BIG ROCK CLUSTER SOLAR FARMS

Biological Resources Technical Report County of Imperial, California

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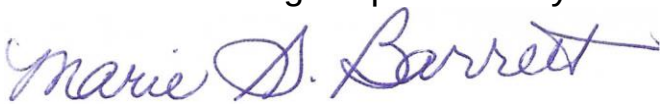
Prepared for:

90FI 8me LLC
92JT 8me LLC
c/o 8minutenergy Renewables
211 Sutter Street, Fl. 6
San Francisco, CA 94108

Prepared by:
Barrett's Biological Surveys
Certified as performed in accordance with established biological practices by:



Marie S. Barrett, Biologist
2035 Forrester Road
El Centro, CA 92243
760.352.4159

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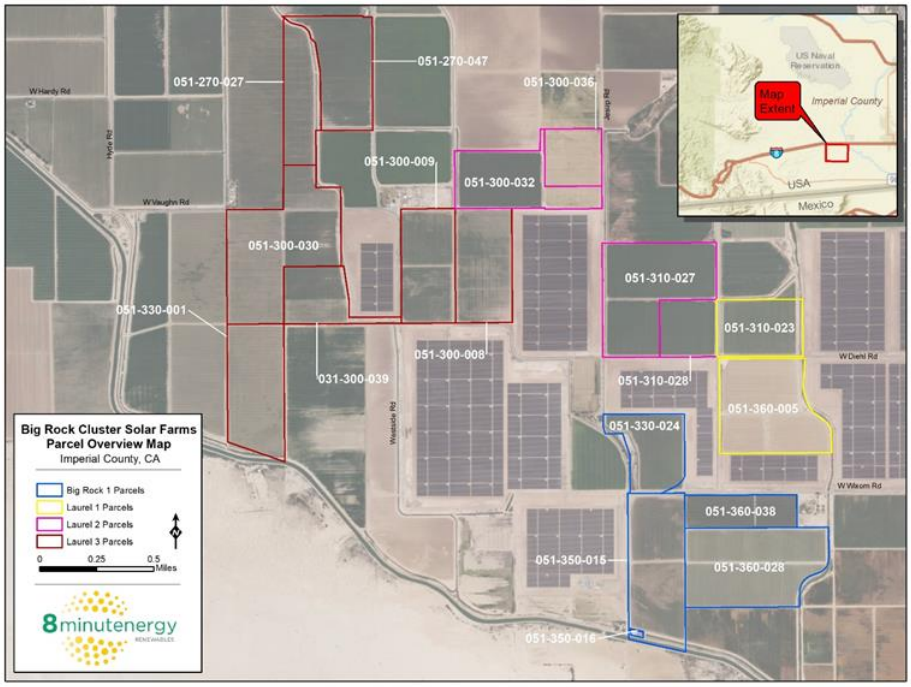
1.0 INTRODUCTION

This report addresses biological resources, project description and California Environmental Quality (CEQA) requirements for the proposed Big Rock Cluster Solar Farm Project, County of Imperial, CA. This report covers approximately 1,380 gross acres and is located in County of Imperial; lead agency will be the County of Imperial.

2.0 PROJECT AND SITE DESCRIPTION

92JT 8me LLC (the "Big Rock Applicant") seeks approval of a Conditional Use Permit (CUP) for the up to 75 megawatt-AC (MW) Big Rock Solar Farm Project. 90FI 8me LLC (the "Laurel Applicant") seeks approval of three CUPs for the construction of Laurel 1 Solar Farm, Laurel 2 Solar Farm, and Laurel 3 Solar Farm, generating up to 40 MW, 70 MW, and 140 MW, respectively. These four Projects together are known as the Big Rock Cluster Solar Farms and would generate up to 325 MW. All four photovoltaic (PV) utility-scale solar farms are located in Imperial County, California. The Projects may cooperate if necessary to meet power production requirements, including by allowing one Project to utilize land designated for another Project. Each Project is intended to have O&M facilities and an on-site substation, but the Projects may also utilize shared facilities.

Figure 1 – Big Rock Cluster Solar Farms Overview



Description of Proposed Project

Big Rock 1 includes five assessor's parcel numbers (APNs), Laurel 1 comprises two APNs, Laurel 2 comprises four APNs, and Laurel 3 comprises seven APNs. The 18 parcels together (collectively, the "Project Sites") total approximately 1,380 gross acres. The topography of the Project Sites is relatively flat. The Project Sites have historically been used for agriculture.

Table 1 – Laurel 1/2/3 Project Parcels (~1,038 acres)

APN	Owner	Zoning	Acreage
Laurel 1			
051-310-023	Pearl Evans, LLC	A-2-R	60
051-360-005	Nancy and JC Nale	A-2-R	111
Laurel 2			
051-300-032 (portion)	Kuhn	A-2-R	80
051-300-036	Kuhn	A-3	40
051-310-027	Kuhn	A-2-R	120
051-310-028	Kuhn	A-2-R	40
Laurel 3			
051-270-027 (portion)	Preece	A-2-R	58
051-270-047	Preece	A-2-R	81
051-300-008	Preece	A-2-R	80
051-300-009	Preece	A-2-R	80
051-300-030 (portion)	Preece	A-2-R	145
051-300-039	Preece	A-2-R	48
051-330-001	Childers	A-3	95

Table 2 – Big Rock 1 Project Parcels (~342 acres)

APN	Owner	Zoning	Acreage
Big Rock 1			
051-350-015, 051-350-016	Carolyn Childers	A-3	107
051-360-038 (portion)	Carroll Childers	A-3	45
051-360-028	Norma Hampton and Carroll Childers	A-3	130
051-330-024	Scopesi	A-2-R	60

The Project Sites are generally south of Interstate 8, west of Drew Road and Vogel Road, north of Mandrapa Road, and east of Hyde Road in the Imperial Irrigation District. The Project Sites are approximately eight miles southwest of the City of El Centro and three miles south of Seeley, a census-designated place, in the unincorporated area of Imperial County.

The Applicants together propose to develop four PV energy solar farms, totaling up to 325 MW-AC. Power generated by the Projects will be delivered from the Project Sites via up to 230 kV overhead and/or underground electrical transmission line(s) originating from an on-site substation(s)/switchyard(s) and terminating at the proposed Imperial Irrigation District (IID) Fern Substation, which will be constructed immediately west of Big Rock 1 Solar Farm. In the alternative, power may be delivered to the San Diego Gas & Electric (SDG&E) Imperial Valley Substation, Drew Switchyard, or Imperial Solar Energy Center West Substation.

The Projects may share operations & maintenance (O&M), substation, and/or transmission facilities as necessary with one another and/or with nearby solar projects, and/or may be remotely operated. Any “unused” O&M, substation, and/or transmission facility areas on-site could be covered by solar panels under such scenarios.

The Applicants have considered the following in their selection of the Project Sites:

- Land availability (approximately 1,380 gross acres)
- Land Use Zoning: A-2-R (General Agricultural Rural Zone) and A-3 (Heavy Agriculture)
- Proximity to interconnecting substation: Fern Substation is immediately west of Big Rock 1; Imperial Valley Substation is approximately 1 mile south of Big Rock 1; Drew Switchyard is approximately 4 miles southeast of Big Rock 1; Imperial Solar Energy Center West Substation is approximately 2.5 miles west of Laurel 3
- Avoidance of high production/value agricultural land: Site avoids Prime Farmland, to the extent feasible

Up to five (5) full-time employees will operate each of the four Projects (a total of 20 employees split between daytime and nighttime shifts). Typically, up to three (3) staff will work during the day shift per Project (sunrise to sunset) and the remainder during the night shifts and weekend. As noted earlier, it is possible that the Projects would share O&M, substation, and/or transmission facilities with one another and/or with nearby solar projects, and/or may be remotely operated. In such scenarios, the Projects’ on-site staff could be reduced.

After the useful life of the Projects, the panels will be disassembled from the mounting frames and the Project Sites will be restored to their pre-development condition.

PV Module Configuration

The Projects will utilize PV panels or modules[1] on mounting frameworks to convert sunlight directly into electricity. Individual panels will be installed on either fixed-tilt or tracker mount systems (single- or dual-axis, using galvanized steel or aluminum). If the panels are configured for fixed tilt, the panels will be oriented toward the south. For tracking configurations, the panels will rotate to follow the sun over the course of the day. The panels will stand up to 20 feet high, depending on mounting system used.

The PV panels would be arranged in continuous rows of up to approximately 500 feet in length, with 10 feet between each row (per fire department requirements) and arrays would be grouped together to form up to 500-foot by 500-foot grids or solar array grids. This grid pattern would be arranged to form “blocks” with the center of each block containing an inverter module and a pad mounted transformer. Blocks will produce direct electrical current (DC), which is converted to alternating electrical current (AC) at the inverter stations. The inverter module and transformer for each grid area would be housed within a 160-square-foot container or similar structure.

Figure 2 - Typical fixed-tilt solar panel rows

[1] Including but not limited to concentrated PV (CPV) or bifacial technology

Figure 3 - Typical single-axis tracking solar panels

Figure 4 - Typical dual-axis tracking solar panels

Each PV module will be placed on a fixed-tilt or tracker mounting structure. The foundations for the mounting structures can extend up to 8 feet below ground, depending on the structure, soil conditions, and wind loads, and may be encased in concrete or utilize small concrete footings. If bifacial modules are used, light-colored, permeable gravel or crushed rock may be used as ground cover under the panels. Final solar panel layout and spacing will be optimized for Site characteristics and the desired energy production profile.

Figure 5 - Typical fixed-tilt mounting structure

Figure 6 - Typical dual-axis mounting structure

Inverter Stations

PV energy is delivered via cable to inverter stations, generally located near the center of each block. Inverter stations are typically comprised of one or more inverter modules with a rated power of up to 2 MW each, a unit transformer, and voltage switch gear. The unit transformer and voltage switch gear are housed in steel enclosures, while the inverter module(s) are housed in cabinets. Depending on the vendor selected, the inverter station may lie within an enclosed or canopied metal structure, typically on a skid or concrete mounted pad.

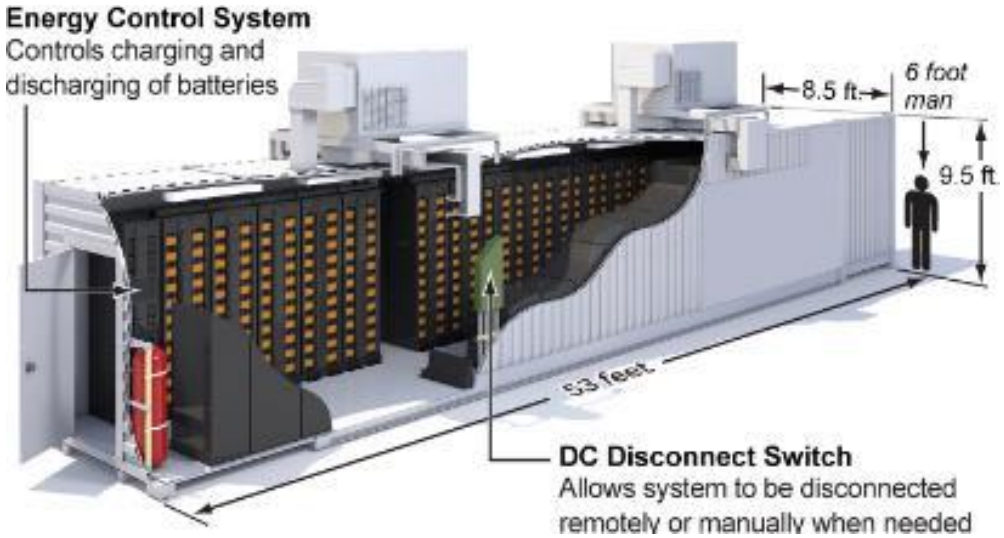
Figure 7 - Typical inverter stations

Energy Storage System

The Projects may include an energy storage system(s), located at or near one or more substations (onsite or shared) and/or at the inverter stations, but possibly elsewhere onsite. Such a large-scale storage system generally would consist of modular and scalable battery packs and battery control systems that conform to US national safety standards. The energy storage modules, which may include commercially available flow batteries, typically consist of ISO standard containers (approximately 40'L x 8'W x 8'H) housed in pad- or post-mounted, stackable metal structures, but may also be housed in a dedicated building in compliance with applicable regulations. The maximum height of a dedicated structure or the energy storage system itself is not expected to exceed 25 feet. The actual dimensions and number of energy storage modules and structures vary

depending on the application, supplier, and configuration chosen, as well as on offtaker/PPA requirements and local building standards. The Projects may share an energy storage system with one another and/or nearby solar projects or may operate standalone energy storage facilities within the Project Sites. Depending on market conditions, one or more of the Projects may also proceed as an energy storage system project only, without development of any solar arrays.

Figure 8 - Typical energy storage systems



Substation

Output from the inverter stations will be transferred via electrical conduits and electrical conductor wires to on-site substation(s). The substation(s) may contain several components, including auxiliary power transformers, distribution cabinets, revenue metering systems, microwave transmission tower, and voltage switch gear. The substation(s) will occupy an area of approximately 200' x 200', secured separately by an additional chain-link fence, and located along the perimeter of the project. The final location(s) will be determined before issuance of building permits.

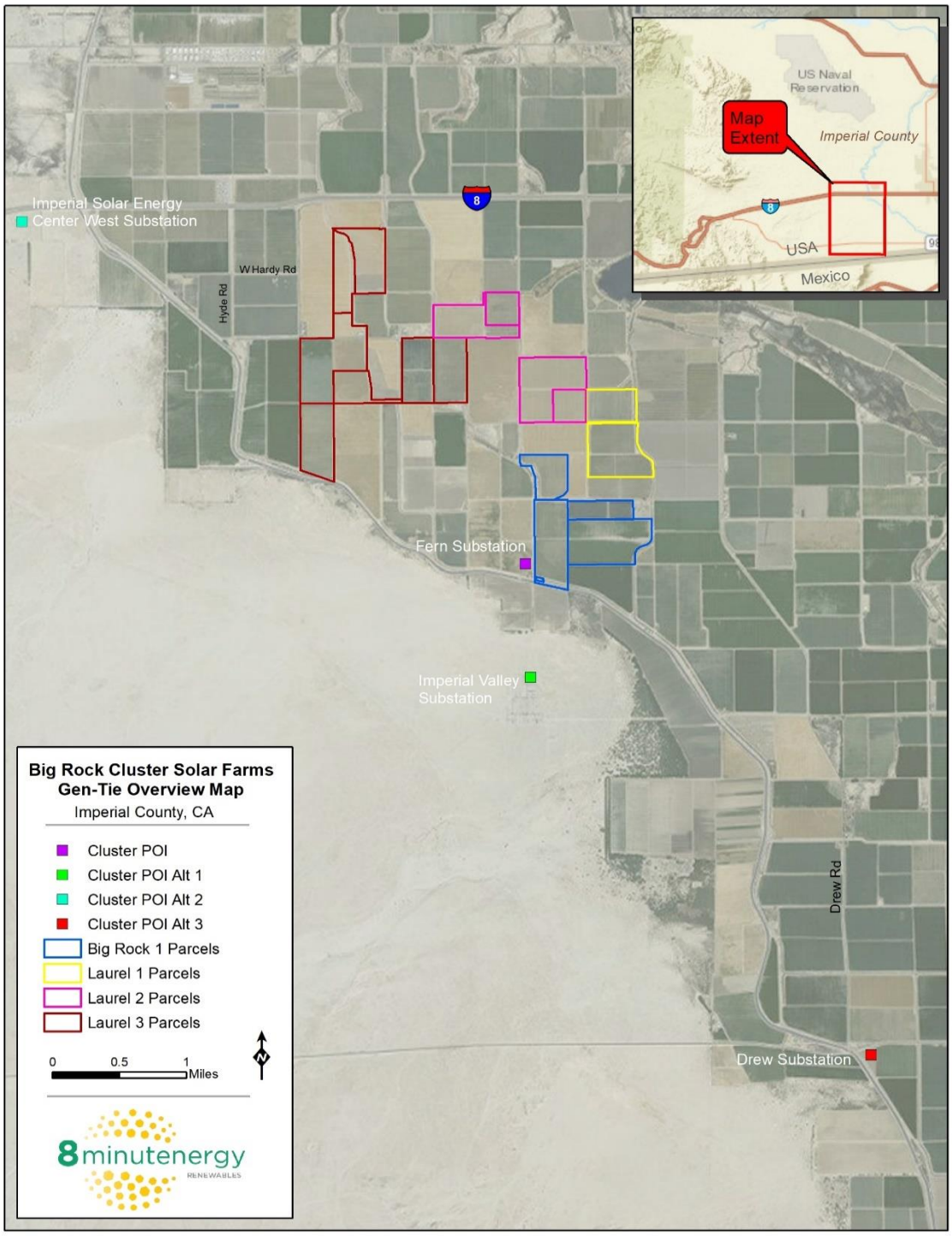
Substations typically include a small control building (roughly 500 square feet) standing approximately 10 feet tall. The building is either prefabricated concrete or steel housing with rooms for the voltage switch gear and the metering equipment, a room for the station supply transformer, and a separate control technology room in which the main computer, the intrusion detection system, and the main distribution equipment are housed. Components of this building (e.g., control technology room and intrusion detection system) may instead be located at an O&M building described later in this document.

Figure 9 - Typical Substation

Transmission Line

From the Project substation(s), power will be transmitted to the proposed IID Fern Substation via up to 230 kV overhead and/or underground line(s). Alternatively, power may be transmitted by 230 kV line(s) to SDG&E's Imperial Valley Substation, Drew Switchyard, or Imperial Solar Energy Center West Substation. The preliminary gen-tie line routes for the Projects are shown on Figure 10.

Figure 10 – Big Rock Cluster Solar Farms Gen-Tie Overview Map



Water Usage

Water demand for panel washing and O&M domestic use is not expected to exceed 100 acre-feet per year for the Projects. Water usage during construction, primarily for dust-suppression purposes, is not expected to exceed 500 acre-feet. Decommissioning may require approximately an additional 500 acre-feet. Water will be obtained from the landowners' water supply or delivered via truck from off-site source(s). A small water treatment system may be installed to provide deionized water for panel washing.

Water Storage Tank(s)

One or more above-ground water storage tanks with a total capacity of up to 100,000 gallons may be placed on-site near the O&M building(s). The storage tank(s) near the O&M building(s) will have the appropriate fire department connections in order to be used for fire suppression purposes.

Operations and Maintenance Building

The Projects are intended to feature one or more O&M buildings of approximately 40' x 80' in size, with associated on-site parking. The O&M building(s) will be steel framed, with metal siding and roof panels. The O&M building(s) may include the following:

1. Office
2. Repair building/parts storage
3. Control room
4. Restroom
5. Septic tank and leach field

Roads, driveways and parking lot entrances will be constructed in accordance with Imperial County improvement standards. Parking spaces and walkways will be constructed in conformance with all California Accessibility Regulations.
As noted earlier, the Projects may share O&M facilities and/or staff with one another and/or nearby solar projects, and/or may be remotely operated. Any "unused" O&M areas on-site could be covered by solar panels.

Site Security and Fencing

The Project Sites will be enclosed with a chain link fence with barbed wire measuring up to eight (8) feet in height (from finished grade). An intrusion alarm system comprised of sensor cables integrated into the perimeter fence, intrusion detection cabinets placed approximately every 1,500 feet along the perimeter fence, and an intrusions control unit, located either in the substation control room(s) or at the O&M Building(s), or similar technology, will be installed. Additionally, the Projects may include additional security measures including, but not limited to, barbed wire, low voltage fencing with warning reflective signage, controlled access points, security alarms, security camera systems, and security guard vehicle patrols to deter trespassing and/or unauthorized activities that could interfere with operation of the Projects.

Controlled access gates will be maintained at the main entrance to the Project Sites. Site access will be provided to offsite emergency response teams that respond in the event of an “after-hours” emergency. Enclosure gates would be manually operated with a key provided in an identified key box location.

Site Lightning

All lighting will be directed away from any public rights-of-way. Lighting used on-site will be minimal. Typical lighting which may be used may include motion sensor Site lighting for security purposes. Lighting used on-site will be of the lowest intensity foot candle level which when taken after dark will be measured at the property line.

Annual Production

The Projects will generate electrical power during daylight hours. Peak electricity demand in California corresponds with air conditioning use on summer afternoons when ambient temperatures are high. The Projects’ peak generating capacity corresponds to this time-period. There is no generating capacity between sunset and sunrise due to the lack of solar energy, though power may be released from the energy storage system(s).

The Projects will have a nominal output capacity of up to 325 MW (AC), generating sufficient electricity to power roughly 156,000 homes and to displace 484,000 tons of carbon dioxide equivalent (CO_2e) per year when compared to a gas-fired power plant or 960,000 tons when compared to a coal-fired power plant.

Construction Activities

The construction period for the Projects, from site preparation through construction, testing, and commercial operation, is expected to commence as early as Q3 2018 and will extend for approximately 12-15 months. The construction period may be extended if the Projects are phased, with one or more Projects beginning in Q3 2018, and the others being built at a later time to be determined by market conditions.

Construction of the facility will include the following activities:

- Site preparation
- Grading and earthwork
- Concrete foundations
- Structural steel work
- Electrical/instrumentation work
- Collector line installation
- Architecture and landscaping

No roadways will be affected by the Projects, except during the Projects’ construction period. Construction traffic will access the Project Sites from Derrick

or Liebert Road. It is estimated that up to 350 workers per day (during peak construction periods) will be required.

Heavy construction is expected to occur between 6:00 am and 5:00 pm, Monday through Friday. Additional hours may be necessary to make up schedule deficiencies or to complete critical construction activities. Some activities may continue 24 hours per day, seven days per week. Low level noise activities may potentially occur between the hours of 10:00 pm and 7:00 am. Nighttime activities could potentially include, but are not limited to, refueling equipment, staging material for the following day's construction activities, quality assurance/control, and commissioning.

Materials and supplies will be delivered to the Project Sites by truck. Truck deliveries will normally occur during daylight hours. However, there will be offloading and/or transporting to the Project Sites on weekends and during evening hours.

Earthmoving activities are expected to be limited to the construction of the access roads, any O&M building, any substation, and any storm water protection or storage (detention) facilities. Final grading may include revegetation with low lying grass or applying earth-binding materials to disturbed areas.

Work Force

Once the Projects are constructed, maintenance will generally be limited to the following:

1. Cleaning of PV panels
2. Monitoring electricity generation
3. Providing Site security
4. Facility maintenance - replacing or repairing inverters, wiring, and PV modules

It is expected that each of the Projects will require an operational staff of up to five full-time employees, for a total of up to 20. As noted earlier, it is possible that the Projects would share O&M, substation, and/or transmission facilities with one another and/or nearby projects. In such a scenario, the Projects could share personnel, thereby potentially reducing the Projects' on-site staff.

The Projects would operate seven days a week, 24 hours a day, generating electricity during normal daylight hours when the solar energy is available. Maintenance activities may occur seven days a week, 24 hours a day to ensure PV panel output when solar energy is available.

Project Features and Best Management Practices

The following sections describe standard Project features and best management practices that will be applied during construction and long-term operation of the Projects in an effort to maintain safety and avoid environmental impact.

Waste and Hazardous Materials Management

The Projects will have minimal levels of materials on-site that have been defined as hazardous under 40 CFR, Part 261. The following materials are expected to be used during the construction, operation, and long term maintenance of the Projects:

- Insulating oil – used for electrical equipment
- Lubricating oil – used for maintenance vehicles
- Various solvents/detergents – equipment cleaning
- Gasoline – used for maintenance vehicles

Hazardous materials and wastes will be managed, used, handled, stored, and transported in accordance with applicable local and State regulations. All hazardous wastes will be maintained at quantities below the threshold requiring a Hazardous Material Management Program (HMMP) (one 55 gallon drum). Though not expected, should any on-site storage of hazardous materials exceed one 55-gallon drum, an HMMP would be prepared and implemented.

Spill Prevention and Containment

Hazardous materials stored on-site will be in quantities of less than 55 gallons. Spill prevention and containment for construction and operation of the Projects will adhere to Environmental Protection Agency (EPA) guidance on Spill Prevention Control and Countermeasures (SPCC).

Waste Water/Septic System

A standard on-site septic tank and leach field may be used at the O&M building to dispose sanitary wastewater, designed to meet operation and maintenance guidelines required by Imperial County laws, ordinances, regulations, and standards.

Inert Solids

Inert solid wastes resulting from construction activities may include recyclable items such as paper, cardboard, solid concrete and block, metals, wire, glass, type 1-4 plastics, drywall, wood, and lubricating oils. Non-recyclable items include insulation, other plastics, food waste, vinyl flooring and base, carpeting, paint containers, packing materials, and other construction wastes. A Construction Waste Management Plan will be prepared for review by the County. Consistent with local regulations and the California Green Building Code, the Plan would provide for diversion of a minimum of 50% of construction waste from landfill.

Chemical storage tanks (if any) would be designed and installed to meet applicable local and state regulations. Any wastes classified as hazardous such as solvents, degreasing agents, concrete curing compounds, paints, adhesives, chemicals, or chemical containers will be stored (in an approved storage

facility/shed/structure) and disposed of as required by local and state regulations. Material quantities of hazardous wastes are not expected.

Health and Safety

Safety precautions and emergency systems will be implemented as part of the design and construction of the Projects to ensure safe and reliable operation. Administrative controls will include classroom and hands-on training in operating and maintenance procedures, general safety items, and a planned maintenance program. These will work with the system design and monitoring features to enhance safety and reliability.

The Projects will have an Emergency Response Plan (ERP). The ERP will address potential emergencies including chemical releases, fires, and injuries. All employees will be provided with communication devices, cell phones, or walkie-talkies, to provide aid in the event of an emergency.

The Projects are located within the jurisdiction of Imperial County Fire Department. On-site fire protection would be provided via portable and fixed fire suppression systems throughout each of the projects. Portable fire extinguishers would be provided at various locations throughout the solar farms, while fixed fire suppressions systems would be available in the form of dedicated on-site storage tank(s). Water from the on-site water storage tank(s) would be intended for the fire protection of the O&M building(s). The O&M building(s) would have access to a wet-fire connection to provide sufficient fire protection. Both the access and service roads (along the perimeter of the project facilities) would have turnaround areas to allow clearance for fire trucks per fire department standards (70 feet by 70 feet, and 20-foot-wide access road).

3.0 PURPOSE OF THE STUDY

The purpose of the study was to determine the inventory of biological resources at the time of the survey; the possibility of the existence of endangered, threatened, sensitive or species of concern within project area: map habitats, and ascertain the probability of the presence of sensitive species on site.

This survey was not intended to determine the presence/absence of threatened or endangered species except for the burrowing owl *Athene cunicularia,* but only assess the potential for them to occur based on habitat suitability. Other focused surveys to determine presence/absence would be at the discretion of the appropriate State or federal resource agencies.

3.0 BIOLOGICAL SURVEY METHODOLOGIES

The California Natural Diversity Database (CNDDB), California Native Plant Society database (CNPS), United States Fish and Wildlife Service (USFWS)/Carlsbad Sensitive Species list, field guides, personal contacts and

other methods to ascertain potential for sensitive species on the site (Appendix A).

Status Assessment and Conservation Plan for the Western Burrowing Owl in the United States, Biological Technical Publication (BTP-R6001-2003) state that 71% of the California burrowing owl (*Athene cunicularia hypugea)* population is found in the agricultural areas of Imperial County and is a California species of special concern therefore a focused burrowing owl survey was performed. This approximately 1,380 gross acres are being farmed.

A biological survey of vegetation, animals and a focused western burrowing owl survey was completed by Marie Barrett, Glenna Barrett, Shawna Bishop and Jacob Calanno, field biologists, as listed in Table 3: Survey Dates. A Garmin GPS, a spotting scope, binoculars and digital camera were used.

Prior consultation with Magdalena Rodriguez, CDFW, Ontario, CA provided permission to start the BUOW surveys in May and end by July 15, 2017 with respect to Laurel 1 Solar Farm (APNs 051-310-023, 051-360-005) and Big Rock 1A (APNs 051-350-015, 051-350-016, 051-360-038 (portion), 051-360-028). For the remainder of the Big Rock Cluster lands, the initial habitat survey was performed September-October and the 3 remaining protocol surveys (Big Rock 1B/Laurel 2/3) will be performed during the height of breeding season.

4.0 BIOLOGICAL SURVEY RESULTS

5.1 PLANT COMMUNITIES

Vegetation has been divided into communities that are groups of plants that usually coexist within the same area. Although this area is considered the Colorado Desert area (*A Manual of California Vegetation,* 2008.Sawyer/Wolf), approximately 500,000 acres of the Colorado Desert in Imperial County has been converted to agricultural use and this approximately 1,380 gross acres is within that conversion area. The plant community would be considered agricultural communities within the project areas (Appendix B -Photographs).

5.1.1 Agriculture

The habitat of the project is active agricultural. When surveyed, the fields were planted to alfalfa and Bermuda or disked.

5.1.2 Ruderal

Ruderal vegetation is found within the Imperial Irrigation District canal and drains Plants were found within the Imperial Irrigation District (IID) Right of Ways were weedy plants such as saltcedar and quail bush (listed with scientific names in Appendix C) were found.

5.1.3 SENSITIVE HABITATS

Sensitive habitats are those that are designated either rare within the region by governmental agencies or known to support sensitive animal or plant species and/or they serve as “corridors” for wildlife within the region. Although the burrowing owl (species of special concern) is abundant in the area, it is due to manmade features such as the irrigation canals, ditches and drains and the cultivation of agricultural crops within the region and not “native” factors. This would also apply to the mountain plover and several species of raptors.

5.2 ZOOLOGICAL/VEGETATIVE SPECIES

Forty one (41) species of zoological species were observed or heard using the site or in the immediate vicinity. Twenty three (23) species of vegetation were found. These are listed in Appendix C.

5.3 BURROWING OWL (BUOW)/BIOLOGICAL RESOURCES

The project site was searched with a pedestrian survey for burrowing owls and their sign (burrows, pellets, feathers, scat, litter, and animal dung) by Glenna Barrett, Marie Barrett, Shawna Bishop and Jacob Calanno, field biologists.

Table 3: Survey Dates

Date	May 4/6, 2017	May 22/24, 2017	June 15-16, 2017	July 7, 2017	Sept 7,27,28 2017(Initial habitat study for additional acreage)
Time/ climate	700-945; 78-84◦ Clear/calm 8.25 hrs.	700-945 76-89◦F 15% cloud cover/0-3 mph 8.25 hrs.	615-800 530-700 72-75◦F clear/0-3 mph 9.75 hrs	600-800 600-730 75-99◦F Clear to 100%/0-6 mph 7.0 hrs.	900-1330 94-103◦F 730-900 730 930 69-76◦F 11.5 hrs
Biologists	Glenna Barrett/ Shawna Bishop/Jacob Calanno	Glenna Barrett/ Shawna Bishop/Jacob Calanno	Glenna Barrett/ Shawna Bishop/Jacob Calanno	Glenna Barrett/ Shawna Bishop	Marie Barrett/Glenna Barrett
Total hours all surveys	44.75 hours				

The burrowing owl (BUOW) is a small, pale, buffy-brown owl that nests in borrowed burrows. The entrances to burrows often have bits of animal dung, prey carcasses, feathers, and litter, among other objects. Up to 12 eggs are laid, primarily from February to May.

The Imperial Valley has a majority of the burrowing owl in southern California. Irrigation canals and drains are commonly used as nesting sites in this area. The Burrowing Owl is a California Department of Fish and Wildlife (CDFW) Species of Special Concern, and a Federal Species of Concern and listed on the Migratory Bird Treaty Act. This survey was done using The CDFW Staff Report (CDFW 2012), which addresses survey and mitigation guidelines for the owl and communications with CDFW Wildlife Biologists, Ontario, CA office.

Burrowing owls, a CDFW species of special concern and burrows were observed within the site. Burrowing owls were also found on the Irrigation District right of ways (IID ROWs) adjacent to the project sites. The Bioresource map marks the location of biological observations on and adjacent to the site. Appendix D, Biological Resources, lists locations of biological resources found on site; (attached in Appendix).

The site is being utilized as burrowing owl foraging habitat as agricultural fields on site support prey for owls and were found along the IID canal and drains, areas which are being utilized as burrowing habitat and onsite. It is expected that the owls are foraging in the agricultural fields found within the project.

One horned lizard scat was found during the May 6 survey. As no other scat was found and no lizards were observed, it is assumed that there in not an active population present. The active agricultural fields are not considered horned lizard habitat.

6.0 EXPECTED IMPACTS TO BIOLOGICAL RESOURCES

Possible CEQA significant impacts that could include the following within the parameters of this project:

Table 4: Expected Impacts

Area	Endangered/threatened/ Species of Concern Habitat	Riparian Habitat	Wetlands	Wildlife Corridors	Local Ordinances	HCP*
Agricultural	None with avoidance/minimization/ mitigation measures	No	No	No	No	No

*Habitat conservation plan

7.0 AVOIDANCE AND MINIMIZATION MEASURES

During this survey, between 3-6 occupied burrows, 4-9 burrowing owls and 4-5 active burrows were found within the IID ROW. The drains and lateral canals will not be removed. Between 2-3 occupied burrows with 2-3 BUOWs and 3-4 active burrows were found onsite and will need to be sheltered in place or passively relocated.

If construction is scheduled to begin during nesting season (February-August), a survey for nesting birds should be performed within 7 days of start of construction. As with any Migratory Bird Treaty Act listed bird, fines of up to a year in prison and up to $5000 per incident can be incurred if birds or nest is harmed.

A BUOW preconstruction survey must be done no less than 14 days prior to start of ground disturbance and 24 hours of construction and report submitted to appropriate agencies.

Burrowing owl mitigation such as sheltering in place could be required if construction is to be initiated within 160 feet of an active burrow outside of nesting season (September –January) or within 250 feet in nesting season (February-August).

Since there are burrowing owls in the vicinity, it is recommended that construction foremen, workers, and all other onsite employees be given worker training by a qualified biologist regarding burrowing owl that would include the following:

- Description of owl
- Biology
- Regulations (CDFW/USFWS)

Wallet card with owl picture/guidelines for protecting owl

Sensitive Species

At this time, bermuda and alfalfa fields are found on and in the vicinity of the site which could attract mountain plover, long billed curlews, or short billed dowitcher. If, in the future, mountain plover, long billed curlews and/or short billed dowitcher are observed foraging on the site or in immediately adjacent agricultural fields, construction should cease until they disperse. These species would be covered under worker training classes given to construction crews by a qualified biologist.

This area does support areas of interest to raptors. There is also a population of prey animals (cottontails) available. There is no evidence of nesting in the utility poles located in the vicinity which have been in place for decades. Bird detractors

will be installed in accordance with accepted biological practices for raptor protection on utility poles.

The other species listed within this report are common throughout the Imperial Valley. Birds would be unlikely to perch upon the solar arrays due to the temperatures on the panels. The proposed 8 foot fence is not high enough to encourage raptor perching. As there are no avian hazards associated with the solar site, use of the habitat and shade would not be harmful to avian species and therefore no minimization of avian usage is necessary.

Jurisdictional Delineation

There were no jurisdictional issues observed on site. At this time, it is understood that no IID ROW waterways adjacent to the project will be undergrounded. Therefore, no streambed alteration permit would be required by CDFW under Section 1600 of the California Fish and Game Code or a Section 401 permit from the California Regional Water Quality Control Board (RWQCB).

8.0 MITIGATION MEASURES

Occupied burrows, burrowing owls and active burrows were found both in the IID ROWs and onsite.

Recommended mitigation for burrowing owls and occupied burrows found on site could include the following:

1. Passive relocation of any occupied burrows found on site. Passive relocation would be done outside of nesting period. Installation of artificial burrows in a 2 (artificial burrow) to 1 (occupied burrow) at a protected site which has been approved by CDFW or sheltering in place to protect BUOW.

2. Placement of solar panels within the project area so that they are outside of the zone of influence: 250 feet to avoid conflict with nesting season.

Any occupied burrows found in IIDROW or construction areas should be sheltered in place with haybales if exposed to construction activity.

A preconstruction survey must be done no less than 14 days of start of ground disturbance and 24 hours of construction and report submitted.

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APPENDIX A
SENSITIVE SPECIES

APPENDIX A

SENSITIVE BOTANICAL AND ZOOLOGICAL SPECIES (CNDDB/CNPS)

Mount Signal Quadrangle (Nine Quad Search) April, 2017

BOTANICAL SPECIES	STATUS[1]	DESCRIPTION OF SPECIES	HABITAT	OBSERVATION/ SITE POTENTIAL
Chaparral sand-verbena *Abronia villosa var aurita*	State: S2.2 (not very threatened); CNPS list:1B.2 (rare, threatened in Ca; fairly endangered in Ca.)	Likes full sun, and sandy soil. Sand-verbena has gray foliage with pinkish purple flowers, and the flowers are fragrant. It does not tolerate weeds and needs bare ground. 80-1600m (263-5249ft	Chaparral, Coastal Shrub, and desert dunes/sandy areas.	L No habitat on site; none observed
Gravel milk-vetch *Astragalus sabulonum*	CNPS: List 2B.2	a dicot, is an annual herb that is native to California and is also found outside of California, but is confined to western North America.	a dicot, is an annual herb that is native to California and is also found outside of California, but is confined to western North America.	L No habitat on site; none observed
Mud nama *Nama stenocarpa*	CNPS: List 2B.2	a dicot, is an annual herb that is native to California.	a dicot, is an annual herb that is native to California.	L No habitat on site; none observed
Wiggins' croton *Croton wigginsii*	Federal: Rare CNPS: List 2B.2	a dicot, is a shrub that is native to California and Arizona, Baja California, Sonora, Mexico.	a dicot, is a shrub that is native to California and Arizona, Baja California, Sonora, Mexico.	L No habitat on site; none observed
Baja California ipomopsis *Ipomopsis effusa*	CNPS: List 2.1	a dicot, is an annual herb that is native to California and to Baja California	Creosote Bush Scrub, Chaparral . Alluvial fans.	L No habitat on site; none observed

BOTANICAL SPECIES	STATUS[1]	DESCRIPTION OF SPECIES	HABITAT	OBSERVATION/ SITE POTENTIAL
Emory's Crucifixion-Thorn *Castela emoryi*	CNPS: List 2.3	A large sprawling, dense shrub or small tree, up to 3(-3.7) m (to 10[-12] feet) tall, with a round crown often with descending branches heavy with thorns. Gray brown bark has narrow ridges with smooth ridges. The stout twigs are blue, gray or yellow green, may be finely hairy, very rigid, up to 20 cm (8 in) long with numerous stout thorns.	Sonoran Desert of southern Arizona and far southeastern California, south into Baja California and Sonora, Mexico.	L No habitat on site; none observed
Annual rock-nettle *Eucnide rupestris*	CNPS List 2.2	is a small, perennial, rounded shrub that grows to at most 3-feet tall. The leaves are about 1/2-inch long, oval, irregularly toothed, and gray-green. The leaves are covered with tiny, needle-like, barbed, stinging hairs that are very difficult to remove from human skin. The flowers are fairly large and open, with five, pale cream-colored petals.	fairly common component of vegetation communities on well-drained sandy, gravelly, and rocky soils in washes and on rocky outcrops in the Upper Sonoran (Mojave Desert Scrub) life zone.	L No habitat on site; none observed
California satintail *Imperata brevifolia*	CNDDB Ranks G2, S2.1; CNS: 2.1	This plant can be weedy or invasive. Grass or grass-like plant, including grasses (Poaceae), sedges (Cyperaceae), rushes (Juncaceae), arrow-grasses (Juncaginaceae), and quillworts (Isoetes).	It is native to the southwestern United States from California to Texas and northern Mexico, where it grows in arid regions where water is available.	L No habitat on site; none observed
Hairy Stickleaf *Mentzelia hirsutissima*	CNDDB Ranks G3, S2S3; CNPS: 2.3	Annual to shrub; hairs needle-like, stinging, or rough	Creosote Bush Scrub	L No habitat on site; none observed

BOTANICAL SPECIES	STATUS[1]	DESCRIPTION OF SPECIES	HABITAT	OBSERVATION/ SITE POTENTIAL
Brown turbans *Malperia tenuis*	CNDDB Ranks G4, S1.3; CNPS: 2.3	is recognized by its annual duration, linear leaves densely arranged along stems or concentrated near bases of stems, loosely arranged heads, and pappi of two kinds of scales.	Sonoran Desert Scrub is the general habitat for Brown Turbans. Near Ocotillo it grows on arid slopes with shallow soils, rocky surface rubble with few large boulders, and little competition from shrubs.	L No habitat on site; none observed
Thurber's Pilostyles *Pilostyles thurberi*	CNDDB Ranks G5, S3.3; CNPS: 4.3	a dicot, is a perennial herb (parasitic) that is native to California and is also found outside of California, but is confined to western North America.	Creosote Bush Scrub	L No indigo bush on site; none observed on indigo bush in buffer zone
Pink Fairy Duster *Calliandra eriophylla*	CNDDB Ranks G5, S2S3; CNPS: 2.3	Fairy Duster is a low, densely branched shrub 8 to 48 inches high. The leaves are formed by 2-to-4 pairs of 1/4-inch, oblong leaflets. It is a member of the Pea Family (**Fabaceae**) which includes acacias and mimosas.	Open hillsides, sandy desert washes and slopes below 5,000 feet.	L No habitat on site; none observed
Abrams's Spurge *Chamaesyce abramisiana*	CNPS list: 2	Annual herbaceous blooms Sept/Nov. Common spurge in area has large purple spot and is prostrate; Abram's is not as colorful.	Sonoran Desert Shrub	L No habitat on site; no Abrams's spurge found.

ZOOLOGICAL SPECIES	STATUS[1]	DESCRIPTION OF SPECIES	HABITAT	OBSERVATION/ SITE POTENTIAL
Sand Food *Pholisma sonorae*	State: S1.2 (threatened); CNPS list:1B.2	Parasite on species such as *Erigonus, /tiquilia, ambrosia, pluchea.* White to brown color. Corolla pink to purple.	Sonoran Desert Dunes; loose deep sand	L No deep loose sand available, no habitat; none observed
Birds				
Burrowing Owl *Athene cunicularia*	CDFG: SC Species of Concern	Small raptors that nest in burrows that have been borrowed from other species in open grassland areas. Have adapted well in Imperial County using canals/drains/ditches to establish burrows and foraging for insects in agricultural fields	Open, dry annual or perennial grasslands; deserts & scrublands	H Owls/burrow found on and near site. Survey results included in this report

ZOOLOGICAL SPECIES	STATUS[1]	DESCRIPTION OF SPECIES	HABITAT	OBSERVATION/ SITE POTENTIAL
Vermillion flycatcher *Pyrocephalus rubinus*	CDFG: SC Species of Concern	Length: 5 inches The adult male has a Bright red cap, throat and underparts; with a Black eyeline, nape, back, wings, and tail The Immature male similar to female but has variable amount of red on underparts. The female and immature has Brown upperparts with White underparts with faint streaks on breast with an undertail coverts tinged pink The adult male Vermilion Flycatcher is very distinctive. The female and immatures are more nondescript but the streaking on the breast and pink tinge to the undertail coverts distinguish them from other flycatchers.	Frequents streams and ponds in arid areas; agricultural areas	L Does not nest in area, no habitat will be removed

ZOOLOGICAL SPECIES	STATUS[1]	DESCRIPTION OF SPECIES	HABITAT	OBSERVATION/ SITE POTENTIAL
Yellow Warbler *Dendroica petechia brewsteri*	CNDDB Rank: G5T3, S2; CDFG: SC	A Family of seed-eating, small to moderately large passerine birds that have strong , stubby beaks , which in some species can be quite large. They have a bouncing flight, alternating flapping with gliding on closed wings. Most sing well.	Yellow warblers in southern California breed in lowland and foothill riparian woodlands dominated by cottonwoods, alders, or willows and other small trees and shrubs typical of low, open-canopy riparian woodland(Garrett and Dunn 1981). During migration, they occur in lowland and foothill woodland habitats such as desert oases, riparian woodlands, oak woodlands, mixed deciduous-coniferous woodlands, suburban and urban gardens and parks, groves of exotic trees, farmyard windbreaks, and orchards (Small 1994).	Medium Could forage in area; some habitat will be removed but sufficient in vicinity will remain to support foraging
Le Conte's Thrasher *Toxostoma lecontei*	CNDDB Rank: G3, S3; CDFG: SC	Sexes are alike. This sandy-colored, 10-inch long bird blends well with dry desert vegetation. Its black tail contrasts with its gray, unspotted breast and belly.	Le Conte's Thrasher is a widespread, but rare permanent resident in the western and southern San Joaquin Valley, upper Kern River Basin, Owens Valley, Mojave Desert, and Colorado Desert in southwestern United States.	L No habitat; none observed

ZOOLOGICAL SPECIES	STATUS[1]	DESCRIPTION OF SPECIES	HABITAT	OBSERVATION/ SITE POTENTIAL
Ferruginous hawk *Buteo regalis*	Species of concern	The male and female have identical markings. The main difference is size, with the female being larger. Perched birds have a white breast and body with dark legs. The back and wings are a brownish rust color. The head is white with a dark streak extending behind the eye. The wing tips almost reach the tip of the tail.	Found in arid to semiarid regions, as well as grasslands and agricultural areas in southwestern Canada, western United States, and northern Mexico.	M Could hunt in area; some habitat will be removed but sufficient in vicinity will remain to support prey base
California Black Rail *Laterallus jamaicensis coturniculus*	CDFG: Threatened	The smallest of all rails, the black rail is slate-colored, with a black bill, red eyes and a white-speckled back. The legs are moderately long and the toes are unwebbed. The sexes are similar.	Most commonly occurs in tidal emergent wetlands dominated by pickleweed or in brackish marshes with bulrushes in association with pickleweed. In freshwater, usually found in bulrushes, cattails, and saltgrass and in immediate vicinity of tidal sloughs. Typically occurs in the high wetland zones near upper limit of tidal flooding, not in low wetland areas with considerable annual or daily fluctuations in water levels. Nests are concealed in dense vegetation, often pickleweed, near upper limits of tidal flooding	L None observed; no habitat on site

ZOOLOGICAL SPECIES	STATUS[1]	DESCRIPTION OF SPECIES	HABITAT	OBSERVATION/ SITE POTENTIAL
Sonoran desert toad *Incillius alvarius*	CDFG: SC	Large: 7.5 inches or more in length. smooth, typically olive-green/brown skin, cranial crests, and prominent, elongated glands on both sides of the back of the head (parotoid glands) and on the hind legs. Young toads have small dark, orange-tipped spots on the back. Larger tadpoles are gray or brown with a rounded tail tip, and grow to about 2.25 inches.	Sonoran Desert scrub, semi-desert grasslands. Can be tied to permanent water, such as major rivers or the edges of agriculture. May be found many miles from water, particularly during the summer monsoons.Most Sonoran Desert toads are found at night during the monsoon season, but they may emerge a month or more before the summer rains begin, particularly in areas of permanent water. Can be found in rodent burrows or underground retreats.	L None observed. No habitat present on site.
Leopard frog *Lithobates yavapaiensis*	Species of concern	Tan, gray-brown or light gray-green to green above; yellow below. Vague upper lip stripe, tuberculate skin. Dark network on rear of thighs; yellow groin color often extends onto rear of belly and underside of legs. Male will exhibit a swollen and darkened thumb base.	Find in desert grassland and in woodlands. Uses permanent water sources, stays near water. Breed Feb-April. Bullfrogs are predators	L No permanent water sources on site; not expected on site.
Yuma Ridgway's rail *Rallus obsoletus yumanensis*	CDFW: SSC	35–40 cm; male 194–347 g, female 160–310 g (yumanensis). Large rail with long, slender, slightly decurved bill.	Salt and brackish marshes, particularly those with tidal sloughs; favors marshes with tall, dense brush	L None observed or heard; Cattails not found in dense stands; no suitable habitat on site or in adjacent drains.

lowland leopard frog *Lithobates yavapaiensis*	CDFW: SSC	is a relatively small leopard frog - maximum length is about 3.4 inches. It is distinguished from other Arizona leopard frogs by a combination of characters, including dorsolateral folds that are broken and inset towards the rear, a dark brown and tight reticulate pattern on the rear of the thigh, and usually no spots on the snout.	is a species of frog in the Ranidae family that is found in Mexico and the United States; Its natural habitats are temperate forests, rivers, intermittent rivers, freshwater lakes, and freshwater marshes.	L No habitat
Northern leopard frog *Lithobates pipiens*	CDFG: SC	2-3½ inches long and has randomly distributed black spots on its back, sides, and legs. Each spot is surrounded by a light halo. The background colors of the frog can range from gold to green. Gold or brown dorsolateral ridges often stand out in contrast.	NLF needs permanent water for overwintering, floodplains and marshes for breeding, and wet meadows and fields for foraging	L No habitat on site or nearby
ZOOLOGICAL SPECIES	**STATUS[1]**	**DESCRIPTION OF SPECIES**	**HABITAT**	**OBSERVATION/ SITE POTENTIAL**
Flat-tailed horned lizard *Phrynosoma mcallii*	CNDDB Rank: G3; S2 CDFG: SC	A small (up to 87 mm or 3.4" from snout to vent), exceptionally flat and wide lizard with a long (for a horned lizard) broad, flat tail and a dark stripe running down the middle of the back.	occupy a small range in the Sonoran Desert of southwestern California, southwestern Arizona, and extreme northern Mexico.	L No undisturbed sandy habitat. May be found in buffer zones which will not be disturbed One horned lizard scat was observed during suveys
Colorado Desert fringe-toed lizard *Uma notata*	CNDDB Rank: G3, S2; CDFG: SC	2 3/4 to 4 4/5 inches long from snout to vent (7 - 12.2 cm). (Stebbins 2003) The tail is about the same length as the body.	Sparsely-vegetated arid areas with fine wind-blown sand, including dunes, flats with sandy hummocks formed around the bases of vegetation, washes, and the banks of rivers. Needs fine, loose sand for burrowing.	L No loose sandy habitat for burrowing on site. May use buffer zones which will not be disturbed

ZOOLOGICAL SPECIES	STATUS[1]	DESCRIPTION OF SPECIES	HABITAT	OBSERVATION/ SITE POTENTIAL
American Badger *Taxidea taxus*	CDFG: Species of Concern	Burrowing animals that feed on ground squirrels, rabbits, gophers and other small animals. Prefer grasslands, agricultural areas.	Found in drier open areas with friable soils	L None seen; no burrows observed with badger characteristics observed. Not expected because of farming activities
Pocketed free-tailed bat *Nyctinomops femorosaccus*	CNDDB Rank: G4, S2S3; CDFG: SC	A small fold, or "pocket" in the wing membrane of the free-tailed bat, near its knee, gives this bat its common name. Pocketed free-tailed bats have large ears and long wings, and fly rapidly, generally pursuing insects on the wing. They eat many kinds of insects, but seem to prefer small moths.	It occurs in the arid lowlands of the desert Southwest, and primarily roosts in crevices in rugged cliffs, slopes, and tall rocky outcrops.	L None seen. Not expected; no habitat
Yuma hispid cotton rat *Sigmodon hispidus eremicus*	CDFG: SC	Hispid cotton rats are small to medium sized rodents, with adults weighing 100 to 225 g (average 159 g). Total length ranges from 80 to 320 mm, with males slightly longer than females. The color of both sexes consists of a mixture of tan, brown, and black fur on their dorsal parts, giving them a coarse, or "hispid," appearance. The underparts are white to greyish, the tail is sparsely haired and considerably shorter than the combined length of the head and body.	In the United States, they are found as far north as Nebraska in the west and coastal and central Virginia to the east. There is also an isolated population in southeastern California in the Imperial Valley along the Colorado River. Hispid cotton rats prefer dense, grassy areas.	L No habitat; no trails observed

ZOOLOGICAL SPECIES	STATUS[1]	DESCRIPTION OF SPECIES	HABITAT	OBSERVATION/ SITE POTENTIAL
California leaf-nosed bat *Macrotus californicus*	CDFG: SC	The California leaf-nosed bat weighs between 12 and 20 grams, has a wingspan of over 30 centimeters and a body length of over 6 centimeters, and is brown in color. As its name implies, it has a triangular fleshy growth of skin, called a noseleaf, protruding above the nose. Because their wings are short and broad they are not suited for long distance flight needed for migration.	It is found in Mexico and the United States. Its natural habitat is hot deserts. Preferred habitats are caves, mines, and rock shelters, mostly in Sonoran desert scrub. Roost sites are usually located near foraging areas. It is threatened by habitat loss.	L No habitat
Big free-tailed bat *Nyctinomops macrotis*	CDFG: SC	They have a wingspan of 435 mm and an average length of 140 mm. Little is known of mortality and longevity. Breeding probably occurs in midwinter while the species is in warmer latitudes. Moths seem to be the mainstay of their diet, although few data have been collected. This bat emerges late in the evening and forages at high altitudes.	a bat species found in South, North and Central America. This bat frequents rocky or canyon country where it roosts in crevices	L No nesting habitat
Western Mastiff Bat *Eumops perotis californicus*	CNDDB Rank: G5T4, S3; CDFG: SC	Eumops perotis can be distinguished from all other North American molossid (free-tail) species based on size. With a forearm of 73-83 mm, it is North America's largest species.	In California, the E. perotis is most frequently encountered in broad open areas. Generally, this bat is found in a variety of habitats, from dry desert washes, flood plains, chaparral, oak woodland, open ponderosa pine forest, grassland, montane meadows, and agricultural areas.	L None seen. Not expected; no habitat

ZOOLOGICAL SPECIES	STATUS[1]	DESCRIPTION OF SPECIES	HABITAT	OBSERVATION/ SITE POTENTIAL
Western Yellow bat *Lasiurus xanthinus*	CDFG SC:	Consumes small to medium-sized, night flying insects. Yellow color/short ears.	Roosts in leafy vegetation the deserts of the southwestern United States. Roosts among the dead fronds of palm trees and cottonwoods	L
Big free tailed bat *Nyctinonmops macrotis*	CDFG: SC	Body length of 5 1/8 to 5 3/4", with a 17" wingspan, which makes it bigger than other free tailed bats. Fur is reddish brown to dark brown, with hairs white at base. Tail extends past membrane at least an inch. Big ears are joined at base and extend out over face like a hat. Eats mostly moths, some crickets, grasshoppers, ants, various other insects.	Lives in rocky areas of desert scrub or coniferous forests. During day roosts in crevices on cliff faces.	L None seen. Not expected; no habitat.
Palm Springs pocket mouse *Perognathus longimembris bangsi*	CDFG: SC	This is a small heteromyid rodent with TL from about 110 to 151 mm and weight from 8 to 11 g. As in all silky pocket mice, the pelage is spineless, and there are usually two small patches of lighter hairs at the base of the ear. Silky pocket mice can be distinguished from sympatric pocket mice of the genus Chaetodipus (fallax, formosus, and penicillatus) by their smaller size (see Ingles 1965 for comparisons), the absences of a tail-crest, and an unlobed antitragus in the outer ear.	Historically known from the San Gorgonio Pass area east to southern Joshua Tree National Park, south through the Coachella Valley to Ocotillo. Its historical range extends from Joshua Tree National Park southward, west to San Gorgonio Pass and down to Borrego Springs and the east side of San Felipe Narrows (Hall 1981)	L No habitat

ZOOLOGICAL SPECIES	STATUS[1]	DESCRIPTION OF SPECIES	HABITAT	OBSERVATION/ SITE POTENTIAL
Colorado Valley woodrat *Neotoma albigula venusta*	CNDDB Rank: G5T3T4, S1S2	a small rodent measuring an average of 12.9 inches (32.8 cm) and weighing an average of 188 g for females and 224 g for males	Typically found at an altitude of 0 to 1,966 meters (0 to 6,450 feet). Mesquite-creosotebush	L No desert vegetation on site; may be found in buffer zone which will not be disturbed

Special Status Species that Occur in Imperial County (USFWS)

Common Name Scientific Name	Status1 Federal/CDFG /CNPS	DESCRIPTION OF SPECIES	Habitat	Suitability Of Habitat In Survey Area
Plants				
Peirson's milk-vetch *Astragalus magdalenae var. peirsonii*	T/E/1B	Silvery, short-lived perennial plant that is somewhat broom like in appearance. A member of the pea and bean family, it can grow to 2.5 feet tall and is notable among milkvetches for its greatly reduced leaves. Peirson´s milkvetch produces attractive, small purple flowers , generally in March or April, with 10 to 17 flowers per stalk. It yields inflated fruit similar to yellow-green pea pods with triangular beaks.	Desert dune habitats. In California, known from sand dunes in the Algodones Dunes system of Imperial County. Was known historically from Borrego Valley in San Diego County and at a site southwest of the Salton Sea in Imperial County	L None observed. No dune habitat

Common Name Scientific Name	Status1 Federal/CDFG /CNPS	DESCRIPTION OF SPECIES	Habitat	Suitability Of Habitat In Survey Area
Birds				
California brown pelican *Pelecanus occidentalis*	E/E/-No longer endangered	Large size and brown color. Adults weigh approximately 9 pounds, and have a wingspan of over 6 feet. They have long, dark bills with big pouches for catching and holding fish. Pelicans breed in nesting colonies on islands without mammal predators. Roosting and loafing sites provide important resting habitat for breeding and non-breeding birds.	Open water, estuaries, beaches; roosts on various structures, such as pilings, boat docks, breakwaters, and mudflats	L None observed. No open water

Common Name Scientific Name	Status1 Federal/CDFG /CNPS	DESCRIPTION OF SPECIES	Habitat	Suitability Of Habitat In Survey Area
Southwestern willow flycatcher *Empidonax traillii extimus*	E/-/-	Small; usually a little less than 6 inches in length, including tail. Conspicuous light-colored wingbars. Lacks the conspicuous pale eye-ring of many similar *Empidonax* species. Overall, body brownish-olive to gray-green above. Throat whitish, breast pale olive, and belly yellowish. Bill relatively large; lower mandible completely pale. The breeding range of extimus includes Arizona and adjacent states.	At low elevations, breeds principally in dense willow, cottonwood, and tamarisk thickets and in woodlands, along streams and rivers. Migrants may occur more widely. Prefers riparian willow/cottonwood but will use salt cedar thickets	L None Observed; no suitable thickets on site
Ridgwway rail *Rallus longirostris yumanensis*	E/T/-	A chickenlike marsh bird with a long, slightly drooping bill and an often upturned tail. Light brownish with dark streaks above. Rust-colored breast; bold, vertical gray and white bars on the flanks; white undertail coverts. Very shy.	Lives in freshwater and brackish marshes. Prefers dense cattails, bulrushes, and other aquatic vegetation. Nests in riverine wetlands near upland, in shallow sites dominated by mature vegetation, often in the base of a shrub. Prefers denser cover in winter than in summer.	L None observed or heard; no suitable habitat; not immediately adjacent to Salton Sea.

Common Name Scientific Name	Status1 Federal/CDFG /CNPS	DESCRIPTION OF SPECIES	Habitat	Suitability Of Habitat In Survey Area
Yellow-billed cuckoo *Coccyzus americanus*	C/E/-	Medium-sized cuckoo with gray-brown upperparts and white underparts. Eye-rings are pale yellow. Bill is mostly yellow. Wings are gray-brown with rufous primaries. Tail is long and has white-spotted black edges. Sexes are similar.	Found in forest and open woodlands, especially in areas with dense undergrowth, such as parks, riparian woodlands, and thickets	L None observed; no habitat on site. Thickets are not present.
Bald eagle *Haliaeetus leucocephalus*	T, PD/E/-	The distinctive white head and tail feathers Beak and eyes yellow. Bald Eagles are about 29 to 42 inches long, can weigh 7 to 15 pounds, and have a wing span of 6 to 8 feet.	Found on shores, lake margins, and near large rivers. Nests in large trees. Winters at lakes, reservoirs, river systems, and some rangelands and coastal wetlands (breeding range is mainly in mountainous habitats near reservoirs, lakes and rivers, mainly in the northern two-thirds of California)	L None observed; no habitat

Common Name Scientific Name	Status1 Federal/CDFG /CNPS	DESCRIPTION OF SPECIES	Habitat	Suitability Of Habitat In Survey Area
Least tern *Sterna antillarum*	E/E/-	Small tern. During breeding, black cap ending at white forehead. Short white eyestripe. Bill yellow with black tip. Back light gray. Underside white. Black leading edge to wing. In nonbreeding plumage has black eyestripe extending to back of head, white top of head, and black bill. Size: 21-23 cm (8-9 in) Wingspan: 48-53 cm (19-21 in) Weight: 30-45 g (1.06-1.59 ounces)	Shallow areas of estuaries, lagoons, and at the joining points between rivers and estuaries	L None observed; no habitat
Least Bell's Vireo *Vireo bellii pusillus*	E/E/-	Drab gray to green above and white to yellow below. It has a faint white eyering and two pale wingbars; has pale whitish cheeks and forehead and greenish wings and tail. longer tail and subtle wingbars. The song is a varied sequence of sharp, slurred phrases that typically end with an ascending or descending note.	Formerly a common and widespread summer resident below about 2,000 feet in western Sierra Nevada. Also was common in coastal southern California, from Santa Barbara County south, below about 4,000 feet east of the Sierra Nevada. Prefers thickets of willow, and other low shrubs afford nesting and roosting cover	L None observed; no habitat on site. Thickets are present off site. Minimal construction on site should not disturb any occupants of thickets

Common Name Scientific Name	Status1 Federal/CDFG /CNPS	DESCRIPTION OF SPECIES	Habitat	Suitability Of Habitat In Survey Area
Mountain plover *Charadrius montanus*	FPT/SC/-	Medium-sized plover with pale brown upperparts, white underparts, and brown sides. Head has brown cap, white face, and dark eyestripe. Upperwings are brown with black edges and white bars; underwings are white. Tail is brown-black with white edges. Sexes are similar.	Avoids high and dense cover. Uses open grass plains, plowed fields with little vegetation, and open sagebrush areas. Likes to follow livestock grazing or burned off fields.	H None observed; usually observed closer to Salton Sea agricultural fields will be removed that if planted to Bermuda or alfalfa could support Mt. plover. Sufficient forage will remain to support species

Common Name Scientific Name	Status1 Federal/CDFG /CNPS	DESCRIPTION OF SPECIES	Habitat	Suitability Of Habitat In Survey Area
Black rail *Laterallus jamaicensis coturniculus*	-/T/-	The smallest of all rails, the black rail is slate-colored, with a black bill, red eyes and a white-speckled back. The legs are moderately long and the toes are unwebbed. The sexes are similar.	Most commonly occurs in tidal emergent wetlands dominated by pickleweed or in brackish marshes with bulrushes in association with pickleweed. In freshwater, usually found in bulrushes, cattails, and saltgrass and in immediate vicinity of tidal sloughs. Typically occurs in the high wetland zones near upper limit of tidal flooding, not in low wetland areas with considerable annual or daily fluctuations in water levels. Nests are concealed in dense vegetation, often pickleweed, near upper limits of tidal flooding	L None observed; no habitat

Common Name Scientific Name	Status1 Federal/CDFG /CNPS	DESCRIPTION OF SPECIES	Habitat	Suitability Of Habitat In Survey Area
Raptors				
Peregrine Falcon *Falco peregrinus*	D/E/-	Large, powerful falcon; pointed winged falcon silhouette. Strong shallow wingbeats may dive at speeds up to 100 mph. Dark with dark hooded effect. Blue gray below with narrow bars Long-winged, long tailed hawk. Habitually flys low over open fields and marshes watching and listening for prey such as rodents and birds. (I observed Harrier with a white faced ibis as prey). Perches low or on ground. Low slow flight. Nests in reeds. Grey with black wingtips.	Most often found along coastlines or marshy habitats. Nest in cliffs and have been known to nest in tall buildings	L None observed; rare visitors to area outside of the Salton Sea. Few waterfowl for prey or cliffs/tall buildings for nesting
Northern Harrier *Circus cyaneus*	-/SC/-	Blue gray above pale reddish below; small size. Tip of tail squared off. Nesting occurs in dense tree stands which are cool, moist, well shaded and usually near water. Hunt in openings at the edges of woodlands and also brushy pastures.	Marshes, open fields. Nests in reeds	M Observed. Could hunt in area; some habitat will be removed but sufficient in vicinity will remain to support prey base. No nesting habitat .
Sharp-shinned Hawk *Accipiter striatus*	-/SC/-	Gray and white with black on lshoulders and under bend of wing. Graceful flyer. Adults have bright red eyes. Medium size hawk; aboaut 15 inches long and about 12 ounces. Males pale with with rufous shoulders and thigh feathers. White tail washed with rufous. Wide head wings in shallow v when soaring.	Sharp-shinned hawks may appear in woodland habitats during winter and migration periods and are often common in southern California in the coastal lowlands and desert areas; winters in woodlands and other habitats.	M Could hunt in area; some habitat will be removed but sufficient in vicinity will remain to support prey base

Common Name Scientific Name	Status1 Federal/CDFG /CNPS	DESCRIPTION OF SPECIES	Habitat	Suitability Of Habitat In Survey Area
White tailed Kite *Elanus leucurus*	/E/		Found in open country; like to perch on treetop. May be seen hovering prior to attack of a rodent.	M Could hunt in area; some habitat will be removed but sufficient in vicinity will remain to support prey base. No nesting habitat
Ferruginous hawk *Buteo regalis*	/SC/		Found in arid to semiarid regions, as well as grasslands and agricultural areas in southwestern Canada, western United States, and northern Mexico.	M Could hunt in area; some habitat will be removed but sufficient in vicinity will remain to support prey base. No nesting habitat
Mammals				
Bighorn sheep *Ovis canadensis*	E/E/-	Sheep have short hair which is light gray to grayish brown, except around their stomachs and rump, where it is creamy white. Their tails are about four inches long. Full-grown rams weigh between 180 and 240 pounds,	Desert Bighorn sheep occupy a variety of plant communities, ranging from mixed-grass hillsides, shrubs. Avoids dense vegetation	L None observed; no habitat

Common Name Scientific Name	Status1 Federal/CDFG /CNPS	DESCRIPTION OF SPECIES	Habitat	Suitability Of Habitat In Survey Area
Reptiles and Amphibians				
Desert tortoise *Gopherus agassizii*	T/T/-	A herbivore that may attain a length of 9 to 15 inches in upper shell (carapace) length. The tortoise is able to live where ground temperature may exceed 140 degrees F because of its ability to dig underground burrows and escape the heat. At least 95% of its life is spent in burrows. Their shells are high-domed, and greenish-tan to dark brown in color. Desert tortoises can grow from 4–6"in height and weigh 8–15 lb (4–7 kg) when fully grown. The front limbs have heavy, claw-like scales and are flattened for digging. Back legs are more stumpy and elephantine	Dry, flat, and gravelly or sandy ground in desert shrub communities where annual and perennial grasses are abundant. Frequent habitats with a mix of shrubs, forbs, and grasses	L None observed; habitat not favorable
Flat-tailed horn lizard *Phrynosoma mcallii*	PT/-/-	Closely related to Desert horned lizard (scat indistinquishable); only found in Imperial, Riverside County,Ca and Yuma area, Az. Small round lizard with distinquishing round spots on back. Diet of ants; needs sandy soil, shade bushes to survive.	Desert washes/sandy areas with vegetative cover. Diet of ants	L No habitat; none observed One horned lizard scat oberved

Common Name Scientific Name	Status1 Federal/CDFG /CNPS	DESCRIPTION OF SPECIES	Habitat	Suitability Of Habitat In Survey Area
Fish				
Desert pupfish *Cyprinodon macularius*	E/E/-	Small, silvery-colored fish with 6 to 9 dark bands on its sides. Grows to a full average length of only 2.5 inches; develop quickly, sometimes reaching full maturity within 2 to 3 months. Although their average life span is 6 to 9 months, some survive more than one year. Pupfish have a short, scaled head with an upturned mouth. The anal and dorsal fins are rounded with the dorsal sometimes exhibiting a dark blotch. The caudal fin is convex at the rear.	Springs, seeps, and slow-moving streams in Salton Sink basin and backwaters and sloughs of the Colorado River	L None observed; no habitat
Razorback Sucker *Xyrauchen texanus*	Fed/CA: Endangered	One of the largest suckers in North America, can grow to up to 13 pounds and lengths exceeding 3 feet. The razorback is brownish-green with a yellow to white-colored belly and has an abrupt, bony hump on its back shaped like an upside-down boat keel	Colorado River	L None observed; no habitat

USFWS Birds of Conservation Concern

Common Name	Species Name	Habitat	Potential Onsite	Region 8 Imperial County	National Rating
Bald Eagle	*Haliaeetus leucocephalus*	Nests on tall trees or on cliffs in forested areas near large bodies of water. Winters in coastal areas, along large rivers, and large unfrozen lakes.	Low Not expected. No tall trees; not observed in area	X	X
Swainson's Hawk	*Buteo swainsoni*	Breeds in open country such as grassland, shrubland, and agricultural areas. Usually migrates in large flocks often with Broad-winged Hawks. Winters in open grasslands and agricultural areas of Southern America.	M Could hunt in area; some habitat will be removed but sufficient in vicinity will remain to support prey base		X
Peregrine Falcon	*Falco peregrinus*	Inhabits open wetlands near cliffs for nesting. Also uses large cities and nests on buildings.	Low No open wetlands or nesting area.	X	X
Black Rail	*Laterallus jamaicensis*	Nests in high portions of salt marshes, shallow freshwater marshes, wet meadows, and flooded grassy vegetation.	Low No salt or freshwater marshes; no vegetation	X	X

Common Name	Species Name	Habitat	Potential Onsite	Region 8 Imperial County	National Rating
Snowy Plover	*Chardrius alexandrinus*	Barren to sparsely vegetated sand beaches, dry salt flats in lagoons, dredge spoils deposited on beach or dune habitat, levees and flats at salt-evaporation ponds, river bars, along alkaline or sailne lakes, reservoirs, and ponds.	Low No habitat; not observed	X	X
Mountain Plover	*Charadrius montanus*	Breeds on open plains at moderate elevations. Winters in short-grass plains and fields, plowed fields, and sandy deserts.	High Could forage in area; some habitat will be removed but sufficient in vicinity will remain to support prey base	X	X
Black Oystercatcher	*Haematopus bachmani*	Rocky seacoasts and islands, less commonly sandy beaches.	Low No habitat; not observed	X	X
Solitary Sandpiper	*Tringa solitaria*	Breeds in taiga, nesting in trees in deserted songbird nests. In migration and winter found along freshwater ponds, stream edges, temporary ponds, flooded ditches and fields, more commonly in wooded regions, less frequently on mudflats and open marshes.	Low No habitat; not observed		X
Lesser Yellowlegs	*Tringa flavipes*	Breeds in open boreal forest with scattered shallow wetlands. Winters in wide variety of shallow fresh and saltwater habitats.	Low No habitat; not observed		X

Common Name	Species Name	Habitat	Potential Onsite	Region 8 Imperial County	National Rating
Upland Sandpiper	*Bartramia longicauda*	Native prairie and other dry grasslands, including airports and some croplands.	Low No habitat; not observed		X
Whimbrel	*Numenius phaeopus*	Breeds in various tundra habitat, from wet lowlands to dry heath. In migration, frequents various coastal and inland habitats, including fields and beaches. Winters in tidal flats and shorelines, occasionally visiting inland habitats.	High Could forage in area; some habitat will be removed but sufficient in vicinity will remain to support prey base	X	X
Long-billed Curlew	*Numenius americanus*	Nests in wet and dry uplands. In migration and winter found on wetlands, grain fields, lake and river shores, marshes, and beaches.	High Could forage in area; some habitat will be removed but sufficient in vicinity will remain to support prey base	X	X
Short-billed Dowitcher	*Limnodromus griseus*	Breeds in muskegs of taiga to timberline, and barely into subarctic tundra. Winters on coastal mud flats and brackish lagoons. In migration prefers saltwater tidal flats, beaches, and salt marshes. Also found in freshwater mud flats and flooded agricultural fields.	High Could forage in area; some habitat will be removed but sufficient in vicinity will remain to support prey base	X	X
Aleutian Tern	*Sterna aleutica*	Nest on flat vegetated islands on or near the coast. Vegetation includes dwarf-shrub tundra, grass and sedgemeadows, and coastal marsh. Migration and winter habitat not known, probably pelagic.	Low No habitat; not observed		X

Common Name	Species Name	Habitat	Potential Onsite	Region 8 Imperial County	National Rating
Least Tern	*Sterna antillarum*	Seacoasts, beaches, bays, estuaries, lagoons, lakes and rivers, breeding on sandy or gravelly beaches and banks of rivers or lakes, rarely on flat rooftops of buildings.	Low No habitat; not observed		X
Gull-billed Turn	*Sterna nilotica*	Breeds on gravelly or sandy beaches. Inters in salt marshes, estuaries, lagoons and plowed fields, along rivers, around lakes and in freshwater marshes.	Low No habitat; not observed		X
Black Skimmer	*Rynchops niger*	Breeds in large colonies on sandbars and beaches. Forages in shallow bays, inlets, and estuaries.	Low No habitat; not observed	X	X
Yellow-billed Cuckoo	*Coccyzus americanus*	Open woodlands with clearings, orchards, dense scrubby vegetation, mainly cottonwood, willow, and adler, often along water.	Low No habitat; not observed	X	X
Black Swift	*Cypseloides niger*	Nests on steep ledges on cliffs or canyons. Migrates and winters over coastal lowlands.	Low No habitat; no swifts observed in area	X	X
Costa's Hummingbird	*Calypte costae*	Primarily low deserts and arid brushy foothills, but also chaparral and coastal sage scrub closer to the coast. Often visits ornamental plantings and feeders in desert communities. In migration and winter frequents a wider variety of habitats, occasionally ranging into pine-oak woodlands in adjacent mountains.	Low No habitat; not observed – no feeders or nectar sources in area	X	X
Calliope Hummingbird	*Stellula calliope*	Open montane forest, mountain meadows, and thickets of willow and alder. In migration and winter also in chaparral, oak and pine-oak woodlands, deserts, and gardens.	Low No habitat; not observed	X	X

Common Name	Species Name	Habitat	Potential Onsite	Region 8 Imperial County	National Rating
Rufous Hummingbird	*Selasphorus rufus*	Breeds in a variety of forested habitats where flowers are found. Frequents montane meadows and just about anywhere else with flowers or feeders during migration. Winters primarily in pine and pine-oak forests in Mexico, but most birds wintering farther north are attracted either to flowers or feeders in gardens.	Low No habitat; not observed – no feeders or nectar in area.		X
Allen's Hummingbird	*Selasphorus sasin*	Breeds in coastal sage scrub, chaparral, and riparian corridors within coastal forests. In Mexico winters in forest edge and scrub clearings with flowers. The resident population on the mainland of southern California is largely restricted to suburban neighborhoods where feeders and flowers are plentiful.	Low No habitat; not observed. No feeders or nectar in area	X	X
Lewis's Woodpecker	*Melanerpes lewis*	Breeds in open arid conifer, oak, and riparian woodlands: rare in coastal areas. Winters in breeding habitat, and oak savannas, orchards, and even in towns.	Low No habitat; not observed	X	X
Olive-sided Flycatcher	*Contopus cooperi*	Montane and northern coniferous forests, at forest edges and openings such as meadows, and at ponds and bags. Winters at forest edges and clearings where tall trees or snags are present.	Low No habitat; not observed	X	X
Willow Flycatcher	*Empidonax trailii*	Breeds in moist, shrubby areas, often with standing or running water. Winters in shrubby clearings and early successional growth.	Low No habitat; not observed	X	X
Loggerhead Shrike	*Lanius ludovicianus*	Open or brushy areas.	Medium Could forage in area; some habitat will be removed but sufficient in vicinity will remain to support foraging	X	X

Common Name	Species Name	Habitat	Potential Onsite	Region 8 Imperial County	National Rating
Bell's Vireo	*Vireo bellii*	Dense, low, shrubby vegetation generally early successional stages in riparian areas, brushy fields, young second-growth forest or woodland, scrub oak, coastal chaparral, and mesquite brushlands, often near water in arid regions.	Low Scant shrubby vegetation on site	X	X
Gray Vireo	*Vireo vicinior*	Found in desert scrub, mixed oak-juniper and pinyon-juniper woodlands, dry chaparral, and thorn scrub in hot, arid mountains and high-plains.	Low No habitat; not observed	X	X
LeConte's Thrasher	*Toxostoma lecontei*	Desert scrub, mesquite, tall riparian brush and, locally, chaparral.	Low No habitat; not observed	X	X
Yellow Warbler	*Dendroica petechia*	Breeds in wet, deciduous thickets, especially in willows and adler. Also in shrubby areas, old fields, gardens and orchards. In southern Florida and farther south, found in mangroves.	Medium Could forage in area; some habitat will be removed but sufficient in vicinity will remain to support foraging	X	
Common Yellowthroat	*Geothlypis trichas*	Thick vegetation from wetlands to prairies to pine forests. Frequently near water.	Low No habitat; not observed	X	
Rufous-winged Sparrow	*Aimophila carpalis*	Found in flat areas of tall desert grass mixed with brush and cactus, and thorn scrub.	Low No habitat; not observed		X
Brewer's Sparrow	*Euphagus cyanocephalus*	Found in a variety of habitats, but prefers open, human-modified areas, such as farmland, fields, residential lawns, and urban parks.	Medium Not observed. Could forage in area; some habitat will be removed but sufficient in vicinity will remain to support foraging	X	X
Black-chinned Sparrow	*Spizella atrogularis*	Arid brush land, commonly in tall and fairly dense sagebrush, and dry chaparral. Often in rocky, rugged country from sea level to around 8,900 ft (2700m).	Low No habitat; not observed	X	X

Common Name	Species Name	Habitat	Potential Onsite	Region 8 Imperial County	National Rating
Tricolored Blackbird	*Agelaius tricolor*	Breeds in marsh vegetation, particularly cattails, near grain fields, riparian scrubland, and forests, but always near water. Dairies and feedlots also commonly used for foraging. Urban and suburban areas occasionally utilized, particularly park lawns. Cultivated lands also suitable for foraging. Large night-time roosts form during nonbreeding season in cattail marshes near foraging grounds.	Low Not recorded in area	X	X
Lawrence's Goldfinch	*Carduelis lawrencei*	Prefers dry interior foothills, mountain valleys, open woodlands, chaparral, and weedy fields. Often found near isolated water sources such as springs and cattle troughs.	Low No habitat; not observed	X	X

CNPS Species or Community Level
G1 = Less than 6 viable element occurrences (EOs) OR less than 1,000 individuals OR less than 2,000 acres.
G2 = 6-20 EOs OR 1,000-3,000 individuals OR 2,000-10,000 acres.
G3 = 21-80 EOs OR 3,000-10,000 individuals OR 10,000-50,000 acres.
G4 = Apparently secure; this rank is clearly lower than G3 but factors exist to cause some concern; i.e., there is some threat, or somewhat narrow habitat.
G5 = Population or stand demonstrably secure to ineradicable due to being commonly found in the world.

State Ranking	
The state rank (S-rank) is assigned much the same way as the global rank, except state ranks in California often also contain a threat designation attached to the S-rank.	The R-E-D Code contains information on Rarity, Endangerment, and Distribution, ranked as a 1, 2, or 3 for each value (as below). This code was originally known as the R-E-V-D Code (through the 3rd edition 1980), and the V (Vigor) was removed in the 4th edition (1984).
S1 = Less than 6 EOs OR less than 1,000 individuals OR less than 2,000 acres	**R - Rarity**
S1.1 = very threatened	1 – Rare, but found in sufficient numbers and distributed widely enough that the potential for extinction is low at this time

S1.2 = threatened	2 – Distributed in a limited number of occurrences, occasionally more if each occurrence is small
S1.3 = no current threats known	3 – Distributed in one to several highly restricted occurrences, or present in such small numbers that it is seldom reported
S2 = 6-20 EOs OR 1,000-3,000 individuals OR 2,000-10,000 acres	**E - Endangerment**
S2.1 = very threatened	1 – Not very endangered in California
S2.2 = threatened	2 – Fairly endangered in California
S2.3 = no current threats known	3 – Seriously endangered in California
S3 = 21-80 EOs or 3,000-10,000 individuals OR 10,000-50,000 acres	**D - Distribution**
S3.1 = very threatened	1 – More or less widespread outside California
S3.2 = threatened	2 – Rare outside California
S3.3 = no current threats known	3 – Endemic to California
S4 = Apparently secure within California; this rank is clearly lower than S3 but factors exist to cause some concern; i.e. there is some threat, or somewhat narrow habitat. NO THREAT RANK.	
S5 = Demonstrably secure to ineradicable in California. NO THREAT RANK.	
Sources: CDFW/CNDDB 2017, California Wildlife 2010; CNPS 2017; USFWS, 2010	
State/CDFG:	**[1]Status: Federal:**
E = Listed as an endangered species; or previously known as “rare, fully protected”	E = Listed as an endangered species
T = Listed as a threatened species	T = Listed as a threatened species
SC = species of special concern (designation intended for use as a management tool and for information; species of special concern have no legal status (www.dfg.ca.gov/wildlife/species/ssc/birds.html))	C = Candidate for listing
CNPS (California Native Plant Society):	D = Delisted
1B = Rare, threatened, or endangered in California or elsewhere	PD = Proposed for delisting/PT = Proposed for threatened status
2= Plants rare, threatened,or endangered in Ca, but more common elsewhere	
3=Plants about which more information is needed	
Habitat Suitability Codes: H = Habitat is of high suitability for this species M = Habitat is of moderate suitability for this species L = Habitat is of low suitability for this species	

APPENDIX B
PHOTOGRAPHS

PHOTOGRAPHS

1. On site, facing east at Liebert Road; alfalfa field. IID canal to left

2. On site, facing southeast at corner of Lieert/Wixom Road; abandoned shed and palms

3. Corner of Liebert/Wixom Roads looking north; alfalfa field

4. On site, looking west from Vogel Road

5. On site, looking northeast from Derrick Road, Bermuda field in background

6. On site, looking northeast from corner of Diehl/Derick Road; alfalfa field in background

7. Occupied burrow with whitewash and pellets on Imperial Irrigation District Right of Way (IIDROW)

8. Southwest corner of Wixom/Derick Roads looking northeast to site; former Bermuda field

9. Wixom Road looking north; west of Derrick Road; former Bermuda field; IID canal in foreground

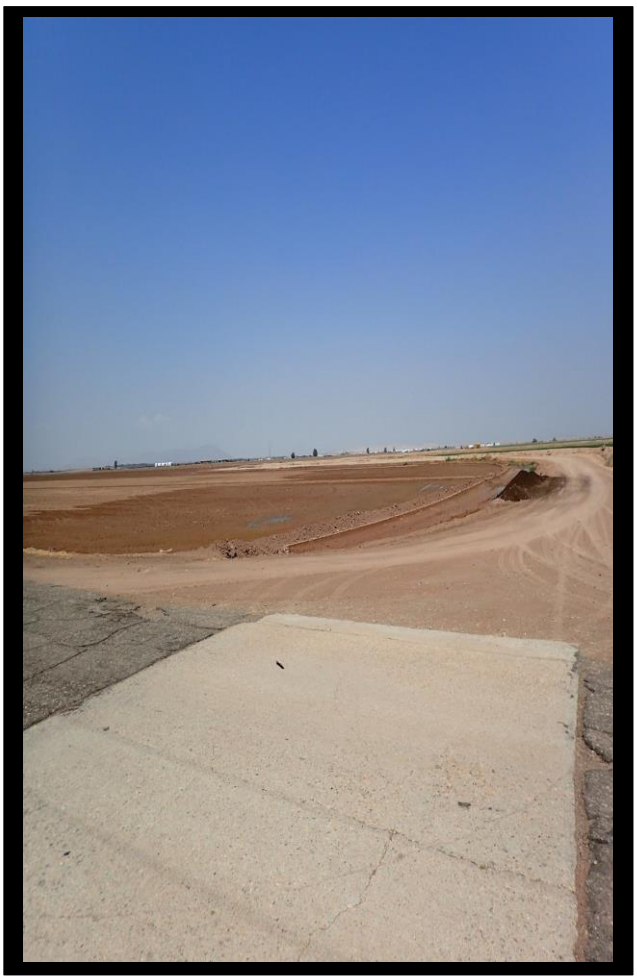
10. Looking east to site (Bermuda field) from IID Canal; North of Wixom and East of Liebert Roads; arrowweed in foreground;

11. Southeast corner of Diehl/Derrick intersection looking northwest to site from Diehl Road; bermuda field

12. Jessup Road looing northwest to site; east boundary; south of West Campbell Road

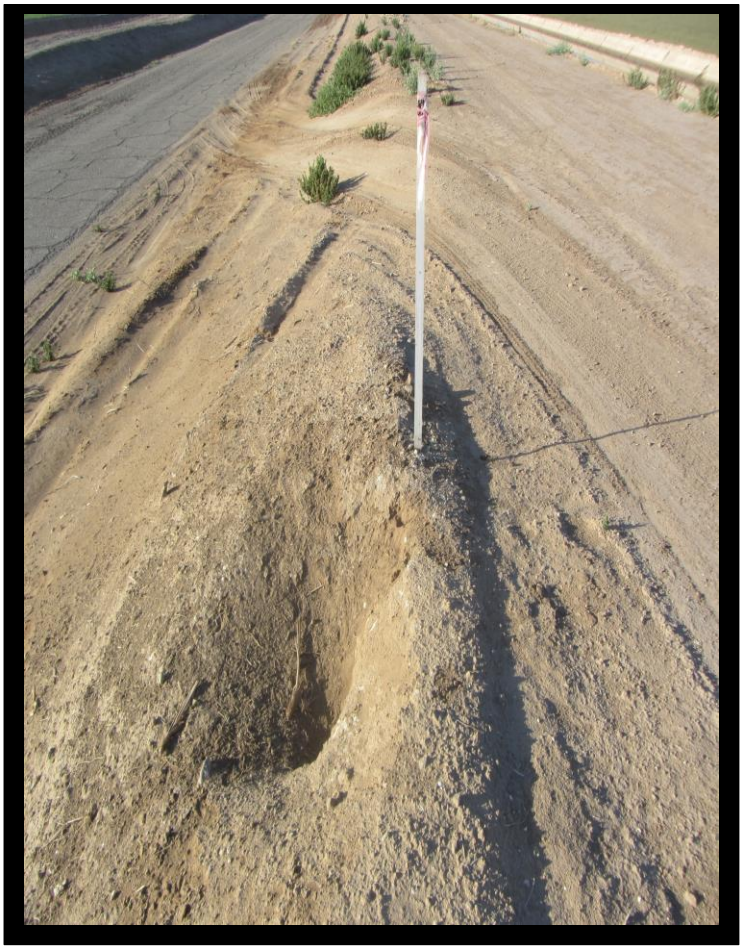
13. Northwest corner of site at Westside Road looking south; south of Imperial County Public School property; alfalfa field

14. West Vaugh Road looking southwest to site (at house lot) to site; Bermuda field



15. West Vaughn Road looking northwest at IID drain to site; disked field

16. Northwest corner at Diehl Road looking southeast to site west of Westside Road; grass field



17. Occupied BUOW burrow on IID ROW

18. Scorpion tracks

APPENDIX C
SPECIES FOUND ON SITE

APPENDIX C
ZOOLOGICAL SPECIES OBSERVED ON OR NEAR SITE

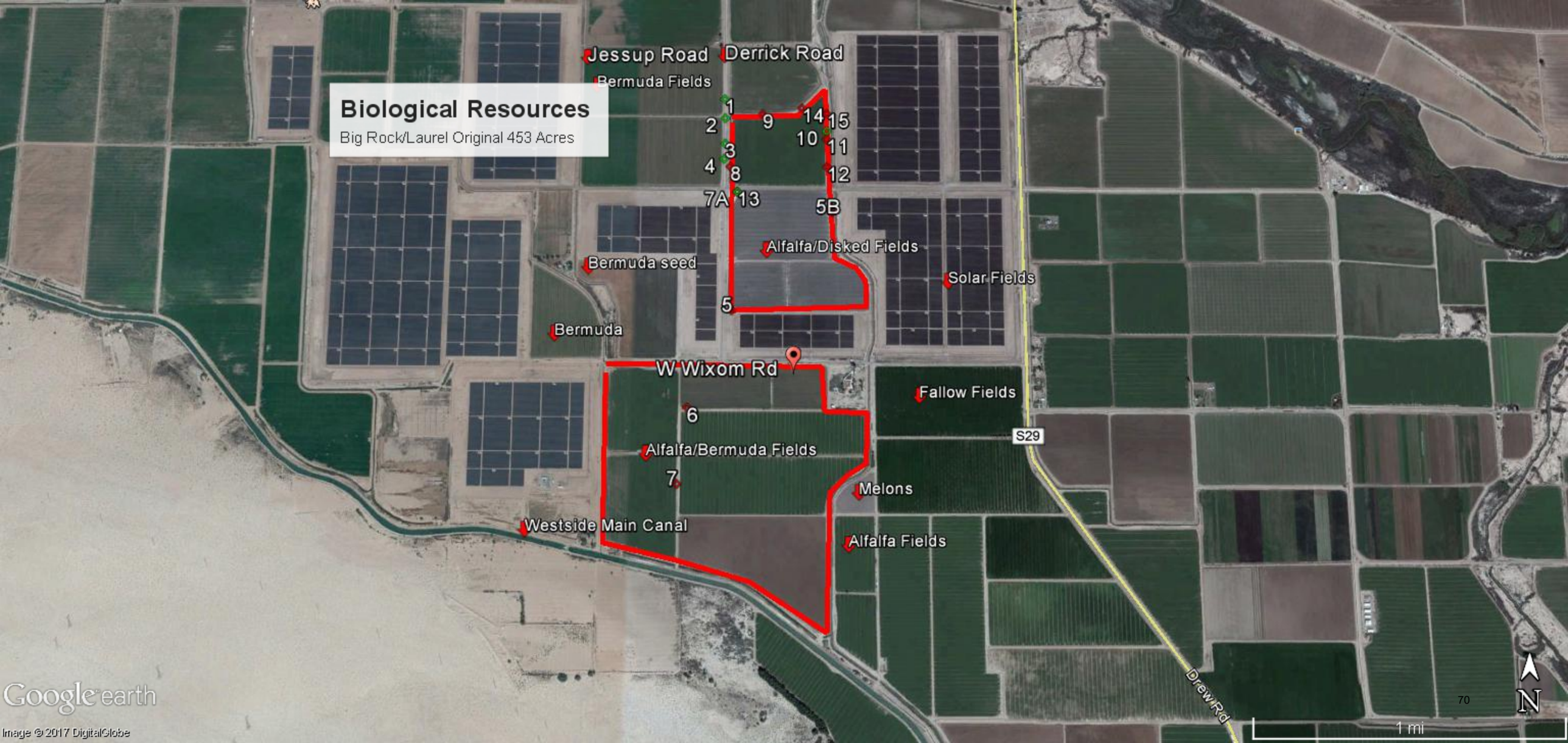
Common name	Scientific name
Birds	
Aberts towhee	*Melozone aberti*
American Kestrel	*Falco sparverius*
Black necked stilt	*Himantopus mexicanus*
Cliff swallows	*Petrochelidon pyrrhonota*
Crow	*Corvus corax*
Doves (Mourning)	*Zenaida macroura*
Doves (white wing)	*Zenaida asiatica*
Doves (Eurasian)	*Streptopelia decaocto*
Black phoebe	*Sayornis nigricans*
Burrowing owl	*Athene cunicularia*
Grackle	*Quiscalus mexicanus*
Killdeer	*Charadrius vociferus*
Mallard	*Anas platyrhynchos*
Meadowlark	*Sturnella neglecta*
Burrowing owl	*Athene cunicularia*
Cattle egret	*Bubulcus ibis*
Green heron	*Butorides virescens*
Great blue heron	*Ardea herodias*
Snowy egret	*Egretta thula*
Northern harrier	*Circus cyaneus*
Pheasant	*Phasianus colchicus*
Red winged blackbird	*Agelaius phoeniceus*
Red-tailed hawk	*Buteo jamaicensis*
Roadrunner	*Geococcyx californianus*
White egret	*Ardea alba*
Gambels quail	*Callipepla gambelii*
Western kingbird	*Tyrannus verticalis*
Mammals	
Gopher mounds	*Thomomys sp.*

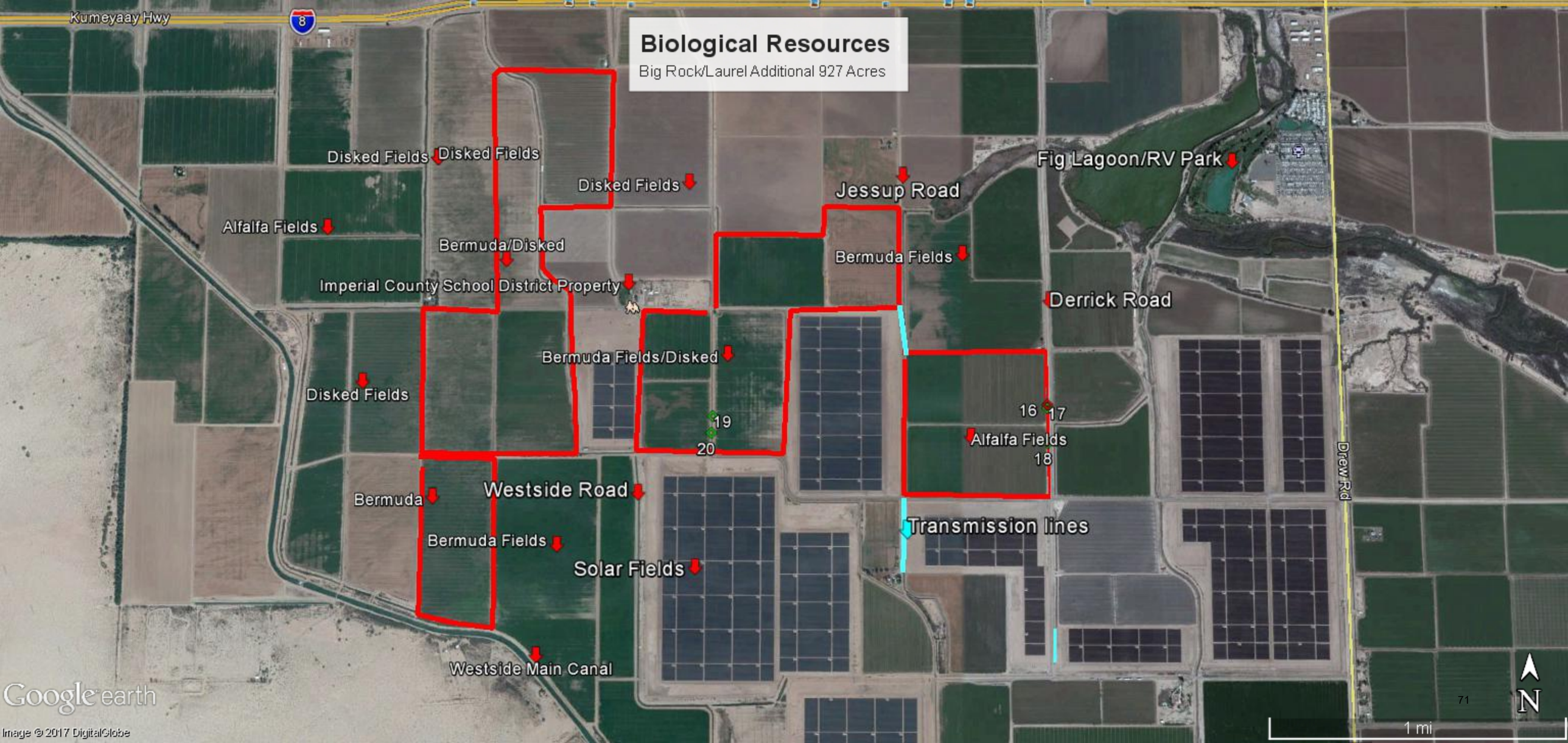
Cottontail	*Sylvilagus audubonii*
Canine tracks/scat	*various*
Muskrat	*Ondatra zibethicus*
Round tailed ground squirrel	*Spermophilus tereticaudus*
Skunk	*Mephitis mephitis*
Reptiles	
California king snake	*Lampropeltis getula californiae*
Side blotched lizard	*Uta stansburiana*
Horned lizard scat	
Insects	
Ants	*various*
Ant lion	*Dendroleon obsoletus*
Alfalfa butterfly	*Colias eurytheme*
Bees	*Aphis sp.*
Crickets	*various*
Dragonflies	*various*
Grasshoppers	*various*
Scorpion tracks	*various*
Velvet ant	*Dasymutilla magnifica*

BOTANICAL SPECIES OBSERVED ON OR NEAR SITE

Common name	Scientific name
Desert broom	*Baccharis sarothroides*
Arrowweed	*Pluchea sericea*
Quailbush	*Atriplex sp.*
Russian thistle	*Salsola tragus*
Bermuda	*Cynodon dactylon*
Sunflower	*Helianthus annuus*
Mesquite	*Prosopis sp.*
Palo verde	*Parkinsonia microphylla*
Date palm	*Phoenix dactylifera*
5 hook bassia	*Bassia hyssopifolia*
Saltcedar	*Tamarix sp.*
Curly dock	*Rumex crispus*
Quailbush	*Atriplex sp.*
Lambsquarter	*Chenopodium album*
Salt grass	*Distichlis spicata*
Alkali mallow	*Malvella leprosa*
Alkali heliotrope	*Heliotropium curassavicum*
Bermuda	*Cynodon dactylon*
Russian thistle	*Salsola tragus*
Phragmites	*Phragmites australis*
Puncture vine	*Tribulus terrestris*
Sprangletop	*Leptochloa sp.*
Spiny aster	*Chloracantha spinosa*

APPENDIX D
BIOLOGICAL RESOURCES


Biological Resources
Big Rock/Laurel Original 453 Acres
Jessup Road
Derrick Road
Bermuda Fields
1
2
3
4
8
7A
13
9
14
15
10
11
12
5B
Alfalfa/Disked Fields
Bermuda seed
Solar Fields
5
Bermuda
W Wixom Rd
Fallow Fields
6
S29
Alfalfa/Bermuda Fields
7
Melons
Westside Main Canal
Alfalfa Fields
Drew Rd
N
1 mi
Google earth
Image © 2017 DigitalGlobe


Biological Resources
Big Rock/Laurel Additional 927 Acres
Kumeyaay Hwy
8
Disked Fields
Disked Fields
Disked Fields
Jessup Road
Fig Lagoon/RV Park
Alfalfa Fields
Bermuda/Disked
Bermuda Fields
Imperial County School District Property
Derrick Road
Bermuda Fields/Disked
Disked Fields
16
17
19
20
Alfalfa Fields
18
Drew Rd
Bermuda
Westside Road
Transmission lines
Bermuda Fields
Solar Fields
Westside Main Canal
Google earth
Image © 2017 DigitalGlobe
71
N
1 mi

BUOW Nesting Surveys Big Rock Laurel

	Description	1st Survey 5/4 and 6/2017	2nd Survey 5/22 and 24/2017	3rd Survey 6/15-16/17	4th Survey 7/7/17
#1 N32°45'12.1" W115°42'26.8" Offsite	IID ROW West side of Derrick Road	Active burrow tracks, whitewash, pellets	Occupied burrow/2 adult BUOW	Occupied burrow/2 adult BUOW	Occupied burrow/2 adult BUOW
2. N32°45'8.6" W115°42'26.7" Offsite	IID ROW west side of Derrick Road	Active burrow Tracks, whitewash, pellets	Occupied burrow/2 adult BUOW	Occupied burrow/2 adult BUOW	Occupied burrow/1 adult BUOW
3. N32°45'3.9" W115°42'26.7" Offsite	IID ROW east side of Derrick Road	Active burrow Tracks, decorations, whitewash, pellets	Active burrow Tracks, decorations, whitewash, pellets	Occupied burrow/1 adult BUOW	Occupied burrow/1 adult BUOW
4. N32°45'1.1" W115°42'26.9 Offsite	IID ROW east side; west side of Derrick Road	Occupied/1 adult BUOW	Occupied burrow/1 adult BUOW	Occupied burrow/1 adult BUOW	Occupied burrow/1 adult BUOW
5. N32°44'33.8" W115°42'25.2" Offsite	IID ROW west side of Derrick Road	Occupied burrow/1 adult BUOW	Active burrow	Occupied burrow/1 adult BUOW	Active burrow
5A N32°44'52.9" W115°42'4.02" Offsite NEW 7/7					Occupied burrow/2 adult BUOW
5B N32°44'51.4" W115°42'4.2" Offsite NEW 7/7					Active burrow Whitewash, pellets

	Description	1st Survey 5/4 and 6/2017	2nd Survey 5/22 and 24/2017	3rd Survey 6/15-16/17	4th Survey 7/7/17
6. N32°44'16.8" W115°42'34.1" Onsite	Berm between fields	Occupied burrow/1 adult BUOW	Disturbed; signs of target practice on top of berm	Occupied burrow/1 adult BUOW	Active burrow
7. N32°44'3.7" W115°42'36.1" Onsite	East side of farmer's field	Active burrow Tracks, whitewash pellets	Burrow dug out by canine	Burrow dug out by canine	Burrow dug out by canine
7A N32°44'55.1" W115°42'24.1" New 5/22/17 onsite	NW corner of farmers field		Occupied burrow/1 adult BUOW	Active burrow	Active burrow
8. N32°44'59.7" W115°42'25.6" Offsite	IID ROW west side of drain	Occupied burrow/2 adult BUOW	Active burrow Whitewash, pellets, fathers	Occupied burrow/2 adult BUOW	Active burrow
9. N32°45'9.3" W115°42'18.8" Offsite	IID ROW north side of drain	Active burrow Tracks, feathers	Active burrow Tracks, feathers	Active burrow Tracks, feathers	Not found
10. N32°45'6.2" W115°42'5.3" On site East side of IID ROW	Embankment below road	Active burrow Tracks, feathers	Occupied burrow/1 adult BUOW	Active burrow Tracks, feathers heard vocals did not see BUOW	Occupied burrow/1 adult BUOW
11. N32°45'4.7" W115°42'5.4" On site	East side of embankment along road	Active burrow decorations	Active burrow Pellets, whitewash	Active burrow Pellets, whitewash	Active burrow Pellets, whitewash
12. N32°44'59.6" W115°42'5.3"	Embankment	Active burrow	No signs of activity	No signs of activity	No signs of activity

	Description	1st Survey 5/4 and 6/2017	2nd Survey 5/22 and 24/2017	3rd Survey 6/15-16/17	4th Survey 7/7/17
On site					
13. N32°44'55.1" W115°42'24.1" On site	Northwest corner of field bank	Occupied burrow/1 adult BUOW	Occupied burrow/1 adult BUOW	Occupied burrow/1 adult BUOW	Occupied burrow/1 adult BUOW
14 N32°45'10.4" W115°42'10.5" Offsite New 5//22/17	North side of field road		Occupied burrow/1 Adult BUOW	Active burrow	Not found
15. N32°45'9.4" W115°42'5.3" Offsite New 5//22/17	East side of field road		Active burrow Whitewash, pellets, feathers	Active burrow Whitewash, pellets, feathers	Active burrow pellets
		Total Numbers of Burrows/BUOW **Offsite**: Active burrows:4 Occupied burrows: 3 Adult BUOW: 4 Juvenile BUOW: 0 **Onsite:** Active burrows:3 Occupied burrows:2 Adult BUOW: 2 Juvenile BUOW:0	Total Numbers of Burrows/BUOW **Offsite**: Active burrows:5 Occupied burrows:4 Adult BUOW: 6 Juvenile BUOW: 0 **Onsite:** Active burrows:1 Occupied burrows:3 Adult BUOW: 3 Juvenile BUOW:0	Total Numbers of Burrows/BUOW **Offsite**: Active burrows:2 Occupied burrows:6 Adult BUOW:9 Juvenile BUOW: 0 **Onsite:** Active burrows:1 Occupied burrows:3 Adult BUOW: 3 Juvenile BUOW:0	Total Numbers of Burrows/BUOW **Offsite**: Active burrows: 4 Occupied burrows:5 Adult BUOW: 7 Juvenile BUOW: 0 **Onsite:** Active burrows:4 Occupied burrows:2 Adult BUOW: 2 Juvenile BUOW:0

ADDITIONAL ACREAGE BIG ROCK 1B/LAUREL 2/3					
	Description	1st Survey 9/27 and 28/2017			
16. N32°45'12.6" W115°42'27.1" Offsite	West of Derrick Road on IID ROW	Active burrow			
17. N32°45'12.1" W115°42'27.1" Offsite	West of Derrick Road on IID ROW	Occupied burrow/2 adult BUOW			
18. N32°45'5.9" W115°42'27.1" Offsite	West side of IID ROW	Occupied burrow/1 adult BUOW			
19. N32°45'11.0" W115°43'38.2" Offsite	West side of IID ROW	Occupied burrow/2 adult BUOW			
20. N32°45'7.8" W115°43'38.2" Offsite	West side of IID ROW	Occupied burrow/2 adult BUOW			
		Total Numbers of Burrows/BUOW **Offsite**: Active burrows:1 Occupied burrows: 4 Adult BUOW: 7 Juvenile BUOW: 0 **Onsite:** Active burrows:0 Occupied burrows:0 Adult BUOW: 0 Juvenile BUOW:0	Total Numbers of Burrows/BUOW **Offsite**: Active burrows:4 Occupied burrows:4 Adult BUOW: 6 Juvenile BUOW: 0 **Onsite:** Active burrows:1 Occupied burrows:2 Adult BUOW: 2 Juvenile BUOW:0	Total Numbers of Burrows/BUOW **Offsite**: Active burrows: Occupied burrows: Adult BUOW: Juvenile BUOW:	Total Numbers of Burrows/BUOW **Offsite**: Active burrows: Occupied burrows: Adult BUOW: Juvenile BUOW:

APPENDIX E
QUALIFICATIONS

GLENNA MARIE BARRETT

PO Box 636 Imperial, California 92251 (760) 425-0688 glennabarrett@outlook.com

PROFILE

Organized and focused individual, adept at implementing multifaceted projects while working alone or as an integral part of a team. Skilled in client/employee communications, report preparation, program analyses and development. Cost conscious, safety oriented and empathetic. A strong communicator with excellent interpersonal skills, which allows development of rapport with individuals on all levels. A sound professional attitude, strong work ethic and pride in personal performance.

WORK EXPERIENCE

Principal Business Consultant, Barrett Enterprises. Imperial, CA December 2001 - currently.
Compile information and complete local, state and federal government forms; such as conditional use permits, reclamation plan applications, Financial Assurance Cost Estimates, zone changes, CEQA, Environmental Evaluation committee responses, and 501 (c)(3) tax exemption applications. Act as liaison between local businesses and local, state, and federal government agencies. Certified to survey for Flat-Tailed Horned Lizards(FTHL) in California and Arizona. Certified to survey for Burrowing Owls (BUOW) and the Desert Tortoise.

Extensive knowledge in southwestern United States, non-migratory and migratory avian biology and ecology. Strong knowledge of common Flora and Fauna communities associated with Southern California and surrounding environs. CEQA, NEPA, MBTA, 401/404, 1600/1601 permit compliance, California Endangered Species Act (CESA) and Federal Endangered Species Act (ESA) knowledge gained through work experience. I have excellent analytical skills, multi-tasking and writing abilities. My past work experience has provided me with many years of hands on experience working with and managing others to find practical solutions to solve problems and achieve common goals.

FIELD EXPERIENCE

Ms. Barrett has done the field work and contributed to the required reports for the following projects:

- Sol Orchard - El Centro, CA: Successfully completed BUOW relocation and artificial burrow installation for six burrows.
- Burrtec – Salton City, CA: Team leader for eight people to complete a FTHL pre-construction site sweep for 320 acres in Imperial County.
- Applied Biological Consulting: Monitored for Desert Tortoise and nesting birds for the 500kV transmission line traverses approximately 153 mi from Blythe, CA to Menifee in Riverside County, CA. Crossing private, state and Federal lands, such as the Bureau of Land Management [BLM], U.S. Forest Service [USFS]. (November 2011 to May 31, 2013)

EDUCATION AND TRAINING

Received **Bachelor of Science in Business** with a focus on Management, along with Economics and Leadership minors, December 2000. Humboldt State University, Arcata, CA.

Special Status/listed species observed/ identified, surveyed, monitored, trapped and/or relocated:
Mohave desert tortoise, Coachella valley milk-vetch, American Badger, Desert kit fox, Mountain lion, Coachella valley fringe toed lizard, Mohave fringe toed lizard, Stephen's kangaroo rat, Mohave ground squirrel, Coast horned lizard, Flat-tailed horned lizard, Orange-throated whiptail, Burrowing Owl.

CERTIFICATIONS/ WORKSHOPS

- FTHL Workshop, 2008 El Centro BLM office. CDFG Certificate;
- USFW Desert Tortoise Egg Handling Desert Tortoise Council Survey Techniques Workshop Certificate, 2008 and 2010.
- Anza Borrego State Park Wildflower Identification Workshop, 2010.
- Southwest Willow Flycatcher Workshop Kernville, CA 2010.
- SCE TRTP Construction Monitoring Training Class and WEAP Redlands, CA 2011.
- DPV2 Construction Monitoring Training Class and WEAP Santa Ana, CA 2011.
- Helicopter/ flight trained on DPV2.
- Certified to handle/ move venomous snakes on DPV2.
- Bat monitoring with Ms. Pat Brown BLM El Centro, CA Office.
- Salton Sea International Bird Festival 2007 Coordinator
- Mountain Plover/ Long-billed Curlew surveys, L.A. Museum of Natural History.

MARIE S. BARRETT 2035 Forrester Road, El Centro, CA 92243 (760) 352 4159 mariebarrett@roadrunner.com

LICENSES/CERTIFICATES

Flat Tailed Horn Lizard Surveyor CDFG/BLM
Burrowing Owl Surveyor (CDFG/USFWS)
USFW Desert Tortoise Egg Handling Desert Tortoise Council Survey Techniques Workshop Certificate
BCI Bat Conservation and Management Workshop (Acoustic) Certificate
Southwestern Willow Flycatcher Workshop Kernville, CA 2010
California Pest Control Advisor #70373 California Pest Control Operator #103123
CA Scientific Collection Permit 126/USFWS Salvage Permit MB52633B-1

CAREER HISTORY

Barrett's Biological Surveys, El Centro, California ***BIOLOGIST*** **3/95 -present**

Helped established protocol and perform Vegetative Baseline Studies and Biological Surveys for Mining Reclamation Plans in Imperial County. Have performed numerous (over 20,000 acres) surveys involving varied wildlife including burrowing owl, nesting birds and plant species and writing reports and biological assessments. Certified to perform Flat Tailed Horned Lizard Surveys; completed Desert Tortoise workshops; approved to handle desert tortoise (American Girl Mine/BLM project, 1/2013). Work closely with governmental agencies such as such as Bureau of Land Management, State Office of Mining Reclamation, California Department of Fish and Game. Written over ten Environmental Assessments for BLM, El Centro office. Over 150 days spent in field monitoring/surveying for FTHL; 98 days in field monitoring/surveying for desert tortoise and 32,000 acres surveyed for burrowing owl and nesting birds; 2 IID Burrowing owl surveys with AECOM (2011/12- 226 hrs). Wrote Imperial Irrigation District Artificial Burrow Installation Manual (2009). Over 25 active burrowing owl burrows passively relocated and 50 artificial burrows installed. Volunteered for desert tortoise work (20 hrs) with Dr. Jeff Lovich. Coachella Valley Projects: Torres-Martinez (Desert Cahuilla Composting Facility Biological Resource Technical Report/Surveys 60 acres, SR 86/Ave 84, 2013; Augustine Tribe (Solar Farm Biological Resource Technical Report/Surveys 10 acres, La Quinta,CA, 2010); Benitez Family Trust Therapeutic Community, Dillon and Cabazon Roads, 10 acres,2008); Chandri Group (Dairy Queen Chill/Grill Project, 1.5 acres, Date Palm Drive/I-10, La Quinta, CA, 2014). Blythe 8Minutenergy Mt. Signal Solar 5000 acres Preconstruction surveys/construction monitoring and BUOW Post construction monitoring; Biological report. 2010-2017
Black Mt. MetTower Installation: desert tortoise survey and monitoring approved by BLM, El Centro office
Salton City Burrtec Landfill FTHL monitoring/clearance 2010-2014 (42.5 hrs); Superior Redi Mix: FTHL surveys, Oat Pit Environmental Assessment for BLM, El Centro, 2009-14. (20 hours) SDG&E La Rosite Pole Replacement FTHL Monitoring 2012-2013(410 hrs); Imperial County Department of Public Works, FTHL surveys for Coyote Mine Environmental Assessment, BLM, El Centro, 2008. (10 hours) All American Aggregates, FTHL surveys, Boyd Road Mine Environmental Assessment, BLM El Centro, 2007. (9.5 hours) All American Aggregates, FTHL surveys, Wheeler Road Mine Environmental Assessment, BLM, El Centro, 2006. (8.5 hours); ValRock, FTHL surveys, Ocotillo ByPass Road Environmental Assessment, County of Imperial/BLM, El Centro, 2004. (7 hours). USFWS Authorized desert tortoise biologist: American Girl Mine and Mesquite Mine.

Citizens' Congressional Task Force on the New River, Brawley, Ca ***PROGRAM COORDINATOR*** **1/98 - present**

Assisted with design, construction, planting and monitoring of four constructed wetlands in Imperial County. Responsible for coordinating activities relating to student and public outreach education to promote the water quality opportunities of wetlands ponding systems on the New River.

Imperial Valley College, Imperial, California ***ENVIRONMENTAL MANAGEMENT PROJECT COORDINATOR*** **9/95-12/99**

Responsible for establishing an Environmental Technology curriculum, presenting public forums, short courses and certificate courses in hazardous materials and safety areas. In conjunction with Division Chairman, established a budget for 96-98 program and obtained funding of $131,000 based on 95-96 program performance. Established short courses that trained over 700 people in hazardous materials safety programs. Compiled a survey of employers, which provided direction for the program.

VOLUNTEER ORGANIZATIONS

CALIFORNIA NATIVE PLANT SOCIETY: Imperial Valley Coordinator, 2006-2016.
SALTON SEA INTERNATIONAL BIRD FESTIVAL: Coordinator: 2001-2010. Organize bird festival in the Imperial Valley that attracts over 300 birders.
COLORDO RIVER WATER QUALITY CONTROL BOARD: Board member Dec 05-Sept 06.
FRIENDS OF SONNY BONO NATIONAL WILDLIFE REFUGE: Board Chairman, May 2015- 16

EDUCATION

University of Arizona, Tucson, Arizona
Masters of Science Degree – AGRICULTURAL EDUCATION
Thesis: Survey and training protocol for documenting burrowing owls and habitat in Imperial County, California
California State Polytechnic College, Kellogg-Voorhis Campus, Pomona, California
Bachelor of Science Degree.- AGRICULTURAL BIOLOGY
Imperial Valley College, Imperial, California *Associate of Science Degree. AGRICULTURE*

Jacob Calanno
Post Office Box 458
Niland, California 92257
760-550-4214

SPECIALTIES: Environmental Remediation and Monitoring, Mechanical Process Applications, Field operations.

EDUCATION: Imperial Valley College, Imperial, Ca. - Municipal Water and Waste Water Treatment; Licensing pending.

COMPUTER SKILLS: Basic computer skills, Lab View for Engineers.

CERTIFIED SPECIALIZED TRAINING: Environmental Review & Compliance for Natural Gas Facilities Seminar- June 5-7, 2012
Desert tortoise Surveying, Monitoring and Handling Techniques Certificate Nov. 5-6, 2012
Flat Tail Horn Lizard Training- June 20, 2012
40 Hour Hazwoper Feb. 8, 2013
CALIFORNIA OSHA TITLE-2011
Confine Space Training, 2005
Lockout/Tagout , 2005
Respirator Training, 2005
Operators Safety Training, 2005
Foreman Field Crew Supervisory and Operations Training, 2005

SUMMARY: Field Operations Crew Foreman/Operations Technician
I have 15 years' experience in the environmental remediation industry. My area of expertise is in remedial mechanical applications, equipment operations and maintenance programs. For the past 5 years I have been specifically working on construction, operation and maintenance for soil vapor direct and indirect fire extraction systems, applied to groundwater remediation projects. I have strong equipment application, organization and field crew tasking skills. I communicate well, ascertain direction and always work as a team player.

Training and hands on experience working in the field with endangered species; Desert Tortoise and the Flat Tail Horned Lizard, followed compliance policy and procedure when encountering endangered species. This training was received while working on specific projects such as:
USDOD, Navy Clean I Program, Salton Sea, Imperial, California; Barrett's Biological Surveys field work and monitoring.

WORK EXPERIENCE:

2013-15 Barrett's Biological Surveys
Project Salton City Burrtec Landfill: 320 acre clearance and provided FTHL training to construction crew(42 hrs)
Project Mesquite Mine: 30 acre desert tortoise clearance; fence installation monitoring (25 hrs)
Project Oat Mine: FTHL monitoring (186 hrs)
Project CalTrans: FTHL monitoring (50 hrs)
Project: Arms and Dudes Film Project FTHL/MBTA monitoring (181 hours)
Project Niland Wastewater Project BUOW/Biological surveys (5 days)

BLM, El Centro, CA office: Volunteer Bat Surveys with Pat Brown (20 hours)
CDFW, Avian Carcass Collection Volunteer (5 hours)

2005 to 2010 Volper, LLC, Burbank, Ca.
Provided field supervision of construction
Responsibilities include plan and coordinate field construction and activities, field reports and tracking hours.
Manager/Grower

2003 to 2005 Cape Environmental, Irvine, California
Field Operations Supervisor/Sr. Operations Technician
Provided technical equipment applications support on various environmental remediation projects.
Responsibilities included; construction, planning and field supervision for the installation, operation and maintenance of ground water remediation equipment.

2000 to 2003 Foster Wheeler Environmental, San Diego, California
Field Operation Supervisor/Sr. Operations Technician
Provided technical equipment applications support on various environmental remediation projects.
Responsibilities included; construction, planning and field supervision for the installation, operation and maintenance of ground water remediation equipment.

1990 to 2000 IT/OHM Remediation Services Corporation, Irvine, California
Provide technical equipment applications support on various environmental remediation projects. Responsibilities include; construction, planning and field crew tasking for installation, operation and maintenance of groundwater remediation equipment. Successful Projects include:

- **USDOD, Navy Clean II Program, Naval Air Facility, El Centro, California**
  - Groundwater remediation project.
- **USDOD, Navy Clean II Program, Camp Pendleton, San Diego, California**
  -Groundwater remediation and UST removal project.
- **USDOE, Superfund Project, Monticello, Utah**
  -Radiological landfill cap project.
- **USDOD, Fuel Farm Project, Wake Island, United State Territory**
  -Petroleum hydrocarbon remediation project
- **USDOD, Navy Clean I Program, Salton Sea, Imperial , California**
  -Groundwater remediation Project
- **USDOD, Fuel Farm Project, Midway Island, United State Territory**
  -Petroleum hydrocarbon remediation and fuel farm Construction
- **USDOD, Navy Clean I Program, Naval Air Facility, El Centro, California**
  -Groundwater remediation project, the largest vapor extraction in the United States.

REFERENCES:

Mr. Fredrick Rivera	Marie Barrett	Ed Cooney
IR Manager,	2035 Forrester Rd	Engineering Technician
Naval Air Facility - El Centro	El Centro, CA 92243	FEAD/PW Bldg.504 NAF El Centro, CA 92243
760-339-2226	760 427 7006	760-339-2469

SHAWNA M. BISHOP

619 Rockwood Road, El Centro, CA 92243 (760) 357-1349 sbishop790@yahoo.com

Education

California Polytechnic State University, San Luis Obispo, California
Bachelor of Science Degree-Ornamental Horticulture (Environmental Horticultural Science)
Bachelor of Science Degree – Crop Science
Senior Project: *Instructional Programs For An Introductory Course In Bonsai*
Curriculum included botany, taxonomy, plant pathology, plant materials, plant protection, soils, native plants, game bird management, and natural resource management
Desert Tortoise Council Certificate: Nov, 2010; Flat Tailed Horned Lizard certificate; April, 2011.

Experience

Bishop Enterprises – El Centro, CA
Biological surveys of over 15,000 acres for varied wildlife and plant species identification. Surveys /monitoring under direction of Barrett's Biological Surveys. 2-IID Burrowing Owl Surveys (220 hrs) with AECOM (2011-2012). Mt. Signal Solar BUOW Preconstruction/Post construction and monitoring 2500 acres. Desert Tortoise construction monitoring and clearance: Union Pacific derailment 7/12 Western Mesquite Mine 10/14 (88 hrs); Burrtec Landfill FTHL clearance (320 acre 36 hrs) July, 2013; SDG&E La Rosita Pole Replacement FTHL Monitoring 2012-13 (475 hrs): CalTans Berm repair FTHL monitoring 6/2014 (17 hrs. 1 FTHL relocation); IID Emergency repair FTHL monitoring 8/13 & 7/14 (20 hrs).

Bishop Ranches, Inc. – El Centro, CA 1982- current
Management of an agricultural production operation with responsibilities in the field production, irrigation, plant protection, hazardous materials, regulations, policy and plans- including PMT and water quality (TMDL), personnel, accounting and communications

Helena Chemical Company - Brawley, CA 3/2006-9/2009
Field man -Scout work in citrus and other crops identifying and quantifying insect pests, diseases, and beneficial predators, taking petiole and soil samples, utilized mapping techniques with pheromone trapping and monitoring in outlying areas

Miller Chemical and Fertilizer Company – El Centro, CA 9/1977-3/1982
Sales Representative – 1977-1980 Performed sales responsibilities and conducted experimental plots for field research and development of proprietary products
Desert District Manager- 1980-1982 Additional responsibilities over product warehousing and sales personnel in Southern California, Arizona, and Colorado

California Polytechnic State University - San Luis Obispo, CA Spring 1977
Teacher Assistant- CRSC 411 Experimental Techniques and Analysis
Assisted with lectures, labs and study sessions for classes on experimental plot designs used in agriculture and methods of analysis of data collected.

Courses/Seminars/Workshops

Desert Weed Management Conference – Advances in Desert Weeds 7/13/2010

Volunteer Organizations

CA Department of Fish and Game: Imperial Valley Junior Pheasant Hunt Sponsor – 1992-2009
Imperial County Game Commission: Pheasant Restoration Project - 2006-2009
Imperial County 4-H
Imperial County Leaders Council: 1996-2004, Vice President 2002-2004, So. Section 4-H Leader Council Representative 2001-2004, Washington, D.C. Focus Chaperone 2001
Mt. Signal 4-H Club Community Leader 1996-2004, Project Leader 1993-2005
Farm Service Agency-USDA: Imperial County Committee Representative 1996-2000, Committee Chairman 1998-1999, Vice Chairman 2000
California Women For Agriculture: I.V. Pioneer Museum- Agriculture Display Coordinator
CAPCA: State Board Member 1979-1983, State Secretary 1981-1983, 1983 Member of the Year State Award, CAPCA member 1977-2000