within the Project vicinity, in combination with the variety of cultural modifications along the transmission line routes (between the Project Site and the PG&E Midway Substation) and within the VSOI, less than significant impacts on scenic attractiveness are anticipated. Therefore, less than significant impacts will occur relative to existing scenic attractiveness.

Visual Impact Significance on Sensitive Viewing Areas

Figures 5.11-8 through 5.11-11, Scenic Attractiveness Evaluation Form for Sensitive View Area and KOP No. 1 through KOP No. 4, depicting existing and simulated views from each of the four selected KOPs, aided in verifying Project-related impacts and assessing visual impact significance. As stated, these four sensitive viewing areas were identified as representative of viewers who will be most susceptible to visual impacts within their viewshed as a result of the Project. The simulations served to present a representative sample of the existing landscape

settings contained within the VSOI, as well as an illustration of how the Project may look from specific key viewing locations. Table 5.11-3, Visual Impact Susceptibility – Sensitive Viewing Areas, Table 5.11-5, Visual Impact Severity – Sensitive Viewing Areas, and Table 5.11-6, Visual Impact Significance – Sensitive Viewing Areas, illustrate the visual impact susceptibility, visual impact severity, and resultant visual impact significance on sensitive viewing areas, respectively. Less than significant visual impacts are expected to occur within the VSOI and region with the construction, operation, maintenance, and long-term presence of the Project.

Four sensitive viewing areas were identified as representative of viewers who will be most susceptible to visual impact within their viewshed as a result of the Project. According to Table 5.11-6, Visual Impact Significance – Sensitive Viewing Areas, potentially significant visual impacts may occur only at the closest residence to the north (represented by KOP 2). The Project has addressed potentially significant visual impacts at KOP 2 with implementation of the mitigation measures described in Section 5.11.4. Less-than-significant impacts are anticipated for the other three identified KOP locations with the construction, operation, maintenance, and long-term presence of the Project.

Lighting/Glare

Lighting will be required for safe and efficient operation of the Project, for example in the following typical areas:

- Building interior, office, control, and maintenance areas
- Building exterior entrances
- Outdoor equipment platforms and walkways
- Transformer and switchyard areas
- Entrance gate

The lighting system is intended to provide personnel with illumination for Project operation under normal conditions, means of egress under emergency conditions, and emergency lighting to perform manual operations during a power outage of the normal power source. The lighting system will be designed and installed to meet Occupational Safety & Health Administration (OSHA) minimum standards, to offer maximum illumination of operating work areas while minimizing offsite illumination. Lighting will be directed downward to avoid backscatter, and shielded from public view to the extent practicable. Lighting not required continuously during nighttime hours will be controlled with sensors or switches operated such that lighting will be on only when needed. Lighting design for the Project will be consistent with applicable lighting LORS.. See Section 2.9.2.3., Specific Project Emergency Systems, in the Project Description for further description of lighting fixtures.

Currently, little nighttime lighting is produced within the VSOI, and consists mainly of street lighting on larger roadways, external lighting of industrial facilities, farming operations, and residences in the area. While the Project may slightly add to existing lighting, the Project will not significantly increase the existing night lighting in the Project area. In addition, structures and transmission towers will be treated to reduce sun reflectivity and reduce potential glint/glare

**Table 5.11-6
Visual Impact Significance – Sensitive Viewing Areas**

Viewing Areas	Description of Impact	Visual Impact Susceptibility	Visual Impact Severity	Visual Impact Significance
<p>Sensitive Viewing Area and KOP No. 1 (Figure 5.11-12, see also Figure 5.11-1 for KOP location) – partially obstructed Elk Hills Elementary School playground view to the southeast.</p>	<p>This KOP location represents the closest recreational user view to the Project. The Elk Hills Elementary School and playground, located approximately 1.5-miles to the southeast, has middleground views to the Project Site, and is consistent with moderate degree of severity because of the proximity to the site. The Project, in the absence of screening, will be highly visible because of the flat, open viewing conditions. In general, persons utilizing recreational areas generally have an expectation of a high quality visual environment. However, as this KOP is an elementary school playground, the focus for recreational users is largely of playground activities, and use of the playground is generally for short durations (e.g., only during recess). Potential plume emissions from Project cooling towers will be clearly visible from this KOP; however plumes are anticipated to occur largely only during seasonal clear weather conditions from November to April (see visible plumes write-up below). New lighting of the Project is not considered to affect the Elk Hills Elementary School, which is primarily used during the day. Visual impact susceptibility from this location is characterized as moderate (see Table 5.11-3). Visual impact severity from this location is characterized as moderate/high (see Table 5.11-4). Thereby, aesthetic impact significance from this location is classified as less than significant.</p>	Moderate	Moderate/High	Less than Significant
<p>Sensitive Viewing Area and KOP No. 2 (Figure 5.11-15, see also Figure 5.11-1 for KOP location) – from largely unobstructed front yard view of closest residence to the north (along Tupman Road).</p>	<p>This KOP location represents the closest unobstructed residential view to the Project Site. KOP 2, located approximately 1 mile north of the Project Site, has middleground views to the site and is consistent with longer viewing durations (i.e., from residential views) of the Project. The Project will be highly visible because of the flat, open viewing conditions. The Project will create a visual contrast to the existing setting, alter middleground views from this residence, and partially obscure distant views to surrounding mountains. Potential plume emissions from Project cooling towers will be clearly visible from this KOP; however plumes are anticipated to occur largely only during seasonal clear weather conditions from November to April (see visible plumes write-up below). However, it should be noted, the existing viewshed has already been modified with the presence of the community of Tupman, cultivated farmland, existing power/telephone transmission lines, oilfield activities and associated structures, abandoned structures, miscellaneous industrial storage tanks, property fencing, Tupman Road, and other cultural modifications in the immediate vicinity. Visual impact susceptibility from this location is characterized as moderate/high (see Table 5.11-3). Visual impact severity from this location is</p>	Moderate/High	Moderate/High	Potentially Significant

**Table 5.11-6
Visual Impact Significance – Sensitive Viewing Areas**

Viewing Areas	Description of Impact	Visual Impact Susceptibility	Visual Impact Severity	Visual Impact Significance
<p>Sensitive Viewing Area and KOP No. 3 (Figure 5.11-18, see also Figure 5.11-1 for KOP location) – traveler view from intersection of I-5 and Stockdale Highway.</p>	<p>characterized as moderate/high (see Table 5.11-4). Thereby, aesthetic impact significance from this location is classified as potentially significant.</p> <p>I-5 is not considered to be a scenic highway; however, it has approximately 32,500 travelers/ADTs; views along I-5 have therefore been considered to have moderate sensitivity. This location represents the closest unscreened view to the Project from I-5. At this distance (4 miles and beyond), while travelers have middleground/ background views to the Project Site, Project structures are expected to be a subordinate new element in the view and will not be noticed by most viewers. Potential plume emissions may draw the viewer’s attention to the area; however plumes are anticipated to occur largely only during seasonal clear weather conditions from November to April (see visible plumes write-up below). Overall, most travelers along I-5 will not have a view to the Project. From this distance topography and other cultural modifications will screen most views to Project Site. This view is consistent with sporadic short viewing durations (i.e., from travelers focusing on the road) and is expected to have a low degree of severity due to distance. Visual impact susceptibility from this location is characterized as moderate/low (see Table 5.11-3).</p> <p>3). Visual impact severity from this location is characterized as low (see Table 5.11-4). Thereby, aesthetic impact significance from this location is classified as less than significant.</p>	<p>Moderate/ Low</p>	<p>Low</p>	<p>Less than Significant</p>
<p>Sensitive Viewing Area and KOP No. 4 (Figure 5.11-21, see also Figure 5.11-1 for KOP location) – from largely unobstructed side yard view of closest residence to the PG&E substation interconnection.</p>	<p>This KOP location represents the closest unobstructed residential view to the Project interconnection to the PG&E Midway Substation. KOP 4, located approximately 0.25 mile west of the proposed interconnection, has foreground views to the substation interconnection and is consistent with longer viewing durations (i.e., from residential views). However, foreground views from this KOP (and other residential viewers in this area) are highly impacted by views of the PG&E Midway Substation (see Figures 5.11-7 for character photos of existing substation and 5.11-11, Sensitive Viewing Area of KOP No.4), numerous large existing power transmission lines, industrial site fencing, and other associated substation structures. Buttonwood Park is located between this residential area and the PG&E Midway Substation, however, does little to alleviate the visual impact of the substation. The addition of Project transmission lines to this viewshed is expected to be virtually indistinguishable to residential viewers at this KOP location. The Project Site is</p>	<p>Low</p>	<p>Low</p>	<p>No Impact</p>

**Table 5.11-6
Visual Impact Significance – Sensitive Viewing Areas**

Viewing Areas	Description of Impact	Visual Impact Susceptibility	Visual Impact Severity	Visual Impact Significance
	<p>not visible from this KOP (as it is located over 8 miles to the south). Therefore, no impacts associated with construction/operation activities at the Project Site or potential plume emissions from Project HRSG stack/cooling towers will occur. Visual impact susceptibility from this location is characterized as low (see Table 5.11-3). Visual impact severity from this location is characterized as low (see Table 5.11-4). Thereby, no aesthetic impacts associated with the Project from this location are anticipated.</p>			

Source: HECA Project

Notes:

HECA = Hydrogen Energy California

KOP = key observation point

VSOI = visual sphere of influence

(see Table 5.11-4, Major Component Design Characteristics, which identifies the list of color/materials for the major equipment on site). Overall, the addition of the Project is not anticipated to create significant glint/glare or night lighting impacts from backscatter light and/or night lighting a nearby viewer may experience when looking toward the Project Site; however, the Project will develop a lighting plan and equipment surface treatment plan as described in Section 5.11.4 to ensure potential glint/glare impacts remain at less than significant levels.

Under certain conditions during construction-related activities, slightly higher amounts of backscatter lighting may be apparent to the casual observer. This condition is due to providing for safety of construction workers during this phase of the Project. Upon completion of construction, night lighting at the Project Site will be substantially reduced and less noticeable to the casual observer. Therefore, visual impacts related to construction activities will be temporary and are considered less than significant. The Project will be consistent with Section 1.10.7, Light and Glare of the Kern County General Plan.

Lighting Related to Airfield Operations

Federal Aviation Agency (FAA) Advisory Circular 70/7460-1K requires that all airspace obstructions over 200 feet in height or in close proximity to an airfield have obstruction lighting. The tallest structure on-site is 288 feet high (carbon dioxide vents). There is one airport and four airfields/landing strips within the identified VSOI (all four are identified on Figures 5.11-1a and 5.11-1 b, VSOI Map). The closest airport; Elk Hills - Buttonwillow Airport, is located approximately 6.5 miles northwest of the Project Site and 3.4 miles southwest of the substation interconnection. This airport covers approximately 216 acres, has one runway, and generally supports small private planes.

In addition to the Elk Hills – Buttonwillow Airport, there are four airfield/landing strips identified within the Project VSOI. The closest landing field to the Project Site is located approximately 2.1 miles to the north of the Project Site near the corner of Dairy Road and Adohr Road. A landing strip is also located to the east of Tupman, approximately 3.4 miles from the Project Site. Two additional landing strips were identified within the VSOI 5 mile radius of the proposed interconnection to the PG&E Midway Substation. The closest landing strip to the proposed interconnection is approximately 2.5 miles to the northwest and the second landing strip is located approximately 3.3 miles to the northeast. In general, these small airfield/landing strips are used by private planes and for small agricultural planes/crop dusting operations.

While the Elk Hills – Buttonwillow Airport and the two landing strips are located within the VSOI 5 mile radius of the interconnection to the PG&E Midway Substation, the transmission poles are well below the 200 feet limit (approximately 110 feet in height); therefore, no obstruction lighting is required for Project transmission poles.

Due to the proximity of the two airfield/landing strips identified within the VSOI 5-mile radius of the Project Site, obstruction lighting for structures over 200 feet in height proposed on site may be required by the FAA. With proper installation of obstruction lighting on proposed structures, no impacts to aircraft operation are expected with construction, operation, and maintenance of the Project.

Visible Plumes

The potential exists for vapor plumes (water vapor condensation) to be visible from two sources at the HECA Project site: (1) plumes from the 50-foot-high wet cooling towers (4-celled ASU

cooling tower and 17-celled Power Block/Gasification cooling towers); and (2) plumes from the 213-foot-high CTG/HRSG stack. Both sources of condensed water vapor plumes were analyzed. The following analysis describes the plume modeling methodology, input data, and assumptions used in the analysis, as well as the results.

Methodology

The frequency, persistence, and size of visible condensate plumes depends primarily on the design and type of combustion turbine generator/HRSG and/or cooling tower, as well as meteorological conditions of temperature and humidity. Specifically, visible plume formation depends on local ambient temperature, humidity conditions, and wind patterns. A location with higher temperature and lower humidity (i.e., general climate in Kern County) would have fewer extended visible plumes compared to operation of the same project at a cooler, more humid location. Visible plume formation is more frequent during the cooler seasons (i.e., winter) when ambient conditions are more conducive to plume formation. Results focused on seasonal daylight clear hours and winter day-time no fog hours. For the purposes of this analysis, **Seasonal Daylight Clear Hours** are defined as: daylight hours from November through April without naturally occurring fog, rain, or limited visibility and include all hours of clear skies and 50 percent of the scattered or broken skies. **Winter Day-Time No Fog Hours** are defined as winter days without any naturally occurring fog. It should be noted that the same ambient conditions that result in plume formation from Project cooling towers will often cause natural weather conditions such as fog, haze, and precipitation to occur, which generally reduces visibility. Days when fog, haze or precipitation is present were excluded from plume frequency calculations for this analysis.

The characteristics of visible plumes important to an assessment of visual impacts include plume length (the distance over which a plume remains intact), plume height (the distance from ground to the centerline of the plume), plume width (the horizontal cross wind spread of the plume) and plume depth (the cross plume spread perpendicular to the width, typically in the vertical direction).

Plumes from the wet cooling towers were modeled using the Seasonal/Annual Cooling Tower Impact (SACTI) model. SACTI is a mathematical model used to predict cooling tower visible plume dimensions over a full range of meteorological conditions experienced at a given location and the frequency of different plume lengths, widths, and heights as a function of direction from the cooling tower. The model is designed to provide predictions and may be used for the licensing of power plants with cooling towers. SACTI model results are summarized in terms of typical and reasonable worst-case visible plume dimensions for the entire year, and during daytime and nighttime hours. For purposes of this analysis, the “typical” plume dimension (height, width, length) is the one that is exceeded 50 percent of the time, and the “reasonable worst-case” is the condition that is exceeded only 10 percent of the time. A description of this model, model data inputs, and model results may be found in Appendix C-1, Modeling Protocol.

Plumes from the HRSG stack were analyzed using the Combustion Source Visible Plume (CSVP) model. The CSVP model determines visible water vapor plume frequency. The model consists of a series of programs, which ultimately calculate the distance downwind the visible plume can extend, the plume height and width. The model requires ambient temperature, relative humidity, precipitation, wind direction, wind speed and stability per hour of input data. The model was originally created to determine plume size for HRSGs. The first module of the

program, CSVP, determines if the plume will reach saturation, and the second module, PLUMEWV, determines plume size by modeling the plume until the centerline of the plume crosses the second intersection point on the saturation curve. Parameters used in the model included the fixed HRSG stack height and diameter at 213 feet and 20 feet respectively. A description of this model, model data inputs, and model results may be found in Appendix C-1, Modeling Protocol.

Model Results

As stated above, visible plume formation is more frequent during the cooler seasons (i.e., winter) when ambient conditions are more favorable to plume formation. Therefore, Table 5.11-7, displays the dimensions of the “reasonable worst-case” plumes from both the Power Block/Gasification and ASU cooling towers predicted to be visible during clear winter day-time hours, when the plumes will be most noticeable. In addition, the dimensions of the typical (or average) daytime plumes from Project cooling towers are also provided in the table below. Typical plumes generated from Project cooling towers were predicted to be much smaller in length, height and width than the worst-case plumes. Visible plumes that extend beyond the cooling tower buildings are predicted to occur approximately 15 to 22% of the winter day-time no fog hours.

**Table 5.11-7
SACTI Cooling Tower Plume Predictions
Winter Day-Time No Fog Hours (Mass Flow Rate = 11554.9 kg/s)**

	Power Block/ Gasification Cooling Tower	ASU Cooling Tower
Length (m)		
50% (Typical)	30m – 40m	30m – 40m
10% (Reasonable Worst-case)	600m – 700m	200m – 250m
Height (m)		
50% (Typical)	20m - 30m	20m – 30m
10% (Reasonable Worst-case)	300m – 310m	90m – 100m
Width (m)		
50% (Typical)	30m – 40m	20m – 30m
10% (Reasonable Worst-case)	130m – 140m	60m – 70m
% of hours Visible Plume		
Extends Beyond Cooling Tower Building (greater than 30 meters from center)	15.53%	21.64%

Source: SACTI Model Output (provided in Appendix C-1, Modeling Protocol)

Notes:

m = meters

Winter Day-Time No Fog Hours = Clear winter days, when a cold, high humidity conditions conducive to plume formation exists.

Similar to the results of the SACTI model, the results presented in Table 5.11-8, provided below, represents the reasonable worst-case (the 10% longest plume), and the typical plume expected (the 50% longest plume). The results depict only the hours that the plumes are visible in seasonal daylight clear conditions.

The reasonable worst-case visible plume predicted by the CSVP model has a plume height of 271.4 meters (890 feet); however, the average height of the visible plume was predicted to be

152.8 meters (501 feet) during seasonal daylight clear hours. Visible plumes are predicted to occur approximately 78% of the seasonal daylight clear hours; however are predicted to occur only 40% of all hours modeled.

**Table 5.11-8
CSVP HRSG Stack Plume Characteristics During Seasonal Daylight
Clear Hours**

	Plume Length (m)	Plume Height (m)	Plume Width (m)	Plume Depth (m)
Reasonable Worst Case (10%)	716	271.4	84.9	75.6
Typical Case (50%)	197	152.8	34.5	39.1

Source: CSVP Model Output (provided in Appendix C-1, Modeling Protocol)

Notes:

m = meters

Seasonal Daylight Clear Hours = daylight hours from November through April without rain, fog, or limited visibility that include clear skies and 50 percent of the scattered or broken skies excluding overcast skies.

Impact Analysis

Plumes generated from Project operations would be visible from residences and travelers within the VSOI. When plumes are formed over the Project Site they will be above and extend downwind of the Project structures.

The reasonable worst-case winter day-time no fog cooling tower plume height starts above the 50 foot (15.2m) Power Block/Gasification and ASU cooling towers and can reach an ultimate height of approximately 1,017 feet (310m) and 328 feet (100m), respectively. However, this worst case scenario is predicted to occur during just 10 percent of the winter day-time no fog hours in the 5 years modeled. Visible plumes lengths are not expected to extend beyond the Power Block/Gasification and ASU cooling towers structures more than 15.5 percent and 21.6 percent during all modeled winter day-time no fog hours.

The reasonable worst-case seasonal daylight clear HRSG plume height starts above the 213 foot (65m) HRSG stack and can reach an ultimate height of approximately 890 feet (271.4m) and is visible for approximately 764 feet (233m) downwind of the stack. However, this scenario is predicted to occur for only 15-25 percent of the seasonal daylight clear hours in the 5 years modeled. The model predicts some type of visible plume from the HRSG stack for 40% of all modeled hours (day, night, and all weather and sky conditions).

Plumes are expected to be visually subordinate from distant viewpoints, and subordinate to co-dominant from middleground to foreground viewpoints, depending upon specific viewing locations and conditions. Currently there are few to no visible plumes within the existing viewshed. Although the addition of plumes to the project area would create a change to existing conditions, most viewers will be at such distances that impacts from visible plumes are considered to be less than significant. The area of highest concern for visible plumes is for the nearest resident within the VSOI, represented by KOP #2.

For KOP #2, reasonable worst case visible plumes generated from Project operations would create a co-dominant effect related to the project structures. However, typical plumes generated from Project operations were predicted to be much smaller in length, height and width than the

reasonable worst-case plumes, and the typical plumes are what KOP #2 and other viewers within the VSOI would see more often.

Project operations would largely be in peak operation during the summer months (outside of the November to April seasonal hours), at which time the temperature at the project site is generally too high for long plumes to occur. Both size and frequency of typical Project cooling tower and HRSG plumes (occurring outside of the winter/no fog and seasonal daylight clear period) are expected to be visually subordinate and would be less than significant. Project cooling tower and HRSG plumes during the reasonable worst case (within the winter/no fog and seasonal daylight clear period) conditions would be visually co-dominant to dominant, however plumes of this size would occur for less than 10 percent of the winter/no fog and seasonal daylight clear period and were thus considered to be less than significant. As plume formation depends upon highly variable atmospheric conditions, peak operation of HECA would be during hot, summer months not conducive to plume formation, and the proximity of most viewers would be at such distances that any potential plumes would be remotely visible, less than significant impacts related to plume generation at the project site are anticipated.

Nighttime plumes could present a potential visual impact under two possible circumstances. If bright upwardly directed night lighting were to illuminate the plumes, they could become visually dominant and obtrusive. However, no such light exists in the project vicinity and on-site lighting would be shielded and directed downward. Thus, no significant impacts from illuminated plumes are anticipated.

Landscaping

According to Kern County Ordinance 19.14.120 Landscaping: Limited Agriculture (A-1) District, no landscaping is required in the A-1 District except where required in conjunction with the approval of a discretionary permit pursuant to Chapter 19.104.

Indirect and Construction-related Impacts

The construction laydown area will be contained within the 315-acre Project Site. The temporary on-site construction area will include the construction laydown area, construction parking, offices, and warehouse. Construction access will be from Tupman Road east of the Project Site. The access road will be approximately 2,000 feet long from Tupman Road to the Project Site, and will be constructed on an existing unimproved road.

Project Site preparation includes site grading to accommodate the Project on the existing landscape. Excavation work will consist of the removal, storage, and/or disposal of earth, sand, gravel, vegetation, organic matter, loose rock, and debris to the lines and grades necessary for construction. See also Section 2.0, Project Description, for more information relating to earthwork.

The Project construction period is expected to last 37 months from approximately March 2011 through April 2014. Construction of the 230 kV transmission line route and interconnection is expected to take approximately 4 months within the 37 month Project construction period. Construction will most typically take place during 10 hour days Monday through Friday. Due to worker health and safety considerations associated with high daytime temperatures, early work hours (prior to daybreak) may be adopted. Additionally, certain critical construction activities may need to occur during nighttime hours to accelerate the Project schedule. The workforce is

expected to be approximately 1,500 workers in the peak month. The workforce is expected to come from the Kern County area.

During the Project construction period, construction activities, construction materials, equipment, trucks, temporary structures, and vehicles, will be visible to surrounding areas to the north and east and some areas to the southeast due to the flat, open viewing conditions surrounding the Project Site. As the Project Site is undeveloped, such construction activities at the site will contrast significantly with the existing natural character of the area; however, interconnection construction activities at the PG&E Midway Substation are not anticipated to contrast significantly with maintenance and other operational activities that routinely occur at the substation. In addition, during construction of the transmission line and 150 foot wide right-of-way, construction materials, equipment, and vehicles will be visible to adjacent areas.

While visual changes associated with construction activities at the Project Site and along the transmission line route will introduce activities and structures not currently occurring in the area, construction activities will be conducted within a 37 month period. Therefore, visual impacts are considered temporary and thus, less than significant. In addition, as previously stated, construction of the 230 kV transmission line is only anticipated to take approximately 4 months to complete. Indirect impacts associated with the construction, operation, and long-term presence of the Project and ancillary facilities may include impacts associated with fugitive dust, night lighting, and presence of construction equipment. Construction activities will be conducted in a manner that minimizes (visible) dust emissions. Potential impacts are considered temporary and insignificant.

5.11.3 Cumulative Impact Analyses

The Project and other projects in the vicinity are not expected to result in significant cumulative impacts to environmental resource areas, including, but not limited to, air quality, land use, cultural resources, visual resources, water resources, or traffic during the construction or operation phases. The areas within the VSOI are generally characterized by agricultural activities, oil extraction and other industrial facilities, as well as desert terrain supported by small towns and other sparsely populated communities. All proposed projects within the VSOI can be characterized primarily as zone changes, lot line/property line adjustments, roadway improvements, home remodeling, agricultural supply services, or activities related to agricultural, or oil and mining operations. No new residential or recreational uses are proposed that may generate additional sensitive visual receptors.

The addition of the Project will alter the existing landscape and visual setting at the Project Site. However, the addition of any of the other listed projects, when considered in combination with the Project, will not cumulatively create significant impacts to the visual setting within the VSOI. Thus, as mentioned above, no significant cumulative impacts have been identified as a result of the construction, operation, maintenance, or long-term presence of the Project and other projects in the area. For further discussion of cumulative impacts, see Appendix J, List of Proposed Projects.

5.11.4 Mitigation Measures

Project design inherently includes mitigation measures. For example, the Project Site location was chosen because of its proximity to other industrial existing land uses (industrial oil

producing area within Kern County). In addition, Project features have been designed to help minimize visual impacts. These include, but are not limited to, shielding/directing lighting on site to avoid backscatter and impacts to public viewers and on-site lighting controlled with sensors such that lighting will be on only when needed.

While the Project includes features that reduce visual impacts from the construction/operation, potentially significant impacts have been identified for the nearest residential viewer to the Project Site (location identified as KOP No.2). Suggested visual resources mitigation measures (VRMM) are provided below to ensure that all potential impacts are reduced to levels considered to be less than significant.

VRMM-1: Prepare Conceptual Landscaping Plan at a 1:40 scale per CEC requirements for screening purposes. The plan shall include information on the type of plant species proposed, their size, quantity, and spacing at planting, expected heights at 5 years and maturity, and expected growth rates. Proposed landscaping should also include:

- Use of native limited height landscaping materials around facility perimeter to ensure proposed landscaping does not further obstruct views.
- Suggested off-site planting on adjacent properties (if landowners are interested) to assist with screening.

In addition to the mitigation measure above, the Project will develop a Lighting Plan and Equipment Surface Treatment Plan to document design measures to minimize lighting or glint glare.

5.11.5 Laws, Ordinances, Regulations, and Standards

The applicable LORS related to visual resources are summarized in Table 5.11-9, Summary of LORS – Visual Resources.

5.11.5.1 *Federal and State*

The Project is located on privately-owned land under the jurisdiction of Kern County. There are a few patches of BLM lands within the area that have views to the Project Site. However, no federal lands considered to be sensitive are located within the VSOI. BLM VRM guidelines were considered for this Project due to the fact that VRM methodology is an effective assessment tool which categorizes impacts based upon changes to scenic quality, sensitivity levels, and distance zones. These are all discussed in detail in Section 5.11.1, Affected Environment. The Project is consistent with all federal aesthetic LORS.

State-designated scenic highways or highways eligible for designation were not identified within the VSOI. Further, no other area managed by the state was identified that will require the Project to adhere to state aesthetic LORS. However, CEQA methodology is described in Section 5.11.2.1, Significance Criteria and Assessment Methodology, and was used as part of the assessment methodology.

5.11.5.2 Local

The Project Site is located on privately-owned land under the jurisdiction of Kern County. The unincorporated community of Tupman located approximately 2 miles to the east of the Project Site will have middle and distant views to the Project Site. The community of McKittrick and the city of Taft are the closest community and city to the Project Site. Both are more than 12 to 15 miles from the Project Site and have no views to the Project Site. Therefore, local LORS were only considered for Kern County, and the unincorporated communities of Tupman and Buttonwillow.

The property is zoned A-1 (Limited Agriculture) in Kern County. See Section 5.4, Land Use, for more information. The Kern County General Plan, Buttonwillow Community Development Plan and Tupman Community Specific Plan contain several goals and policies relating specifically to aesthetics and minimizing impacts to visual resources. The Buttonwillow Community Development Plan and Tupman Community Specific Plan was prepared in conjunction with Kern County, therefore, majority of Tupman's and Buttonwillow's goals/policies related to aesthetic and visual resources are very similar if not the same as the goals/policies identified in the Kern County General Plan. Each of these local LORS, and the Project's conformance to these LORS, are summarized in Table 5.11-9, Summary of LORS – Visual Resources.

The Project Site is located adjacent to the Elk Hills Oil Fields. The land surrounding the Project Site is primarily used for oil extraction, industrial, other similar land uses and farmland to the north of the Project vicinity. Proper light/glare shielding consistent with local LORS, during both construction and operation of the Project Site, is included as part of Project design. While the Project Site will add to existing area lighting, the Project will not significantly increase the existing night lighting, backscatter light, or glare in the Project area due to its adjacency with similar existing industrial land uses. Additionally, by containing power development to this localized area, changes to visual resources will be minimized to less than significant levels. The Project will not create a significant visual change to existing area conditions.

In addition, Project design elements have been incorporated into the Project description that will be effective in minimizing visual impacts (See Section 2.0, Project Description). The Project will conform to all applicable local LORS related to the preservation of areas identified as retaining high scenic value. Based on the inventory of scenic attractiveness and ESILs, areas retaining high scenic value were not identified within the VSOI. Therefore, compliance with local aesthetic LORS will be maintained.

SECTION FIVE

Environmental Information

**Table 5.11-9
Summary of LORS – Visual Resources**

LORS	Requirements	Conformance to Requirements	Administering Agency	Agency Contact
Federal Jurisdiction				
There are no applicable federal LORS.				
State Jurisdiction				
Application for Certification Requirements	Rules of Practice and Procedure and Power Plant Site Certification Regulations, Appendix B.	See Data Adequacy Worksheet	California Energy Commission (CEC)	1
State Scenic Highway Requirements	Requirements are applicable to state designated scenic highways.	The portions of roads and highways within the Project vicinity are not designated official State Scenic Highways. See Section 5.11.2.2.4.	California Department of Transportation (Caltrans)	2 & 4
Local Jurisdiction				
Kern County General Plan, 1.8 Industrial – Policy 6	Encourage upgrading the visual character of existing industrial areas through the use of landscaping, screening, or buffering.	According to Kern County Ordinance 19.14.120 Landscaping: Limited Agriculture (A-1) District, no landscaping is required in the A-1 District except where required in conjunction with the approval of a discretionary permit pursuant to Chapter 19.104. Therefore, compliance with this regulation is inapplicable. See Section 5.11.2.2.4.	County of Kern	3
Kern County General Plan, 1.8 Industrial – Policy 7	Require that industrial uses provide design features such as screen walls, landscaping, increased height and/or setbacks, and lighting restrictions between the boundaries of residential land use designation so as to reduce impacts on residences due to light, noise, sound, and vibration.	Proper light/glare shielding is included as part of Project design. See Section 5.11.2.2.2.	County of Kern	3
Kern County General Plan, 1.8 Industrial – Implementation Measure VI	Design, layout, and visual appearance coordinated with existing adjacent industrial uses.	The Project design and layout are in conformance with the existing industrial land uses within the area. See Sections 5.11.1.1, 5.11.2.2.1.1.1, 5.11.2.2.1.1.2	County of Kern	3

**Table 5.11-9
Summary of LORS – Visual Resources**

LORS	Requirements	Conformance to Requirements	Administering Agency	Agency Contact
Kern County General Plan, 1.8 Industrial – Map Provisions Service Industrial (Map Code 7.2)	Industrial properties/activities which involve outdoor storage/use of heavy equipment. Such uses produce significant air or noise pollution and are visually obtrusive.	The Project area is located north of existing industrial structures and storage tanks. The design of the Projects components will visually blend in with the existing industrial land uses. See Section 5.11.1.1	County of Kern	3
Kern County General Plan, 1.10.8 Smart Growth Policy 49g	Aesthetically pleasing and unifying design features that promote a visually pleasing environment.	The Project design and visual aesthetics are similar to the existing industrial land uses with in the area. See Sections 5.11.1.1, 5.11.2.2.1.1.1, 5.11.2.2.1.1.2	County of Kern	3
Kern County General Plan, 1.10.7 Light and Glare Policy 47	Ensure that light and glare from discretionary new development projects are minimized in rural as well as urban areas.	Proper light/glare shielding is included as part of Project design. See Section 5.11.2.2.2.	County of Kern	3
Kern County General Plan, 1.10.7 Light and Glare Policy 48	Encourage the use of low-glare lighting to minimize the nighttime glare effects on neighboring properties	Proper light/glare shielding is included as part of Project design. See Section 5.11.2.2.2.	County of Kern	3
Kern County General Plan, Zoning Ordinance Code Chapter 19.86,	Requires public notification and review of any project that might adversely impact visual resources.	Given that the zoning of the Project property is A-1; a Landscape Plan is not required. See Section 5.11.2.2.4.	County of Kern	3
Kern County General Plan Circulation Element – 2.3.9 Scenic Route Corridors	Requirements are applicable to state designated scenic highways. The California Scenic Highways Master Plan designates three state highways in Kern County “Eligible State Scenic Highway,” including portions of State Routes 14, 58, 41 and State Highway 395.	The portions of roads and highways within the Project vicinity are not designated official State Scenic Highways. See Section 5.11.1.3.3.	County of Kern	4
Kern County River Plan Element, Chapter III - 3.2.3 Policies (3)	Building heights and setbacks shall not significantly obstruct river views, and they shall be regulated in accordance with potential to obstruct river views from existing or planned roads or trails.	There are no river views within the Project vicinity; therefore this requirement is not applicable to the Project. See Section 5.11.1.1 and Figure 5.11.2.	County of Kern	3

SECTION FIVE

Environmental Information

**Table 5.11-9
Summary of LORS – Visual Resources**

LORS	Requirements	Conformance to Requirements	Administering Agency	Agency Contact
Tupman Rural Community Specific Plan, Scenic Highways Implementation 2	All proposed existing and or expanding land uses adjacent to the Tupman Road route shall seek approval of the Planning Agency prior to issuance of permits so as to provide for the screening of unsightly uses.	From a conversation with Shawn Beyeler, Planner 2 (County of Kern Planning Department) on 30 May 2008 it was determined that Tupman Road is not designated as a scenic route and there are to date no scenic routes designated throughout Kern County. See Section 5.11.1.3.3.	County of Kern	4
Buttonwillow Community Development Plan, Open Space	Encourages continuing dual use of transmission line easements as open space or possible greenbelt areas.	Some portions of the Project's proposed transmission route follow existing transmission lines and poles. Section 5.11.1.1.	County of Kern	3
Buttonwillow Community Development Plan, Scenic Lands	Encourage continuing implementation of the County Scenic Highway Programs	Currently there are no designated County Scenic Highways within the Project vicinity. See Section 5.11.1.3.3.	County of Kern	4

Notes:

BLM = Bureau of Land Management

LORS = laws, ordinances, regulations, and standards

5.11.6 Involved Agencies and Agency Contacts

The local agency for the Project is the County of Kern Environmental Health Services Department (EHSD) shown in Table 5.11-10, Agency Contact List for LORS.

**Table 5.11-10
Agency Contact List for LORS**

Agency		Contact Information
State Jurisdiction		
1	California Energy Commission Energy Facilities Siting Division Community Resources Unit	Mark Hamblin, Senior Planner/Supervisor 1516 Ninth Street, Sacramento, CA 95814 916-654-5107
2	California Department of Transportation (Caltrans) Guidelines for the Official Designation of Scenic Highways Office of Landscape	Senior Landscape Architect 2800 Gateway Oaks Drive, Suite 100 Sacramento, CA 95833 Ken Murray, L.A. #4345 916-274-6138
Local Jurisdiction		
3	County of Kern	Scott Denney, Supervising Planner 2700 "M" Street, Suite 100 Bakersfield, CA 93301-2323 661-862-8631
4	County of Kern	Shawn Beyeler, Planner 2 2700 "M" Street, Suite 100 Bakersfield, CA 93301-2323 661-862-8641

Note:
LORS = laws, ordinances, regulations, and standards

5.11.7 Permits Required and Permit Schedule

No permits are required pertaining to visual resources.

5.11.8 References

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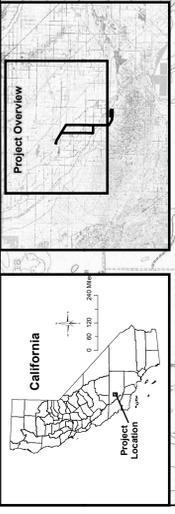
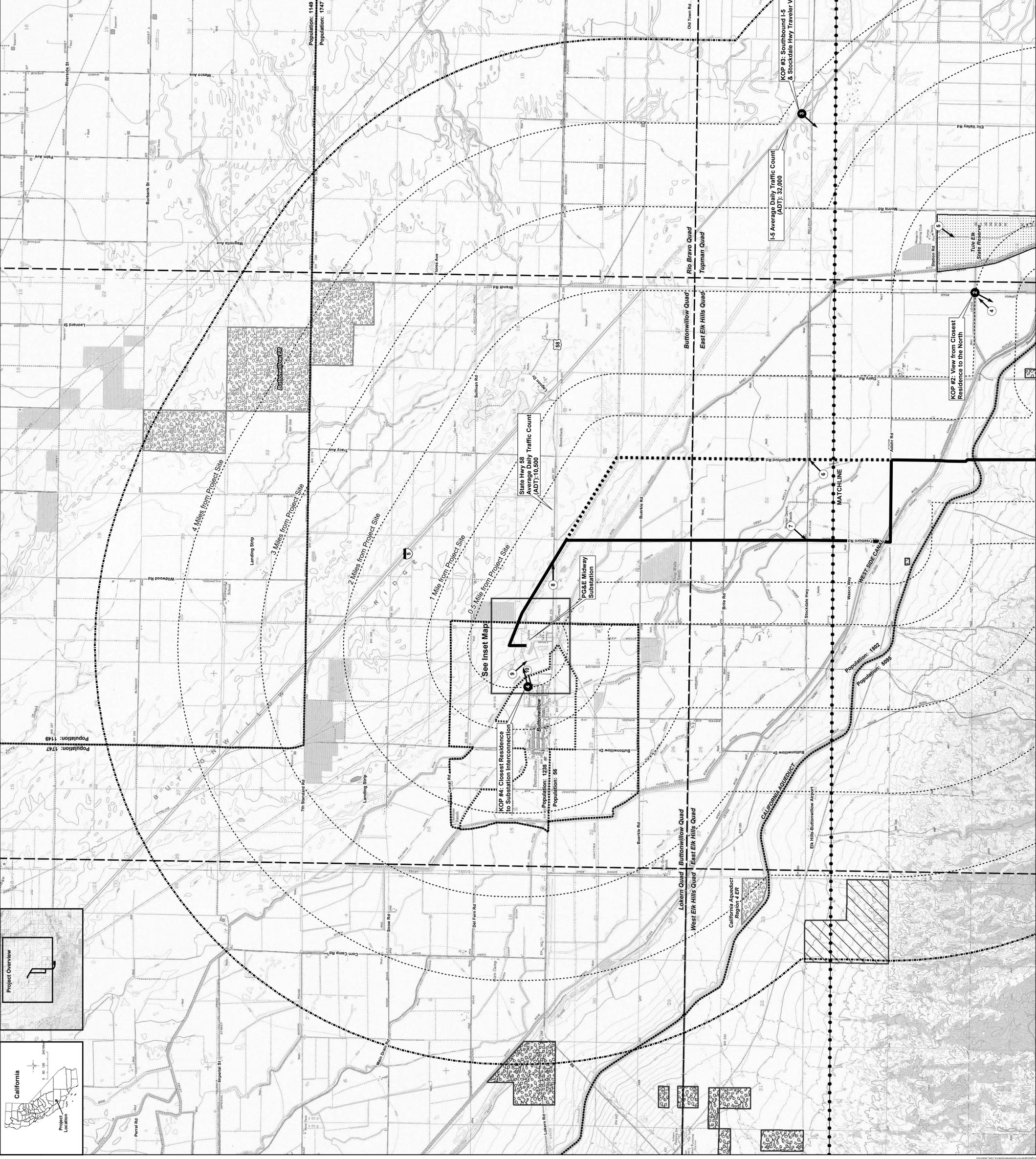
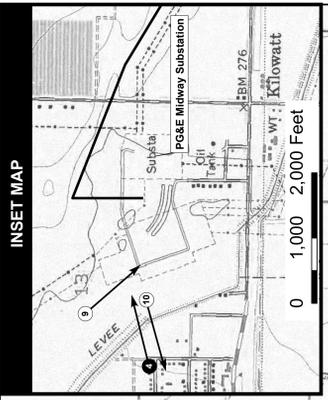
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- URS Corporation (URS). 2006. Application for Certification (AFC) for Panoche Energy Center Power Plant Project, 06-AFC-5. 2006.



LEGEND

- Key Observation Point (KOP)
- Character Photo Location
- 7.5 USGS Quad Index
- Visual Sphere of Influence (VSOI)

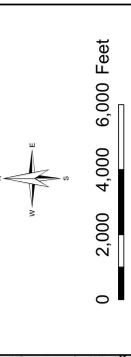
TRANSMISSION LINES

- Option 1
- Option 2
- HECA Project Site
- 2004 Census Block Groups
- Lokem Ecological Reserve (CDFG)

PUBLIC LANDS

- Bureau of Land Management
- CA Dept of Parks and Recreation
- CA Dept of Fish and Game Ecological Reserve (ER)
- Project Not Visible*

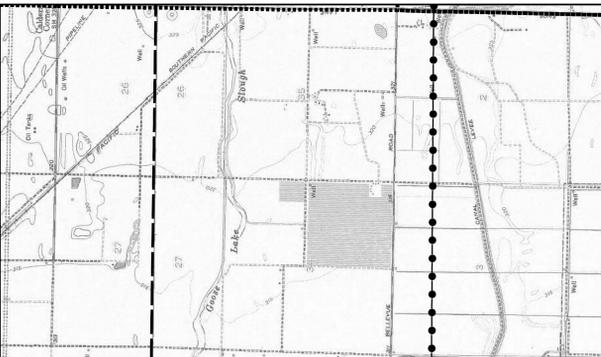
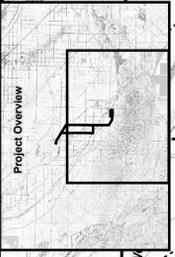
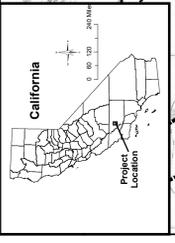
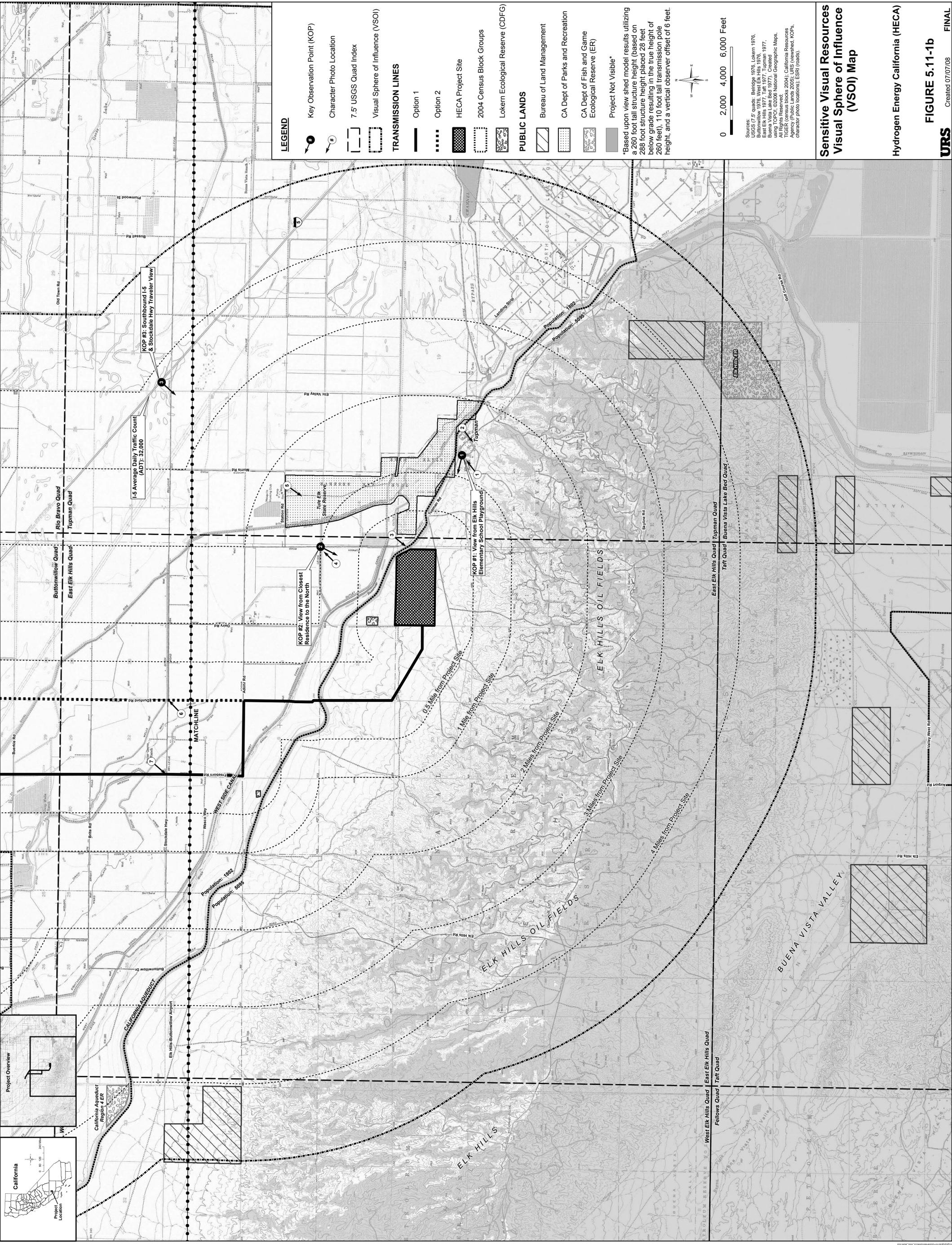
*Based upon view shed model results utilizing a 260 foot tall structure height (based on 288 foot structure height placed 28 feet below grade resulting in the true height of 260 feet), 110 foot tall transmission pole height, and a vertical observer offset of 6 feet.



Sources:
 USGS (7.5 quads: Bendigo 1976, Lokem 1976, Butteview 1976, West Elk Hills 1976, Buena Vista Lake Bed 1977). Created using TOPOI, ©2006 National Geographic Maps. All Rights Reserved. ©2004, California Resources Agency (Public Lands 2005), URS (viewshed, KOPs, character photo locations), ESRI (roads).

Sensitive Visual Resources Visual Sphere of Influence (VSOI) Map

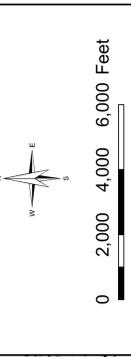
Hydrogen Energy California (HECA)



LEGEND

- Key Observation Point (KOP)
- Character Photo Location
- 7.5 USGS Quad Index
- Visual Sphere of Influence (VSOI)
- TRANSMISSION LINES**
- Option 1
- Option 2
- HECA Project Site
- 2004 Census Block Groups
- Lokem Ecological Reserve (CDFG)
- PUBLIC LANDS**
- Bureau of Land Management
- CA Dept of Parks and Recreation
- CA Dept of Fish and Game Ecological Reserve (ER)
- Project Not Visible*

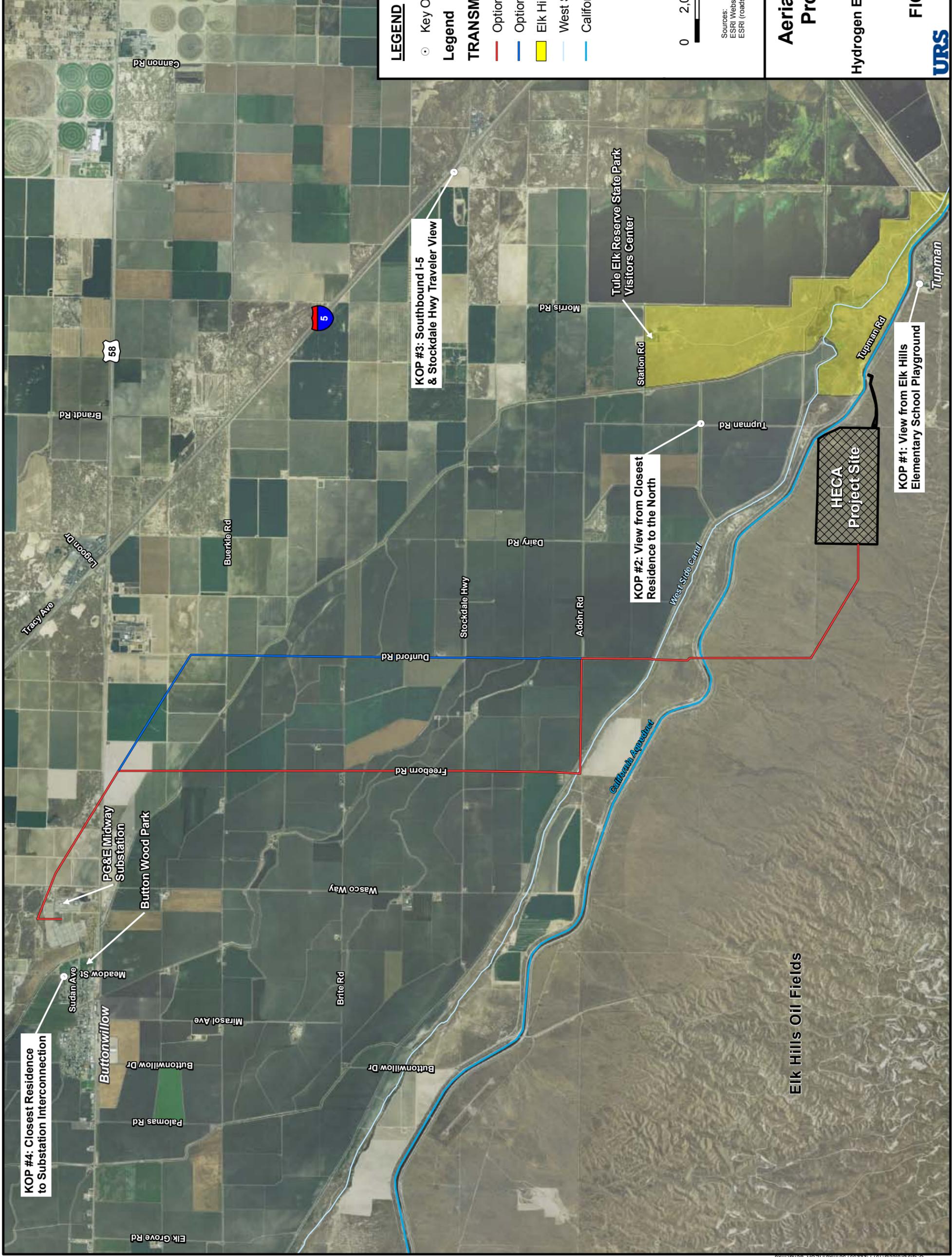
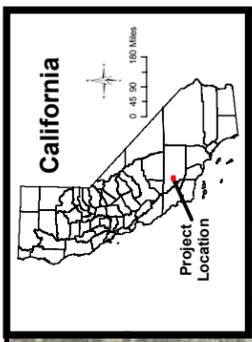
*Based upon view shed model results utilizing a 260 foot tall structure height (based on 288 foot structure height placed 28 feet below grade resulting in the true height of 260 feet), 110 foot tall transmission pole height, and a vertical observer offset of 6 feet.



Sources:
 USGS 7.5 quads: Beidge 1976, Lokem 1976, Buena Vista 1977, West Elk Hills 1976, Buena Vista Lake Bed 1971, Created using TOPOI, ©2006 National Geographic Maps. All Rights Reserved. ©2004, California Resources Agency (Public Lands 2005), URS (viewshed, KOPs, character photo locations), ESRI (roads).

**Sensitive Visual Resources
 Visual Sphere of Influence
 (VSOI) Map**

Hydrogen Energy California (HECA)



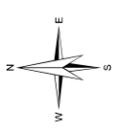
LEGEND

- Key Observation Point Location

Legend

TRANSMISSION LINES

- Option 1
- Option 2
- █ Elk Hills State Reserve
- West Side Canal
- California Aqueduct



Sources:
 ESRI Webserver (NAIP aerial 2005);
 ESRI (roads); CERES (hydrography 1998).

Aerial of Immediate Project Vicinity

Hydrogen Energy California (HECA)

FIGURE 5.11-2



Created 07/07/08

FINAL

KOP #4: Closest Residence to Substation Interconnection

KOP #3: Southbound I-5 & Stockdale Hwy Traveler View

KOP #2: View from Closest Residence to the North

KOP #1: View from Eik Hills Elementary School Playground

Eik Hills Oil Fields



Photo Location 1: Elk Hills Elementary School Playground (middleground view to the Project site)



Photo Location 2: Residence at Tupman Road and Grace Avenue Intersection (no view to Project site)



NO SCALE

**CHARACTER PHOTOS OF PROJECT AREA
HYDROGEN ENERGY CALIFORNIA (HECA)
(FIGURE 1 OF 5)**

CREATED BY: VT

DATE: 06-02-08

FIG. NO:

PM:JD

PROJ. NO: 22239758

5.11-3



Photo Location 3: View of Project site from Tupman Road / California Aqueduct crossing (foreground view to Project site)



Photo Location 4: Closest residence to the north of Project site on Tupman Road (middleground view to the Project site)



URS

NO SCALE

**CHARACTER PHOTOS OF PROJECT AREA
HYDROGEN ENERGY CALIFORNIA (HECA)
(FIGURE 2 OF 5)**

CREATED BY: VT

DATE: 06-02-08

FIG. NO:

PM:JD

PROJ. NO: 22239758

5.11-4



Photo Location 5: View from observation deck in Tule Elk Preserve State Park Visitor's Center looking southwest towards the Project site (middleground view to Project Site)



Photo Location 6: Location of proposed transmission line crossing at Dunford Road & Stockdale Hwy (view from southwest quadrant of intersection)



URS

NO SCALE

**CHARACTER PHOTOS OF PROJECT AREA
HYDROGEN ENERGY CALIFORNIA (HECA)
(FIGURE 3 OF 5)**

CREATED BY: VT

DATE: 06-02-08

FIG. NO:

PM:JD

PROJ. NO: 22239758

5.11-5



Photo Location 7: Location of proposed transmission line crossing at Freeborn Road & Stockdale Hwy (view from northeast quadrant)



Photo Location 8: View of proposed transmission line crossing at State Hwy 58 (view from eastbound State Hwy 58 looking east)



URS

NO SCALE

**CHARACTER PHOTOS OF PROJECT AREA
HYDROGEN ENERGY CALIFORNIA (HECA)
(FIGURE 4 OF 5)**

CREATED BY: VT

DATE: 06-02-08

FIG. NO:

PM:JD

PROJ. NO: 22239758

5.11-6



Photo Location 9: PG&E Midway Substation



Photo Location 10: Closest residence to the proposed Project interconnection (foreground view of proposed Project interconnection point)



URS

NO SCALE

**CHARACTER PHOTOS OF PROJECT AREA
HYDROGEN ENERGY CALIFORNIA (HECA)
(FIGURE 5 OF 5)**

CREATED BY: VT

DATE: 06-02-08

FIG. NO:

PM:JD

PROJ. NO: 22239758

5.11-7

FIGURE 5.11-8
SCENIC ATTRACTIVENESS EVALUATION FORM FOR
SENSITIVE VIEW AREA AND KOP NO. 1

Landform	H (5)	H/M (4)	M (3)	<u>M/L (2)</u>	<u>L (1)</u>
Vegetation	H (5)	H/M (4)	M (3)	M/L (2)	<u>L (1)</u>
Water	H (5)	H/M (4)	M (3)	<u>M/L (2)</u>	<u>L (1)</u>
Color	H (5)	H/M (4)	M (3)	M/L (2)	<u>L (1)</u>
Adjacent Scenery	H (5)	H/M (4)	M (3)	M/L (2)	<u>L (1)</u>
Scarcity	H (5)	H/M (4)	M (3)	M/L (2)	<u>L (1)</u>
Modifications*	H (2)	H/M (1)	M (0)	<u>M/L (-2)</u>	L (-4)
Scenic Attractiveness Class C (10)					

Scenic Quality
Classifications
A = 19 or more
B = 12 to 18
C = 11 or less

Note: Evaluation score is bold and underlined; H = High; M = Moderate; and L = Low

* Explains cultural modifications present in the landscape, ranging from negative intrusions (-4) to those that complement the scenic quality and promote visual harmony (2)



Narrative Landscape Description and Photograph: Sensitive Viewing Area and KOP No. 1 (Figure 5.11-12, see also Figure 5.11-1 for KOP location) was taken from the Elk Hills Elementary School playground (501 Kern Street), located in the Town of Tupman, approximately 1.3 miles southwest of the Project site. A topographic rise of this area allows for more open, expansive views of the adjacent areas. Topographic relief across the setting consists of a broad horizontal composition varying from relatively flat terrain to distant rolling hills, adding to the panoramic visual appeal to form and line characteristics of the area. There are no natural water features in the Project area. The only water source within view from this KOP is the California Aqueduct, which runs in a northwest to southeast orientation east of the Project site. A variety of cultural modifications (including industrial storage tank/structures, fencing, and telephone/transmission lines along Tupman Road) are visible in foreground and middleground views. The area is characterized by little color variations (mainly from patches of sparse low-lying vegetation), and has low contrast of generally mute tones. Views from this KOP to the east also consist of large expanses of farmlands. This landscape is mildly interesting within its setting, but fairly common within the region (see Figure 5.11-3 for a character photo of the Elk Hills Elementary School playground).

**FIGURE 5.11-9
SCENIC ATTRACTIVENESS EVALUATION FORM FOR
SENSITIVE VIEW AREA AND KOP NO. 2**

Landform	H (5)	H/M (4)	M (3)	M/L (2)	<u>L (1)</u>
Vegetation	H (5)	H/M (4)	M (3)	M/L (2)	<u>L (1)</u>
Water	H (5)	H/M (4)	M (3)	M/L (2)	<u>L (1)</u>
Color	H (5)	H/M (4)	M (3)	M/L (2)	<u>L (1)</u>
Adjacent Scenery	H (5)	H/M (4)	M (3)	M/L (2)	<u>L (1)</u>
Scarcity	H (5)	H/M (4)	M (3)	M/L (2)	<u>L (1)</u>
Modifications*	H (2)	H/M (1)	M (0)	<u>M/L (-2)</u>	L (-4)
Scenic Attractiveness Class C (9)					

Scenic Quality Classifications A = 19 or more B = 12 to 18 C = 11 or less

Note: Evaluation score is bold and underlined; H = High; M = Moderate; and L = Low

* Explains cultural modifications present in the landscape, ranging from negative intrusions (-4) to those that complement the scenic quality and promote visual harmony (2)



Narrative Landscape Description and Photograph: Sensitive Viewing Area and KOP No. 2 (Figure 5.11-14, see also Figure 5.11-1 for KOP location) was taken from the front yard view of the closest residence along Tupman Road, approximately 1 mile to the north looking south towards the Project site. Topographic relief is similar to that described for KOP #1. The terrain is generally flat, varying little in distinctive setting. The hills in the background provide the main form and line characteristics in the area. The only water source in the area is the California Aqueduct (extending from the right side of this photo to the left). However, the water is below grade and is therefore, not visible from this KOP. Cultural modifications visible in foreground and middleground views include cultivated farmland, miscellaneous tanks/structures, Tupman Road, fencing and telephone/transmission lines. There are also a number of oil facilities on the horizon. There is some variety in colors and contrast of the area; however, this is largely created by cultural modifications (mainly from agricultural crops). What little naturally occurring color variation exists is created mainly from patches of sparse low-lying vegetation. The main visual interest and/or draw to this area is essentially created by the open expanses of land. While this landscape is mildly interesting within its setting, it is fairly common within the region (see Figure 5.11-4 for a character photo of this residence).

**FIGURE 5.11-10
SCENIC ATTRACTIVENESS EVALUATION FORM FOR
SENSITIVE VIEW AREA AND KOP NO. 3**

Landform	H (5)	H/M (4)	M (3)	<u>M/L (2)</u>	<u>L (1)</u>
Vegetation	H (5)	H/M (4)	M (3)	M/L (2)	<u>L (1)</u>
Water	H (5)	H/M (4)	M (3)	M/L (2)	<u>L (1)</u>
Color	H (5)	H/M (4)	M (3)	M/L (2)	<u>L (1)</u>
Adjacent Scenery	H (5)	H/M (4)	M (3)	M/L (2)	<u>L (1)</u>
Scarcity	H (5)	H/M (4)	M (3)	<u>M/L (2)</u>	<u>L (1)</u>
Modifications*	H (2)	H/M (1)	M (0)	<u>M/L (-2)</u>	L (-4)
Scenic Attractiveness Class C (6)					

Scenic Quality Classifications
A = 19 or more
B = 12 to 18
C = 11 or less

Notes:

Evaluation score is bold and underlined; H = High; M = Moderate; and L = Low

* Explains cultural modifications present in the landscape, ranging from negative intrusions (-4) to those that complement the scenic quality and promote visual harmony (2)



Narrative Landscape Description and Photograph: Sensitive Viewing Area and KOP No. 3 (Figure 5.11-16, see also Figure 5.11-1 for KOP location) was taken at the I-5/Stockdale Highway intersection, looking west towards the Project site, to represent traveler views along these roadways. This KOP is located approximately 4-miles east of the Project site along southbound I-5 to represent “worst-case” traveler views along this highway. The topography varies from flat terrain to low-lying distant hills with a variety of cultural modifications including the Stockdale Highway overpass and associated highway signage, property fencing, transmission and telephone poles/lines limiting visual appeal to form and line characteristics of the area. All significant color variations are created from cultural modifications. Vegetation and color within the area is sparse (tan barren landscape with dried weeds and grasses line the highway). No water sources are within or are visible from this area.

**FIGURE 5.11-11
SCENIC ATTRACTIVENESS EVALUATION FORM FOR
SENSITIVE VIEW AREA AND KOP NO. 4**

Landform	H (5)	H/M (4)	M (3)	M/L (2)	<u>L (1)</u>
Vegetation	H (5)	H/M (4)	M (3)	<u>M/L (2)</u>	<u>L (1)</u>
Water	H (5)	H/M (4)	M (3)	M/L (2)	<u>L (1)</u>
Color	H (5)	H/M (4)	M (3)	<u>M/L (2)</u>	<u>L (1)</u>
Adjacent Scenery	H (5)	H/M (4)	M (3)	<u>M/L (2)</u>	<u>L (1)</u>
Scarcity	H (5)	H/M (4)	M (3)	M/L (2)	<u>L (1)</u>
Modifications*	H (2)	H/M (1)	M (0)	<u>M/L (-2)</u>	L (-4)
Scenic Attractiveness Class C (7)					

Scenic Quality Classifications
A = 19 or more
B = 12 to 18
C = 11 or less

Notes:

Evaluation score is bold and underlined; H = High; M = Moderate; and L = Low

- Explains cultural modifications present in the landscape, ranging from negative intrusions (-4) to those that complement the scenic quality and promote visual harmony (2)



Narrative Landscape Description and Photograph: Sensitive Viewing Area and KOP No. 4 (Figure 5.11-18, see also Figure 5.11-1 for KOP location) was taken from the side yard view of the closest residence to the proposed Project substation interconnection, approximately 0.25-mile to the west looking east towards the substation. The PG&E Midway Substation is the dominant focal point of easterly views from this KOP. However, Button Wood Park lies between the residences in this area and the existing substation. The park consists of grass fields, a playground, two baseball fields, and has a number of trees that aide in blocking residential views of the substation. This area consists of relatively flat lands in all directions. Virtually all contrasts to form, line and color variations are created from cultural modifications (including the substation, the adjacent park, and the cluster of other residences in the area). Button Wood Park and the ornamental landscaping surrounding the adjacent residences create the limited visual interest to this area. See Figure 5.11-7 for a character photo of the substation and a character photo of this residence).



KOP 1: Existing view from closest recreational area (Elk Hills Elementary School playground) to the southeast, looking west toward the HECA site (approximately 1.3 miles southeast of HECA).

**EXISTING VIEW OF HECA FROM KOP #1
HYDROGEN ENERGY CALIFORNIA (HECA)**



NO SCALE

CREATED BY: VT

DATE: 06-16-08

FIG. NO:

PM:JD PROJ. NO: 22239758

5.11-12



KOP 1: Simulated view from closest recreational area (Elk Hills Elementary School playground) to the southeast, looking west toward the HECA site (approximately 1.3 miles southeast of HECA). This photo location is meant to represent “worst-case” views from recreational viewers.

**SIMULATED VIEW OF HECA FROM KOP #1
HYDROGEN ENERGY CALIFORNIA (HECA)**



NO SCALE

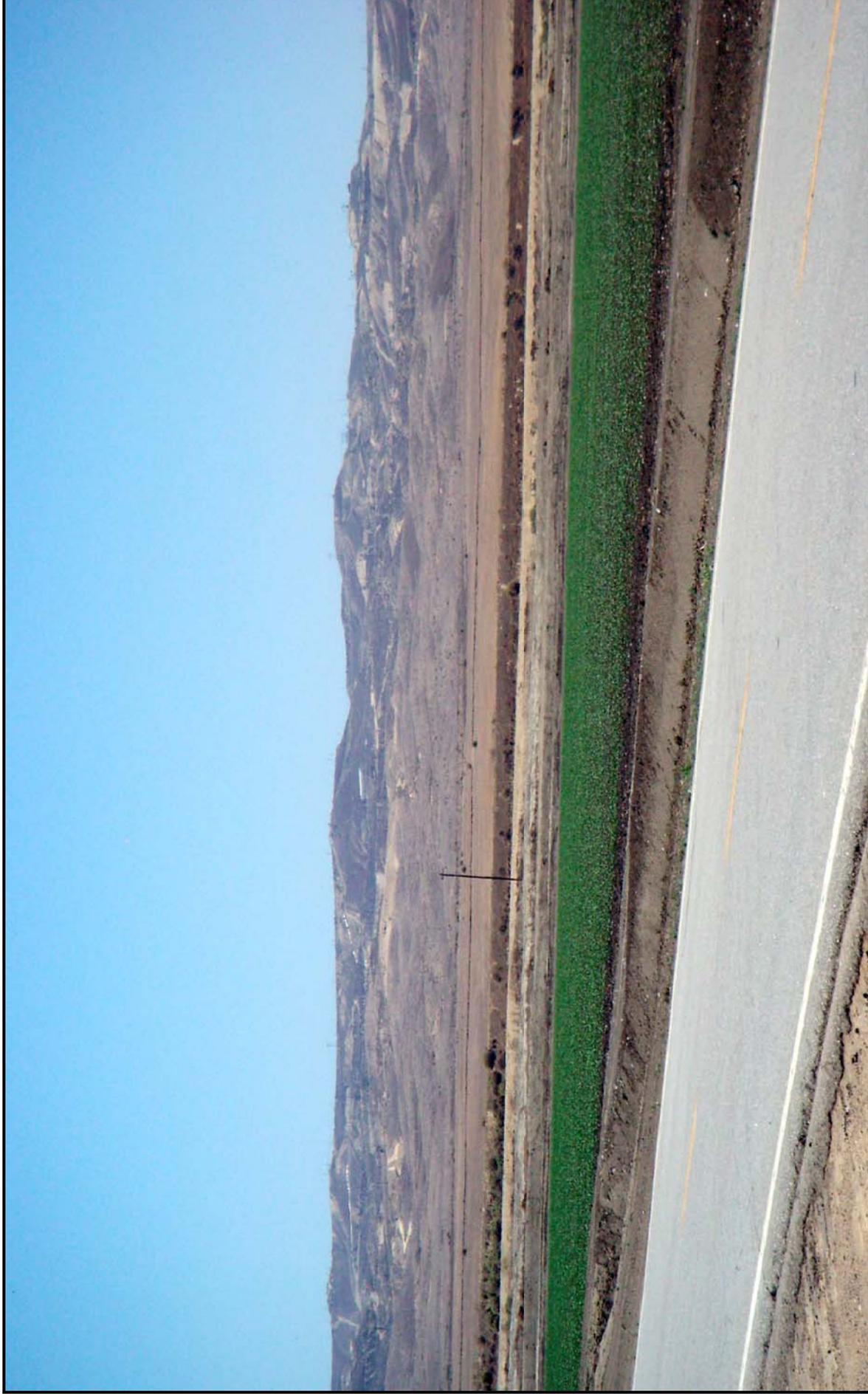
CREATED BY: VT

DATE: 07-16-08

FIG. NO:

PM:JD PROJ. NO: 22239758

5.11-13



KOP 2: Existing view from closest residence, looking southwest toward the HECA site (approximately 1 mile north of HECA).

**EXISTING VIEW OF HECA FROM KOP #2
HYDROGEN ENERGY CALIFORNIA (HECA)**



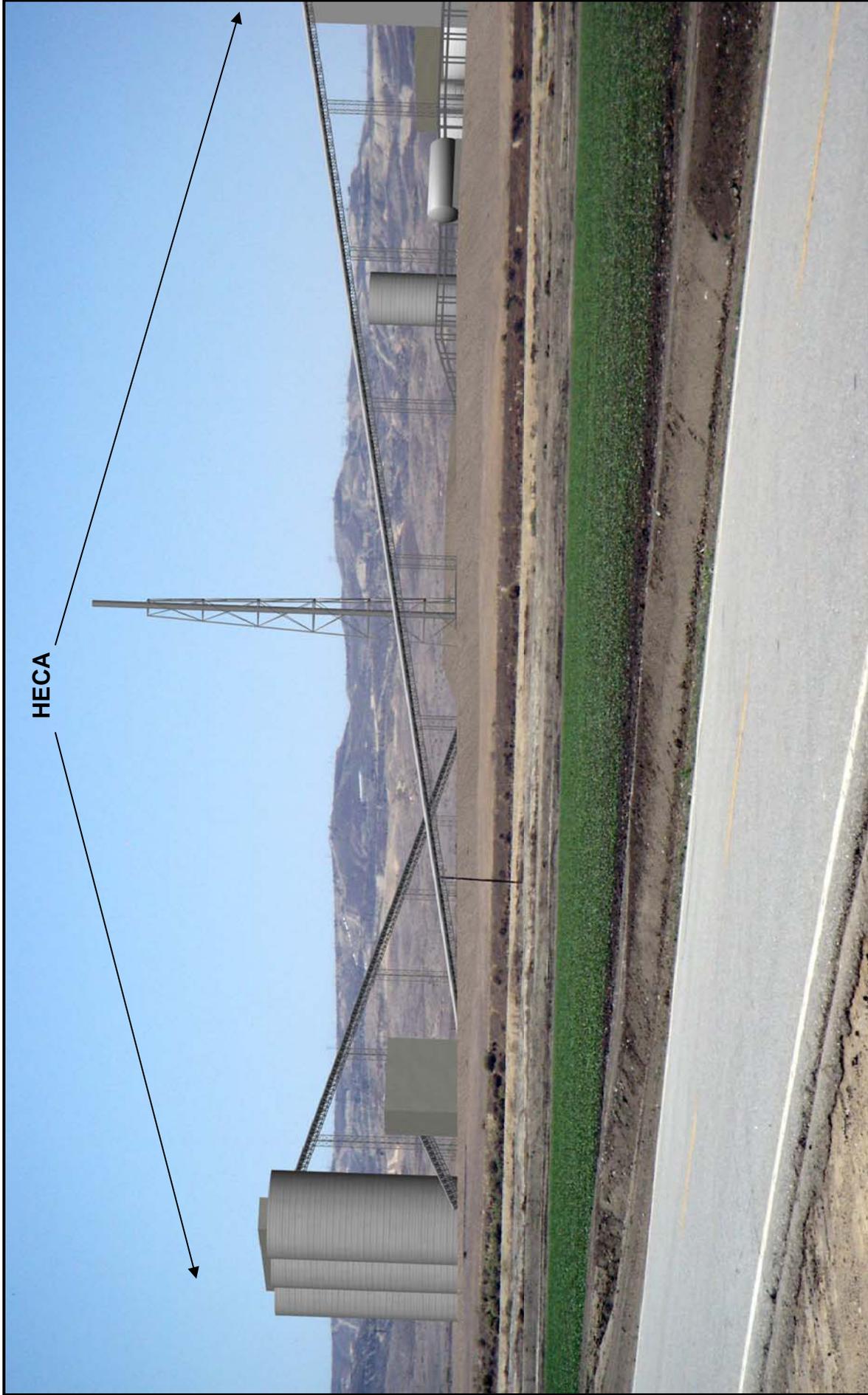
NO SCALE

CREATED BY: VT

DATE: 07-16-08

FIG. NO:
5.11-14

PM:JD PROJ. NO: 22239758



KOP 2: Simulated view from closest residence, looking southwest toward the HECA site (approximately 1 mile north of HECA). This photo location is meant to represent "worst-case" views from residential viewers.

**SIMULATED VIEW OF HECA FROM KOP #2
HYDROGEN ENERGY CALIFORNIA (HECA)**



NO SCALE

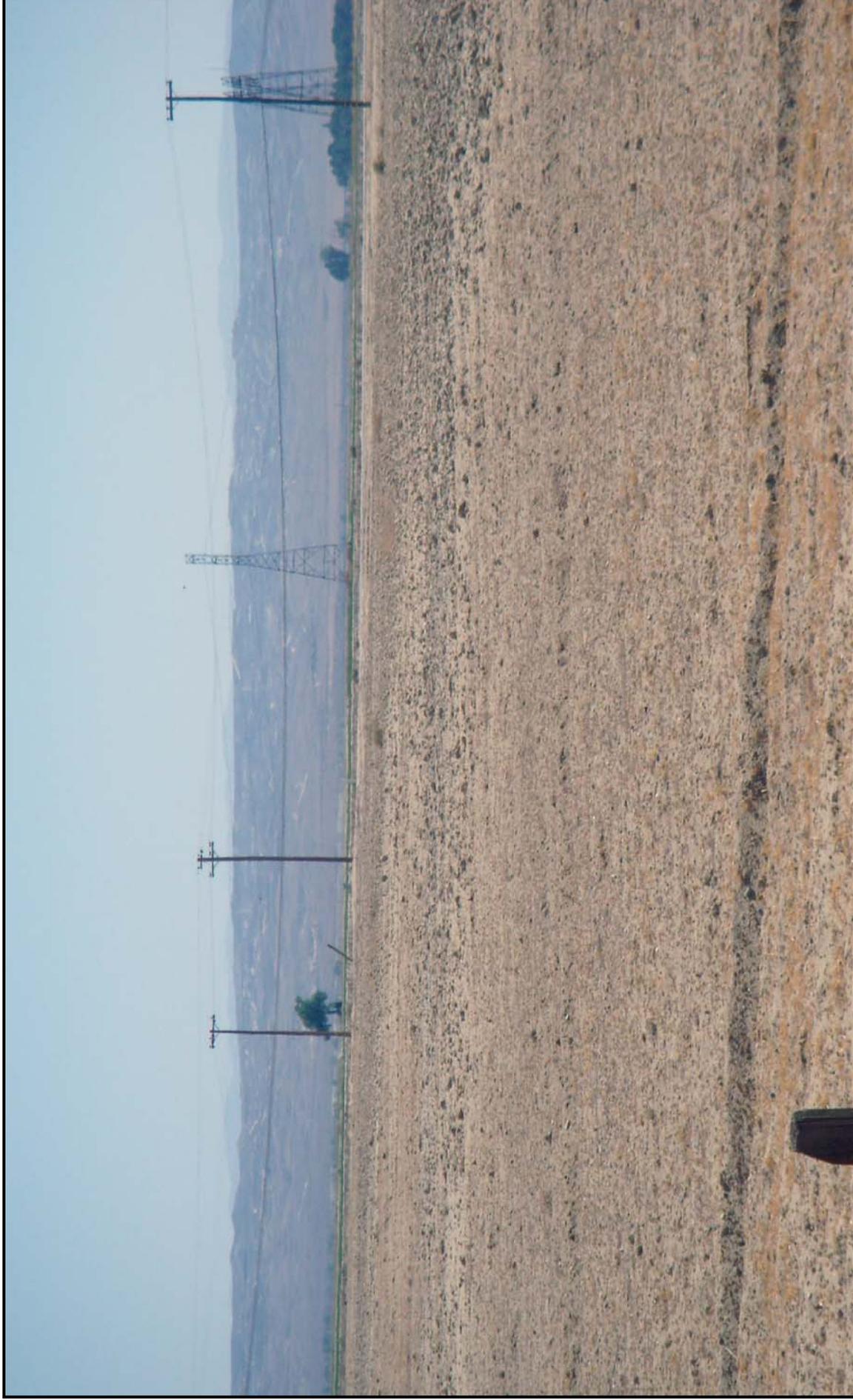
CREATED BY: VT

DATE: 07-16-08

FIG. NO:

PM:JD PROJ. NO: 22239758

5.11-15



KOP 3: Existing traveler view near the intersection of Interstate 5 and Stockdale Highway, looking southwest toward the HECA site (approximately 4.0 miles northeast of HECA).

**EXISTING VIEW OF HECA FROM KOP #3
HYDROGEN ENERGY CALIFORNIA (HECA)**



NO SCALE

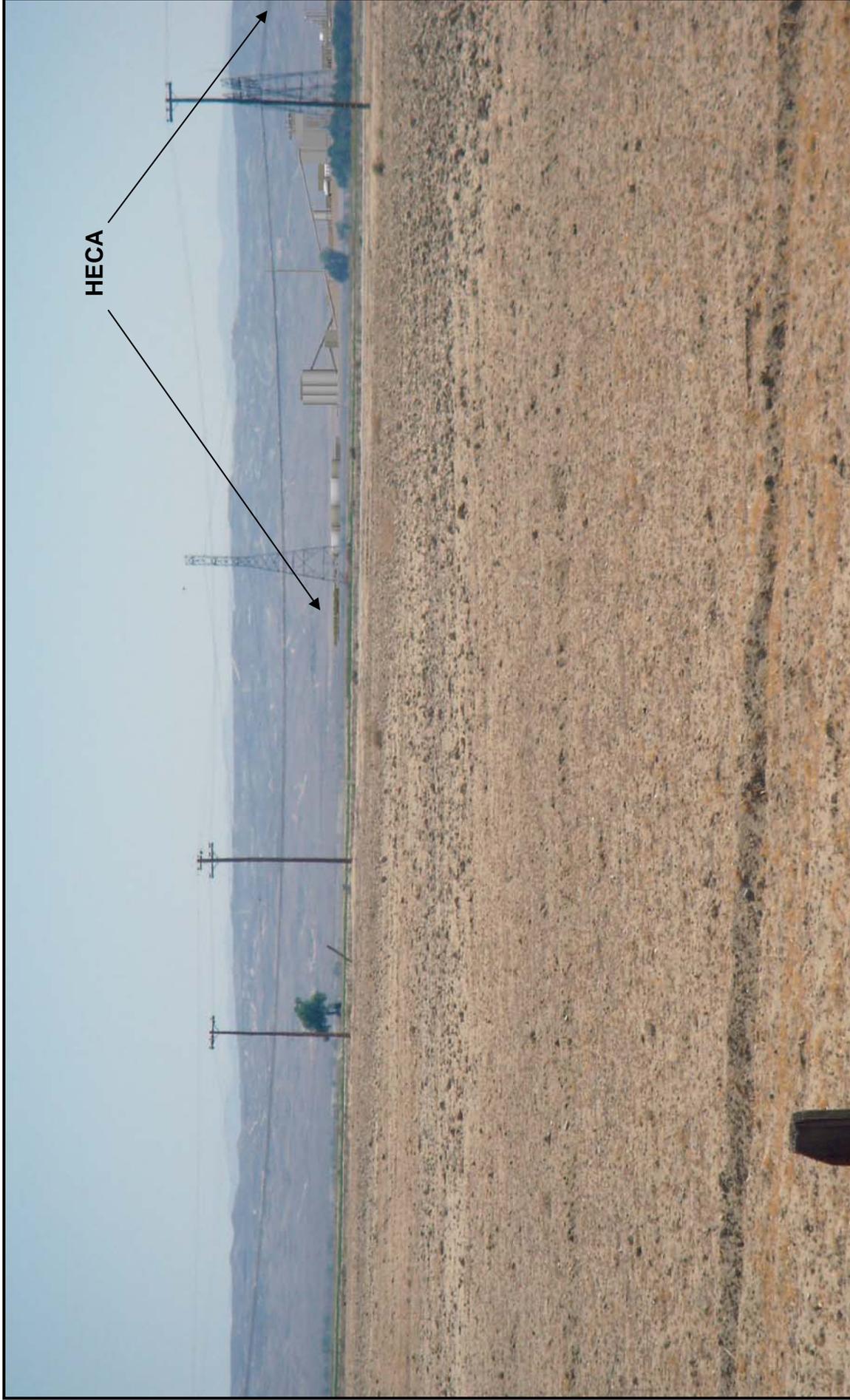
CREATED BY: VT

DATE: 06-16-08

FIG. NO:

PM:JD PROJ. NO: 22239758

5.11-16



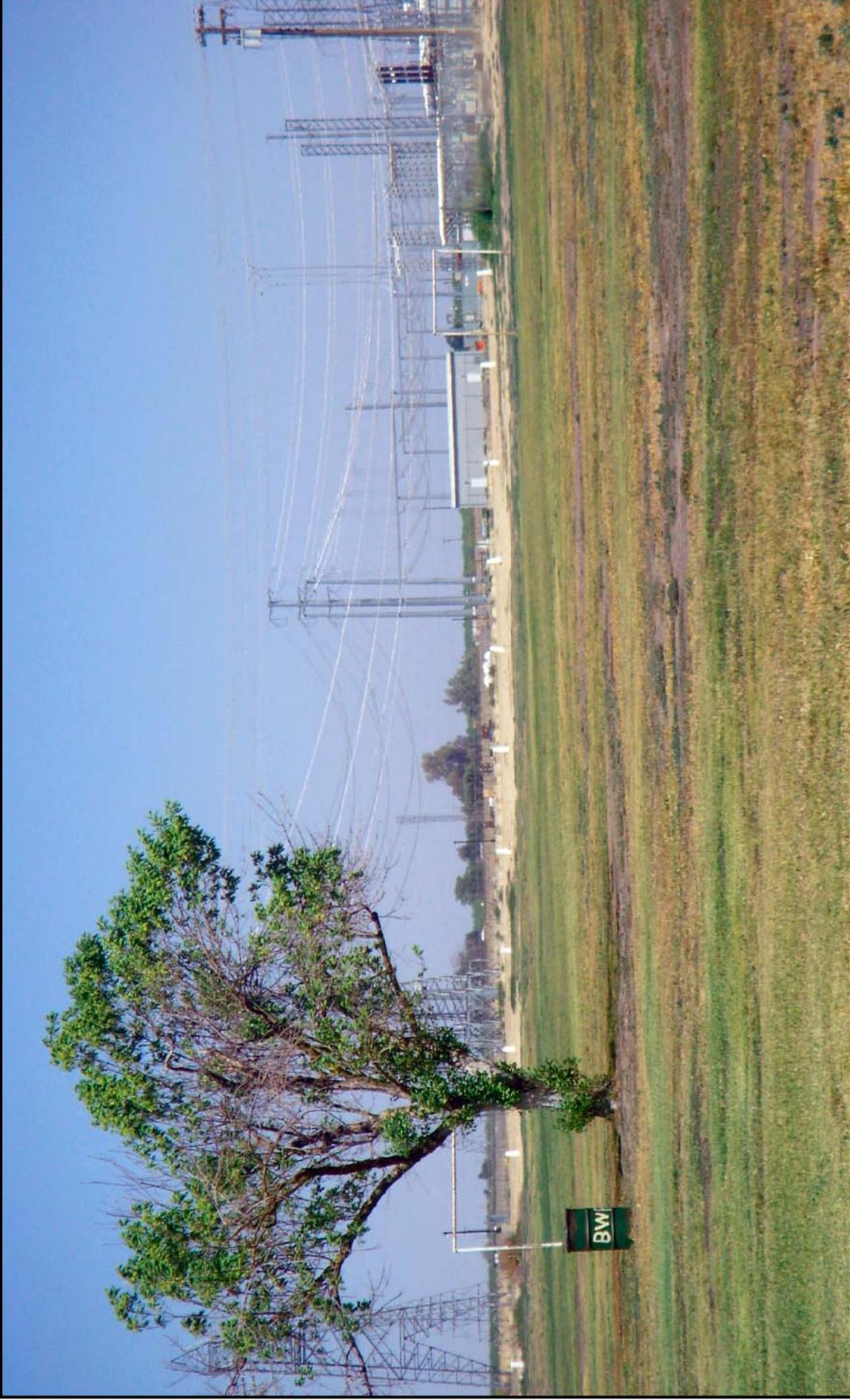
KOP 3: Simulated traveler view near the intersection of Interstate 5 and Stockdale Highway, looking southwest toward the HECA site (approximately 4.0 miles northeast of HECA). This photo location is meant to represent "worst-case" travelers view.

**SIMULATED VIEW OF HECA FROM KOP #3
HYDROGEN ENERGY CALIFORNIA (HECA)**



NO SCALE

CREATED BY: VT	DATE: 07-16-08	FIG. NO:
PM:JD	PROJ. NO: 22239758	5.11-17



KOP 4: Existing view from closest residence to the proposed interconnection at the existing PG&E Midway Substation, looking east toward the proposed interconnection (approximately 0.25 mile west of the PG&E Midway Substation).

**EXISTING VIEW OF HECA FROM KOP #4
HYDROGEN ENERGY CALIFORNIA (HECA)**



NO SCALE

CREATED BY: VT

DATE: 06-16-08

FIG. NO:

PM:JD PROJ. NO: 22239758

5.11-18



KOP 4: Simulated view from closest residence to the proposed interconnection at the existing PG&E Midway Substation, looking east toward the proposed interconnection (approximately 0.25 mile west of the PG&E Midway Substation). This photo location is meant to represent “worst-case” views from the closest residence.

**SIMULATED VIEW OF HECA FROM KOP #4
HYDROGEN ENERGY CALIFORNIA (HECA)**



NO SCALE

CREATED BY: VT

DATE: 06-16-08

FIG. NO:

PM:JD PROJ. NO: 22239758

5.11-19

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (1)	...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.	Section 5.11.1 Section 5.11.2 Section 5.11.3 Section 5.11.4		
Appendix B (g) (6) (A)	Descriptions of the existing visual setting of the vicinity of the proposed project site and the proposed routes for any project-related linear facilities. Include:	Section 5.11.1		
Appendix B (g) (6) (A) (i)	Topographic maps at a scale of 1:24,000 that depict directions from which the project would be seen, the view areas most sensitive to the potential visual impacts of the project, and the locations where photographs were taken for (g)(6)(C); and	Figure 5.11-1a and b		
Appendix B (g) (6) (A) (ii)	Description of the existing visual properties of the topography, vegetation, and any modifications to the landscape as a result of human activities, including existing water vapor plumes, above-ground electrical transmission lines, and nighttime lighting levels in the project viewshed.	Section 5.11.1		
Appendix B (g) (6) (B)	An assessment of the visual quality of those areas that would be affected by the proposed project. For projects proposed to be located within the coastal zone, the assessment should also describe how the proposed project would be sited to protect views to and along the ocean and scenic coastal areas, would minimize the alteration of natural land forms, would be visually compatible with the character of surrounding areas.	Section 5.11.1.4		

Adequacy Issue: Adequate Inadequate **DATA ADEQUACY WORKSHEET** Revision No. 0 Date _____

Technical Area: Visual Resources Project: _____ Technical Staff: _____

Project Manager: _____ Docket: _____ Technical Senior: _____

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (6) (C)	In consultation with Energy Commission staff, identify: i) any designated scenic roadways or scenic corridors and any visually sensitive areas that would be affected by the proposed project, including recreational and residential areas; and ii) the locations of the key observation points to represent the most critical viewing locations from which to conduct detailed analyses of the visual impacts of the proposed project. Indicate the approximate number of people using each of these sensitive areas and the estimated number of residences with views of the project. Also identify any major public roadways and trails of local importance that would be visually impacted by the project and indicate the types of travelers (e.g., local residents, recreationists, workers, commuters, etc.) and the approximate number of vehicles, bicyclists, and/or hikers per day.	Section 5.11.1.3		
Appendix B (g) (6) (D)	A table providing the dimensions (height, length, and width, or diameter) and, proposed color(s), materials, finishes, patterns, and other proposed design characteristics of each major component visible from off the project site, including any project-related electrical transmission line and/or offsite aboveground pipelines and metering stations.	Table 5.11-4		

Adequacy Issue: Adequate Inadequate **DATA ADEQUACY WORKSHEET** Revision No. 0 Date _____

Technical Area: Visual Resources Project: _____ Technical Staff: _____

Project Manager: _____ Docket: _____ Technical Senior: _____

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (6) (E)	Provide the cooling tower and heat recovery steam generator (HRSG) exhaust design parameters that affect visible plume formation. For the cooling tower, data shall include heat rejection rate, exhaust temperature, exhaust mass flow rate, liquid to gas mass flow ratio, and, if the tower is plume-abated, moisture content (percent by weight) or plume-abated fogging curve(s). The parameters shall account for a range of ambient conditions (temperature and relative humidity) and proposed operating scenarios, such as duct firing and shutting down individual cells. For the heat recovery steam generator exhausts, data shall include moisture content (percent by weight), exhaust mass flow rate, and exhaust temperature. The parameters must correspond to full-load operating conditions at specified ambient conditions, and shall account for proposed operating scenarios, such as power augmentation (i.e., evaporative coolers, inlet foggers, or steam injection) and duct firing, or proposed HRSG visible plume abatement, such as the use of an economizer bypass. For simple-cycle projects, provide analogous data for the exhaust stack(s).	Section 5.11.2.2 Section 5.1 Air Quality		

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (6) (F)	<p>Provide:</p> <p>i) full-page color photographic reproductions of the existing site, and</p> <p>ii) full-page color simulations of the proposed project at life-size scale when the picture is held 10 inches from the viewer's eyes, including any project-related electrical transmission lines, in the existing setting from each key observation point. If any landscaping is proposed to comply with zoning requirements or to mitigate visual impacts, include the landscaping in simulation(s) representing sensitive area views, depicting the landscaping five years after installation; and estimate the expected time until maturity is reached.</p>	Figures 5.11-12 to 5.11-19		
Appendix B (g) (6) (G)	<p>An assessment of the visual impacts of the project, including light, glare, and any modeling of visible plumes. Include a description of the method and identify any computer model used to assess the impacts. Provide an estimate of the expected frequency and dimensions (height, length, and width) of the visible cooling tower and/or exhaust stack plumes. Provide the supporting assumptions, meteorological data, operating parameters, and calculations used.</p>	Section 5.11.2		
Appendix B (g) (6) (H)	<p>If any landscaping is proposed to reduce the visual impacts of the project, provide a conceptual landscaping plan at a 1:40 scale (1"=40'). Include information on the type of plant species proposed, their size, quantity, and spacing at planting, expected heights at 5 years and maturity, and expected growth rates.</p>	Section 5.11.4		

Adequacy Issue: Adequate Inadequate **DATA ADEQUACY WORKSHEET** Revision No. 0 Date _____

Technical Area: Visual Resources Project: _____ Technical Staff: _____

Project Manager: _____ Docket: _____ Technical Senior: _____

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (i) (1) (A)	Tables which identify laws, regulations, ordinances, standards, adopted local, regional, state, and federal land use plans, leases, and permits applicable to the proposed project, and a discussion of the applicability of, and conformance with each. The table or matrix shall explicitly reference pages in the application wherein conformance, with each law or standard during both construction and operation of the facility is discussed; and	Table 5.11-9		
Appendix B (i) (1) (B)	Tables which identify each agency with jurisdiction to issue applicable permits, leases, and approvals or to enforce identified laws, regulations, standards, and adopted local, regional, state and federal land use plans, and agencies which would have permit approval or enforcement authority, but for the exclusive authority of the commission to certify sites and related facilities.	Table 5.11-10		
Appendix B (i) (2)	The name, title, phone number, address (required), and email address (if known), of an official who was contacted within each agency, and also provide the name of the official who will serve as a contact person for Commission staff.	Table 5.11-10		
Appendix B (i) (3)	A schedule indicating when permits outside the authority of the commission will be obtained and the steps the applicant has taken or plans to take to obtain such permits.	N/A		

