from the solar site parcels through the Mount Signal Solar Farm Project to the Imperial Solar Energy switchyard. Alternatively, each CUP may independently construct a 230 kilovolt (kV) step-up transformer and switchyard. Collector lines located within the 32 solar field site parcels would aggregate the electricity from all of the solar fields and convey it to the Gen-Tie line. Eight towers would be added to the Mount Signal Farm Project segment of the Gen-Tie to accommodate co-location. The Project would also include operations and maintenance buildings and depending on technology a type of energy storage facility that could accommodate a variety of evolving energy storage technologies within each CUP. The Project may also include auxiliary facilities such as raw water/fire water storage, treated water, water filtration buildings and equipment controls building, onsite water treatment and parking. 6-4 cont.

The Project would result in permanent, direct effects to approximately 2,793 acres of vegetation communities and other land cover types, the majority of which is classified as agriculture. Other vegetation communities include riparian and wetlands, e.g., tamarisk scrub, arrow weed scrub, open water, drains and canals. The Full Build-out Scenario of the project would impact jurisdictional (56.6 acres) and non- wetlands waters (12.1 acres). 6-5

We offer the following comments and recommendations to help avoid, minimize, and mitigate adverse impacts to public trust resources, including migratory birds, the federally endangered Yuma Ridgway's rail (*Rallus obsoletus yumanensis)* and State Species of Special Concern--the western burrowing owl (*Athene cunicularia hypugaea*) and Mountain plover (*Charadrius montanus*). 6-6

Migratory Birds

The Migratory Bird Treaty Act (MBTA), 16 U.S.C. 703, is the cornerstone of migratory bird conservation and protection in the United States, and migratory birds are a public trust resource of the Service and other State and Federal conservation agencies. The MBTA implements four treaties that provide for international protection of migratory birds. The MBTA protects most native species of birds in the United States, including those likely to occur in the project area; a list of species protected by the MBTA can be found at 50 CFR 10.13. The MBTA prohibits the "take" or possession of protected species of migratory birds; "take" means to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempts to do so (50 CFR 10.12). The MBTA does not specifically authorize the incidental take of migratory birds. The State Fish and Game Code contains similar prohibitions. 6-7

Migratory birds are important economically; they help control insect and rodent pests and are important to numerous communities where bird-watching attracts tourists. However, solar energy projects adversely affect migratory bird species in several ways. The clearance of vegetation and loss of habitat from development of facilities causes a loss of breeding, seasonal, and foraging habitat for resident and migratory species, which cumulatively can affect the vigor and viability of affected populations. Birds also are killed or injured from collisions with solar panels, mirrors, heliostats, electrical generation-tie and transmission lines, fences, and other structures. Relatively high numbers of terrestrial species, such as sparrows, doves, warblers, etc. are killed by panel and mirror collisions apparently induced by light reflectivity off these surfaces. In addition, birds routinely become entangled and die in the netting on water ponds created for dust control or wastewater evaporation 6-8

purposes. Solar flux fields generated by solar thermal power tower technologies also can burn and cause other physiological damage to birds that fly through those fields. The bright light emitted from the towers also attracts flying insects, which then attract insectivorous birds and bird-eating raptors, creating a trophic cascade mortality trap (Service 2014a). 6-8 cont.

This growing evidence suggests a particular hazard to water-associated birds seeking migratory stopover habitat typically found along rivers and lakeshores (Service 2014a), and is commonly referred to as a "lake effect" (Xu and Small 2014). Based on the species composition of avian fatalities found at three sites in the Mojave and Sonoran deserts--thin film photovoltaic, solar thermal trough, solar thermal power tower--all three technologies resulted in an unexpectedly high composition (approximately 30 to 40 percent by project) (McCrary et al. 1986; Ironwood Consulting 2013; AECOM 2013) of water-associated birds in the total number of avian fatalities across at least 17 families and 43 species (Service file information). The magnitude of impact from the lake effect is potentially related to many potential migratory flyway and species-specific factors that have yet to be investigated, including availability of other appropriate migratory stopover habitat, seasonality, broad-front vs. corridor migration patterns, weather and wind conditions, moon phase, etc. Projects along the Interstate-10 corridor are among those reporting higher mortality rates of water-associated birds (Service 2014a), which is likely related to the large number of water-associated species moving among the Lower Colorado River Valley, Salton Sea Basin, and the Pacific Coast. 6-9

Many aquatic insects are particularly vulnerable to "polarized light pollution" (Horvath et al. 2009, Kriska et al. 2009, Horvath et al. 2010), and can fly continuously over solar panels until they become exhausted and die (Kriska et al. 2009, Lundy et al. 2013). Among others, some of the more vulnerable insect groups include Odonata (dragonflies and damselflies), Trichoptera (caddisflies), Ephemeroptera (mayflies), and Tabanidae (tabanid flies). Decreases in the number of insects may indirectly affect other species than depend on them as important sources of food, such as fish, birds and other insect species. 6-10

To minimize this effect on aquatic insects, Horvath et al. (2010) showed that solar panels with white borders or grids of white strips that criss-cross the panels can reduce the attractiveness of solar panels to aquatic insects by 10 to 26 fold. Thus, the geographic placement and type of solar panel technology relative to aquatic habitats can make a significant difference in the amount of insect mortality. 6-11

The Project is located southwest of the Salton Sea, which is a critical stopover along the Pacific Flyway, providing permanent habitat and seasonal refuge to resident water-associated birds and migratory birds (Shuford et al. 2002). The agricultural fields surrounding the Salton Sea also provide habitat for a variety of wintering birds and shorebirds (Patten et al. 2003). To date, limited information exists on bird collisions at utility-scale solar energy facilities within the Salton Sea basin due to a lack of systematic, statistically rigorous monitoring. However, utility-scale photovoltaic, parabolic trough, and power tower projects that are currently under construction or in operation are reporting mortalities and injuries to a wide range of avian species, including water-associated birds, passerines, and raptors involving various project features, such as solar panels or heliostats, evaporation ponds, fencing, distribution lines within the facility, and gen-tie lines. 6-12

We agree with the assessment that the Project poses potentially direct and indirect significant impacts to migratory birds that may be foraging or nesting near the Project. Currently, our information regarding which solar technologies and configuration of panels would result in fewer impacts to migratory and resident birds is limited and over the next several years, we may have more information from the robust, systematic avian and bat mortality monitoring programs implemented on recently constructed projects. These data may increase our knowledge of which technologies or configurations may reduce avian collision rates or potential design features that could minimize impacts to various birds. The Phased CUP Scenario, which would be constructed over a 10-year period, may require additional mitigation measures based on evolving science and data from project monitoring if significant impacts are to be effectively minimized and offset. We recommend that the CEQA analysis account this need for additional mitigation or minimization measures to reduce the significance of the impacts based on monitoring results proposed for the Phased CUP Scenario, consistent with regulatory adaptive management principles. 6-13

Currently, available information is lacking on how different solar technologies, on-site panel configuration, mounting systems, and potential deterrents may affect/reduce bird mortality rates. Some potential design variables include the type of PV [thin film, crystalline silicon wafer, and concentrator PV (CPV)]; fixed versus single or dual-axis tracking systems; and multi-layer anti-reflection coating. Because the Project may be phased and built incrementally, it offers and ideal opportunity to test the mortality rates and generate comparative data across various technologies. Because most or all projects in this region of the County are thin film PV with similar mounting systems, use of alternative technologies, with appropriate mortality monitoring, could provide valuable information on the potentially different mortality rates for respective types of technologies. We consider this experimental approach a type of onsite avoidance and minimization measure that could benefit migratory birds for the Project and better inform decision making on future projects. We are available to assist the County and applicant in designing a suite of various technologies and configurations amenable to comparative monitoring for adaptive management purposes. 6-14

The proposed avian-specific construction measures include most of the components that we are recommending for solar projects; however, we recommend some specific clarifications to the post-construction monitoring plan and language and additional avoidance, minimization, and mitigation measures (see Enclosure). We recommend the proposed mitigation measure MM4.12.14a include a statistically robust, systematic avian and bat mortality and injury monitoring program to achieve the following: (1) estimate annual mortality by taxa and season using appropriate statistical design and appropriate estimators (this estimate should include mortality associated with all features of the project that are likely to result in injury and mortality - e.g., fences, ponds, solar panels, collector lines, gen-ties); (2) identify collision and other mortality during diurnal and nocturnal times of the day; and (3) assess the spatial distribution and abundance of mortalities [species composition (including rare and sensitive species), abundance, and distribution] on the project site. We recommend that the County require salvaging all dead and injured birds during construction and that the Applicant to apply for USFWS Special Purpose Utility Permit (SPUT) toproperly handle, store, and report all avian carcasses found during the construction phase. Please refer to the Enclosure for more details on post-construction monitoring during the operational phase. 6-15 6-16

Mr. Jim Minnick (FWS-IMP-15B008-15CPA005) 5

Regardless of the proposed mitigation measures to reduce the significance to avian species by avoidance measures and requiring post-construction mortality studies, some residual impacts would remain. Cumulatively, the development of numerous renewable energy projects in California has resulted in the loss of tens of thousands of acres of bird habitat and has likely affected their populations. For these reasons, the Service recommends that the County include a mitigation measure in the CUP to address the effects on direct habitat loss to birds and impacts to populations of migratory birds. Possible mitigation could include contributing to a fund to identify and reduce sources of mortality of migratory birds in the region and to enhance habitat specifically for the benefit of these species. We are eager to work with the County and Applicant to develop and implement appropriate mitigation; one of the joint ventures that the Service is partnering in for the conservation of migratory birds may have programs in place that would facilitate the implementation of such mitigation. A joint venture is a collaborative, regional partnership of government agencies, non-profit organizations, corporations, tribes, and individuals that conserves habitat for priority bird species, other wildlife, and people. More information on joint ventures is available at: http://www.fws.gov/birdhabitat/JointVentures/index.shtm. 6-17

Burrowing Owl and Mountain Plover

The agricultural lands in Imperial Valley support the highest known population densities of burrowing owl in the State (Rosenberg 2013). Multiple sources suggest Imperial Valley supports about 70 percent of the State-wide owl population, and provides one of the major wintering grounds in North America for mountain plover (Wunder and Knopf 2003). 6-18

The Project would directly displace 22 owls onsite and indirectly affect 81 to 148 owls on adjoining lands. Impacts and losses of this scale are cumulatively significant and warrant mitigation to offset impacts to the extent feasible. The proposed CEQA mitigation package for the Project includes a list of options for the impact of 614 acres of modeled "core" burrowing owl foraging habitat. Options include entering other farmland into short-term (e.g., 1 to 5 years) farm agreements to grow and retain burrowing owl friendly crops. Mitigation ratios (1:1 for "core" habitat) would be further reduced if farmers integrate owl-friendly farm practices to reduce mortality to owls. While the Service generally supports a farm incentive program (see Enclosure), we do not agree with the proposed mitigation ratios or the duration of the short-term conservation leases. We would like to work with CDFW, County, and Applicant on the development of a comprehensive package to account for complete loss of foraging habitat for owls and wintering habitat for plovers associated with the Project (2,793 acres). Key elements of a mitigation package for both species should include (1) owl and plover-friendly farming practices implemented through an incentive program with cooperating landowners, (2) a menu of mitigation options for loss of foraging and nesting habitats consistent with the long-term maintenance of agricultural practices upon which the owl and plover depend, (3) development of a standardized owl displacement strategy that optimizes survivorship based on the results of a comparative study between active and passive translocation methods, and (4) monitoring studies on the fate of burrowing owls nesting adjacent to the Project but suffering significant losses of foraging habitat that they depend on in their breeding territories and yearlong home ranges. 6-19

Yuma Ridgway's Rail

The Yuma Ridgway's rail, formally named the Yuma clapper rail, is currently restricted to a few managed wetlands along the Salton Sea, and lower Colorado River, as well as an array of tiny, transient marshes along the Gila River in Arizona from Phoenix west to the Colorado River (Service 2009, 2014b), and a few other small marsh complexes colonized as satellite populations distant from these population centers. These secretive birds only occupy early-successional freshwater and brackish marshes dominated by low- to medium-density stands of southern cattail (*Typha domingensis*) and select species of bulrush (Nadeau et al. 2011). Based on recent research, rails are for the most part non-migratory, but localized movements and documented long distance dispersal occur within the range of the species. Dispersing clapper rails are assumed subadults evicted from natal territories, unpaired males seeking lower-density populations to establish territories, or adult rails displaced from established territories either by marsh senescence or by disturbances, such as flood scouring, fire, vegetation removal, and construction and maintenance activities (Eddleman 1989, Bennet and Ohmart 1978). In the 1980's radar studies conducted at the south end of the Salton Sea along the Alamo and New Rivers documented clapper rails departing marsh habitats at night and flying at relative low altitudes of 150-300 feet, and flying in an easterly/northeasterly direction, potentially to the Colorado River (McKernan per. communication). This dispersal behavior and low elevation flight patterns make all age classes of rails susceptible to collisions with various structures or power lines. For example a Yuma Ridgway's rail was found dead this spring at the base of a chainlink fence on the Solar Gen 2 site near Calipatria, suggesting a potential fence collision or injury from a PV panel collision and subsequent death while wandering about the site. 6-20

We agree with the assessment that there are potentially significant direct and indirect impacts during construction and operations of the Project because (1) rails and known to disperse across short and long distances, and significant movements within the Imperial Valley are known to occur as rails move between local patches of marsh, (2) rails disperse by night and fly at low elevations, making them vulnerable to collisions with various structures, including transmission lines (Service file information on various rail species colliding with different infrastructures —available upon request), and (3) Yuma Ridgway's rail and other species have died in collisions with PV panels and therefore are vulnerable to the lake effect. The proposed mitigation measure MM4.12.5, proposes to conduct a field habitat assessment to determine if potentially suitable habitat is adjacent to the Project or Study Area. This measure does not reduce the significance of impacts from Project without a corresponding offsetting measure, nor does it address the potential for panel collision or collision with other project features. Solar and transmission projects within the resident and dispersal range of Yuma Ridgway's rail are likely to kill multiple individuals over the life span of these projects, given the observed pattern of dispersal events across the Mojave and Sonoran deserts and the large cumulative disturbance footprint (e.g., 20,000 acres in the Imperial Valley alone) of solar energy projects. Other infrastructure associated with solar facilities also poses a threat, including collisions with fences and electrical transmission lines. As such, existing and proposed utility-scale solar projects and their associated infrastructure introduce new sources of mortality to resident and dispersing rails, which cumulatively could be significant enough to function as ongoing sources of mortality for the species for the life of these projects. 6-21

Therefore, we recommend developing a mitigation strategy to address the potential for incidental take of Yuma Ridgway's rail. A key component would be a mortality monitoring program designed 6-22

to detect relatively uncommon mortality events associated with rare species, such as Yuma Ridgway's rail. Once mortality is documented, or if the Applicant opts for advance incidental take authorization, the take may be addressed by either requiring that the applicant apply for an incidental take permit through the development of a Habitat Conservation Plan (HCP) that satisfies the permit issuance criteria stipulated under section 10(a)(1)(B) of the Endangered Species Act. HCPs provide for partnerships with non-Federal parties to conserve the ecosystems upon which threatened and endangered species depend for survival and recovery and permit the take of listed species incidental to otherwise lawful activities. Alternatively, the Desert Renewable Energy Conservation Plan (DRECP), which is currently in development, is intended to serve as a multiple species HCP providing similar incidental take coverage for a wider array of species proposed for conservation under that planning effort. Under the DRECP alternative, Imperial County would apply for and obtain County-wide incidental take authority for covered species and could extend take authorization to projects requiring County permits subject to defined obligations under the plan. Lastly, if a Federal regulatory nexus exists for the Project, i.e., a Federal agency undertakes, funds, permits, or authorizes the action, the Federal agency may consult with the Service under section 7 of the Act to obtain an exemption from the Act's take prohibitions.

6-22 cont.

We appreciate the opportunity to provide comments on the draft EIR. We have attached specific recommendations to further assist in avoidance and minimization of impacts to public trust resources Should you have any questions regarding these comments, or if we can assist you in developing a bird and bat conservation strategy, please contact Tera Baird of my staff at 760-322-2070, extension 217.

6-23

Sincerely,

for Kennon A. Corey
Assistant Field Supervisor

Enclosure

cc:
Magdalena Rodrigez, California Department of Fish and Wildlife
Kevin Grant, Principal Ericsson-Grant Inc.

Enclosure

U.S. Fish and Wildlife Service
Interim Migratory Bird and Bat Conservation Recommendations with
Avoidance and Minimization Measures

Prepare and implement an interim Bird and Bat Conservation Strategy (BBCS) in consultation with involved jurisdictions, including BLM, California Department of Fish and Wildlife (CDFW), California Energy Commission, counties, and Service for review, comment, and agency approval. The interim BBCS should include the following: 6-24

- A description and assessment of the habitat impacts, characterization or mortality risk, and appropriate onsite avoidance and minimization measures. 6-25

- Using appropriate sampling designs and estimators, conduct a statistically robust avian and bat mortality (and injury) monitoring program to: (1) estimate annual mortality by taxa and season (including rare and sensitive species when directed by the Service or CDFW) for all project structures likely to cause injury and fatality; (2) determine collision rates during diurnal and nocturnal periods; (3) assess the spatial distribution and abundance of mortalities on the project site; and (4) determine species composition, on the project site. 6-26

- An adaptive management and decision-making framework for translating monitoring results into improved avoidance and minimization measures onsite, and directing offsite mitigation funding to species most affected by the project.

Based on the available information regarding bird fatalities, the project specific or cumulative effects to migratory birds is potentially significant for some species (or groups of species), and therefore, warrant systematic mortality monitoring. Separate monitoring strategies should be developed for the construction and operation phases of proposed projects. 6-27

Mortality monitoring is an important to (1) better understand how numerous physical and biological variables influence bird mortality by location and technology type, (2) develop effective onsite best management practices, avoidance and minimization measures, and adaptive management programs, and (3) quantify impacts for appropriate CEQA/NEPA mitigation measures. To determine differences in mortality rates and effectiveness of avoidance/minimization measures, a consistent monitoring scheme needs to be implemented across different projects. The interim guidelines in the Enclosure include (1) general information on the recommended content of the monitoring program, (2) the main components needed to generate comparative data, and (3) general measures to help avoid and minimize direct, indirect, and cumulative effects based on the limited extent of our current knowledge. 6-28

The avian and bat mortality and injury monitoring program should include:

- Project site monitoring using accepted sampling design and statistical methods, at a level that will produce statistically robust data with acceptable confidence intervals. The monitoring effort should account and correct for potential spatial bias and allow for the extrapolation of 6-29