Figure No. 10D

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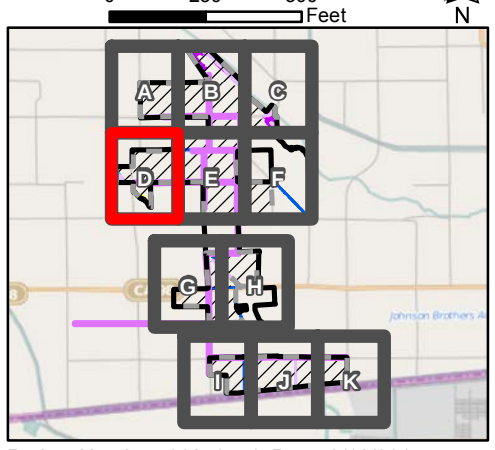

Project Number: 60250473 Date: 3/12/2014

Project Name: Wistaria Solar Ranch
Projection: NAD 83 CA State Plane Zone 6

Legend

- Project Site Boundary
- CUP Boundary
- Biological Survey Area
- Electric Collector Line Corridor

Impact Type

- Permanent
- Permanent Crossing

Waters of the U.S. and State (USACE, CDFW, RWQCB)

- Nonwetland Water, Streambed
- Wetland, Riparian
- Wetland, Streambed

Waters of the State (CDFW)

- Floodplain
- Riparian
- Streambed

Wistaria Ranch Solar Energy Center
Biological Technical Report

Impacts to Jurisdictional Waters of the U.S. and State Detail Map

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CUP 13-0044

CUP 13-0043

CUP 13-0041

CUP 13-0040

CUP 13-0038

CUP 13-0039

Preston Rd

Rockwood Rd

George Rd

Kubler Rd

Permanent Crossing

Permanent Crossing

Permanent Crossing

Permanent Crossing

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Figure No. 10E

1:6,000 1 inch = 500 feet

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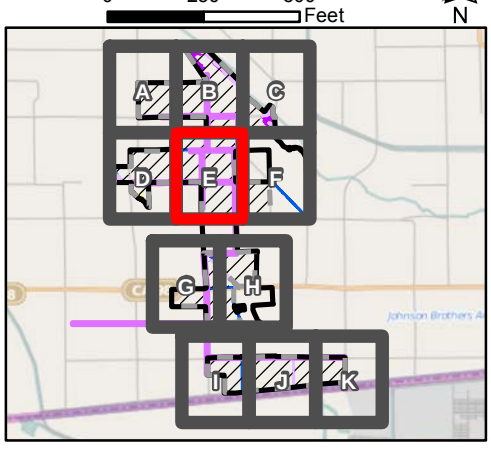

Project Number: 60250473 Date: 3/12/2014

Project Name: Wistaria Solar Ranch
Projection: NAD 83 CA State Plane Zone 6

Legend

- Project Site Boundary
- CUP Boundary
- Biological Survey Area
- Electric Collector Line Corridor

Impact Type

- Permanent
- Permanent Crossing

Waters of the U.S. and State (USACE, CDFW, RWQCB)

- Nonwetland Water, Streambed
- Wetland, Riparian
- Wetland, Streambed

Waters of the State (CDFW)

- Floodplain
- Riparian
- Streambed

Wistaria Ranch Solar Energy Center
Biological Technical Report

Impacts to Jurisdictional Waters of the U.S. and State Detail Map

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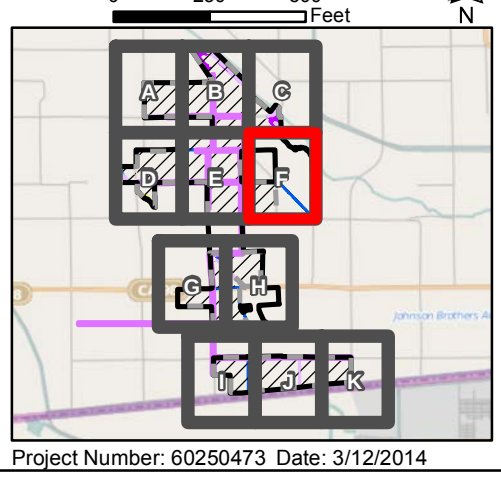

Project Number: 60250473 Date: 3/12/2014

Project Name: Wistaria Solar Ranch
Projection: NAD 83 CA State Plane Zone 6

Legend

- Project Site Boundary
- CUP Boundary
- Biological Survey Area
- Electric Collector Line Corridor

Impact Type

- Permanent
- Permanent Crossing

Waters of the U.S. and State (USACE, CDFW, RWQCB)

- Nonwetland Water, Streambed
- Wetland, Riparian
- Wetland, Streambed

Waters of the State (CDFW)

- Floodplain
- Riparian
- Streambed

Figure No. 10F

Wistaria Ranch Solar Energy Center
Biological Technical Report

Impacts to Jurisdictional Waters of the U.S. and State Detail Map

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Permanent Crossings

CUP 13-0037

CUP 13-0036

98

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Figure No. 10G

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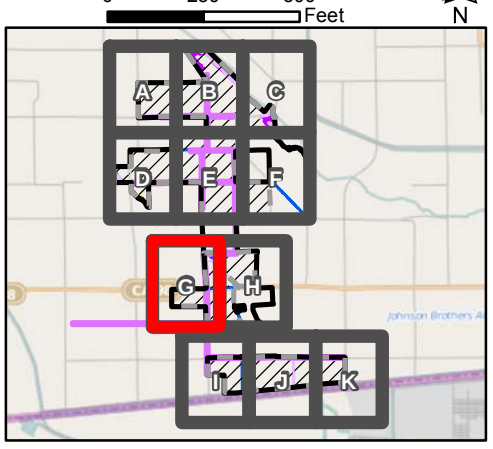

Project Number: 60250473 Date: 3/12/2014

Project Name: Wistaria Solar Ranch
Projection: NAD 83 CA State Plane Zone 6

Legend

- Project Site Boundary
- CUP Boundary
- Biological Survey Area
- Electric Collector Line Corridor

Impact Type

- Permanent
- Permanent Crossing

Waters of the U.S. and State (USACE, CDFW, RWQCB)

- Nonwetland Water, Streambed
- Wetland, Riparian
- Wetland, Streambed

Waters of the State (CDFW)

- Floodplain
- Riparian
- Streambed

Wistaria Ranch Solar Energy Center
Biological Technical Report

Impacts to Jurisdictional Waters of the U.S. and State Detail Map

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Permanent Crossing

CUP 13-0037

CUP 13-0036

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Figure No. 10H

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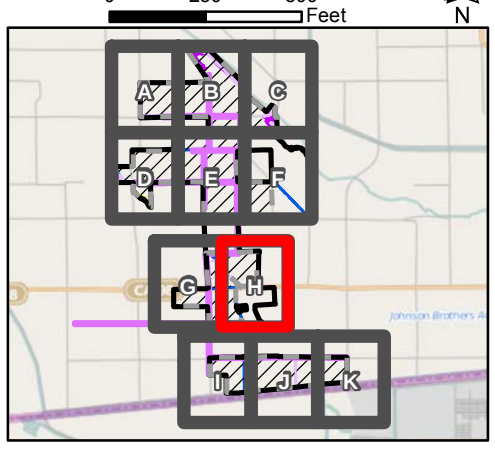

Project Number: 60250473 Date: 3/12/2014

Project Name: Wistaria Solar Ranch
Projection: NAD 83 CA State Plane Zone 6

Legend

- Project Site Boundary
- CUP Boundary
- Biological Survey Area
- Electric Collector Line Corridor

Impact Type

- Permanent
- Permanent Crossing

Waters of the U.S. and State (USACE, CDFW, RWQCB)

- Nonwetland Water, Streambed
- Wetland, Riparian
- Wetland, Streambed

Waters of the State (CDFW)

- Floodplain
- Riparian
- Streambed

Wistaria Ranch Solar Energy Center
Biological Technical Report

Impacts to Jurisdictional Waters of the U.S. and State Detail Map

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W Anza Rd

Rockwood Rd

CUP 13-0050

CUP 13-0051

Mandrapa Rd

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Figure No. 10I

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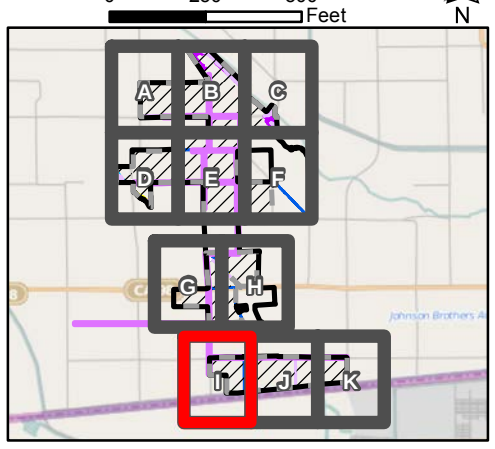

Project Number: 60250473 Date: 3/12/2014

Project Name: Wistaria Solar Ranch
Projection: NAD 83 CA State Plane Zone 6

Legend

- Project Site Boundary
- CUP Boundary
- Biological Survey Area
- Electric Collector Line Corridor

Impact Type

- Permanent
- Permanent Crossing

Waters of the U.S. and State (USACE, CDFW, RWQCB)

- Nonwetland Water, Streambed
- Wetland, Riparian
- Wetland, Streambed

Waters of the State (CDFW)

- Floodplain
- Riparian
- Streambed

Wistaria Ranch Solar Energy Center
Biological Technical Report

Impacts to Jurisdictional Waters of the U.S. and State Detail Map

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W Anza Rd

CUP 13-0051

CUP 13-0052

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Figure No. 10J

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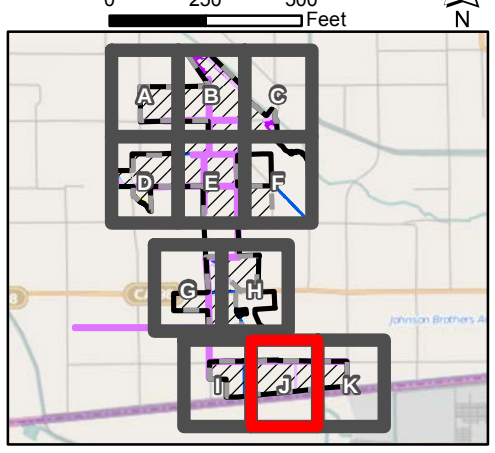

Project Number: 60250473 Date: 3/12/2014

Project Name: Wistaria Solar Ranch
Projection: NAD 83 CA State Plane Zone 6

Legend

- Project Site Boundary
- CUP Boundary
- Biological Survey Area
- Electric Collector Line Corridor

Impact Type

- Permanent
- Permanent Crossing

Waters of the U.S. and State (USACE, CDFW, RWQCB)

- Nonwetland Water, Streambed
- Wetland, Riparian
- Wetland, Streambed

Waters of the State (CDFW)

- Floodplain
- Riparian
- Streambed

Wistaria Ranch Solar Energy Center
Biological Technical Report
Impacts to Jurisdictional Waters of the U.S. and State Detail Map

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Figure No. 10K

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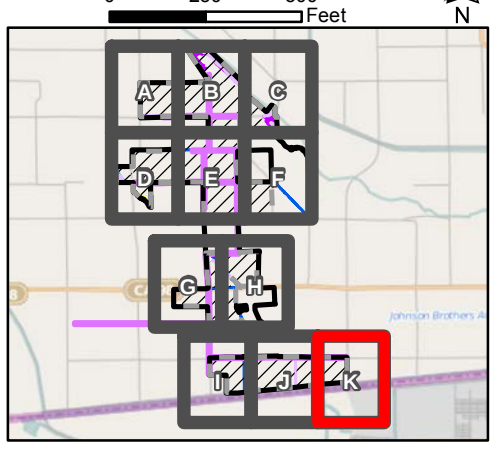

Project Number: 60250473 Date: 3/12/2014

Project Name: Wistaria Solar Ranch
Projection: NAD 83 CA State Plane Zone 6

Legend

- Project Site Boundary
- CUP Boundary
- Biological Survey Area
- Electric Collector Line Corridor

Impact Type

- Permanent
- Permanent Crossing

Waters of the U.S. and State (USACE, CDFW, RWQCB)

- Nonwetland Water, Streambed
- Wetland, Riparian
- Wetland, Streambed

Waters of the State (CDFW)

- Floodplain
- Riparian
- Streambed

Wistaria Ranch Solar Energy Center
Biological Technical Report

Impacts to Jurisdictional Waters of the U.S. and State Detail Map

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4.2.4 Flora – Nonlisted Special-Status Species

No nonlisted special-status plants were detected within each CUP area (excluding CUP area 13-0047), the electric collector lines, and Mount Signal Solar gen-tie line corridor; therefore, no impacts to nonlisted special-status plant species would result from construction of Project. CUP area 13-0047 was added to the Project subsequent to the completion of the field rare plant habitat assessment. Based on desktop analysis, nonlisted special-status plant species may have some potential to occur in these areas due to the presence of sandy or rocky areas along the edge of the New River.

This subsection describes potential direct and indirect impacts resulting from construction of the Project to nonlisted special-status plant species that may be present within CUP area 13-0047. No other CUP areas are expected to have impacts to nonlisted special-status plant species.

4.2.4.1 Direct Impacts (CUP Area 13-0047)

Potential construction-related direct impacts in the form of permanent removal would occur if nonlisted special-status plant species were present in CUP area 13-0047.

4.2.4.2 Indirect Impacts (CUP Area 13-0047)

Additionally, potential temporary indirect impacts would occur in CUP area 13-0047 to nonlisted special-status plant species would arise from runoff and sedimentation, erosion, fugitive dust, and unauthorized access outside of the Project footprint. Herbicide used during control of nonnative plant species has potential to be inadvertently applied to adjacent nonlisted special-status plants; however, herbicides are regularly used during agriculture activities and herbicide use within each CUP area would decrease when agriculture activities cease. These impacts would be considered significant.

Extending the duration of construction activities to develop the 17 individual CUPs over a 10-year period as opposed to at one time are assumed to have a similar level of indirect impacts given that impacts (e.g., noise, lighting) would be extended over a greater period of time; however, if the project were built all at once, the impacts would be more intense but shorter in duration. Thus, we assume either approach would result in a comparable indirect impact.

4.2.4.3 Significance Determination

Potential construction-related direct and indirect impacts to nonlisted special-status plant species would be reduced to less than significant within CUP area 13-0047 through implementation of the avoidance, minimization, and mitigation measures described in Section 5.2.2. Measures include an on-site rare plant habitat assessment and focused rare plant surveys, if necessary, for nonlisted special-status plants species.

4.2.5 Wildlife – Federally and State-listed Species

This subsection describes potential direct and indirect impacts to federally or state-listed wildlife species resulting from construction of the Project and is applicable to all CUP areas. Permanent and temporary removal of vegetation communities that support federally or state-listed wildlife within each CUP area is quantified in Tables 12 through 14, as referenced in the text below.

4.2.5.1 Southwestern Willow Flycatcher

One nonvocal flycatcher exhibiting characteristics consistent with those of willow flycatcher (state endangered) was seen perching and foraging in the BSA in early May 2010 during a focused protocol BUOW survey (see Section 3.5.1.1). This individual could not be identified to the subspecies level given the lack of vocalization during observation but was likely a migrant passing through the BSA. All subspecies of willow flycatcher are state-listed as endangered under the CESA, and the southwestern willow flycatcher (one of three subspecies of willow flycatcher occurring in California) is federally listed as endangered under the ESA. Occurrences of willow flycatchers within the BSA, including potential southwestern willow flycatchers, are expected to be limited to migrants given the lack of breeding habitat in the BSA and vicinity (see Section 3.5.1.1). Additionally, there is no evidence that the southwestern willow flycatcher has ever nested in the Imperial Valley (Patten et al. 2003).

Direct Impacts (All CUP Areas)

Solar Energy Center Facilities

Permanent direct impacts to suitable willow flycatcher migration stopover habitat, including drains and canals, arrow weed scrub, and tamarisk scrub, would occur within CUP areas 13-0037, 13-0038, 13-0039, 13-0040, 13-0042, 13-0045, 13-0046, 13-0047, and 13-0049 (Table 13). Permanent direct impacts to suitable willow flycatcher migration habitat would be greatest in CUP area 13-0047 and would occur as a result of grading and installing the solar facility, which would result in the permanent removal of vegetation along the New River (Table 13).

Potential impacts to migrating willow flycatchers (including potential southwestern willow flycatchers) resulting from construction-related activities within CUP areas 13-0037, 13-0038, 13-0039, 13-0040, 13-0042, 13-0045, 13-0046, 13-0047, and 13-0049 may include collisions with equipment or vehicles. However, such effects are expected to be minimal because migrating individuals would likely avoid or pass over areas under construction because these areas would not contain riparian habitat. Because willow flycatchers do not breed in the Imperial Valley, impacts during the vegetation clearing stage of construction to nesting birds and their young are not expected.

Potential direct impacts to migrating willow flycatchers also include impacts resulting from collisions with PV panels prior to the initiation of O&M activities. Polarized light pollution caused by solar PV panels may affect foraging behaviors, navigation, and orientation in birds, leading to potential collisions with panels (Horvath et al. 2009, Horvath et al. 2010). Waterbirds have composed the majority of avian mortalities at the Desert Sunlight PV facility (CEC 2013, 2014, Kagan et al. 2014), and the potential effect of polarized light pollution on migrating willow flycatchers is not known.

Electric Collector Line Corridor

Electric collector line pole structures would be located within agriculture fields. These areas are not considered suitable willow flycatcher migration stopover habitat (i.e., riparian scrub). Therefore, no direct impacts to migrant willow flycatcher habitat would result from construction activities associated with the installation of pole structures. Potential direct impacts to willow flycatcher also include impacts

resulting from collisions with overhead wires and other structures associated with the electric collector lines prior to the initiation of O&M activities.

Mount Signal Solar Gen-tie Line

The Mount Signal Solar Project has already constructed a 230-kV single-circuit gen-tie line designed to be expanded to carry a second circuit. The Project would use the second circuit and would share 230-kV gen-tie structures with the Mount Signal Solar Project to connect to the ISECS switchyard. The Mount Signal Solar gen-tie line pole structures that would be upgraded or installed are not located within suitable willow flycatcher migration stopover habitat (i.e., riparian scrub); therefore, no direct impacts to migrant willow flycatcher habitat would result from construction work within the Mount Signal Solar gen-tie line corridor. Potential direct impacts to willow flycatcher also include impacts resulting from collisions with overhead gen-tie wires, gen-tie tower guy wires, and other structures associated with the Mount Signal Solar gen-tie line prior to the initiation of O&M activities.

Indirect Impacts (All CUP Areas)

Potential indirect impacts to migrating willow flycatchers (including southwestern willow flycatchers) are expected to be similar for construction of the solar facilities within each CUP area, the electric collector lines, and Mount Signal Solar gen-tie line upgrades. Potential temporary indirect construction impacts may occur to migrating willow flycatchers that may stopover in riparian scrub within IID drains and canals or along areas of the New River and Greeson Wash as a result of increased noise levels, nighttime lighting, dust, sedimentation, and erosion. These indirect impacts have the potential to degrade willow flycatcher habitat and alter foraging and migration behavior.

Extending the duration of construction activities to develop the 17 individual CUPs over a 10-year period as opposed to at one time are assumed to have a similar level of indirect impacts given that impacts (e.g., noise, lighting) would be extended over a greater period of time; however, if the project were built all at once, the impacts would be more intense but shorter in duration. Thus, we assume either approach would result in a comparable indirect impact.

Significance Determination

Potential construction-related direct and indirect impacts to migrating willow flycatchers and southwestern willow flycatchers would be considered significant since these species are listed under CESA and ESA, respectively. Impacts would be reduced to less than significant through implementation of the avoidance, minimization, and mitigation measures described in Chapter 5. Measures include minimizing the footprint to the maximum extent possible, minimizing project lighting, designing the above-ground lines, transformers, or conductors to Avian Power Line Interaction Committee (APLIC) standards, using nonreflective PV or CPV modules, using qualified biologists to ensure that issues relating to biological resources are appropriately and lawfully managed, and implementing avian-specific measures to avoid take. In addition a Bird and Bat Conservation Strategy (BBCS) (formerly called an Avian and Bat Protection Plan) would be developed using the concepts and objectives outlined in the Interim Guidelines for the Development of a Project Specific Avian and Bat Protection Plan for Solar Energy Plants and Related Transmission Facilities (USFWS 2010) and Land-Based Wind Energy Guidelines (USFWS 2012a).

4.2.5.2 Yuma Clapper Rail

Yuma clapper rail was not observed during surveys, but has moderate potential to occur within and/or adjacent to the BSA given the connectivity to known occurrences in Fig Lagoon (see Section 3.5.1.2).

Direct Impacts (All CUP Areas)

Solar Energy Center Facilities

Construction within CUP 13-0047 would result in permanent removal of open water bordered with areas of potential Yuma clapper rail habitat (i.e., cattail habitat within the open water) along the New River (Table 13). No other CUP areas would impact potential Yuma clapper rail habitat. Tamarisk scrub removed within CUP 13-0046 and 13-0045 is not suitable Yuma clapper rail habitat. Construction of solar facilities within each CUP area may result in impacts to individuals, e.g., collision with equipment vehicles. Such construction-phase impacts are expected to be limited to construction of the solar facilities within CUP 13-0047, 13-0046, and 13-0045 that are directly adjacent to the New River where the species is most likely to occur within the project area. However, the probability of impacts within CUP 13-0046 and 13-0045 are expected to be low since construction would occur up on a bluff approximately 30 feet (9 meters) above the New River and construction would not occur within wetland vegetation.

Potential direct impacts to Yuma clapper rail also include impacts resulting from collisions with PV panels prior to the initiation of O&M activities. Polarized light pollution caused by solar PV panels may affect foraging behaviors, navigation, and orientation in birds, leading to potential collisions with panels (Horvath et al. 2009, Horvath et al. 2010). Waterbirds have composed the majority of avian mortalities at the Desert Sunlight PV facility (CEC 2013, 2014, Kagan et al. 2014). Additionally, large areas of solar PV or CPV panels in the desert environment may mimic water bodies and inadvertently attract Yuma clapper rail. Although studies have shown that glare intensity and/or reflectivity of CPV modules are lower than that of water and similar to asphalt (Dudek 2014), avian species may collide with PV panels and/or become stranded in solar fields resulting in fatalities (Kagan et al. 2014). A single Yuma clapper rail mortality has been recorded at the Desert Sunlight PV facility (CEC 2014, Kagan et al. 2014). Although this individual was detected near a PV panel (CEC 2014), Kagan et al. (2014) do not note the cause of death for this species.

Electric Collector Line Corridor

Construction within the electric collector line corridor would not result in permanent and temporary removal of Yuma clapper rail habitat. Potential direct impacts to Yuma clapper rail include impacts resulting from collisions with overhead wires and other structures associated with the electric collector lines prior to the initiation of O&M activities.

Mount Signal Solar Gen-tie Line

The Mount Signal Solar gen-tie line pole structures that would be upgraded or installed are not located within suitable Yuma clapper rail habitat; therefore, no direct impacts to Yuma clapper rail habitat would result from construction work within the Mount Signal Solar gen-tie line corridor. Potential direct impacts to Yuma clapper rail also include impacts resulting from collisions with overhead gen-tie

wires, gen-tie tower guy wires, and other structures associated with the Mount Signal Solar gen-tie line prior to the initiation of O&M activities.

Indirect Impacts (All CUP Areas)

Potential indirect impacts to Yuma clapper rail are expected to be limited to construction of the solar facilities within CUP 13-0047, 13-0046, and 13-0045 that are directly adjacent to the New River. Potential temporary indirect construction impacts to Yuma clapper rail and its habitats include habitat fragmentation, increased human presence, increased noise levels, nighttime lighting, dust, sedimentation, and erosion. These indirect impacts have the potential to degrade Yuma clapper rail habitat and alter foraging behavior. Extending the duration of construction activities to develop the 17 individual CUPs over a 10-year period as opposed to at one time are assumed to have a similar level of indirect impacts given that impacts (e.g., noise, lighting) would be extended over a greater period of time; however, if the project were built all at once, the impacts would be more intense but shorter in duration. Thus, we assume either approach would result in a comparable indirect impact.

Significance Determination

Potential construction-related direct and indirect impacts to the Yuma clapper rail would be considered significant since this species is listed under CESA and ESA. Impacts would be reduced to less than significant through implementation of the avoidance, minimization, and mitigation measures described in Chapter 5. Measures include minimizing the footprint to the maximum extent possible, minimizing project lighting, designing above-ground lines, transformers, and conductors to APLIC standards, using nonreflective PV or CPV modules, using qualified biologists to ensure that issues relating to biological resources are appropriately and lawfully managed, and implementing avian-specific measures such as pre-construction nest surveys. In addition, a BBCS would be developed using the concepts and objectives outlined in the Interim Guidelines for the Development of a Project Specific Avian and Bat Protection Plan for Solar Energy Plants and Related Transmission Facilities (USFWS 2010) and Land-Based Wind Energy Guidelines (USFWS 2012a).

4.2.5.3 Greater Sandhill Crane

Greater sandhill crane was not observed during surveys, but has high potential to occur in the BSA (see Section 3.5.3.1). Suitable winter foraging habitat exists throughout the BSA in agricultural fields. No breeding habitat occurs within the BSA.

Direct Impacts (All CUP Areas)

Solar Energy Center Facilities

Construction within CUP areas would result in permanent removal of agriculture fields, which are greater sandhill crane winter foraging habitat (Table 13). Potential impacts to cranes resulting from construction-related activities within the Project Area may include collisions with equipment or vehicles. However, such effects are expected to be minimal because the only individuals expected in the Project area are adults or subadults (the species does not breed in Imperial Valley) that would easily avoid or pass over areas under construction.

Potential direct impacts to greater sandhill crane also include impacts resulting from collisions with PV panels prior to the initiation of O&M activities. Polarized light pollution caused by solar PV panels may affect foraging behaviors, navigation, and orientation in birds, leading to potential collisions with panels (Horvath et al. 2009, Horvath et al. 2010). Waterbirds have composed the majority of avian mortalities at the Desert Sunlight PV facility (CEC 2013, 2014, Kagan et al. 2014). Additionally, large areas of solar PV or CPV panels in the desert environment may mimic water bodies and inadvertently attract greater sandhill crane. Individuals may collide with solar panels and/or become stranded in solar fields resulting in fatalities. Although studies have shown that glare intensity and/or reflectivity of CPV modules are lower than that of water and similar to asphalt (Dudek 2014), avian species may collide with PV panels and/or become stranded in solar fields resulting in fatalities (Kagan et al. 2014).

Electric Collector Line Corridor

Construction within the electric collector line corridor would result in permanent and temporary removal of greater sandhill crane winter foraging habitat. Direct permanent and temporary impacts resulting from installation of pole structures would occur within agriculture fields (Table 14). Construction of the electric collector line corridor may result in impacts to individuals from vehicular strikes or excavation equipment. Collisions occur most frequently during the vegetation clearing stage of construction, and involve eggs, nestlings, and recently fledged young that cannot safely avoid equipment. However, this species does not breed within the Imperial Valley and impacts to eggs, nestlings, and recently fledged young would not occur.

Potential direct impacts to greater sandhill crane also include impacts resulting from collisions with overhead wires and other structures associated with the electric collector lines prior to the initiation of O&M activities.

Mount Signal Solar Gen-tie Line

The Mount Signal Solar gen-tie line pole structures that would be upgraded or installed are not located within suitable greater sandhill crane habitat; therefore, no direct impacts to greater sandhill crane habitat would result from construction work within the Mount Signal Solar gen-tie line corridor. Potential direct impacts to greater sandhill crane also include impacts resulting from collisions with overhead gen-tie wires, gen-tie tower guy wires, and other structures associated with the Mount Signal Solar gen-tie line prior to the initiation of O&M activities.

Indirect Impacts (All CUP Areas)

Potential indirect impacts to greater sandhill crane are expected to be similar for construction of the solar facilities within each CUP area, the electric collector lines, and Mount Signal Solar gen-tie line upgrades. Potential temporary indirect construction impacts to greater sandhill crane and its habitats include habitat fragmentation, increased human presence, increased noise levels, nighttime lighting, dust, sedimentation, and erosion. These indirect impacts have the potential to degrade greater sandhill crane habitat and alter foraging behavior. Extending the duration of construction activities to develop the 17 individual CUPs over a 10-year period as opposed to at one time are assumed to have a similar level of indirect impacts given that impacts (e.g., noise, lighting) would be extended over a

greater period of time; however, if the project were built all at once, the impacts would be more intense but shorter in duration. Thus, we assume either approach would result in a comparable indirect impact.

Significance Determination

Potential construction-related direct and indirect impacts to the greater sandhill crane would be considered significant since this species is state-listed threatened species and fully protected species. Impacts would be reduced to less than significant through implementation of the avoidance, minimization, and mitigation measures described in Chapter 5, including measures to comply with the greater sandhill crane's Fully Protected status. Measures include minimizing the footprint to the maximum extent possible, minimizing project lighting, designing above-ground lines, transformers, or conductors to APLIC standards, using nonreflective PV or CPV modules, using qualified biologists to ensure that issues relating to biological resources are appropriately and lawfully managed, and implementing avian-specific measures such as pre-construction nest surveys. In addition, a BBCS would be developed using the concepts and objectives outlined in the Interim Guidelines for the Development of a Project Specific Avian and Bat Protection Plan for Solar Energy Plants and Related Transmission Facilities (USFWS 2010) and Land-Based Wind Energy Guidelines (USFWS 2012a).

4.2.6 Wildlife – Nonlisted Special-Status Species

This subsection describes potential direct and indirect impacts to nonlisted special-status species wildlife species resulting from construction of the Project and is applicable to all CUP areas. Permanent and temporary removal of vegetation communities that support nonlisted wildlife within each CUP area is quantified in tables referenced in the text.

4.2.6.1 Western Burrowing Owl

BUOW are common throughout the BSA (see Section 3.5.3.1). The agriculture fields provide suitable foraging habitat, and breeding habitat occurs within the BSA, adjacent to canals, drains, and dirt roads.

Direct Impacts (All CUP Areas)

Solar Energy Center Facilities

Construction within CUP areas would result in permanent removal of BUOW foraging and breeding habitat. Construction of solar facilities within each CUP area may result in impacts to individuals from vehicular strikes or excavation equipment. Vehicular collisions occur most frequently during the vegetation clearing and grading stage of construction, and involve eggs, nestlings, and recently fledged young that are within burrows and cannot safely avoid equipment. Potential direct impacts to BUOW also include impacts resulting from collisions with PV panels prior to the initiation of O&M activities. Polarized light pollution caused by solar PV panels may affect foraging behaviors, navigation, and orientation in birds, leading to potential collisions with panels (Horvath et al. 2009, Horvath et al. 2010). Waterbirds have composed the majority of avian mortalities at the Desert Sunlight PV facility (CEC 2013, 2014, Kagan et al. 2014). The potential effect of polarized light pollution on BUOW is not known.

The majority of occupied BUOW burrows were detected within the IID ROWs and, aside from new or upgraded vehicular crossings, no direct impacts would occur within IID ROW easements and their associated canals and drains. Thus, occupied burrows within IID ROW easements would not be directly impacted. Occupied burrows within farming canals and drains inside Project parcels would be removed to install solar facilities. Of the 148 occupied burrows documented within the BSA, approximately 22 would be removed at full buildout (Table 16).

Table 16
Anticipated Permanent Direct Impacts to Occupied Burrows for the Project

CUP Area	Number of Occupied Burrows[1]
CUP 13-0036	0
CUP 13-0037	2
CUP 13-0038	0
CUP 13-0039	0
CUP 13-0040	0
CUP 13-0041	0
CUP 13-0042	2
CUP 13-0043	10
CUP 13-0044	0
CUP 13-0045	0
CUP 13-0046	1
CUP 13-0047	0
CUP 13-0048	5
CUP 13-0049	0
CUP 13-0050	1
CUP 13-0051	1
CUP 13-0052	0
Full Buildout	***22***

[1] BUOW transects required by protocol breeding surveys were not completed for CUP area 13-0047; however, portions of this CUP were surveyed during visual coverage scans using binoculars within the 500-foot (150-meter) buffer of the BSA.

The majority of foraging habitat that will be permanently removed as a result of grading, construction, and placement of solar facilities is in the form of agriculture fields. While foraging habitat (i.e., agriculture) ranges throughout the Project footprint, the quality of foraging habitat varies. Most animals tend to occupy and use certain areas (i.e., core areas) of their home range with greater intensity (Dixon and Chapman 1980). Core areas represent areas that provide essential resources such as food, mates, or shelter (Seaman and Powell 1990) BUOW home range studies in the Imperial Valley have focused on the distance BUOW forage from their nest. However, core areas are often not evenly

distributed within an area (Seaman and Powell 1990). As such, home ranges may include unused habitat and provide a misleading representation of the area used by an animal. For example, BUOW may fly over or pass by areas to forage in a particular crop type leading to the impression that all habitats in a given area were used when in reality foraging may be limited to a smaller area.

To determine the extent of core BUOW foraging habitat for BUOW that use the Wistaria Project site, Live Oak Associates, Inc. (LOA) and Conservation Science Partners (CSP) used an occupancy modeling framework to investigate the relationship between habitat and BUOW occupancy based on rigorous data set collected during 2012 BUOW surveys. LOA and CSP (2014) analyzed spatial patterns between occupied BUOW burrow locations and environmental variables thought to be important for the BUOW, including soil, crop, hydrography, and road features (LOA and CSP 2014). Occupancy models were incorporated into a geographic information system (GIS) to derive spatially explicit estimates of occupancy to quantify the importance of adjacency between burrows and environmental variables, namely dominant crop types (LOA and CSP 2014). LOA and CSP (2014) determined that, for the BSA, the quality of the habitat was strongly influenced by crop type (wheat and alfalfa), crop consistency, and soils, and inversely related to distance to roads. LOA and CSP (2014) estimate 614 acres (248 hectares) of high quality or core foraging habitat would be impacted by full buildout of the Project (Table 17). While other foraging habitat exist onsite, site specific, statistically robust estimates of core foraging habitat determined this acreage to be the most important for BUOW that use the Project footprint. Detailed analytical methods and results of this estimate can be found in the LOA and CSP report (Appendix H).

Table 17
Anticipated Permanent Direct Impacts to Core Burrowing Owl Foraging Habitat

CUP Area	Core Foraging Habitat (acres)
CUP 13-0036	123.7
CUP 13-0037	6.9
CUP 13-0038	0.0
CUP 13-0039	7.8
CUP 13-0040	37.9
CUP 13-0041	0.0
CUP 13-0042	0.0
CUP 13-0043	133.2
CUP 13-0044	0.0
CUP 13-0045	28.6
CUP 13-0046	14.7
CUP 13-0047	0.4
CUP 13-0048	9.1
CUP 13-0049	1.9
CUP 13-0050	99.6
CUP 13-0051	150.2
CUP 13-0052	0.0
Total	**614.0**

Source: LOA and CSP 2014

Electric Collector Line Corridor

Construction within the electric collector line corridor would result in permanent and temporary removal of BUOW foraging (agriculture fields) habitat (Table 14). Installation of pole structure associated with the electric collector line would occur in agriculture fields and would not be within BUOW breeding habitat (Table 14). Thus, direct impacts to occupied burrows are not expected. Construction of the electric collector line corridor may result in impacts to individuals from vehicular strikes or excavation equipment. Potential direct impacts to BUOW also include impacts resulting from collisions with overhead wires and other structures associated with the electric collector lines prior to the initiation of O&M activities.

Mount Signal Solar Gen-tie Line

The Mount Signal Solar Project has already constructed a 230-kV single-circuit gen-tie line designed to be expanded to carry a second circuit. The Project would be using the second circuit and would share 230-kV gen-tie structures with the Mount Signal Solar Project to connect to the ISECS switchyard. Occupied burrows were detected within portions of the Project's gen-tie facilities that would be shared with the Mount Signal Solar Project's existing structures (RECON 2011). The berms of earthen roads, disturbed habitat, and/or canals/drains that remain within the Mount Signal Solar gen-tie corridor have potential for occupied burrows to be present within them. However, the majority of the Mount Signal Solar gen-tie line corridor is adjacent to IID ROW easements. No structures within the Mount Signal Solar gen-tie line corridor occur in IID ROW easements, which include IID access roads, canals, and/or drains. Direct removal of occupied burrows in portions of the Mount Signal Solar gen-tie line corridor adjacent to IID ROW easements is likely to be minimal because if burrows are present, they are likely within IID ROW easements that would not be impacted. Construction within the Mount Signal Solar gen-tie line corridor may result in impacts to individuals from vehicular strikes or excavation equipment required for new installations. Potential direct impacts to BUOW also include impacts resulting from collisions with overhead gen-tie wires, gen-tie tower guy wires, and other structures associated with the Mount Signal Solar gen-tie line prior to the initiation of O&M activities.

Indirect Impacts (All CUP Areas)

Potential indirect impacts to BUOW are expected to be similar for construction of the solar facilities within each CUP area, the electric collector lines, and Mount Signal Solar gen-tie line upgrades. Potential temporary indirect construction impacts to BUOW and their habitats include habitat loss (foraging and breeding habitat), fragmentation, increased human presence, increased noise levels, nighttime lighting, dust, sedimentation, and erosion. These indirect impacts have the potential to degrade and eliminate BUOW habitat and alter foraging and breeding behavior. Permanent indirect impacts could result from increased common raven and raptor predation associated with the construction of new elevated perching sites, including the gen-tie structures, perimeter fencing, and gen-tie lines. Trash present on-site may attract ravens in numbers beyond those afforded by the normal conditions extant in the Project vicinity. In addition, BUOW inhabiting occupied burrows within IID drains and canals may be permanently displaced due to the removal of adjacent agricultural habitat and non-IID canal and drains. BUOW displacement may increase potential for predation of BUOW by raptors and other predators. This effect would likely be greatest in locations where IID drains and canals are completely encircled by solar facilities. Foraging habitat would remain within the

IID drains and canals, which may support BUOW. IID drains and canals that are bordered by both solar facilities and agricultural fields would provide greater opportunities for BUOW to forage.

Extending the duration of construction activities to develop the 17 individual CUPs over a 10-year period as opposed to at one time are assumed to have a similar level of indirect impacts given that impacts (e.g., noise, lighting) would be extended over a greater period of time; however, if the project were built all at once, the impacts would be more intense but shorter in duration. Thus, we assume either approach would result in a comparable indirect impact.

Significance Determination

Potential construction-related direct and indirect impacts to the BUOW would be considered significant since this species is identified as an SSC by CDFW. Impacts would be reduced to less than significant through implementation of the avoidance, minimization, and mitigation measures described in Chapter 5. Measures include designing the Project to avoid high-density BUOW areas along the eastern edge of the BSA; minimizing project lighting; designing above-ground lines, transformers, or conductors to APLIC standards, using nonreflective PV or CPV modules; using qualified biologists to ensure that issues relating to biological resources are appropriately and lawfully managed; and implementing burrowing owl-specific measures, such as pre-construction clearance surveys, burrow replacement, and foraging habitat mitigation options, including development of a Burrowing Owl Farm Contract Plan and a BUOW Exclusion Plan. In addition, a BBCS would be developed using the concepts and objectives outlined in the Interim Guidelines for the Development of a Project Specific Avian and Bat Protection Plan for Solar Energy Plants and Related Transmission Facilities (USFWS 2010) and Land-Based Wind Energy Guidelines (USFWS 2012a).

4.2.6.2 Loggerhead Shrike

Loggerhead shrike was observed twice during surveys within the BSA (see Section 3.5.3.2). The agriculture fields provide suitable foraging habitat throughout the BSA and breeding habitat occurs in arrow weed scrub and tamarisk scrub within the Greeson Wash and New River.

Direct Impacts (All CUP Areas)

Solar Energy Center Facilities

Construction within CUP areas would result in permanent removal of loggerhead shrike foraging and breeding habitat. The majority of direct impacts resulting from construction within each CUP area would occur from removal of agriculture fields that are suitable for foraging (Table 13). Within CUP area 13-0047, suitable breeding habitat, including arrow weed scrub and tamarisk scrub, would be permanently lost.

Construction of solar facilities within each CUP area may result in impacts to individuals from vehicular strikes or excavation equipment. Vehicular collisions occur most frequently during the vegetation clearing stage of construction, and involve eggs, nestlings, and recently fledged young that cannot safely avoid equipment. Potential direct impacts to loggerhead shrike also include impacts resulting from collisions with PV panels prior to the initiation of O&M activities. Polarized light pollution caused by solar PV panels may affect foraging behaviors, navigation, and orientation in birds, leading to

potential collisions with panels (Horvath et al. 2009, Horvath et al. 2010). Waterbirds have composed the majority of avian mortalities at the Desert Sunlight PV facility (CEC 2013, 2014, Kagan et al. 2014). The potential effect of polarized light pollution on loggerhead shrike is not known.

Electric Collector Line Corridor

Construction within the electric collector line corridor would result in permanent and temporary removal of loggerhead shrike foraging habitat. Direct permanent and temporary impacts resulting from installation of pole structures would occur within agriculture fields (Table 14). No impacts would occur to suitable breeding habitat. Construction of the electric collector line corridor may result in impacts to individuals from vehicular strikes or excavation equipment. Collisions occur most frequently during the vegetation clearing stage of construction, and involve eggs, nestlings, and recently fledged young that cannot safely avoid equipment. Potential direct impacts to loggerhead shrike also include impacts resulting from collisions with overhead wires and other structures associated with the electric collector lines prior to the initiation of O&M activities.

Mount Signal Solar Gen-tie Line

The Mount Signal Solar gen-tie line pole structures that would be upgraded or installed are not located within suitable loggerhead shrike habitat; therefore, no direct impacts to loggerhead shrike would result from construction work within the Mount Signal Solar gen-tie line corridor.

Indirect Impacts (All CUP Areas)

Potential indirect impacts to loggerhead shrike are expected to be similar for construction of the solar facilities within each CUP area, the electric collector lines, and Mount Signal Solar gen-tie line upgrades. Potential temporary indirect construction impacts to loggerhead shrike and their habitats include habitat fragmentation, increased human presence, increased noise levels, nighttime lighting, dust, sedimentation, and erosion. Permanent indirect impacts could result from increased common raven and raptor predation associated with the construction of new elevated perching sites, including the gen-tie structures, perimeter fencing, and gen-tie lines. Trash present on-site may attract ravens in numbers beyond those afforded by the normal conditions extant in the Project vicinity. These indirect impacts have the potential to degrade loggerhead shrike habitat and alter foraging and breeding behavior.

Extending the duration of construction activities to develop the 17 individual CUPs over a 10-year period as opposed to at one time are assumed to have a similar level of indirect impacts given that impacts (e.g., noise, lighting) would be extended over a greater period of time; however, if the project were built all at once, the impacts would be more intense but shorter in duration. Thus, we assume either approach would result in a comparable indirect impact.

Significance Determination

Potential construction-related direct and indirect impacts to the loggerhead shrike would be considered significant since this species is identified as an SSC by CDFW. Impacts would be reduced to less than significant through implementation of the avoidance, minimization, and mitigation measures described in Chapter 5. Measures include minimizing the footprint to the maximum extent

possible, minimizing project lighting, designing above-ground lines, transformers, or conductors to APLIC standards, using nonreflective PV or CPV modules, using qualified biologists to ensure that issues relating to biological resources are appropriately and lawfully managed, and implementing avian-specific measures such as pre-construction nest surveys. In addition, a BBCS would be developed using the concepts and objectives outlined in the Interim Guidelines for the Development of a Project Specific Avian and Bat Protection Plan for Solar Energy Plants and Related Transmission Facilities (USFWS 2010) and Land-Based Wind Energy Guidelines (USFWS 2012a).

4.2.6.3 Yellow-headed Blackbird

Yellow-headed blackbird was observed three times during surveys (see Section 3.5.3.3). Suitable foraging habitat exists throughout the BSA in agricultural fields. No breeding habitat occurs within the BSA.

Direct Impacts (All CUP Areas)

Solar Energy Center Facilities

Construction within CUP areas would result in permanent removal of agriculture fields, which are yellow-headed blackbird foraging habitat (Table 13). Construction of solar facilities within each CUP area may result in impacts to individuals from vehicular strikes or excavation equipment. Vehicular collisions occur most frequently during the vegetation clearing stage of construction, and involve eggs, nestlings, and recently fledged young that cannot safely avoid equipment. Potential direct impacts to yellow-headed blackbird also include impacts resulting from collisions with PV panels prior to the initiation of O&M activities. Polarized light pollution caused by solar PV panels may affect foraging behaviors, navigation, and orientation in birds, leading to potential collisions with panels (Horvath et al. 2009, Horvath et al. 2010). Waterbirds have composed the majority of avian mortalities at the Desert Sunlight PV facility (CEC 2013, 2014, Kagan et al. 2014). The potential effect of polarized light pollution on yellow-headed blackbird is not known.

Electric Collector Line Corridor

Construction within the electric collector line corridor would result in permanent and temporary removal of yellow-headed blackbird foraging habitat. Direct permanent and temporary impacts resulting from installation of pole structures would occur within agriculture fields (Table 14). Construction of the electric collector line corridor may result in impacts to individuals from vehicular strikes or excavation equipment. Collisions occur most frequently during the vegetation clearing stage of construction, and involve eggs, nestlings, and recently fledged young that cannot safely avoid equipment. Potential direct impacts to yellow-headed blackbird also include impacts resulting from collisions with overhead wires and other structures associated with the electric collector lines prior to the initiation of O&M activities.

Mount Signal Solar Gen-tie Line

The Mount Signal Solar gen-tie line pole structures that would be upgraded or installed are not located within suitable yellow-headed blackbird habitat; therefore, no direct impacts to yellow-headed blackbird would result from construction work within the Mount Signal Solar gen-tie line corridor.

Indirect Impacts (All CUP Areas)

Potential indirect impacts to yellow-headed blackbird are expected to be similar for construction of the solar facilities within each CUP area, the electric collector lines, and Mount Signal Solar gen-tie line upgrades. Potential temporary indirect construction impacts to loggerhead shrike and its habitats include habitat fragmentation, increased human presence, increased noise levels, nighttime lighting, dust, sedimentation, and erosion. Permanent indirect impacts could result from increased common raven and raptor predation associated with the construction of new elevated perching sites, including the gen-tie structures, perimeter fencing, and gen-tie lines. Trash present on-site may attract ravens in numbers beyond those afforded by the normal conditions extant in the Project vicinity. These indirect impacts have the potential to degrade yellow-headed blackbird habitat and alter foraging and breeding behavior.

Extending the duration of construction activities to develop the 17 individual CUPs over a 10-year period as opposed to at one time are assumed to have a similar level of indirect impacts given that impacts (e.g., noise, lighting) would be extended over a greater period of time; however, if the project were built all at once, the impacts would be more intense but shorter in duration. Thus, we assume either approach would result in a comparable indirect impact.

Significance Determination

Potential construction-related direct and indirect impacts to the yellow-headed blackbird would be considered significant since this species is identified as an SSC by CDFW. Impacts would be reduced to less than significant through implementation of the avoidance, minimization, and mitigation measures described in Chapter 5. Measures include minimizing the footprint to the maximum extent possible, minimizing project lighting, designing above-ground lines, transformers, or conductors to APLIC standards, using nonreflective PV or CPV modules, using qualified biologists to ensure that issues relating to biological resources are appropriately and lawfully managed, and implementing avian-specific measures such as pre-construction nest surveys. In addition, a BBCS would be developed using the concepts and objectives outlined in the Interim Guidelines for the Development of a Project Specific Avian and Bat Protection Plan for Solar Energy Plants and Related Transmission Facilities (USFWS 2010) and Land-Based Wind Energy Guidelines (USFWS 2012a).

4.2.6.4 Merlin

Merlin was observed once during surveys (see Section 3.5.3.4). Suitable winter foraging habitat exists throughout the BSA in agricultural fields. No breeding habitat occurs within the BSA.

Direct Impacts (All CUP Areas)

Solar Energy Center Facilities

Construction within CUP areas would result in permanent removal of agriculture fields, which are merlin winter foraging habitat (Table 13). Construction of solar facilities within each CUP area may result in impacts to individuals from vehicular strikes or excavation equipment. Vehicular collisions occur most frequently during the vegetation clearing stage of construction, and involve eggs, nestlings, and recently fledged young that cannot safely avoid equipment. However, this species does

not breed within the Imperial Valley and impacts to eggs, nestlings, and recently fledged young would not occur.

Potential direct impacts to merlin also include impacts resulting from collisions with PV panels prior to the initiation of O&M activities. Polarized light pollution caused by solar PV panels may affect foraging behaviors, navigation, and orientation in birds, leading to potential collisions with panels (Horvath et al. 2009, Horvath et al. 2010). Waterbirds have composed the majority of avian mortalities at the Desert Sunlight PV facility (CEC 2013, 2014, Kagan et al. 2014). The potential effect of polarized light pollution on merlin is not known.

Electric Collector Line Corridor

Construction within the electric collector line corridor would result in permanent and temporary removal of merlin winter foraging habitat. Direct permanent and temporary impacts resulting from installation of pole structures would occur within agriculture fields (Table 14). Construction of the electric collector line corridor may result in impacts to individuals from vehicular strikes or excavation equipment. Collisions occur most frequently during the vegetation clearing stage of construction, and involve eggs, nestlings, and recently fledged young that cannot safely avoid equipment. However, this species does not breed within the Imperial Valley and impacts to eggs, nestlings, and recently fledged young would not occur. Potential direct impacts to merlin also include impacts resulting from collisions with overhead wires and other structures associated with the electric collector lines prior to the initiation of O&M activities.

Mount Signal Solar Gen-tie Line

The Mount Signal Solar gen-tie line pole structures that would be upgraded or installed are not located within suitable merlin habitat; therefore, no direct impacts to merlin would result from construction work within the Mount Signal Solar gen-tie line corridor. Potential direct impacts to merlin also include impacts resulting from collisions with overhead gen-tie wires, gen-tie tower guy wires, and other structures associated with the Mount Signal Solar gen-tie line prior to the initiation of O&M activities.

Indirect Impacts (All CUP Areas)

Potential indirect impacts to merlin are expected to be similar for construction of the solar facilities within each CUP area, the electric collector lines, and Mount Signal Solar gen-tie line upgrades. Potential temporary indirect construction impacts to merlin and its habitats include habitat fragmentation, increased human presence, increased noise levels, nighttime lighting, dust, sedimentation, and erosion. These indirect impacts have the potential to degrade merlin habitat and alter foraging behavior. Extending the duration of construction activities to develop the 17 individual CUPs over a 10-year period as opposed to at one time are assumed to have a similar level of indirect impacts given that impacts (e.g., noise, lighting) would be extended over a greater period of time; however, if the project were built all at once, the impacts would be more intense but shorter in duration. Thus, we assume either approach would result in a comparable indirect impact.

Significance Determination

Potential construction-related direct and indirect impacts to the merlin would be considered significant since this species is identified as a Watch List species by CDFW. Impacts would be reduced to less than significant through implementation of the avoidance, minimization, and mitigation measures described in Chapter 5. Measures include minimizing the footprint to the maximum extent possible, minimizing project lighting, designing above-ground lines, transformers, or conductors to APLIC standards, using nonreflective PV or CPV modules, using qualified biologists to ensure that issues relating to biological resources are appropriately and lawfully managed, and implementing avian-specific measures, such as pre-construction nest surveys. In addition, a BBCS would be developed using the concepts and objectives outlined in the Interim Guidelines for the Development of a Project Specific Avian and Bat Protection Plan for Solar Energy Plants and Related Transmission Facilities (USFWS 2010) and Land-Based Wind Energy Guidelines (USFWS 2012a).

4.2.6.5 Mountain Plover

Mountain plover was not observed during surveys, but has high potential to occur in the BSA (see Section 3.5.3.5). Suitable winter foraging habitat exists throughout the BSA in agricultural fields. No breeding habitat occurs within the BSA.

Direct Impacts (All CUP Areas)

Solar Energy Center Facilities

Construction within CUP areas would result in permanent removal of agriculture fields, which are mountain plover winter foraging habitat (Table 13). Construction of solar facilities within each CUP area may result in impacts to individuals from vehicular strikes or excavation equipment. Vehicular collisions occur most frequently during the vegetation clearing stage of construction, and involve eggs, nestlings, and recently fledged young that cannot safely avoid equipment. However, this species does not breed within the Imperial Valley and impacts to eggs, nestlings, and recently fledged young would not occur.

Potential direct impacts to migrating mountain plover also include impacts resulting from collisions with PV panels prior to the initiation of O&M activities. Polarized light pollution caused by solar PV panels may affect foraging behaviors, navigation, and orientation in birds, leading to potential collisions with panels (Horvath et al. 2009, Horvath et al. 2010). Waterbirds have composed the majority of avian mortalities at the Desert Sunlight PV facility (CEC 2013, 2014, Kagan et al. 2014). The the potential effect of polarized light pollution on mountain plover is not known.

Electric Collector Line Corridor

Construction within the electric collector line corridor would result in permanent and temporary removal of mountain plover winter foraging habitat. Direct permanent and temporary impacts resulting from installation of pole structures would occur within agriculture fields (Table 14). Construction of the electric collector line corridor may result in impacts to individuals from vehicular strikes or excavation equipment. Collisions occur most frequently during the vegetation clearing stage of construction, and involve eggs, nestlings, and recently fledged young that cannot safely avoid equipment. However, this

species does not breed within the Imperial Valley and impacts to eggs, nestlings, and recently fledged young would not occur. Potential direct impacts to mountain plover also include impacts resulting from collisions with overhead wires and other structures associated with the electric collector lines prior to the initiation of O&M activities.

Mount Signal Solar Gen-tie Line

The Mount Signal Solar gen-tie line pole structures that would be upgraded or installed are not located within suitable mountain plover habitat; therefore, no direct impacts to mountain plover would result from construction work within the Mount Signal Solar gen-tie line corridor.

Indirect Impacts (All CUP Areas)

Potential indirect impacts to mountain plover are expected to be similar for construction of the solar facilities within each CUP area, the electric collector lines, and Mount Signal Solar gen-tie line upgrades. Potential temporary indirect construction impacts to mountain plover and its habitats include habitat fragmentation, increased human presence, increased noise levels, nighttime lighting, dust, sedimentation, and erosion. Permanent indirect impacts could result from increased raptor predation associated with the construction of new elevated perching sites, including the gen-tie structures, perimeter fencing, and gen-tie lines. These indirect impacts have the potential to degrade mountain plover habitat and alter foraging behavior.

Extending the duration of construction activities to develop the 17 individual CUPs over a 10-year period as opposed to at one time are assumed to have a similar level of indirect impacts given that impacts (e.g., noise, lighting) would be extended over a greater period of time; however, if the project were built all at once, the impacts would be more intense but shorter in duration. Thus, we assume either approach would result in a comparable indirect impact.

Significance Determination

Potential construction-related direct and indirect impacts to the mountain plover would be considered significant since this species is identified as an SSC by CDFW. Impacts would be reduced to less than significant through implementation of the avoidance, minimization, and mitigation measures described in Chapter 5. Measures include minimizing the footprint to the maximum extent possible, minimizing project lighting, designing above-ground lines, transformers or conductors to APLIC standards, using nonreflective PV or CPV modules, using qualified biologists to ensure that issues relating to biological resources are appropriately and lawfully managed, and implementing avian-specific measures such as pre-construction nest surveys. In addition, a BBCS would be developed using the concepts and objectives outlined in the Interim Guidelines for the Development of a Project Specific Avian and Bat Protection Plan for Solar Energy Plants and Related Transmission Facilities (USFWS 2010) and Land-Based Wind Energy Guidelines (USFWS 2012a).

4.2.6.6 Bats

Western mastiff bat, western yellow bat, and pocketed free-tailed bat were not observed during surveys, but have moderate potential to occur in the BSA (see Section 3.5.3.6). Suitable winter foraging habitat exists throughout the BSA in agricultural fields. Palm trees within the BSA and buffer

could serve as roost sites for the western yellow bat. No roosting habitat occurs for the other two species.

Direct Impacts (All CUP Areas)

Solar Energy Center Facilities

Construction within CUP areas would result in permanent removal of agriculture fields, which are bat foraging habitat (Table 13). Construction of solar facilities within each CUP area may result in impacts to individuals from vehicular strikes or excavation equipment. However, typical construction work hours are expected to be from 6:00 a.m. to 5:00 p.m. when bats are not active and impacts to bats would likely be minimal.

Electric Collector Line Corridor

Construction within the electric collector line corridor would result in permanent and temporary removal of bat foraging habitat. Direct permanent and temporary impacts resulting from installation of pole structures would occur within agriculture fields (Table 14). Construction of the electric collector line corridor may result in impacts to individuals from vehicular strikes or excavation equipment. However, typical construction work hours are expected to be from 6:00 a.m. to 5:00 p.m. when bats are not active and impacts to bats would likely be minimal.

Mount Signal Solar Gen-tie Line

The Mount Signal Solar gen-tie line pole structures that would be upgraded or installed are located along canals and/or drains that provide suitable foraging habitat for bats. Construction of pole structures may result in impacts to individuals from vehicular strikes. However, typical construction work hours are expected to be from 6:00 a.m. to 5:00 p.m. when bats are not active and impacts to bats would likely be minimal.

Indirect Impacts (All CUP Areas)

Potential indirect impacts to bats are expected to be similar for construction of the solar facilities within each CUP area, the electric collector lines, and Mount Signal Solar gen-tie line upgrades. temporary indirect construction impacts to bats and their habitats include habitat fragmentation, increased human presence, increased noise levels, nighttime lighting, dust, sedimentation, and erosion. These indirect impacts have the potential to degrade bat foraging habitat and alter foraging behavior.

Extending the duration of construction activities to develop the 17 individual CUPs over a 10-year period as opposed to at one time are assumed to have a similar level of indirect impacts given that impacts (e.g., noise, lighting) would be extended over a greater period of time; however, if the project were built all at once, the impacts would be more intense but shorter in duration. Thus, we assume either approach would result in a comparable indirect impact.

Significance Determination

Potential construction-related direct and indirect impacts to western mastiff bat, western yellow bat, and pocketed free-tailed bat would be considered significant since these species are identified as

SSC by CDFW. Impacts would be reduced to less than significant through implementation of the avoidance, minimization, and mitigation measures described in Chapter 5. Measures include minimizing the footprint to the maximum extent possible, minimizing project lighting, and using qualified biologists to ensure that issues relating to biological resources are appropriately and lawfully managed. In addition, a BBCS would be developed using the concepts and objectives outlined in the Interim Guidelines for the Development of a Project Specific Avian and Bat Protection Plan for Solar Energy Plants and Related Transmission Facilities (USFWS 2010) and Land-Based Wind Energy Guidelines (USFWS 2012a).

4.2.6.7 American Badger

A burrow exhibiting signs of predation by an American badger was observed within the 500-foot buffer of the BSA adjacent to the New River (see Section 3.5.3.7). Therefore, although this species was not directly observed during biological surveys, it is considered present within the 500-foot buffer of the BSA.

Direct Impacts (All CUP Areas)

Solar Energy Center Facilities

Construction within Project CUP areas may result in impacts to individuals from vehicular strikes or excavation equipment. Construction within CUP areas would also result in permanent and removal of badger foraging habitat. Direct impacts to foraging habitat resulting from construction within CUP areas would occur on the edge of agriculture fields and in drains or canals (Table 13). Construction within CUP 13-0047 would impact burrowing and/or denning habitat within the undisturbed areas along the New River. Active agriculture fields are regularly disturbed and, therefore, do not provide suitable denning or burrowing habitat.

Electric Collector Line Corridor

Construction within the electric collector line corridor would result in permanent and temporary removal of American badger foraging habitat. Direct permanent and temporary impacts resulting from installation of pole structures would occur near the edge of agriculture fields (Table 14). Construction of the electric collector line corridor may result in impacts to individuals from vehicular strikes or excavation equipment.

Mount Signal Solar Gen-tie Line

The Mount Signal Solar gen-tie line pole structures that would be upgraded or installed are located within disturbed habitat and American badger is not expected to occur in these areas. Therefore, no direct impacts to American badger would result from construction work within the Mount Signal Solar gen-tie line corridor.

Indirect Impacts (All CUP Areas)

Potential indirect impacts to the American badger are expected to be similar within each CUP area. Potential permanent indirect construction impacts to the badger and its habitat include the introduction and proliferation of invasive nonnative plant species. Potential temporary indirect impacts to the

species and its habitats include habitat fragmentation, increased human presence, increased noise levels, human presence, nighttime lighting, sedimentation, and erosion. These indirect impacts have the potential to degrade badger habitat and alter breeding and foraging behaviors.

Extending the duration of construction activities to develop the 17 individual CUPs over a 10-year period as opposed to at one time are assumed to have a similar level of indirect impacts given that impacts (e.g., noise, lighting) would be extended over a greater period of time; however, if the project were built all at once, the impacts would be more intense but shorter in duration. Thus, we assume either approach would result in a comparable indirect impact.

Significance Determination

Potential construction-related direct and indirect impacts to the American badger would be considered significant since this species is identified as an SSC by CDFW. Impacts would be reduced to less than significant through implementation of the avoidance, minimization, and mitigation measures described in Chapter 5. Measures include minimizing the footprint to the maximum extent possible, minimizing project lighting, and using qualified biologists to ensure that issues relating to biological resources are appropriately and lawfully managed.

4.2.7 Migratory Birds

This subsection describes potential direct and indirect impacts to migratory birds protected exclusively by the MBTA and associated state laws (CFGC Sections 3503, 3503.5, 3513) and not discussed above in Sections 4.2.5 and 4.2.6. The avian species discussed in Section 4.2.5 and 4.2.6 are protected by MBTA and associated state laws (CFGC Sections 3503, 3503.5, 3513), as well as other federal and/or state laws.

The following subsections describe potential direct and indirect impacts to migratory birds not discussed in Sections 4.2.5 and 4.2.6 using the BSA and vicinity for foraging and breeding purposes. Discussion of potential direct and indirect impacts from construction of the Project is applicable to all CUP areas. Permanent and temporary removal of vegetation communities that support migratory birds within each CUP area is quantified in tables referenced in the text.

4.2.7.1 Direct Impacts (All CUP Areas)

Solar Energy Center Facilities

Potential direct impacts to migratory birds resulting from construction are expected to be similar within each CUP area. Potential permanent direct impacts to migratory birds include removal of habitat and potential collisions with construction equipment or vehicles. Direct impacts to vegetation communities within each CUP area would be greatest to agriculture habitats (Table 13). At full buildout, approximately 90 percent (2,318 acres [938 hectares]) of anticipated permanent direct impacts would occur to agriculture (Table 13). Approximately 3 percent of anticipated permanent direct impacts would occur in riparian and wetlands (59 acres [24 hectares]) and native upland habitat (8 acres [3 hectares]) (Table 13). The remaining impacts would occur in developed or disturbed habitat (178 acres [72 hectares]) (Table 13). The agriculture primarily provides foraging habitat for migratory birds while riparian or nonagricultural upland habitats may provide foraging or breeding habitat for migratory

birds. Vehicular collisions occur most frequently during the vegetation clearing stage of construction and involve eggs, nestlings, and recently fledged young that cannot safely avoid equipment. Thus, potential collisions to migratory bird individuals during the vegetation clearing stage of construction are expected to be limited to those migratory species nesting within the BSA. Loss of foraging habitat would affect both wintering and breeding birds within the region.

Potential direct impacts to migratory birds also include impacts resulting from collisions with PV panels prior to the initiation of O&M activities. Polarized light pollution caused by solar PV panels may affect foraging behaviors, navigation, and orientation in birds, leading to potential collisions with panels (Horvath et al. 2009, Horvath et al. 2010). Waterbirds have composed the majority of avian mortalities at the Desert Sunlight PV facility (CEC 2013, 2014, Kagan et al. 2014). The potential effect of polarized light pollution on other migrating avian species is not known. Therefore, migratory waterbirds may be at increased risk of collisions with PV panels relative to other migratory birds. Additionally, large areas of solar PV or CPV panels in the desert environment may mimic water bodies and inadvertently attract waterbird species (Kagan et al. 2014). Although studies have shown that glare intensity and/or reflectivity of CPV modules are lower than that of water and similar to asphalt (Dudek 2014), individuals may collide with solar panels and/or become stranded in solar fields resulting in fatalities (Kagan et al. 2014).

Electric Collector Line Corridor

Construction within the electric collector line corridor would result in permanent and temporary removal of migratory bird foraging habitat. Direct permanent and temporary impacts resulting from installation of pole structures would occur within agriculture, although permanent loss of habitat would be minimal (Table 14). Construction of the electric collector line corridor may result in impacts to individuals from vehicular strikes or excavation equipment. Collisions occur most frequently during the vegetation clearing stage of construction, and involve eggs, nestlings, and recently fledged young that cannot safely avoid equipment. Potential direct impacts to migratory birds also include impacts resulting from collisions with overhead wires and other structures associated with the electric collector lines prior to the initiation of O&M activities.

Mount Signal Solar Gen-tie Line

The Mount Signal Solar gen-tie line pole structures that would be upgraded or installed are located within disturbed habitat; however, some ground-nesting avian species may occur in these areas. Construction within the Mount Signal Solar gen-tie corridor may result in impacts to individuals from vehicular strikes or excavation equipment. Collisions occur most frequently during the vegetation clearing stage of construction, and involve eggs, nestlings, and recently fledged young that cannot safely avoid equipment. Potential direct impacts to migratory birds also include impacts resulting from collisions with overhead gen-tie wires, gen-tie tower guy wires, and other structures associated with the Mount Signal Solar gen-tie line prior to the initiation of O&M activities.

4.2.7.2 Indirect Impacts (All CUP Areas)

Potential indirect impacts to migratory birds are expected to be similar for construction of the solar facilities within each CUP area, the electric collector lines, and Mount Signal Solar gen-tie line

upgrades. Potential temporary indirect impacts to these species and their habitats include habitat fragmentation, increased human presence, increased noise levels, nighttime lighting, dust, sedimentation, and erosion. Permanent indirect impacts could result from increased common raven and raptor predation associated with the construction of new elevated perching sites, including the gen-tie structures, perimeter fencing, and gen-tie lines. Trash present on-site may attract ravens in numbers beyond those afforded by the normal conditions extant in the Project vicinity. These indirect impacts have the potential to degrade migratory bird habitat and alter breeding, foraging, and migratory behaviors.

Extending the duration of construction activities to develop the 17 individual CUPs over a 10-year period as opposed to at one time are assumed to have a similar level of indirect impacts given that impacts (e.g., noise, lighting) would be extended over a greater period of time; however, if the project were built all at once, the impacts would be more intense but shorter in duration. Thus, we assume either approach would result in a comparable indirect impact.

4.2.7.3 Significance Determination

Potential direct and indirect impacts to nesting migratory birds during construction of the Project would be considered significant. Chapter 5 provides measures, including avian-specific measures, designed to avoid, minimize, and mitigate potential direct impacts to migratory birds. Measures include minimizing the footprint to the maximum extent possible, minimizing project lighting, designing above-ground lines, transformers, or conductors to APLIC standards, using nonreflective PV or CPV modules, using qualified biologists to ensure that issues relating to biological resources are appropriately and lawfully managed, and implementing avian-specific measures such as pre-construction nest surveys. In addition, a BBCS would be developed using the concepts and objectives outlined in the Interim Guidelines for the Development of a Project Specific Avian and Bat Protection Plan for Solar Energy Plants and Related Transmission Facilities (USFWS 2010) and Land-Based Wind Energy Guidelines (USFWS 2012a).

4.2.8 Wildlife Corridors

The BSA is likely used by a variety of wildlife species for local and regional movements (see Section 3.6). Local movements include dispersals and movements related to home range activities (i.e., foraging for food or water, defending territories, searching for mates, breeding areas, or cover) by all groups of wildlife (e.g., birds, mammals, and reptiles). Regional movements are likely limited to migratory bird movements through the BSA during spring and fall migration periods.

The following subsection describes potential direct and indirect impacts to wildlife movement resulting from construction of the Project and is applicable to all CUP areas.

4.2.8.1 Direct Impacts (All CUP Areas)

Solar Energy Center Facilities

Potential direct impacts to wildlife movement resulting from construction are expected to be similar for each CUP area. Extending the duration of construction activities to develop the 17 individual CUPs over a 10-year period as opposed to at one time would have a greater potential for direct impacts.

Construction vehicles have the potential to result in accidental injury to or mortality of on-site species during construction. The perimeter of each CUP area would be fenced with an up to 7-foot (2.1-meter) chain-link fence with 3-strand barbed-wire placed at the top, extending to a total of up to 8 feet (2.4 meters) (see Section 1.2.5.10). Fencing may impede some wildlife movement for dispersal and home range activities, particularly for species that move through agriculture habitat. However, fencing would not impede wildlife movement along the New River, Greeson Wash, or IID ROWs and, therefore, corridors would remain to allow wildlife to move through and around the perimeter of each CUP area. The BSA is not part of a regional corridor for terrestrial species (Section 3.6). It is likely that most regional movements occur within designated open spaces, such as the Yuha Basin ACEC, as opposed Imperial Valley agriculture matrix (Section 3.6). Therefore regional movement for terrestrial species would not be impeded.

Construction within CUP areas would not impede movement of migratory birds through the BSA and vicinity to important stopover sites such as, Sonny Bono Salton Sea National Wildlife Refuge and the Imperial State Wildlife Area (including Finney-Ramer Lakes). However, migratory bird mortalities have been recently documented at solar PV installations (CEC 2013). Polarized light pollution caused by nonoperating (i.e., prior to commissioning) solar PV panels installed during construction may affect foraging behaviors, navigation, and orientation in birds, leading to potential collisions with panels (Horvath et al. 2009; Horvath et al. 2010). Therefore, each CUP area may result in impacts to individual birds migrating through the area. Additionally, large areas of solar PV or CPV panels in the desert environment may mimic water bodies and inadvertently attract waterbird species (Kagan et al. 2014). Although studies have shown that glare intensity and/or reflectivity of CPV modules are lower than that of water and similar to asphalt (Dudek 2014), individuals may collide with solar panels and/or become stranded in solar fields resulting in fatalities (Kagan et al. 2014).

Electric Collector Line Corridor

Construction within the electric collector line corridor would not impede movement of migratory birds and/or terrestrial wildlife. Construction vehicles have the potential to result in accidental injury to or mortality of on-site species during construction. Potential direct impacts to migratory birds also include impacts resulting from collisions with overhead wires and other structures associated with the electric collector lines prior to the initiation of O&M activities.

Mount Signal Solar Gen-tie Line

The Mount Signal Solar Project has already constructed a 230-kV single-circuit gen-tie line that the Project would use. Construction to install new double dead-end structures and upgrade existing structures would not result in impacts to movement of migratory birds and/or terrestrial wildlife. Construction vehicles have the potential to result in accidental injury to or mortality of on-site species during construction Potential direct impacts to migratory birds also include impacts resulting from collisions with overhead gen-tie wires, gen-tie tower guy wires, and other structures associated with the Mount Signal Solar gen-tie line prior to the initiation of O&M activities.

4.2.8.2 Indirect Impacts (All CUP Areas)

Potential indirect impacts to wildlife movement resulting from construction are expected to be similar for each CUP area, the electric collector lines, and Mount Signal Solar gen-tie line upgrades. Indirect impacts to wildlife movement (including terrestrial and avian) may result during construction from increased human presence, construction-generated noise and nighttime lighting, and edge effects associated with development. These indirect impacts may result in avoidance of the site during movements and may have harmful effects on individuals, population genetics, and metapopulation dynamics. These impacts may vary depending on the population structure, size of the home range, migration patterns, and dispersal movements of the species being considered, as well as the species' behavioral response to artificial light, noise, degraded surrounding habitat, and other anthropogenic influences.

Extending the duration of construction activities to develop the 17 individual CUPs over a 10-year period as opposed to at one time are assumed to have a similar level of indirect impacts given that impacts (e.g., noise, lighting) would be extended over a greater period of time; however, if the project were built all at once, the impacts would be more intense but shorter in duration. Thus, we assume either approach would result in a comparable indirect impact.

4.2.8.3 Significance Determination

Potential construction-related direct and indirect impacts to wildlife movement would be reduced to less than significant through implementation of the avoidance, minimization, and mitigation measures described in Chapter 5. Measures include minimizing the footprint to the maximum extent possible, minimizing project lighting, designing above-ground lines, transformers, or conductors to APLIC standards, using nonreflective PV or CPV modules, and limiting speed limits to minimize collisions with wildlife. In addition, a BBCS would be developed using the concepts and objectives outlined in the Interim Guidelines for the Development of a Project Specific Avian and Bat Protection Plan for Solar Energy Plants and Related Transmission Facilities (USFWS 2010) and Land-Based Wind Energy Guidelines (USFWS 2012a).

4.3 OPERATION IMPACTS

This section identifies impacts to the biological resources occurring within the BSA that would result from operation-related activities. Potential direct and indirect impacts are grouped into one discussion because impacts are expected to be similar for operation of solar facilities within each CUP area, the electric collector lines, and Mount Signal Solar gen-tie line. Potential indirect impacts, discussed in the introduction to Chapter 4, as applicable to each biological resource are listed within each of their respective sections.

4.3.1 Vegetation Communities

This subsection describes potential direct and indirect impacts to vegetation communities resulting from operation of the Project and is applicable to all CUP areas.

4.3.1.1 Direct Impacts (All CUP Areas)

All operation activities associated with each CUP area, electric collector lines, and the Mount Solar Signal gen-tie corridor would occur within areas permanently cleared of vegetation during construction. Therefore, permanent and temporary direct impacts to vegetation communities would not occur during operation of the Project.

4.3.1.2 Indirect Impacts (All CUP Areas)

Indirect impacts to vegetation communities resulting from operation are expected to be similar for each CUP area, electric collector lines, and the Mount Signal gen-tie corridor. Potential indirect impacts to vegetation communities associated with operation include trampling of vegetation due to long-term unauthorized trespass, O&M-generated fugitive dust, erosion, sedimentation, storm water contaminant runoff, and the potential introduction and proliferation of invasive nonnative plant species. Herbicide used during control of nonnative plant species has potential to be inadvertently applied to adjacent native plants; however, herbicides are regularly used during agriculture activities and herbicide use within each CUP area would decrease when agriculture activities cease. These indirect impacts have the potential to result in off-site vegetation degradation.

4.3.1.3 Significance Determination

Potential operation-related indirect impacts to sensitive vegetation communities, including arrow weed scrub, drains and canals, open water, and tamarisk scrub would be considered significant where these habitats occur adjacent to the Project footprint. Impacts would be reduced to less than significant through implementation of the avoidance, minimization, and mitigation measures described in Chapter 5. Measures include implementing a SWPPP, which will specify post-construction storm water control standards, and preparation and implementation of a Weed Management Plan.

4.3.2 Jurisdictional Waters and Wetlands

This subsection describes potential direct and indirect impacts to jurisdictional waters and wetlands resulting from operation of the Project and is applicable to all CUP areas.

4.3.2.1 Direct Impacts (All CUP Areas)

Operation of the Project, i.e., each CUP area, electric collector lines, and Mount Solar Signal gen-tie corridor, are not expected to include activities occurring within potential jurisdictional waters and wetlands. Therefore, direct impacts to jurisdictional waters and wetlands are not expected to occur during operation of the Project.

4.3.2.2 Indirect Impacts (All CUP Areas)

Potential indirect impacts to jurisdictional waters and wetlands associated with Project operation include increased human use and the potential for long-term unauthorized trespass, O&M-generated fugitive dust, erosion, sedimentation, and storm water contaminant runoff, as well as the potential introduction and proliferation of invasive nonnative plant species. Herbicide used during control of nonnative plant species has potential to inadvertently enter jurisdictional waters and wetlands; however, herbicides are regularly used during agriculture activities and herbicide use within each CUP

area would decrease when agriculture activities cease. These indirect impacts have the potential to result in degradation of jurisdictional waters and wetlands.

4.3.2.3 Significance Determination

Potential operation-related indirect impacts to jurisdictional waters and wetlands would be considered significant where waters and wetlands occur adjacent to the Project footprint. Impacts would be reduced to less than significant through implementation of the avoidance, minimization, and mitigation measures described in Chapter 5. Measures include implementing a SWPPP, which will specify post-construction storm water control standards, fencing and other measures to reduce trespass, and preparation and implementation of a Weed Management Plan.

4.3.3 Special-Status Flora

This subsection describes potential direct and indirect impacts resulting from operation of the Project to nonlisted special-status plant species that may be present within CUP area 13 0047. No other CUP areas are expected to have impacts to nonlisted special-status plant species.

4.3.3.1 Direct Impacts (CUP Area 13-0047)

All operation activities associated with CUP Area 13-0047 would occur within areas permanently cleared of vegetation during construction. Therefore, no direct impacts to special-status plant species would result from operation of the Project.

4.3.3.2 Indirect Impacts (CUP Area 13-0047)

CUP area 13-0047 was added to the Project subsequent to the completion of the field rare plant habitat assessment. Based on desktop analysis, nonlisted special-status plant species may have some potential to occur in areas adjacent to the Project footprint due to the presence of sandy or rocky areas along the edge of the New River. Potential indirect impacts to special-status plants associated with operation include trampling of plants due to long-term unauthorized trespass, O&M-generated fugitive dust, erosion, sedimentation, storm water contaminant runoff, and the potential introduction and proliferation of invasive nonnative plant species. Herbicide used during control of nonnative plant species has potential to be inadvertently applied to adjacent nonlisted special-status plants; however, herbicides are regularly used during agriculture activities and herbicide use within CUP Area 13-0047 would decrease when agriculture activities cease. These indirect impacts have the potential to result in off-site habitat degradation that may adversely affect special-status plants ability to thrive and reproduce.

4.3.3.3 Significance Determination

Potential operation-related indirect impacts to special-status plants would be considered significant where they occur adjacent to the Project footprint. Impacts would be reduced to less than significant through implementation of the avoidance, minimization, and mitigation measures described in Chapter 5. Measures include implementing a SWPPP, which will specify post-construction storm water control standards, and preparation and implementation of a Weed Management Plan as well as a Long-Term Maintenance Plan for the retention/detention basins.

4.3.4 Special-Status Wildlife and Migratory Birds

This subsection describes potential direct and indirect impacts resulting from operation of the Project is applicable to all CUP areas. The discussion below is applicable to all special status wildlife and migratory bird species described in Section 3.5.

4.3.4.1 Direct Impacts (All CUP Areas)

Potential direct impacts to special-status wildlife and migratory birds include mortality of individuals by vehicle collisions during O&M activities. The Project is located along the Pacific Flyway (see Section 3.6), and migratory birds may migrate through the BSA and vicinity during operation of the Project. Potential direct impacts to avian species include impacts resulting from collisions with overhead gen-tie wires, gen-tie tower guy wires, and other structures associated with the electric collector lines and Mount Signal Solar gen-tie line. Avian power line collisions are a widespread problem with potentially significant local impacts when high-risk conditions are present (CEC 2002). The level of risk depends on a combination of biological and physical factors, such as weather, design and placement of gen-tie structures, and species-specific behavior (CEC 2002).

In addition to collisions with gen-tie structures, avian collisions with solar PV installations have been documented (CEC 2013; CEC 2014). Potential direct impacts to avian species include impacts resulting from collisions with PV panels. Polarized light pollution caused by solar PV panels may affect foraging behaviors, navigation, and orientation in birds, leading to potential collisions with panels (Horvath et al. 2009, Horvath et al. 2010). Waterbirds have composed the majority of avian collisions with PV panels to date (CEC 2013), and the potential effect of polarized light pollution on other migrating avian species is not known. Therefore, migratory waterbirds may be at increased risk of collisions with PV panels relative to other migratory birds. Additionally, large areas of solar PV or CPV panels in the desert environment may mimic water bodies and inadvertently attract waterbird species. Individuals may collide with solar panels and/or become stranded in solar fields resulting in fatalities. Most evidence of this phenomenon is anecdotal (CEC 2014) and little research exists as to the actual cause of mortalities. Studies have shown that glare intensity and/or reflectivity of CPV modules are lower than that of water and similar to asphalt (Dudek 2014).

4.3.4.2 Indirect Impacts (All CUP Areas)

Potential indirect impacts from Project operation include increased noise levels, nighttime lighting, human use, O&M-generated fugitive dust, erosion, sedimentation, storm water contaminant runoff, and the potential introduction and proliferation of invasive nonnative plant species. Operations-related indirect impacts could result from increased common raven and raptor predation associated with elevated perching sites, including the gen-tie structures, perimeter fencing, and gen-tie lines. Trash present on-site may attract ravens in numbers beyond those afforded by the normal conditions extant in the Project vicinity. These indirect impacts have the potential to degrade special-status wildlife and migratory bird habitat and alter migration behaviors.

4.3.4.3 Significance Determination

Potential direct and indirect impacts to the special-status wildlife and migratory birds during operation would be considered significant. Impacts would be reduced to less than significant through implementation of the avoidance, minimization, and mitigation measures described in Chapter 5. Measures, including avian-specific measures, are designed to avoid, minimize, and mitigate potential direct impacts to special-status wildlife and migratory birds. Measures also include project design features, such as, minimizing project lighting, designing above-ground lines, transformers, or conductors to APLIC standards, and using nonreflective PV or CPV modules, to minimize avian collisions and electrocutions. In addition, a BBCS would be developed using the concepts and objectives outlined in the Interim Guidelines for the Development of a Project Specific Avian and Bat Protection Plan for Solar Energy Plants and Related Transmission Facilities (USFWS 2010) and Land-Based Wind Energy Guidelines (USFWS 2012a).

4.3.5 Wildlife Movement

Project operation would not result in any additional direct or indirect impacts to wildlife movement beyond those described in Section 4.2.8.

4.4 DECOMMISSIONING IMPACTS

Decommissioning activities would result in direct and indirect impacts to biological resources described in Chapter 3. Impact would be similar to those described above for construction (see Section 4.2). The Project would remain free of vegetation; thus, wildlife species would not inhabit the Project footprint. Most impacts would be indirect because biological resources would likely only remain within areas adjacent (i.e., off-site) to the Project (e.g., BUOW nesting in adjacent canals or drains may be disturbed by decommissioning activities). Direct impacts in all CUP areas would be limited to special-status wildlife species described in Section 3.5. Special-status wildlife species may suffer from impacts to individuals as a result of vehicular or equipment strikes. Direct and indirect impacts in all CUP areas to biological resources would be temporary because the site would be restored to pre-project conditions at the completion of decommissioning. Decommissioning is generally considered beneficial to biological resources. However, potential direct and indirect impacts to biological resources during decommissioning activities – although temporary – may be considered significant. Impacts would be reduced to less than significant through implementation of the avoidance, minimization, and mitigation measures described in Chapter 5.

5.0 Project Design Features and Avoidance, Minimization, and Conservation Measures

This section identifies avoidance, minimization, and mitigation measures that will be implemented as part of the Project for each CUP (regardless of the number of CUP areas developed) to prevent degradation of sensitive biological resources to the maximum extent feasible. Measures provided in this chapter are categorized by Project stage (i.e., design, construction, operation, and decommissioning) and organized by general and resource-specific measures. Measures are applicable to all CUP areas unless otherwise noted.

5.1 DESIGN FEATURES

This section describes design features that will be implemented as part of the Project. These design features will be implemented to prevent environmental degradation to the greatest extent feasible. Design features are divided into general and avian-specific measures. General measures are applicable for avoidance and minimization of direct and indirect construction and O&M impacts to all biological resources discussed in Sections 4.2 and 4.3. Avian-specific measures are applicable for avoidance and minimization of direct and indirect construction and O&M impacts to avian species discussed in Sections 4.2 and 4.3.

5.1.1 General Design Features (All CUP Areas)

- The development footprint of the Project will be confined to the minimal amount of area necessary for construction and safe, reliable operation. Access routes will be limited to existing roadways to the maximum extent possible. All construction areas, staging areas, and access routes will be clearly delineated in the final engineering plans.
- Lights on Project components will be motion sensitive rather than steady burning and will be downcast and shielded to keep light within the boundary of the Project. The use of high-intensity lighting; steady-burning lights; or bright lights such as sodium vapor, quartz, halogen, or other bright spotlights will be minimized.
- Final engineering plans for new vehicular crossings and/or upgrades to IID vehicular crossings will be designed to avoid impacts to USACE wetlands, with the exception of CUP area 13-0047, to facilitate Project permits under USACE's Nationwide Permit (NWP) program. One of the regional conditions published by USACE Los Angeles District that pertains to the NWPs most applicable to the proposed project (e.g., NWP 14 for Linear Transportation Projects or NWP 51 for Land-Based Renewable Energy Generation Facilities) indicates that individual permits are required for all discharges of fill material that will result in the "loss" of wetlands (USACE Special Public Notice 15 March 2012) within the USGS Hydrologic Unit Code [HUC] where the project is located (Salton Sea-181002).

5.1.2 Avian-Specific Design Features (All CUP Areas)

- To the extent feasible, nonreflective PV or CPV modules will be used over reflective technologies to minimize collision risk.

- When above-ground lines, transformers, or conductors are necessary, all will be spaced and designed to fully comply with the APLIC (2006) suggested practices to prevent avian electrocutions.

  When above-ground lines are necessary, power line/wire marking devices including aerial marker spheres, swinging plates, bird diverters, paint, and other bird avoidance devices will be used to prevent avian collisions as outlined in the APLIC Reducing Avian Collisions with Power Lines: State of the Art document (2012). Bird flight diverters have proven effective for reducing and preventing bird collisions in some cases (CEC 2002).

- WRS is committed to assessing Project-related impacts to avian and bat species to avoid and reduce potential impacts to the greatest extent feasible. WRS is voluntarily developing a BBCS for this Project. This plan will be developed in coordination with the County of Imperial, USFWS, and CDFW. Avian- and bat-specific measures outlined herein will be finalized during the development process of the BBCS. The primary objectives of the BBCS are to:

  1. Identify feasible conservation measures that could be implemented to reduce negative impacts to avian and bat species.
  2. Develop a wildlife monitoring and reporting program to estimate post-construction fatality rates and impacts on avian and bat species.
  3. Determine whether avoidance, minimization, and mitigation measures implemented for the Project are adequate or whether additional corrective action or adaptive management is warranted. An adaptive management framework will be prepared to inform the potential development of additional actions.

  To meet these objectives, the BBCS will include the following components:

  - A description and assessment of the existing habitat and avian and bat species;
  - An avian and bat risk assessment and specific measures to avoid, minimize, reduce, or eliminate avian and bat injury or mortality during all phases of the project.
  - A post-construction monitoring plan that will be implemented to assess impacts on avian and bat species resulting from the Project. The post-construction monitoring plan will include a description of standardized carcass searches, scavenger rate (i.e., carcass removal) trials, searcher efficiency trials, and reporting. Statistical methods will be used to estimate Project avian and bat fatalities if sufficient data is collected to support analysis.
  - An injured bird response plan that defines care and curation of any and all injured birds.
  - A nesting bird management strategy to outline actions to be taken for avian nests detected within the impact footprint during operation of the Project. A conceptual adaptive management and decision-making framework for reviewing, characterizing, and responding to monitoring results.

- Monitoring studies following commencement of commercial operation of each CUP area. Monitoring results will be reviewed annually by the Applicant and the County of Imperial, in consultation with CDFW and USFWS, to inform adaptive management responses,

5.2 CONSTRUCTION MEASURES

This section describes construction avoidance, minimization, and mitigation measures that will be implemented as part of the Project. Construction avoidance, minimization, and mitigation measures are divided into general and resource-specific measures. General measures are applicable for avoidance and minimization of direct and indirect construction impacts to all biological resources discussed in Section 4.2. Resource-specific measures are applicable for avoidance, minimization, and mitigation of direct and indirect construction impacts to jurisdictional waters and wetlands, special-status flora, special-status wildlife, and migratory birds discussed in Section 4.2.

5.2.1 General Construction Measures (All CUP Areas)

- The Applicant will identify a qualified biologist(s) approved by CDFW. The name, documented experience, any permit numbers, and resumes for the qualified biologist(s) will be submitted to the CDFW for approval at least 30 days prior to initiation of construction. It is assumed CDFW will approve qualified biologist(s) within 15 days of the submittal. The qualified biologist(s) will be present on-site during all ground-disturbing phases of construction to regularly monitor construction activities and ensure construction is proceeding in compliance with the avoidance, minimization, and mitigation measures committed to by the Applicant, as well as measures required by regulatory agencies. In addition, the qualified biologist(s) will maintain communications with the appropriate personnel (project manager, resident engineer) to ensure that issues relating to biological resources are appropriately and lawfully managed. The qualified biologist will be responsible for reporting any noncompliance issues to CDFW within 48 hours. The resident engineer will be immediately notified to halt work, if necessary. The qualified biologist(s) will provide a report to CDFW at least monthly identifying construction activities and the results of compliance monitoring related to implementation of avoidance and minimization measures. The qualified biologist(s) will meet the following minimum qualifications:
    - Have a bachelor's degree in biological sciences, zoology, botany, ecology, or a closely related field or at least 4 years of experience in field biology or current certification of a nationally recognized biological society, such as The Ecological Society of America or The Wildlife Society;
    - Have at least 1 year of field experience with biological resources found in the geographic region of the Project; and
    - Have extensive knowledge of the biology and ecology of sensitive species occurring and potential occurring within the Project site.

  - Have specialized avian experience in the Imperial Valley (e.g., knowledge of nesting chronology, avian behavior) necessary to conduct nesting surveys and monitor buffers.

- A Worker Environmental Awareness Program (WEAP) will be developed and implemented prior to the start of construction. The environmental training will be led by the qualified biologist(s) and will cover the following:
  - The potential presence and ecology of sensitive biological resources found on-site, such as potential jurisdictional waters and nesting avian species;
  - Flagging/fencing of exclusion areas;
  - Proper implementation of protective measures to avoid impacts to special-status species;
  - The reasons, need, and method by which employees should report an wildlife mortality, follow nest management protocols, dispose of carcasses, comply with applicable regulations (including the consequences of noncompliance), and the appropriate agencies and personnel that should be contacted after incidents; and
  - Other permit requirements and environmental issues.

  All construction site personnel will be required to attend the environmental training in conjunction with hazard and safety training prior to working on-site.

- All construction-related activities will take place within the development footprint of the Project, as defined by the final engineering plans. The anticipated impact areas, including staging areas, equipment access, and disposal or temporary placement of spoils, will be delineated with staking and/or orange construction fencing prior to construction to avoid natural resources where possible. No construction-related activities will occur outside of the designated impact area. All construction materials, staging, storage, dispensing, fueling, and maintenance activities will be designated on construction maps and will be situated a minimum of 50 feet from all drainages. Staging and temporary access will occur on existing roadways whenever possible.

- Parking of vehicles will occur within the fenced Project area or within previously disturbed areas prior to construction of the fencing, and away from sensitive habitats.

- Grading will only occur where necessary and as specified by the Project's final engineering plans, and will be avoided wherever possible to minimize the amount of ground disturbance. To the extent possible, Project layout and design will generally follow existing contours of the Project site to minimize the amount of grading required.

- To the extent possible, nighttime construction will be avoided. When activities must occur at night, all Project lighting (e.g., staging areas, equipment storage sites, roadway) will be directed downward and away from natural vegetation communities. Light glare shields will be used to reduce the extent of illumination into adjoining areas.

- Nighttime and daytime on-site construction vehicle speeds will be restricted to 10 miles per hour and 20 miles per hour, respectively. Speed limit signs will be posted throughout the site to remind construction workers of travel speed restrictions.
- Spoils, trash, and any construction-generated debris will be removed to an approved off-site disposal facility. A trash abatement program will be established. Trash and food items will be contained in closed containers and removed daily to reduce the attraction of opportunistic predators such as common ravens, coyotes, and feral cats and dogs that may prey on sensitive species.
- When handling toxic substances, construction vehicles will carry a Hazardous Material Spill Kit for use in the event of a spill. All construction personnel working on-site will be trained in using these kits. Spill containment materials must be on-site or readily available for any equipment maintenance or refueling.
- Construction workers will be prohibited from bringing domestic pets and firearms to the site.
- A SWPPP or equivalent will be prepared prior to the start of construction to comply with applicable RWQCB storm water management provisions. The SWPPP or SWPPP equivalent document will identify the design features and BMPs that will be used to effectively manage drainage-related issues (e.g., erosion and sedimentation) during construction. Erosion control measures will be regularly checked by inspectors, the qualified biologists, and/or resident engineer. Fencing and erosion control measures of all construction areas will be inspected a minimum of once per week.
- All construction activities will cease during heavy rains to prevent unnecessary erosion, runoff, and sedimentation, and will not resume until conditions are suitable for the movement of equipment and materials.
- A Weed Management Plan will be developed prior to the commencement of construction activities. The plan will include a variety of measures that will be undertaken during construction and operation activities to prevent the introduction and spread of new weed species. The plan will also address monitoring, plus educating personnel on weed identification and methods for avoiding and treating infestations. Weed control methods may include both physical and chemical control.
- No planting or seeding of invasive plant species on the most recent version of the California Invasive Plant Council (Cal-IPC) California Invasive Plant Inventory for the Project region will be permitted.
- To prevent indirect effects to sensitive natural resources from fugitive dust associated with construction of the Project, all active construction areas will be watered down as necessary. All trucks hauling soil, sand, and other loose materials will be covered or will maintain at least 2 feet of free-board. All unpaved access roads, parking areas, and staging areas at construction sites will have nonpotable water or nontoxic soil stabilizers applied as needed.
- At the completion of construction, all construction-related materials will be removed from the site.

5.2.2 Resource- Specific Construction Measures

5.2.2.1 Jurisdictional Waters and Wetlands Measures (All CUP Areas)

- Project design will avoid direct and indirect impacts to jurisdictional waters to the greatest extent feasible. Construction within jurisdictional waters will be subject to prior authorization by USACE, RWQCB, and CDFW.
- All equipment operating in and near jurisdictional waters or wetlands will be in good working condition and free of leaks. All vehicles will have drip pans during storage to contain minor spills and drips. No refueling or storage will take place within 100 feet of a drainage channel or structure. In addition, all maintenance crews working with heavy equipment will be trained in spill containment and response.
- Discharges will not permanently restrict or impede the passage of normal or expected high flows, or cause the permanent relocation or diversion of the flows.
- Where turbidity or erosion occurs or is expected to occur from drainage structures, biofilters, detention basins or other appropriate drainage catchment structures will be installed where flow conveyance occurs from a project site directly into a jurisdictional area.
- Temporary impacts to jurisdictional waters and wetlands will be recontoured to pre-construction conditions. Temporary impacts to vegetated jurisdictional waters and wetlands will also be revegetated with appropriate native vegetation or non-native compatible with the landscape palette.
- Temporary and permanent impacts to jurisdictional waters and wetlands will be mitigated either through on-site and/or off-site re-establishment and/or enhancement of jurisdictional waters and wetlands or through an approved-mitigation bank or in-lieu fee program, if one is available. The type of mitigation, mitigation location, and the final mitigation ratios will be established during the permit process for the Project's USACE Section 404 permit, the RWQCB Section 401 Water Quality Certification, and a CDFW Streambed Alteration Agreement. The federal agencies have published guidance on mitigation, i.e., the final rule for Compensatory Mitigation for Losses to Aquatic Resources that was issued by USACE and USEPA. Issuance of required permits/authorizations and preparation of a detailed mitigation plan reviewed and approved by USACE, RWQCB, and CDFW will be required before impacts to jurisdictional waters.
- Compliance for permitting may require measures additional to those identified herein. In addition, the determination of whether the project may be permitted under USACE's NWP program, or whether an individual permit will be required, will be determined formally as part of the CWA Section 404 permit process. To qualify for an NWP, the proposed action and the associated unavoidable impacts to jurisdictional waters based on final project designs must satisfy all terms and conditions of the applicable NWP, as well as all general conditions and any relevant regional conditions of the NWP program
- The wetland/waters mitigation plan will describe on-site and off-site mitigation. For all habitat restoration proposed, this plan will include details regarding site preparation (e.g., grading),

planting specifications, and irrigation design, as well as maintenance and monitoring procedures. The plan will also outline yearly success criteria and remedial measures should the mitigation effort fall short of the success criteria, and a strategy for long-term mitigation site management. Alternatively, mitigation obligations may be satisfied by participating in a fee-based mitigation program (e.g., a wetland mitigation bank) in which case, long-term management for such mitigation will be covered under the terms of the formal banking agreement or by purchasing appropriate mitigation credits from a regulatory approved bank.

5.2.2.2 Special-Status Flora Construction Measures (CUP Area 13-0047)

- Prior to the onset of construction within CUP area 13-0047, a field rare plant habitat assessment will be conducted to assess the need for focused rare plant surveys within this CUP area. Should rare plants have potential to occur in CUP area 13-0047, then surveys will be required during appropriate conditions. If focused rare plant surveys detect special-status species, the Applicant will prepare a salvage and relocation plan in coordination with CDFW.

5.2.2.3 Avian-Specific Construction Measures (All CUP Areas)

- To the extent possible, construction will occur outside the typical avian breeding season (February 15 through September 15). If construction must occur during the general avian breeding season, a pre-construction nest survey will be conducted within the impact area and a 500-foot (150-meter) buffer by qualified biologist no more than 7 days prior to the start of vegetation clearing and/or ground disturbing construction activities in any given area of the Project footprint. Construction crews will coordinate with the qualified biologist at least 7 days prior to the start of construction activity in a given area to ensure that the construction area has been adequately surveyed. An active nest is defined as active once birds begin constructing or repairing the nest in readiness for egg-laying. A nest is no longer an “active nest” if abandoned by the adult birds or once nestlings or fledglings are no longer dependent on the nest. If no active nests are discovered, construction may proceed. If active nests are observed that could be disturbed by construction activities, these nests and an appropriately sized buffer (typically a 200-foot (61-meter) buffer for nonraptor species nests and at least a 500-foot (150-meter) buffer for raptor or federally listed species nests) would be avoided until the young have fledged. Final construction buffers or setback distances will be determined by the qualified biologist in coordination with USFWS and CDFW on a case-by-case basis, depending on the species, season in which disturbance will occur, the type of disturbance, and other factors that could influence susceptibility to disturbance (e.g., topography, vegetation, existing disturbance levels, etc.). Active nests will be avoided until the young have fledged and/or the monitor determines that no impacts are anticipated to the nesting birds or their young. If vegetation clearing and/or ground disturbing construction activities ceases for 14 or more consecutive days during the nesting season in areas where suitable nesting habitat remains, repeat nesting bird surveys will be required to ensure new nesting locations have not been established within the impact area and the defined buffers.

- Construction-generated noise may result in disturbance to nesting migratory birds. The following measures will be incorporated to minimize noise generated from construction activities:
    - The qualified biologist will coordinate with contractors to ensure that heavy equipment will be repaired as far as practical from habitats where nesting birds may be present.
    - Construction equipment, including generators and compressors, will be equipped with manufacturers' standard noise-control devices or better (e.g., mufflers, acoustical lagging, and/or engine enclosures).
    - The construction contractor will maintain all construction vehicles and equipment in proper operating condition and provide mufflers on all gas- and diesel-powered equipment.
- The Project's BBCS will be implemented during the construction stage of the Project. Incidental avian carcasses or injured birds found during construction will be documented. Should a carcass be found by Project personnel, the carcass will be photographed, the location will be marked, the carcass will not be moved, and a qualified biologist will be contacted to examine the carcass. When a carcass is detected, the following data will be recorded (to the extent possible): observer, date/time, species or most precise species group possible, sex, age, estimated time since death, potential cause of death or other pertinent information, distance and bearing to nearest structure (if any) that may have been associated with the mortality, location (recorded with a Global Positioning System [GPS]), and condition of carcass.

5.2.2.4 Yuma Clapper Rail Construction Measures (CUP Area 13-0047, 13-0046, and 13-0045)

- Prior to the onset of construction within CUP area 13-0047, a field Yuma clapper rail habitat assessment will be conducted to delineate potential habitat and assess the need for focused Yuma clapper rail surveys within the Project footprint within CUP area 13-0047 and/or within a 500-foot (150-meter) buffer of the Project footprint. Should suitable Yuma clapper rail habitat occur within in CUP 13-0047, focused surveys will be conducted using methods outlined the USFWS National Marsh Bird Survey Protocol (Conway 2009). At least 3 breeding surveys will be conducted during between March 15 and April 30 (Conway 2009). Focused survey will be conducted by ornithologists with marsh bird experience. If focused Yuma clapper rail surveys detect this species, the Applicant will consult with USFWS.
- Prior to the onset of construction within CUP areas 13-0046 and 13-0045 a field Yuma clapper rail habitat assessment will be conducted to delineate potential habitat within the Project footprint within CUP areas 13-0046 and 13-0045 and/or within a 500-foot (150-meter) buffer of the Project footprint in these CUP areas. No Yuma clapper rail habitat will be removed within these CUP areas. Additionally, no project-related construction, clearing or ground disturbing activities within CUP areas 13-0046 and 13-0045 will occur within 250-feet of potential Yuma clapper rail habitat during the breeding season (February 15 through June 30).

5.2.2.5 Burrowing Owl Construction Measures (All CUP Areas)

- A qualified biologist will be on-site during all ground-disturbing construction activities in potential BUOW habitat. The qualified biologist will be responsible for implementing and overseeing BUOW avoidance and minimization measures. The qualified biologist will have the authority to stop construction activities if WRS is in violation of avoidance and minimization measures.
- Per CDFW guidance (CDFW 2012), a take avoidance survey (i.e., pre-construction clearance survey) will be conducted by a qualified biologist to determine presence or absence of BUOW no less than 14 days and no more than 30 days prior to initiating construction activities. Surveys will include areas within the Project footprint and a surrounding 500-foot (150-meter) buffer. The survey will consist of walking parallel transects and noting any fresh BUOW sign or presence of BUOW. The results of the take avoidance survey will be provided to CDFW. If more than 30 days pass between the take avoidance survey and initiation of Project activities, additional take avoidance surveys may be required, depending on what actions have been implemented to deter BUOW from moving into the Project footprint and buffer area. A final take avoidance survey will be conducted within the Project footprint within 24 hours prior to initiation of construction activities. Given the total duration of construction and the size of the Project, it is expected that take avoidance surveys will be conducted in phases, in order to stay within the required survey windows associated with construction activities.
- If occupied burrows are found during take avoidance surveys, appropriate construction buffers or setback distances will be determined by the qualified biologist on a case-by-case basis, depending on the season in which disturbance will occur, the type of disturbance, and other factors that could influence susceptibility to disturbance (e.g., topography, vegetation, existing disturbance levels, etc.). To the extent feasible, buffers of 246 feet (75 meters) will be used during the breeding season (February 1 through August 31) and 164 feet (50 meters) will be used during nonbreeding season (September 1 through January 31). “Shelter in place” techniques will be used if necessary to create a visual and auditory barrier between construction activities and the occupied burrow. Techniques will include placing hay bales, fencing, or another physical barrier between the occupied burrow and construction activities. The qualified biologist will determine if and/or when shelter in place is necessary and feasible for implementation. When construction activities commence adjacent to the buffer area, a qualified biologist will be present on-site full time to monitor the behavior of BUOW for at least 3 days. The qualified biologist will have the authority to increase the setback distance if there are signs of disturbance, such as changes in behavior as a result of construction or other indications of distress by BUOW.
- If BUOW activity is detected at a burrow within the Project footprint during the nonbreeding season (September 1 through January 31), BUOW will be excluded from active burrows and encouraged to passively relocate to suitable, unoccupied habitat outside of the exclusion area. BUOW will be excluded by installing one-way doors in burrow entrances. Although passive relocation does not result in control of the recipient area for BUOW, the qualified biologists will verify that there is an acceptable “recipient” area within a reasonable distance that provides the necessary subsidies to support BUOW with the goal to minimize the stress

of relocation. Subsidies to be considered include suitable burrows (primary and satellite) and habitat quality (e.g., vegetation cover, diversity) that is equal to or greater than that from which they were relocated. If, during pre-construction surveys, BUOW activity is detected at a burrow within the Project footprint during the breeding season (February 1 through August 31), then an appropriate construction buffer or setback distance will be determined by the qualified biologist on a case-by-case basis. This buffer will be flagged and all Project-related activity will remain outside of the flagged area until a qualified biologist determines the burrow is no longer occupied (e.g., juveniles are foraging independently and are capable of independent survival).

- The LOA and CSP (2014) BUOW occupancy analysis and modeling determined that the Project will result in impact to 614 acres (248 hectares) of core BUOW foraging habitat at full buildout (Appendix H). The Project Applicant shall mitigate for a loss of up to 614 acres of core burrowing owl foraging habitat at a 1:1 base mitigation ratio using any of the following compensatory mitigation strategies alone or in combination:
    - Securing conservation easements or other similar protections over farm land in the Imperial Valley
    - Paying in-lieu fees to a qualified entity that shall use the fees to secure conservation easements or other similar protections over farm land in the Imperial Valley
    - Implementing a Burrowing Owl Farm Contract Plan developed and approved by CDFW
- The Burrowing Owl Farm Contract Plan will compensate for impacts to core foraging habitat through short-term contracts with farmers who would agree, and be compensated for, planting and maintaining burrowing owl-friendly foraging crops, e.g., wheat, alfalfa, based on the LOA and CSP (2014) analysis. The short-term contracts may also include a commitment to implement burrowing owl safe farming practices to reduce on-farm mortality to burrowing owls. In some limited cases, the Burrowing Owl Farm Contract Plan may use conservation easements or other similar permanent protections as a part of an overall foraging habitat compensatory mitigation portfolio.
- The Project Applicant will prepare a Burrowing Owl Farm Contract Plan in cooperation with representatives from the Imperial Valley farming community, CDFW, and USFWS. The Burrowing Owl Farm Contract Plan will include the following:
    - Identify a qualified implementing entity(ies), such as the Imperial Valley Community Foundation-Burrowing Owl Stewardship and Education Fund (IVCF-BOSEF) to enroll farmers in Burrowing Owl Farm Contracts (Farm Contracts), hold the endowment(s) to fund the Burrowing Owl Farm Contract Plan, and implement monitoring and reporting.
    - Specify crops eligible for Farm Contracts, e.g., durum wheat, alfalfa
    - Specify Burrowing Owl Safe Farm Practices (BOSFP) that would be implemented through Farm Contracts to reduce on-farm owl mortality through, e.g., worker education programs, marking nest burrows. For farm land enrolled in Farm Contracts

that include requirements to implement BOSFP, impacts to core BUOW foraging habitat will be mitigated at a ratio reduced from the 1:1 ratio for land enrolled in Farm Contracts for (only) crop type and consistency. The Burrowing Owl Farm Contract Plan will finalize the reduced ratio (recommended in the LOA/CSP Report at 0.7:1) to reflect the combined benefit of crop type and patterns using BOSFP through short-term Farm Contracts (Table 18).

- Run a Property Analysis Record (PAR) or PAR-like analysis to develop a long-term financing plan; the Project Applicant will fund a non-wasting endowment account sufficient to fund the Burrowing Owl Farm Contract Plan for the life of the project (30 years).
- Establish a Farm Contract incentive plan, including how to compensate farmers for entering into and successfully executing Farm Contracts, and eligibility requirements
- Identify minimum duration of Farm Contracts and other Farm Contract management practices
- Establish an accounting mechanism for tracking acreage enrolled in Farm Contracts
- Identify options for "make up" acreage for Farm Contracts that are not properly implemented
- Establish a monitoring and reporting program
- Describe use of adaptive management in the implementation of the Burrowing Owl Farming Contract Plan, such as changes to BOSPs and Farm Contract duration
- Allow for purchase of conservation easements and include mechanism to provide long-term funding to enroll lands in agricultural conservation easements with a requirement to implement BOSFP, under the discretion of the implementing entity. The Burrowing Owl Farm Contract Plan will finalize a reduce mitigation ratio to reflect the added conservation value of restricting land under an agricultural easement to implement BOSFP; the proposed mitigation ratio is 0.5:1 (Table 18).

The total number of acres encumbered at any one time (as Farm Contracts will be short-term agreements) will depend on the portfolio of Farm Contracts, i.e., whether a property is implementing burrowing owl-friendly crops only or also implementing BOSFP, and the quantity of acres in conservation easements (LOA and CSP 2014).

- In the event that BUOW will be excluded from the Project footprint and occupied burrows will be impacted, a mitigation site with suitable burrows and habitat must be secured. A BUOW Exclusion Plan must be developed and approved by CDFW prior to excluding BUOW from burrows. Specific objectives for BUOW protection addressed by this Plan are to describe exclusion methodology, burrow excavation procedures, identification of artificial burrow sites, and post-relocation monitoring and reporting.
- Occupied BUOW burrows directly impacted will be replaced by installing artificial burrows on mitigation sites (i.e., conservation easements, in-lieu fee lands, Farm Contract land), or other land as agreed to by CDFW, at a ratio of 1:1. If the mitigation sites identified for the Project

have at least two suitable BUOW burrows for each occupied burrow directly impacted, then artificial burrows will not be installed. Suitable burrows are defined as burrows greater than approximately 4 inches (10 centimeters) in diameter (height and width) and greater than approximately 60 inches (150 centimeters) in depth (Johnson et al. 2010). Burrows will be scoped to ensure they are of proper depth for BUOW.

Table 18
Compensation for Core Burrowing Owl Foraging Habitat Under the Burrowing Owl Farm Contract Plan (acres)

CUP Area	Core Foraging Habitat Impacts	Base Burrowing Owl Friendly Crops/ Consistency (1:1)	Burrowing Owl Friendly Crops/ Consistency + BOSFP (0.7:1)[1]	Conservation Easements + BOSFP (0.5:1)[1]
CUP 13-0036	123.7	123.7	86.6	61.9
CUP 13-0037	6.9	6.9	4.8	3.5
CUP 13-0038	0.0	0.0	0.0	0.0
CUP 13-0039	7.8	7.8	5.5	3.9
CUP 13-0040	37.9	37.9	26.6	19.0
CUP 13-0041	0.0	0.0	0.0	0.0
CUP 13-0042	0.0	0.0	0.0	0.0
CUP 13-0043	133.2	133.2	93.2	66.6
CUP 13-0044	0.0	0.0	0.0	0.0
CUP 13-0045	28.6	28.6	20.0	14.3
CUP 13-0046	14.7	14.7	10.3	7.4
CUP 13-0047	0.4	0.4	0.3	0.2
CUP 13-0048	9.1	9.1	6.4	4.6
CUP 13-0049	1.9	1.9	1.3	1.0
CUP 13-0050	99.6	99.6	69.7	49.8
CUP 13-0051	150.2	150.2	105.2	75.1
CUP 13-0052	0.0	0.0	0.0	0.0
Total	**614.0**	**614.0**	**430.0**	**307**

[1]Reduced ratios reflect added conservation value of implementing BOSFP through (short-term) Farm Contracts and perpetual conservation easements. Ratios shown are proposed and will be finalized in Burrowing Owl Farm Contract Plan.

5.3 OPERATIONS AND MAINTENANCE MEASURES

This section describes O&M avoidance and minimization measures that will be implemented as part of the Project. Note that several project design features and construction-phase measures identified in Sections 5.1 and 5.2 also mitigate impacts during the O&M phase of the Project. O&M avoidance and minimization measures are divided into general and avian-specific measures. General measures are applicable for avoidance and minimization of direct and indirect O&M impacts to all biological resources discussed in Section 4.3. Resource-specific measures are applicable for avoidance, minimization, and mitigation of direct and indirect O&M impacts to avian species discussed in Section 4.3.

5.3.1 General Operations Measures (All CUP Areas)

- Develop and implement an O&M Worker Education Plan to advise personnel on general operations measures.
- Operation and maintenance personnel will be prohibited from:
    - Harming, harassing, or feeding wildlife and/or collecting special-status plant or wildlife species.
    - Traveling (either on foot or in a vehicle) outside of Project footprint except on public roads.
    - Littering on the Project area.
    - Allowing persons not employed at the facility to remain on site after daylight hours or exceeding normal nighttime operational noise or lighting.
- All O&M equipment, including cranes and personnel, will stay within the permanent impact footprint of the Project, except when not physically feasible or when necessary to protect human life or property. O&M vehicles will be parked in designated areas and away from sensitive habitats.
- Nighttime and daytime vehicle speeds within the project property will be restricted to 10 miles per hour and 25 miles per hour, respectively. Speed limit signs will be posted throughout the site to remind O&M workers of travel speed restrictions.
- The Project site will be kept clear of trash and other litter to reduce the attraction of opportunistic predators such as common ravens, coyotes, and feral dogs that may prey on sensitive species.
- O&M employees will maintain Hazardous Materials Spill Kits on-site. All O&M staff will be trained in how to use kits in the event of a spill.
- O&M employees will be prohibited from bringing domestic pets and firearms to the site.
- The Weed Management Plan will continue to be implemented during O&M stages of the Project (see Section 5.2.1).
- The General Construction Permit will specify post-construction storm water control standards, and preparation and implementation of a Long-Term Maintenance Plan for the retention/detention basins.

5.3.2 Avian-Specific Operations and Maintenance Measures (All CUP Areas)

- To the extent possible, O&M activities requiring vegetation clearing or trimming will occur outside the general avian breeding season (February 15 through September 15). If vegetation clearing or trimming must occur during the general avian breeding season, a pre-construction nest survey will be conducted within the impact area and a 500-foot (150-meter) buffer by a qualified biologist no more than 7 days prior to the start of clearing or trimming. An active nest is defined as active once birds begin constructing or repairing the nest in readiness for egg-laying. A nest is no longer an “active nest” if abandoned by the adult birds or once nestlings or

fledglings are no longer dependent on the nest. If no active nests are discovered, clearing or trimming may proceed with no additional measures. If active nests are observed that could be disturbed by construction activities, appropriate construction buffers or setback distances will be determined by the qualified biologist on a case-by-case basis, depending on the species, season in which disturbance will occur, the type of disturbance, and other factors that could influence susceptibility to disturbance (e.g., topography, vegetation, existing disturbance levels, etc.). Active nests will be avoided until the young have fledged and/or the monitor determines that no impacts are anticipated to the nesting birds or their young. If clearing or trimming ceases for 14 consecutive days following which clearing or trimming is reinitiated during the nesting season, additional nesting bird surveys may be required.

- The Project's BBCS will be implemented during the O&M stage of the Project. The BBCS will include post-construction avian mortality monitoring and adaptive management programs.

5.4 DECOMMISSIONING MEASURES

This section describes decommissioning avoidance, minimization, and mitigation measures that will be implemented as part of the Project. Decommissioning avoidance and minimization measures are divided into general and avian-specific measures. General measures are applicable for avoidance and minimization of direct and indirect decommissioning impacts to all biological resources discussed in Section 4.4. Resource-specific measures are applicable for avoidance, minimization, and mitigation of direct decommissioning impacts to avian species discussed in Section 4.4.

5.4.1 General Decommissioning Measures (All CUP Areas)

- All mitigation measures required during construction of the Project to avoid or minimize impacts to biological resources will also be required during decommissioning activities.
- Decommissioning of the Project will minimize new site disturbance and removal of native vegetation to the maximum extent possible.
- Topsoil removed during decommissioning will be stockpiled and used as topsoil during restoration efforts associated with decommissioning disturbance.
- Soil will be stabilized and revegetated with plant species characteristic of native species within adjacent habitats, except where immediately reclaimed as agriculture. Local seed sources will be used where feasible.
- Surface water flows will be restored to pre-disturbance conditions. Unnecessary stream crossings, roads, and pads will be removed and revegetated. Erosion control measures will be installed in all disturbance areas.
- Petroleum and chemical spills will be remediated prior to the completion of decommissioning.

5.4.2 Avian-Specific Specific Decommissioning Measures (All CUP Areas)

- Unnecessary overhead powerlines and poles will be removed from the site.

6.0 Cumulative Effects

The Project's potential impacts to biological resources are reduced to a less than significant level with the implementation of the avoidance, minimization, and mitigation measures outlined within Chapter 5. However, based on the geographic extent of cumulative projects' potential impacts to agricultural land within the Imperial Valley and the importance of the Imperial Valley for many wildlife species' life history, this section will address the potential cumulative loss of foraging habitat for those species discussed in Chapter 4 that use agricultural lands for foraging. A complete discussion of Project-related loss of agricultural-related foraging habitat is presented in Chapter 4.

6.1 GEOGRAPHIC SCOPE

The geographic scope for considering cumulative impacts on species that use farm fields for foraging includes the entire irrigated Imperial Valley, which is part of the Pacific Migration Flyway for birds migrating between as far south as South America and as far north as the arctic circle, and serves as an important stopover site for many species for rest and foraging, and, for some, as breeding grounds. Table 19 below identifies the list of cumulative projects that were considered for this analysis. The list below was cross checked against the County's list of renewable energy projects which totals about 20,000 acres (8,094 hectares) converted from agricultural uses to other land uses that generally do not support avian species' breeding or foraging needs (Imperial County Planning Service 2014). In addition, approximately 87,000 acres (35,207 hectares) of agricultural fields generally used for row crops and other crop types typical in the Imperial Valley will be planted with sugarcane and/or sorghum.

Table 19
Proposed, Approved, and Reasonably Foreseeable Projects in Imperial County

Name of Project	Use	Project Description	Status	Impacts
Calexico I-A	Photovoltaic Solar Facility	A 100-megawatt solar facility on approximately 666 acres generally located 6 miles west of the City of Calexico. This project was under construction at the time the traffic counts were collected; therefore, the cumulative traffic is accounted for within the existing baseline data.	Approved	666 acres of agricultural land
Calexico I-B	Photovoltaic Solar Facility	A 100-megawatt solar facility on approximately 666 acres generally located 6 miles west of the City of Calexico.	Approved	666 acres of agricultural land
Calexico II-A	Photovoltaic Solar Facility	A 100-megawatt solar facility on approximately 733 acres generally located 6 miles west of the City of Calexico.	Approved	733 acres of agricultural land

Name of Project	Use	Project Description	Status	Impacts
Calexico II-B	Photovoltaic Solar Facility	A 100-megawatt solar facility on approximately 732 acres generally located 6 miles west of the City of Calexico.	Approved	732 acres of agricultural land
Campo Verde Solar	Photovoltaic Solar Facility	A 140-megawatt solar generation facility generally located 7 miles southwest of the City of El Centro, California, south of Interstate 8 and west of Drew Road.	Approved; construction completed	2,200 acres of agricultural land
Centinela Solar	Photovoltaic Solar Facility	A 275-megawatt solar facility generally located in the vicinity of SR-98 and Drew Road.	Approved; under construction; approximately 90% complete	2,067 acres of agricultural land
County Center II Expansion	Mixed Use	Commercial center, expansion of the Imperial County Office of Education, a Joint-Use Teacher Training and Conference Center, Judicial Center, County Park, Jail expansion, County Administrative Complex, Public Works Administration, and a County Administrative Complex located on the southwest corner of McCabe Road and Clark Road.	Draft EIR, June 2010; under review, no construction planned in 2014	
IV Substation and SDG&E Ocotillo Solar	Transmission Interconnection	Project connecting the Imperial Irrigation District's "S" line from the Imperial Irrigation District substation to the Imperial Valley substation and a photovoltaic solar facility capable of producing approximately 14 megawatts of electricity on approximately 100 acres located adjacent to the SDG&E Imperial Valley Substation.	Drew Switchyard completed	160 acres on BLM managed desert lands
Imperial Solar 1 LLC (Heber Solar Energy Facility)	Photovoltaic Solar Facility	A solar facility on approximately 80 acres generally located in the vicinity of Dogwood Road south of E. Heber Road.	Approved	80 acres of agricultural land
Imperial Solar Energy Center South	Photovoltaic Solar Facility	A 200-megawatt solar facility on approximately 950 acres generally located south of SR-98 and east of Drew Road.	Construction complete	950 acres of agricultural land
Imperial Solar Energy Center West	Photovoltaic Solar Facility	A 250-megawatt solar facility on approximately 1,130 acres generally located east of Dunaway Road and both north and south of I-8.	Approved	1,130 acres of designated agricultural land that has not been farmed in over 20 years

Name of Project	Use	Project Description	Status	Impacts
Canergy	Ethanol	Cellulosic bio-fuel ethanol/chemical manufacturing facility and growth of cane crops.	Proposed	~12, 500 acres of cropping pattern changed from traditional to sugarcane-type crop that looks like Sudan grass
California Ethanol and Power	Ethanol, electricity, and bio-methane facility	Ethanol, electricity, and bio-methane facility on approximately 158.2 acres, located approximately 4.5 miles south-southeast of the City of Brawley; and, 41,000 acres of sugarcane supplemented by 33,000 acres of sweet sorghum.	Approved	160 acres of agricultural land plus fuel supply that has a potential to convert 74,000 acres of traditionally cropping pattern to sugarcane and sorghum
IRIS Solar Farm	Photovoltaic Solar Facility	A 200-megawatt solar facility located north of SR-98 between Brockman Road and Weed Road.	Proposed. NOP underway	1,400 acres of agricultural land
Linda Vista	Mixed Use	A mixed-use project of 182 single-family homes and a 6-acre commercial lot generally located on the west side of Clark Road between Interstate 8 and McCabe Road.	Proposed	Still in permitting process
Mount Signal Solar Farm I	Photovoltaic Solar Facility	A 200-megawatt solar facility on approximately 1,375 acres generally located south of SR-98 between Pulliam Road and Ferrell Road. This project was under construction at the time the traffic counts were collected; therefore, the cumulative traffic is accounted for within the existing baseline data.	Currently under construction	1,375 acres of agricultural land

Another potential source of cumulative loss of farm fields as foraging habitat not included in Table 19 is the Quantification Settlement Agreement (QSA), the State Water Resources Control Board (SWRCB) orders, and IID Water Transfer Agreement. According to IID's Equitable Distribution Plan Negative Declaration (2006), IID implemented a rotation fallowing program to successfully create conserved water to deliver to the Salton Sea with IID plans to increase fallowing incrementally to a maximum of about 25,000 acres (10,117 hectares).

The IID's Equitable Distribution Plan (EDP) allows for agricultural fallowing in the event of a supply/demand imbalance (SDI) to generate water to satisfy its legal obligations under the SWRCB orders, QSA, and/or Water Transfer Agreement. By October of each year, the IID staff forecast water demand and available supply and recommend whether there will be a SDI. The decision to recommend and adopt an SDI and implement fallowing under the EDP may take into account land that is already "fallowed" by renewable energy projects, including the proposed Project.

Figure 3 of the Negative Declaration shows that the IID's EDP fallowing program's impacts are less than significant in comparison with the historic variation in "natural" fallowing levels in Imperial Valley (see Table 20 below) (IID 2006). The IID's EDP Negative Declaration also analyzed the cumulative impacts of the EDP's fallowing program and concluded "Because there are no [biological resource] environmental impacts associated with implementation of the EDP, there are no cumulative impacts to consider" (IID 2006). This BTR incorporates this conclusion by reference into this cumulative impacts analysis.

Table 20
Agricultural Crop History for 2005–2012 in the Imperial Valley[1]

Year	Total (Acres)	Variation (acres)
2012	434,583	27,728
2011	406,855	4,802
2010	402,053	(13,312)
2009	415,365	(61,517)
2008	476,882	63,165
2007	413,717	(22,357)
2006	436,074	28,497
2005	407,577	
Average	*424,138*	

[1] Estimated field crops and alfalfa and Bermuda for seed; Variation from Prior Year;
Source: Imperial County (2006–2012)

However, the QSA has caused IID to fallow farmland in order to conserve water. IID's recent solar fallowing program requires land converted to solar energy use to enter a fallowing program that helps the IID meet its obligations under the QSA and results in an offset to the IID's fallowing requirements. This allows land that would have been fallowed to continue to be farmed. Thus, renewable energy projects, which comprise the bulk of the 20,000 acres (8,094 hectares) of potential impact, provide an offset of IID's fallowing obligations and thus the net amount of irrigated agricultural land is still available for foraging.

The IID plans to phase out EDP fallowing by 2018 (IID 2013). Thus, losses due to IID's EDP fallowing that are not offset by solar fallowing will overlap with Project-related loss of agriculture for up to 3 years. For these reasons, IID's EDP fallowing program's impacts associated with loss of foraging opportunities on farm fields are not considered any further in this cumulative discussion.

The California Ethanol and Power Project and the Canergy ethanol project listed in Table 19 are of concern to USFWS due to the conversion of vegetable and hay fields to sugarcane and sweet sorghum (USFWS 2012b). The Imperial County Agricultural Commissioner's Office and the Imperial County Farm Bureau provided a response to the USFWS and noted that "The diversification of [sugarcane and sorghum] crops can vary dramatically from year to year depending on the economics

of a particular crop. In the past 50 years along we have seen sorghum peak at 150,000 acres (60,703 hectares) and drop to our current 520 acres (210 hectares). We have a constantly evolving cycle as new crops have been added while others have fallen out of favor…. " (Imperial County Farm Bureau 2013; Imperial County Agricultural Commissioner 2013). The Imperial County Agricultural Commissioner's Office and the Imperial County Farm Bureau response letters also included a discussion of the continued foraging opportunities provided by the ethanol projects, consistent with existing and traditional cropping patterns. For these reasons, impacts associated with conversion of cropping patterns to accommodate crops to support ethanol production, i.e., the California Ethanol and Power Project and the Canergy ethanol project, are not considered any further in this cumulative discussion.

6.2 ANALYSIS

Loss of agriculture

As described above, cumulative projects considered for their potential significant cumulative loss to foraging habitat would result in an approximately 20,000-acre (8,094-hectare) conversion of agricultural land use to a nonagricultural land use. Like the Proposed Action, which will result in a long-term fallowing of agricultural land, most other cumulative projects identified in Table 19 will also result in a long-term fallowing/agricultural land use conversion. Unlike a permanent conversion of agricultural land to urban or industrial use, the solar projects are considered long-term fallowing because they are required to restore the sites back to agricultural use.

The Project and all cumulative projects must comply with requirements that reduce and mitigate their impacts on biological resources. Among the statutory and regulatory requirements that the Project and cumulative projects may be required to comply with, and that may reduce the effects of reduced farm fields for foraging for those animal species identified in Section 4, are the Federal ESA, MBTA (16 U.S.C. 703 et seq.), and CFGC Sections 3503.5, 3503, and 3513.

CDFW mitigation guidelines for BUOW (CDFW 2012) define mitigation measures to avoid and minimize direct effects to BUOW during construction activities as well as provide compensatory mitigation for indirect effects caused by loss of foraging habitat. Project proponents generally incorporate the 2012 CDFW Staff Report's recommendations to reduce proposed project impacts on BUOW foraging habitat to less than significant in their CEQA document (e.g., EIR, mitigated negative declaration) by protecting agricultural lands through a conservation easement or acquisition of fee title and lease back for agricultural use.

The County of Imperial General Plan has provisions to protect biological resources, as well as stringent measures to protect agricultural land uses in the Imperial Valley. Regional land designations also provide protection for wildlife species and biological resources. The California Desert Conservation Area (CDCA) encompasses 25 million acres (10 million hectares) of land in southern California that were designated by the Federal Lands and Policy Management Act. The Bureau of Land Management (BLM) directly administers approximately 10 million acres (4 million hectares) of the CDCA. The CDCA Plan-designated Yuha Basin ACEC Management Plan was prepared to give additional protection to unique cultural resource and wildlife values found in the region, while also

providing for multiple use management. While the Yuha Basin ACEC is not farmed land, it is adjacent to the Imperial Valley agricultural matrix and provides natural habitats that provide foraging opportunities for wildlife species.

As discussed above, cumulative agricultural losses are estimated to impact a total of 20,000 acres (8,094 hectares) of the 565,372 acres (228,798 hectares) of irrigated farmland in the Imperial Valley. Foraging lands within the Imperial Valley Agricultural Complex surrounds El Centro and spans from Mexico to the Salton Sea. In 2012, the Imperial County Agricultural Crop and Livestock Report (Imperial County 2012) reported approximately 396,839 acres (160,595 hectares) of field crops being grown within this large agricultural complex, including primarily alfalfa hay, Bermuda grass hay, Kleingrass hay, pastured crops, Sudan grass hay, and wheat. An additional 37,744 acres (15,274 hectares) of primarily alfalfa and Bermuda grass were grown as seed crops (Imperial County 2012), totaling over 434,583 acres (175,870 hectares) of alfalfa and grass crops. However, as documented in Table 20, the amount of land in agricultural production varies widely from year to year.

The approximately 20,000 acres (8,094 hectares) of agricultural land expected to experience long-term conversions to nonagricultural uses by cumulative projects, is well within the annual variation of amount of land in agricultural production. Furthermore, a net loss of approximately 20,000 acres (8,094 hectares) of foraging habitat within the (average) 424,138-acre (171,643 hectares) alfalfa and grass crops complex (Table 20) represents less than a 5 percent loss.

Mitigation for loss of BUOW foraging habitat (agricultural fields) provided by the Project (the equivalent of 614 acres (248 hectares) of core foraging habitat through short-term farm agreements or conservation easements contributes to the other cumulative projects' mitigation that are also conserving farm field foraging lands for the benefit of BUOW and other wildlife species. For these reasons, cumulative impacts from the Project and those cumulative projects in Table 19 identified to have potentially significant foraging habitat impacts would be less than significant.

Loss of wetlands and waters

The Federal Wetland Permitting Program: Avoidance and Minimization Requirements (Environmental Law Institute, March 2008), states that the Los Angeles District's final mitigation guidelines and monitoring requirements contain several lengthy references to alternatives analysis, avoidance, and minimization. Guidelines state that no discharge of dredged or fill material will be permitted if there is a practicable alternative available to the proposed discharge that would have less adverse impact on the aquatic ecosystem, if the alternative does not have other significant adverse environmental consequences. Practicability is defined in terms of cost, logistics, and existing technology in light of the overall project purpose. An applicant is required to notify the Corps regarding authorization under an existing General Permit; it is likely that the USACE Los Angeles District's verification letter/notice to proceed will require compensatory mitigation. Clearly, the sequence of avoidance, minimization, and compensatory mitigation specified by the Section 404(b)(1) Guidelines and the Mitigation Memorandum of Agreement is fundamental to the administration of the USACE's regulatory program. USACE strives to avoid or minimize adverse impacts to waters of the U.S., and to achieve a goal of no net loss of wetland functions and values. Implementation of USACE's permitting policy directive of

no net loss of wetland function and values will result in the proposed Project not contributing to a significant cumulative biological resources impact.

The Federal Clean Water Act and California's Porter-Cologne Water Quality Control Act provide protection for water-related biological resources by controlling pollution, setting water quality standards, and preventing jurisdictional streams, lakes, and rivers from being filled without a federal permit. The proposed Project would comply with these and other laws, regulations and guidelines and therefore would not contribute substantially to a cumulative biological resources impact. Similarly, the cumulative actions within the geographic scope of the proposed Project (Table 19) will be required to comply with the legal frameworks set forth above, as well as others. The cumulative actions will be required to mitigate their impacts to a less than significant level. Because the identified laws, regulations and guidelines are implemented at the federal, State, and local level through NEPA, CEQA, and local planning compliance, they form comprehensive protection scheme for the biological resources identified in Chapter 4.

As with the proposed Project, each of the projects identified in Table 19 would also be required to provide mitigation for any unavoidable impacts to wetlands and jurisdictional waters. Additionally, a majority of the cumulative projects' potential impacts are the result of a loss of agricultural land. As discussed above, normal crop rotation practices and the reduced need for IID fallowing may offset these potential impacts. For these reasons, the cumulative impact to wetlands and jurisdictional waters from the Project and cumulative projects identified in Table 19 would be less than significant.

Finally, BLM and Department of Energy (DOE) analyzed the cumulative impacts of solar development across a six-state study area on biological resources in the Final Solar Programmatic Environmental Impact Statement (PEIS) (BLM and DOE 2012; see page 6-96). BLM and DOE concluded that cumulative impacts on wildlife from foreseeable development in the six-state region would be small provided mitigation measures to preserve important habitat and migration corridors are implemented (or sufficient alternative lands are set aside as compensation).

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Appendix A – RECON Jurisdictional Waters Delineation Report for the Wistaria Ranch Solar Energy Center Project

RECON

Jurisdictional Waters Delineation Report for the Wistaria Ranch Solar Energy Center Project

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1: Field Data Forms
2: Preliminary Jurisdictional Determination Form

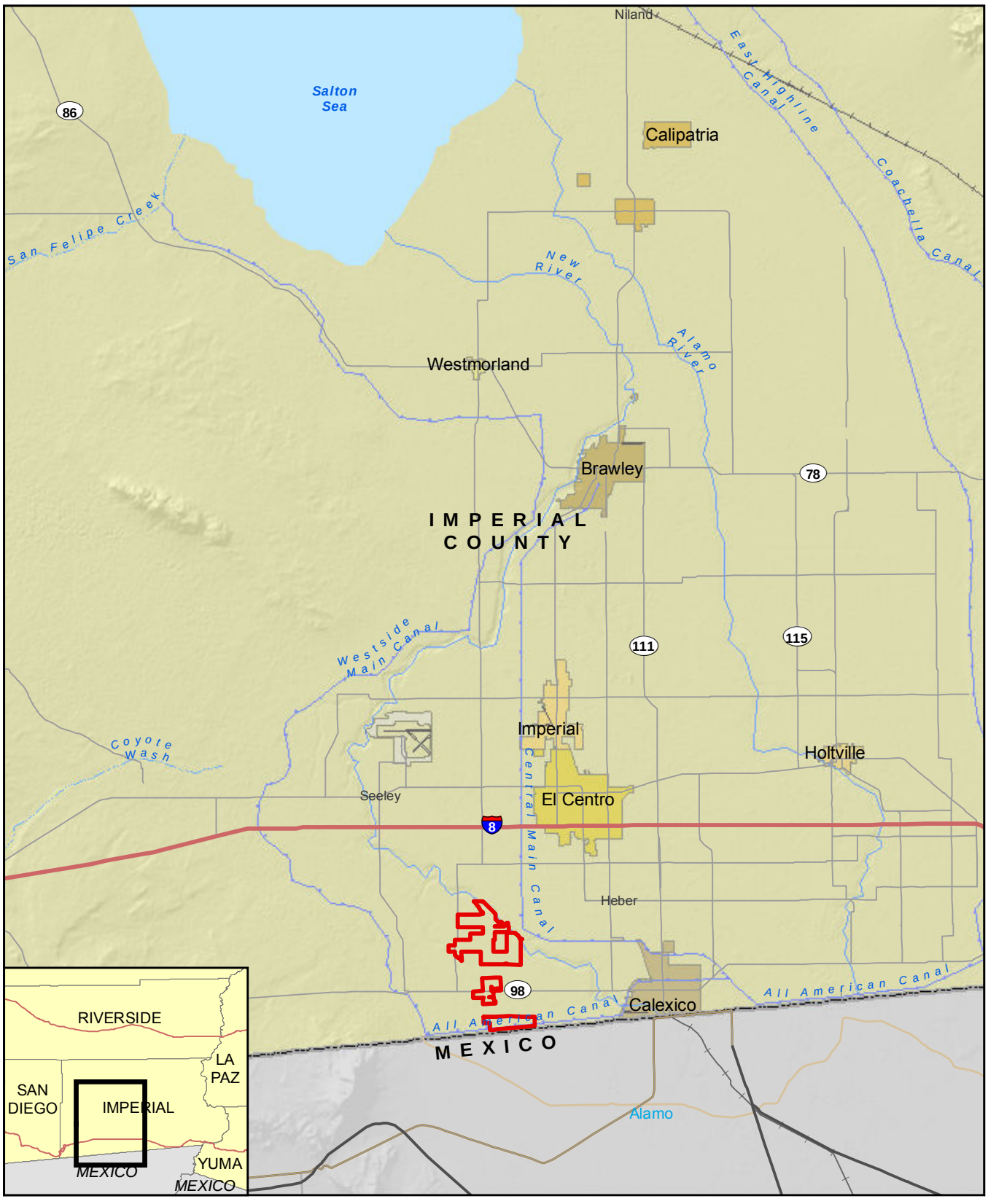
1.0 Summary of Findings

RECON biologists conducted a routine jurisdictional waters delineation within the Wistaria Ranch Solar Energy Center project area. The project survey area is located in the county of Imperial on agricultural lands north and south of State Route 98 with a proposed south and then easterly transmission line corridor. The transmission line corridor from this project will connect to an existing transmission line that terminates at the Imperial Valley Substation. Methods for delineating wetlands followed guidelines set forth by the U.S. Army Corps of Engineers (ACOE), including *Final Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (ACOE 2008a) and *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States: A Delineation Manual* (ACOE 2008b*)*. Jurisdictional waters of the State were also delineated in accordance with the California Department of Fish and Game (CDFW) and Regional Water Quality Control Board (RWQCB), as described later in this report. A Preliminary Jurisdictional Determination Form that addresses the natural drainage features on the site is included as an attachment to this report.

2.0 Introduction

This report describes the results of the jurisdictional waters delineation conducted within the Wistaria Ranch Solar Energy Center project survey area. The results of the delineation are used to identify and map the extent of the federal jurisdictional waters of the U.S. and waters of the State, including any adjacent wetlands.

The proposed Wistaria Ranch solar project is made up of a photovoltaic facility site and an electrical transmission line corridor. The site of the proposed photovoltaic facility is located on 3,177 acres of privately owned land, with the majority of the land utilized for agricultural production. The photovoltaic site is located in the unincorporated area of the county of Imperial, approximately 4.5 miles southwest of the city of El Centro (Figure 1). The Wistaria Ranch project area is located mostly east of Brockman Road, west of Ferrell Road, south of Schaniel Road, and north of the international border with Mexico (Figure 2). The site is bisected by State Route 98.



Wistaria Ranch Project Boundary

FIGURE 1

Regional Location

RECON

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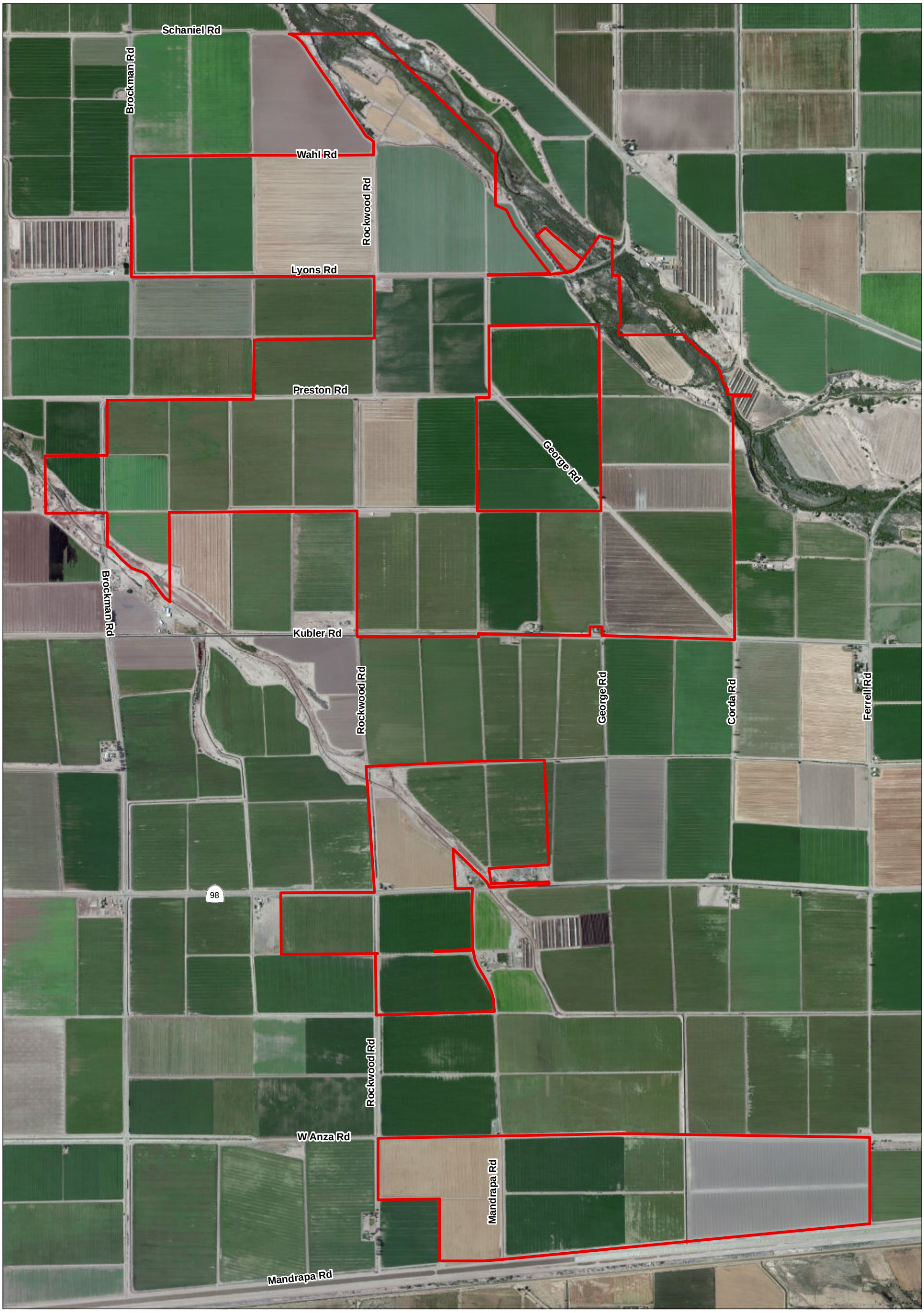
Image source: NAIP (flown April 2010)



Wistaria Ranch Project Boundary

FIGURE 2

RECON

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Wistaria Ranch Project Location on Aerial Photograph

3.0 Methods and Jurisdictions

A routine wetland delineation, following the guidelines set forth by ACOE (1987, 2008a, 2008b), was performed to gather field data at potential jurisdictional waters in the survey area. Prior to conducting the delineation, aerial photographs and U.S. Geological Survey (USGS) topographic maps of the site were examined. Once on-site, the potential federal and state jurisdictional areas were examined to determine the presence and extent of any jurisdictional waters.

3.1 U.S. Army Corps of Engineers

As stated in the federal regulations for the Clean Water Act (CWA), wetlands are defined as:

> . . . those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances, do support a prevalence of vegetation typically adapted for life in saturated soil conditions (Environmental Protection Agency, 40 Code of Federal Regulations [CFR] 230.3 and CE, 33 CFR 328.3).

In the *Headwaters Inc. v. Talent Irrigation District* court case decided by the Ninth Circuit in 2001, the court determined that the irrigation canals were tributaries because they are "streams which contributes their flow to a larger stream or other body of water." Tributaries are "waters of the United States" and are subject to the requirements of the CWA.

In 2006, the United States Supreme Court decided *Rapanos v. United State and Carabell v. United States,* 126 S. Ct. 2008 (2006) ("Rapanos"), which were consolidated cases determining the extent of ACOE's jurisdiction over waters of the United States under the CWA. Interpreting these decisions, and according to the Rapanos Guidance Memorandum, the ACOE and the U.S. Environmental Protection Agency (USEPA) assert jurisdiction of the following waters:

- Traditional navigable waters;
- Wetlands adjacent to traditional navigable waters;
- Non-navigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow year-round or have continuous flow at least seasonally (e.g., typically three months); and

- Wetland that directly abut such tributaries.

The ACOE and USEPA will decide jurisdiction over the following waters based on a fact-specific analysis to determine whether they have a significant nexus with a traditional navigable water:

- Non-navigable tributaries that are not relatively permanent;
- Wetlands adjacent to non-navigable tributaries that are not relatively permanent; and
- Wetlands adjacent to but do not directly abut a relatively permanent non-navigable tributary.

Where a significant nexus analysis is required, the ACOE and USEPA will apply the significant nexus standards as follows:

- A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by all wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of downstream traditional navigable waters; and
- Significant nexus includes consideration of hydrologic and ecologic factors.

The ACOE and USEPA generally will not assert jurisdiction over the following features:

- Swales or erosional features (e.g., gullies, small washed characterized by low volume, infrequent, or short duration flow); and
- Ditches (including roadside ditches) excavated wholly in and draining only uplands and that do not carry a relatively permanent flow of water.

Wetlands are delineated using three parameters, which include hydrophytic vegetation, wetland hydrology, and hydric soils. According to ACOE, indicators for all three parameters must be present to qualify an area as a wetland.

3.1.1 Wetland Parameters

3.1.1.1 Hydrophytic Vegetation

Hydrophytic vegetation is defined as “the sum total of macrophytic plant life growing in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content” (ACOE 1987). The potential wetland areas were surveyed by walking throughout the site and making observations of those areas exhibiting characteristics of jurisdictional waters or wetlands. Vegetation units with the potential to

be wetlands were examined, and data for each vegetation stratum (i.e., tree, shrub, herb, and vine) were recorded on the datasheet provided in the 2008 Arid Supplement (ACOE 2008a). The percent absolute cover of each species present was visually estimated and recorded.

The wetland indicator status of each species recorded was determined by using the list of wetland plants for California provided by the United States Fish and Wildlife Service (USFWS 1997). An obligate (OBL) indicator status refers to plants that have a 99 percent probability of occurring in wetlands under natural conditions. A Facultative-Wet (FACW) indicator status refers to plants that occur in wetlands (67–99 percent probability), but are occasionally found in non-wetlands. A Facultative (FAC) indicator status refers to plants that are equally likely to occur in wetlands or non-wetlands (estimated probability 34–66 percent). Facultative upland (FACU) species are more often found in upland sites. Upland (UPL) species have a high probability to occur in upland sites. An NI indicator status refers to species that have insufficient data available to determine an indicator status at this time for the local region.

Plant species nomenclature follows that contained in *The Jepson Manual* (Hickman 1993). Dominant species with an indicator status of "NI" (not indicated) or not listed in the USFWS 1997 list were evaluated as either wetland or upland indicator species based on local professional knowledge of where the species are most often observed in habitats that are characteristic in southern California.

3.1.1.2 Hydric Soils

A hydric soil is a soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation (ACOE 1987). Hydric soil indicators are formed predominantly by the accumulation or loss of iron, manganese, sulfur, or carbon compounds (ACOE 2008a). The hydric soil criterion is considered fulfilled at a location if soils in the area can be inferred to have a high groundwater table, evidence of prolonged soil saturation, or any indicators suggesting a long-term reducing environment in the upper 18 inches of the soil profile.

Sample points were selected within potential wetland areas and where the apparent boundary between wetland and upland was inferred based on changes in the composition of the vegetation and topography. Soil pits were dug to a depth of at least 18 inches or to a depth necessary to determine soil color, evidence of soil saturation, depth to groundwater, and indicators of a reducing soil environment (i.e., mottling, gleying, and sulfidic odor).

3.1.1.3 Wetland Hydrology

The presence of wetland hydrology indicators confirm that inundation or saturation has occurred on a site, but may not provide information about the timing, duration, or frequency of the event. Hydrology features are generally the most ephemeral of the three wetland parameters (ACOE 2008a).

In the 2008 Arid Supplement, wetland hydrology indicators are divided into four groups. Those that are determined based on direct observation are in Group A. These include the presence of surface water, a high water table, and saturation. Water marks, drift deposits, surface soil cracks, and other indicators of flooding or ponding fall within Group B. Group C consists of indicators that provide indirect evidence that a site was saturated recently, such as the presence of sulfidic odors or oxidized rhizospheres along living roots. Finally, Group D consists of vegetation and soil features that indicate recent wet conditions such as the FAC-neutral test or a shallow aquitard (ACOE 2008a). These indicators are further classified as primary or secondary indicators.

Hydrologic information for the site was obtained by reviewing USGS topographic maps and by directly observing hydrology indicators in the field. The wetland hydrology criterion is considered fulfilled at a location if, based upon the conclusions inferred from the field observations, an area has a high probability of being periodically inundated or has soils saturated to the surface at some time during the growing season to develop anaerobic conditions in the surface soil environment, especially the root zone (ACOE 1987). If at least one primary indicator or at least two secondary indicators are found at a sample point, the wetland hydrology criterion is considered fulfilled.

3.2 Non-wetland Jurisdictional Waters

Non-wetland jurisdictional waters typically have strong hydrology indicators such as the presence of seasonal flows and an ordinary high watermark. An ordinary high watermark is defined as:

> ". . . that line on the shore established by the fluctuations of water and indicated by physical characteristics such as [a] clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas" (33 CFR Part 328.3).

To supplement this definition and provide better guidance for the identification of the OHWM in arid west systems, the ACOE published a new manual (ACOE 2008b). Ephemeral channels in the arid west delineated as non-wetland jurisdictional waters usually lack wetland vegetation and hydric soil characteristics. These types of

jurisdictional waters are delineated by the lateral and upstream/downstream extent of the OHWM of the particular drainage.

Stream geomorpholgy of ephemeral channels plays an important role in the determination of the lateral extent of the OHWM (ACOE 2008b). Bankfull zones are more transient and less discernible in ephemeral channels of the arid southwest, where the dominant channel-forming discharge is the result of one or more low-flow features in an active floodplain zone. The dynamic nature of the low-flow channels in these arid ephemeral drainages is due to how easy they may relocate during low- to moderate-discharge events (5–10 years). Immature and poorly consolidated soils that lack stabilizing vegetation cover and that are subject to episodic discharge patterns also make the system dynamic.

3.3 Waters of the State

Under sections 1600–1607 of the Fish and Game Code, CDFW regulates activities that would divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake that supports fish or wildlife. CDFW has jurisdiction over riparian habitats (e.g., desert wash scrub) associated with arid watercourses. Jurisdictional waters of the State are delineated by the outer edge of riparian vegetation or at the top of the bank of streams or lakes, whichever is wider. The Fish and Game Commission has defined “stream” in Section 1.72 in Title 14 of the California Code of Regulations as follows: “[A] body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life. This includes watercourses having a surface or subsurface flow that supports or has supported riparian vegetation.” In addition, Section 1.56 in Title 14 of the California Code of Regulations adds to this definition “includes natural lakes or man-made reservoirs”.

RWQCB is the regional agency responsible for protecting water quality in California. The jurisdiction of this agency includes all waters of the state and all waters of the United States as mandated by both the federal Clean Water Act and the California Porter-Cologne Water Quality Control Act. State waters generally include all waters subject to the jurisdiction of ACOE and CDFW, and include certain isolated waters that may be excluded from ACOE jurisdiction. The RWQCB regulates impacts to water quality in isolated waters under the state Porter Cologne Act utilizing a Waste Discharge Requirement or through waiver of waste discharge requirements. There may be regional differences in how a particular RWQCB asserts jurisdiction over waters.

4.0 Results of Field Data

A description of the hydrophytic vegetation units observed, soil types encountered, and a discussion of the local hydrology in the survey area are presented below. Copies of the field data forms summarizing information collected in the field on vegetation, soils, and hydrology observed at each sample site are provided in Attachment 1.

4.1 Vegetation

The majority of the vegetation in the project area is agricultural crops. Native vegetation still occurs along the New River and Greeson Wash/Drain and their respective floodplains. Imperial Irrigation District (IID) drains are earthen and can support vegetation along the lower banks of and within the low flow channel. IID canals are concrete lined and generally lack vegetation (Photographs 1 and 2).

Vegetation along the New River and its floodplain is dominated by salt cedar (*Tamarix chilensis*), arroweed (*Pluchea sericea*), and common reed (*Phragmites australis)*, which are all hydrophytic vegetation types (Photographs 3 and 4). Small areas of mesquite (*Prosopis* sp.) and big saltbush (*Atriplex lentiformis*) occur in the outer areas of the floodplain fringe. Portions of the floodplain have been converted to agricultural fields.

The vegetation along Greeson Wash/Drain is primarily arroweed, common reed, and big saltbush, while its floodplain supports an open growth of iodine bush (*Allenrolfea occidentalis*), bush seepweed (*Suaeda moquinii*), big saltbush, and salt cedar (Photograph 5). All of these plants are hydrophytic vegetation types. Large areas of the Greeson Wash/Drain floodplain lack significant vegetation growth due to the high salinity of the soil (Photograph 6).

The vegetation associated with the IID drains varies between individual drain systems, and the amount of vegetation present at any one time depends on when the drain was last maintained. In general, the earthen drains have very steep slopes that are at least 10-20 feet high so the vegetation is usually restricted to the low flow channel and lower portions of the banks within the capillary fringe (Photographs 7 and 8). Plant species observed growing in the various IID drains within the project area included arroweed, salt cedar, Mexican sprangletop (*Leptochloa uninervia*), Johnsongrass (*Sorghum halepense*), and when the water is stagnant for long periods, duckweed (*Lemna* sp.). These plant species are all hydrophytic vegetation types.

PHOTOGRAPH 1
View of Woodbine Lateral 2 IID Canal

PHOTOGRAPH 2
View of Wistaria IID Canal