DESERT TORTOISE TRANSLOCATION PLAN
STATELINE SOLAR FARM PROJECT
CASE FILE NUMBER CACA-48669
SAN BERNARDINO COUNTY, CALIFORNIA

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List of Acronyms

AC	Alternating Current
ACEC	Area of Critical Environmental Concern
BLM	U.S. Bureau of Land Management
BMP	Best Management Practice
BO	Biological Opinion
CDFG	California Department of Fish and Game
CHU	Critical Habitat Unit
DB	Designated Biologist
DOI	U.S. Department of the Interior
DTCC	Desert Tortoise Conservation Center
DWMA	Desert Wildlife Management Area
ECM	Environmental Compliance Manager
ELISA	Enzyme-linked Immunosorbent Assay
GIS	Geographic Information System
I-15	Interstate 15
ITS	Incidental Take Statement
kV	Kilovolt
LTB	Lead Translocation Biologist
MCL	Mean Carapace Length
MW	Megawatt
MWD	Metropolitan Water District
O&M	Operations and Maintenance
PV	Photovoltaic
ROW	Right-of-Way
SBBM	San Bernardino Base and Meridian
URTD	Upper Respiratory Tract Disease
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

1.0 INTRODUCTION

This section provides a brief summary of the project description for the Stateline Solar Farm Project (Project) (Case File #CACA-48669) proposed by Desert Stateline, LLC. (Stateline), who has requested a right-of-way grant from the U.S. Bureau of Land Management (BLM) to construct and operate a new solar photovoltaic energy generating facility, to be located in unincorporated San Bernardino County, California, near the interstate boundary of California and Nevada, southwest of Primm, Clark County, Nevada (Figure 1). The solar farm and associated generation interconnection (gen-tie) line are collectively referred to in this report as the Stateline Solar Farm Project (Stateline or Project).

The Project site is located west of Interstate 15 and Ivanpah Dry Lake and can be found on the Ivanpah Lake 7.5-Minute U.S. Geological Survey topographic quadrangle. The site is located on BLM-administered lands outside the boundaries of an Area of Critical Concern (ACEC), Desert Wildlife Management Area (DWMA), BLM wilderness area, or U.S. Fish and Wildlife Service (USFWS) designated critical habitat unit (CHU) for desert tortoise (*Gopherus agassizii*). The Project is considering three layout alternatives; however, features common to each alternative include phasing of construction, project components, and construction methods.

The Project would include a 300-megawatt (MW) alternating current (AC) solar photovoltaic (PV) energy-generating solar farm and 220-kilovolt (kV) transmission line (gen-tie line). The solar farm components will include PV arrays, transformers, an on-site electrical substation, a monitoring and maintenance facility, one or more meteorological stations, a security guard facility, site fencing, a 2.3-mile generation tie-line, and primary access road. A detailed Project description is included in the Draft Biological Assessment.

Desert tortoises a federal- and state-listed threatened species are expected to occur within the Project site during construction. Translocation of desert tortoises is proposed to minimize impacts to the species. This Desert Tortoise Translocation Plan has been prepared in conjunction with the Biological Assessment and is drafted in accordance to most current USFWS guidelines, *Translocation of Mojave Desert Tortoises from Project Sites: Plan Development Guidance* (USFWS 2011a). The objective of this plan is to provide:

- Estimates of desert tortoise presence within the Project site, Recipient and Control Sites,
- Detailed descriptions of the methods to be used to translocate tortoises at the time of Project construction in order to avoid and minimize potential “take” of desert tortoises during construction and O&M phases of the Project, and
- Strategy for long-term monitoring and reporting to track the effectiveness of translocation.

Stateline Solar Farm Project
Desert Stateline, LLC

Figure 1
Regional Setting

Stateline Solar Farm Project
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Figure 2
Project Site

2.0 EVALUATION PROCESS

This section discusses the selection process for recipient and control sites and summarizes the methods used to estimate tortoise densities within relevant areas. Other methods used to assess the conditions of translocation sites including ongoing tortoise research area also provided.

2.1 Recipient Site Selection

The selection criteria for the recipient sites are based on recommendations in the *Translocation of Mojave Desert Tortoises from Project Sites: Plan Development Guidance* (USFWS 2011a):

- Supports desert tortoise habitat suitable for all life stages;
- Disease prevalence within the resident desert tortoise population is less than 20 percent.
- Located a minimum 10 km from major unfenced roads or highways (Distances from roads may be reduced if the proposed action includes provisions to install and maintain desert tortoise exclusion fencing as a minimization measure);
- Located within 40 km of the project site, with no natural barriers to movement between them, to ensure that the desert tortoises at the two sites were likely part of a larger mixing population and similar genetically;
- Occurs on lands where desert tortoise populations have been depleted or extirpated yet still support suitable habitat. Depleted areas may include lands adjacent to highways;
- Contains no detrimental rights-of-way (ROWs) or other encumbrances; and
- Will be managed for conservation so that potential threats from future impacts are precluded.

Additional criteria were considered in the selection of potential recipient sites:

- Proximity to existing home ranges of individuals on the Project;
- Risk of increased predation (e.g., raven subsidies);
- Baseline disease prevalence for comparison between the project site and recipient sites;
- Existing tortoise densities and distribution; and
- Similar habitat to home range
- Site access.

Guided by these criteria, areas within 40 kilometers (24.9 miles) of the Project site were evaluated for potential recipient sites. Areas that met the largest number of the aforementioned selection criteria were further refined prior to conducting field studies. Sites were evaluated for potential within-home-range translocation [moved up to 500 meters (1,640 feet) from original location] and outside-home-range translocation [moved greater than 500 meters (1,640 feet) from original location]. Outside-home-range recipient sites were initially delineated to be at least the same size of the proposed Project, which would support some of the anticipated post-translocation tortoise dispersal; however, desert tortoises moved greater than 500 meters (1,640 feet) from their original location may settle as far as 6.5 kilometers (4 miles) from their release point (USWFS 2011a). A discussion of anticipated dispersal relative to characteristics of each recipient site is provided in Section 3.2.

2.2 Density Estimates

Density estimates were calculated from live tortoise observations recorded during full-coverage protocol desert tortoise surveys conducted between 2008 and 2012. Over 30 square miles (19,000 acres) (includes Project and Recipient Sites) were surveyed. Full details of focused desert tortoise surveys can be found in the *Biological Assessment, Stateline Solar Farm Project, BLM Case File Number CACA-48669*. The estimated number of tortoises within a given area was calculated using the imbedded formula in Table 3 of the revised protocol, *Preparing for Any Action That May Occur within the Range of The Mojave Desert Tortoise (Gopherus agassizii)* (USFWS 2010). The results of tortoise estimates and density calculations for the project, recipient, and control sites are discussed in Section 3.0. Density estimates for the recipient sites were directly compared to the maximum post-translocation density limits for the Eastern Mojave Recovery Unit per Table 3 from the USFWS guidelines (USFWS 2011), which equals 15 tortoises per square mile (USFWS 2011a). Additional details of tortoise estimates can be found in the *Biological Assessment, Stateline Solar Farm Project, BLM Case File Number CACA-48669*.

2.3 Comparative Habitat Assessment

Habitat characteristics (i.e., vegetation structure and soil substrate composition) that correlate with desert tortoise suitability were assessed for the Project site and recipient sites. Line-intercept transects were conducted within site in spring of 2012 to obtain quantitative data on vegetative structure and substrate composition. Ten stations were randomly selected within each site. Two 100-meter (328-foot) transects were conducted per station (Canfield 1949). Perennial plant species including shrubs and succulents were recorded along each transect. Annual plant species were recorded using a 20 by 50 centimeter (7.9 by 19.9 inches) Daubenmire plot placed every 10 meters (32.8 feet) along each transect line (Daubenmire 1959). Soil type and substrate class were described at each corner of the Daubenmire plots according to a soil texture triangle (Thien 1979).

2.4 Pre-Translocation Research

Two distinct research studies within the Ivanpah Valley commenced in 2012.These will add to the base of knowledge of desert tortoises in Ivanpah Valley, inform translocation activities, and provide baseline data for future monitoring. The demographic study encompasses the Project site and most proximate proposed recipient sites. The connectivity studies are located at two prominent high-elevation passes, Stateline and McCullough Passes, where least-cost path models indicate a likelihood of gene flow. These studies, in combination with future monitoring of resident tortoises within the recipient and control sites, will provide the basis for the future effectiveness monitoring program requirements of the USFWS (USFWS 2011a). Desert Stateline, LLC has contributed funding and resources for these studies.

2.4.1 Demographic Study (*In Situ* Monitoring)

A demographic-based study, led by research biologist Ms. Danna Hinderle [10(a)# TE-218901-3], is analyzing home range size, distribution, habitat use/selection, disease prevalence (*Mycoplasma agassizii* and *M. testudenium*), and contaminant exposure of tortoises within and around the Stateline Project site. Federal and state agency authorizations for the demographic research study were obtained in early June 2012. The study has been designed and funded to render results, analysis, and reporting following one full year of pre-project data collection. This level of data collection and analysis would typically occur after the NEPA and Section 7 processes; however, the recent USFWS translocation guidance expressed that this information may be valuable in earlier stages of project development. Stateline and the BLM also believe that obtaining such detailed information on desert tortoise earlier in the process is relevant and important for incorporation into this translocation plan and adaptive management practices. Methods for performing *in situ* monitoring are further discussed in Section 4.1.

2.4.1.1 Home Range

The home range and core use areas will be determined through application of minimum convex polygons, fixed and adaptive kernel density estimates, and correlated with large-scale landscape features (i.e., mountains and lake beds), anthropogenic features (e.g., highways and power line corridors) and disease conspecifics. A substantial amount of monsoonal rainfall occurred in the Ivanpah Valley beginning in July 2012 and periodically continuing through September 2012. Following rainfall events, observations of desert tortoises indicated a distinct increase in activity levels. Subsequently, the research study was initiated in mid-August, beginning with surveys and applying transmitters to tortoises within the research area. Tortoises were tracked within 24 hours of applying transmitters and then on a weekly basis to accumulate initial data on home ranges.

2.4.1.2 Contaminants

Contaminant testing will be conducted on a subset of tortoises to establish baseline data for persistent organic compounds (POPs, associated with pesticides), polycyclic aromatic hydrocarbons (PAHs - associated with a traffic source), non-targeted analysis, screening for a wide range of organic chemicals (to establish preliminary data) and metal analysis, both toxic and rare earth metals (relating to mining activities in the region). These activities are anticipated to (1) contribute to the existing knowledge base for desert tortoises in the Ivanpah Valley, (2) explore how anthropogenic pollutants may impact desert tortoises, and (3) inform potential future translocation events resulting from projects in the valley. The scope of the contaminant testing will be coordinated with contaminant monitoring currently being performed by ISEGS.

2.4.1.3 Health Assessments

In fall of 2012, blood samples and health assessments were performed on all tortoises within the study population. Thirty-four tortoises have been included in the research study within and adjacent to the Stateline Project. Additional tortoises will be added as they are encountered during future survey

efforts, incidentally, and during tracking events. Methods and initial results of health assessments are provided in Section 4.2.

2.4.2 Connectivity Studies

Connectivity studies, led by U.S. Geological Survey research herpetologist Dr. Ken Nussear, began in spring of 2012 to provide data on the rate of tortoise-to-tortoise contact at Stateline Pass. With the use of modern technology (e.g., proximity detectors or GPS data loggers) specific data and inferences can be obtained to record animal to animal interaction. Ultimately, connectivity will be measured using the number and distribution of tortoise contacts through the corridor and can be compared to rates of tortoise contact and connectivity in open habitat.

3.0 SITE CHARACTERISTICS

3.1 Project Site

The Project site supports two distinct areas of occupied desert tortoise habitat. Most of the site consists of Creosote Bush-White Bursage Series. Within this community, plant diversity (including species known to be primary forage for desert tortoises) was observed to be higher within the rocky terrain of the stabilized alluvial fan, which occurred in the higher elevations (generally above 2,500 ft amsl). Live desert tortoises and associated sign were substantially more abundant within the higher alluvial fan than within the lower elevations near the dry lakebed that transitions into Mixed Saltbush Series. Saltbush communities at the edge of dry lake beds are typically not ideal for desert tortoises (USFWS 2011c).

Full details of the results of focused desert tortoise surveys can be found in the *Biological Assessment, Stateline Solar Farm Project, BLM Case File Number CACA-48669*. In 2012 live tortoise observations were evenly distributed across higher elevations of the alluvial fan within areas that supported a stabilized soils consisting of rocky, gravelly soils. Within the boundaries of the Project site (2,015 acres), fifteen live adult tortoises (>160 mm MCL) were recorded (Figure 3). Four more adult live tortoises were recorded in 2012 than in 2008 and abundance estimates were updated as a result (Table 1).

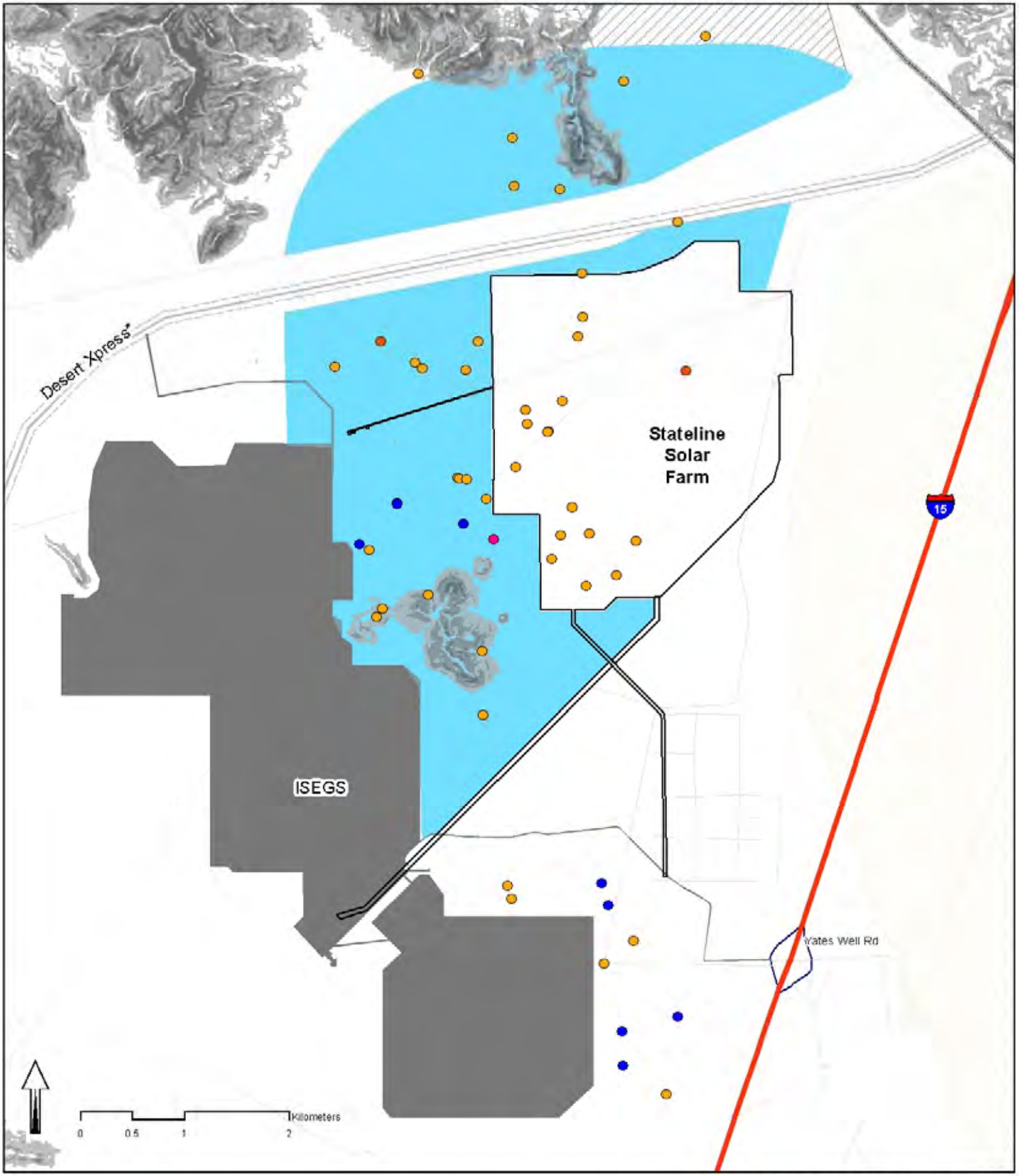
Table 1 - Adult Desert Tortoise Estimates[1]

Live Adult Tortoises Observed[2]	15
Estimated Number of Adult Tortoises	37
Lower 95% Confidence Interval	14
Upper 95% Confidence Interval	100

[1] Includes only adult tortoises >160mm mean carapace length (MCL); estimates rounded to nearest whole number
[2] Unknown age classes were treated as adult tortoises

At the end of the fall active season, thirty-four tortoises were fitted with radio transmitters. Weekly tracking data of tortoise movement were compiled in a master database and incorporated into a Geographic Information System (GIS) to depict current use areas for resident tortoises. Health assessments were performed on all transmittered tortoises (discussed in further detail in Section 4.2).

Immature desert tortoises (<160 mm MCL) are difficult to detect during routine surveys (Boarman 2002). Calculating the actual number of immature tortoises is not possible using survey observations only; therefore, estimation tools are required. An approach for approximating the number of immature tortoises within the project has been previously utilized by the USFWS and relies on the following data: number of adult tortoises (>160 mm MCL); 1:1 sex ratio; published survival rates; and published annual egg production estimates (USFWS 2011c; Turner et al. 1987). Consistent with this approach, estimates for immature tortoises within three subclasses have been calculated for the project site based on the point estimate of 37 adult tortoises that resulted from 2012 survey records (Table 3). The multiplier used for eggs and hatchlings was 3.1, tortoises 49.7 to 120mm MCL was 5.6, and tortoises 120 to 160mm MCL was 0.5.



Perimeter Recipient Site

Stateline North Recipient Site (Alternative)

*Desert Xpress alignment and location was digitized from low resolution imagery. The accuracy requires verification.

Live Tortoise Record (Mean Carapace Length)

- ≥160mm
- 90-159mm
- <90mm
- Unknown

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Figure 3
Project Site
Desert Tortoise Records

Table 2 - Immature Desert Tortoise Estimates

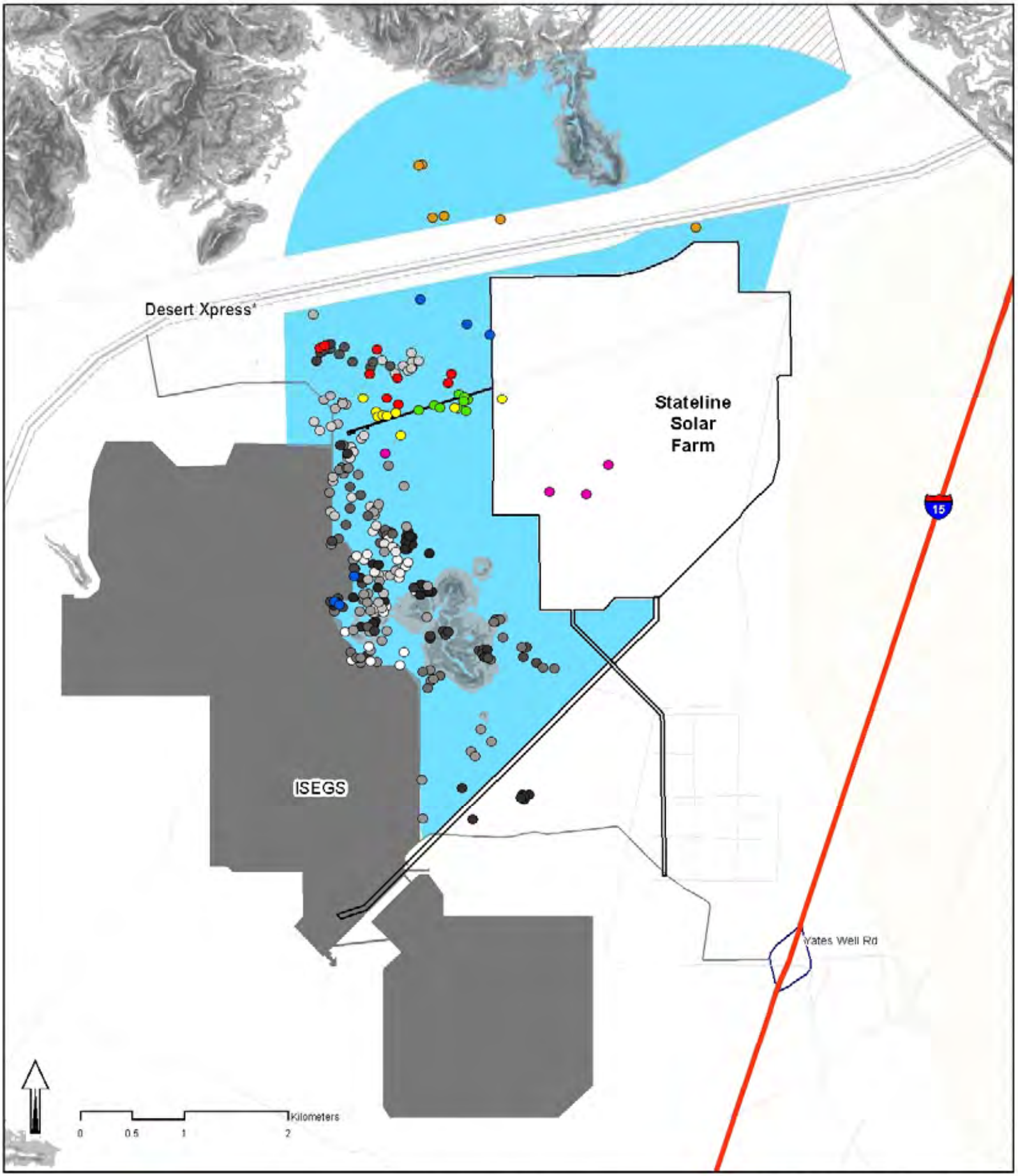
Desert Tortoise Size Class	Eggs & Hatchlings	49.7 mm - 120 mm	120 mm - 160 mm
Point Estimate	114	208	17
Lower 95% Confidence Interval	43	78	7
Upper 95% Confidence Interval	304	557	47

Ivanpah Solar Electric Generating Station (ISEGS) Translocated Tortoises

The ISEGS project site is located approximately 1.5 kilometers west of the Stateline site. In spring 2012, approximately fourteen adult tortoises were translocated along the eastern boundary of ISEGS Units 1, 2, and 3. These translocated tortoises have been monitored to determine the likelihood for them to use the Stateline site and potentially be present on the Stateline site at the time of construction. The BLM has led a coordinated effort between both projects to track this potential. Figure 4 shows the locations of six ISEGS-translocated tortoises that have moved eastward and have been recorded in close proximity to the western and northern boundaries of the Stateline site (California Energy Commission 2012). Regular coordination would continue to determine the location of these tortoises as well as any other ISEGS-translocated tortoises with the potential to occur within the Stateline site. Section 4.4.4 describes the process for addressing ISEGS-translocated tortoises if encountered during fencing installation or clearance surveys at Stateline.

3.2 Recipient Sites

Recipient sites were evaluated for both within-home-range translocation [moved up to 500 meters (1,640 feet) from original location] and outside-home-range translocation [moved greater than 500 meters (1,640 feet) from original location]. One within-home-range recipient site (Perimeter) and three outside-home-range recipient sites (Stateline Pass, Mesquite, and East Lake Alternative) were evaluated in detail and discussed below (Figure 5). These sites may be considered individually or utilized in combination with one another. If other options for recipient sites exist that are not currently described in this plan, they will be reviewed in detail and discussed with the BLM, USWFS, and CDFG. An initial analysis of disease (*Mycoplasma agassizii* and *M. testudenium*) prevalence within the resident and proposed translocated tortoise populations of the Project and Perimeter Recipient Site has been performed (results discussed in Section 4.2). Similar health assessments have not been performed for the alternative recipient sites (Stateline North, Mesquite, and East Lake Alternative). Baseline desert tortoise densities varied for each recipient site (discussed in further detail below). Sign of potential predators to desert tortoise were recorded during full-coverage surveys. Presence of coyote, kit fox, badger, bobcat, mountain lion, raven, red-tailed hawk, and golden eagle were recorded. Although these species may prey on desert tortoises, they are generally present within most desert systems. Locations of predator concentrations, especially active coyote dens, would be referenced and avoided at the time of translocation.



Perimeter Recipient Site

Stateline North Recipient Site (Alternative)

Most Proximate ISEGS Tortoises

- BS55
- BS70
- BS89
- BS167
- BS223
- BS49

* Desert Xpress alignment and location was digitized from low resolution imagery. The accuracy requires verification.

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Figure 4
ISEGS
Desert Tortoise Records

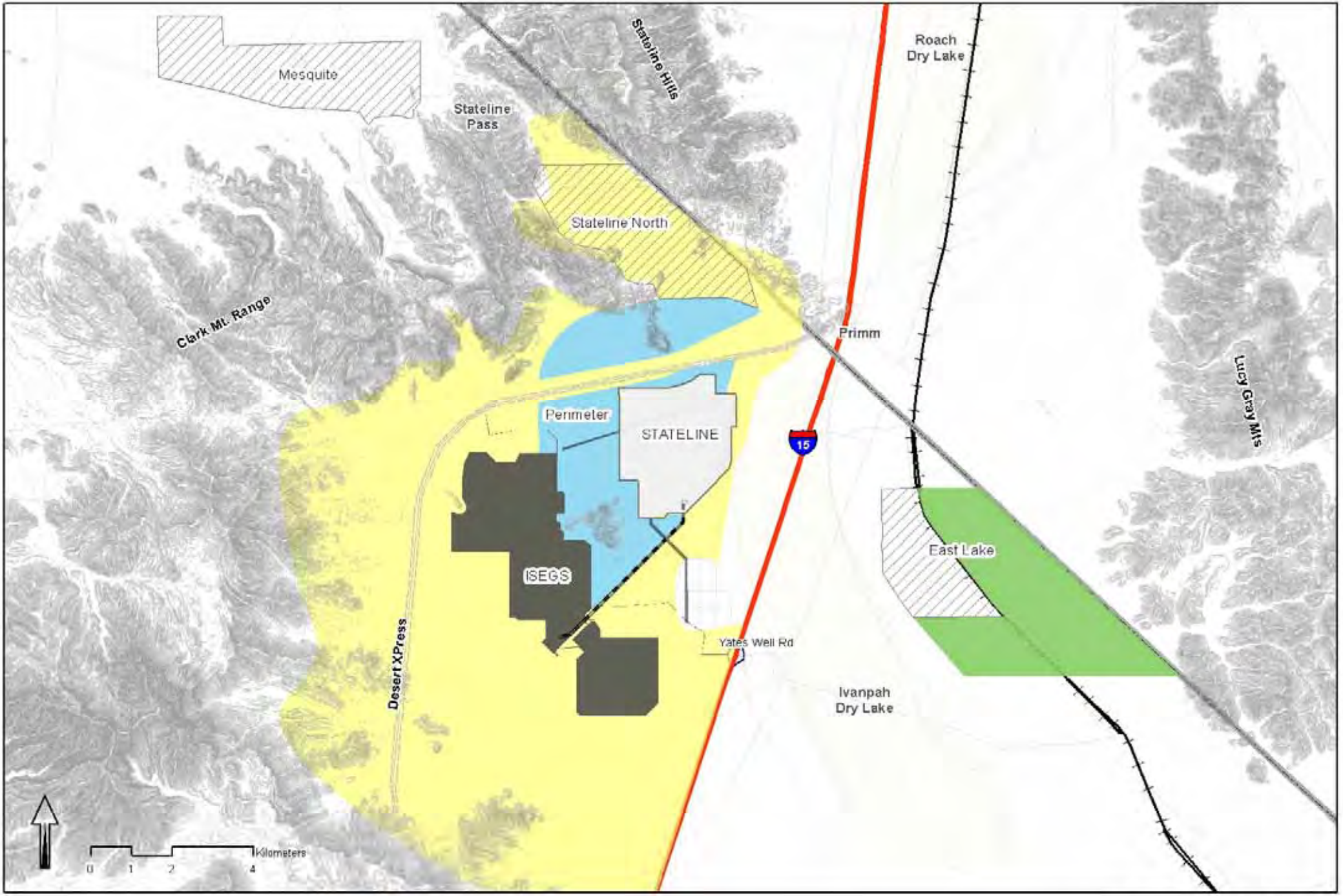

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Figure 5
Translocation Sites

3.2.1 Perimeter Recipient Site

The Perimeter Recipient Site [approximately 5.9 square miles (3,800 acres)] would be located within BLM-managed land immediately adjacent to the northern, western and southern boundaries of the Project. This area would serve as the primary recipient site due to its proximity to the Project and is proposed for both within-home-range and outside-home-range translocation. The Perimeter Recipient Site supports Creosote Bush-White Bursage plant associations, similar to habitats found on the Project. The ISEGS project site is located to the west and is approximately 0.8 kilometer (0.5 mile) from the Project at its nearest point in the southwest corner and approximately 1.7 kilometers (1.1 miles) at its furthest point. Metamorphic Hill borders the Project for approximately 700 meters (2,297 feet) along its southwestern boundary.

The Perimeter Recipient Site avoids, but is adjacent to existing utility rights-of-way (ROW) associated with the Los Angeles Department of Water and Power (LADWP) transmission lines and Kern River Pipeline. In addition, the proposed Desert Xpress Rail Line project includes an alternative (Segment 4C) that would generally follow the path of the existing utility rights-of-way along the base of the Clark Mountain Range. Desert Xpress would consist of a grade-separated, dedicated double track, passenger-only, high-speed railroad within a 75-foot wide permanent and 400 foot wide temporary ROW. Construction of DesertXpress is being proposed through a design-build process, which defers detailed engineering designs after the record of decision; therefore, details regarding the specific impacts of this project have been made with specific assumptions that include no substantial effect to alluvial fan hydrology or desert tortoise connectivity.

The combined rights-of-way for the transmission lines and Desert Xpress would be avoided during direct placement of translocated tortoises. Resident and translocated tortoises would be allowed to move across the rights-of-way. Site-specific raven monitoring and adaptive management would be implemented due to the presence for increased subsidies associated with existing transmission lines.

Although paved roads (e.g., Interstate 15 and Yates Well Road) exist within ten miles of the site, these roads do not pose a major threat to resident and translocated tortoises because of existing tortoise exclusion fencing. Outside-home-range translocatees could move long distances after translocation; however, the relative isolated condition of the lobe of the Ivanpah Valley west of Interstate 15 would limit post-translocation movement to areas outside the Clark Mountain Range, Stateline Hills, Ivanpah Dry Lake and Interstate 15. Additional tortoise exclusion fencing may be necessary along the western edge of developed properties in Primm, near Whiskey Pete's Hotel and Casino. Graded dirt roads occur within the site including those associated with existing transmission lines (running east-west). Vehicular traffic is relatively low on these roads; nevertheless, they present a potential threat to resident and translocated tortoises.

Data on desert tortoise occurrence within the Perimeter Recipient Site (within-home-range dispersal area) were derived from full-coverage surveys conducted in 2008, 2011, and 2012. Baseline tortoise densities within the site were calculated to be approximately eight adult tortoises per square mile [sixty adult tortoises within 5.9 square miles (3,800 acres)] based on the point estimate generated from the

USFWS estimation table (USFWS 2010). Approximately fourteen tortoises were translocated from the ISEGS project site into this area in spring of 2012. With the addition of these tortoises, the density estimate increased to approximately ten adult tortoises per square mile. The USFWS translocation guidance recommends a maximum post-translocation density of fifteen tortoises per square mile based on average density calculations for the Eastern Mojave Recovery Unit (USFWS 2011a). These calculations indicate that the Perimeter Recipient Site can hold approximately forty additional tortoises without exceeding the post-translocation limit.

Resident tortoises in the perimeter recipient area are to a large degree already transmittered as a component of the demographic study described above. Home ranges, movement patterns and other baseline data relating to these animals is currently being collected.

Desert tortoises translocated greater than 500 meters from original location (outside-home-range) into the Perimeter Recipient Site may be expected to move up to 6.5 kilometers from their release point (USFWS 2011a). Figure 5 depicts the potential dispersal area for outside-home-range translocated tortoises. The dispersal area is bounded by the Clark Mountain Range, Stateline Hills, and Interstate 15. Although there are potential linkages at Stateline Pass and through culverts under Interstate 15 (currently blocked with desert tortoise exclusion fence per the ISEGS recipient site), it is not expected that tortoises translocated from the Stateline site would move north into Mesquite Valley, east across Interstate 15 or northeast across Stateline Hills. Baseline tortoise densities within the potential outside-home-range dispersal area were approximated from site-specific survey data and qualified by regional density information. Baseline densities within the lobe of the Ivanpah Valley west of Interstate 15 may range from 6 to over 20 tortoises per square mile (USFWS 2011c). The average density for the entire lobe west of Interstate 15 is not expected to be substantially different that the Ivanpah Valley CHU (derived from line distance sampling averages from 2007 to 2010), which is approximately 12.2 adult tortoises per square mile (USFWS 2011a). The western lobe contains approximately 33,360 acres (52.6 square miles) of potential desert tortoise habitat [0.5 or greater threshold (Nussear 2009)], which would be reduced by approximately 6% to 31,550 acres (49.3 square miles) as a result of the Stateline Project. The decrease in available habitat as a result of the Project is directly proportional to the increase in density following translocation. A density of 12.2 adult tortoises per square mile over an area measuring 52.6 square miles equals a population size of approximately 642 adult tortoises. If the number of tortoises that exist prior to translocation, and immediately after translocation, is constant and the amount of available habitat decreases by 3.3 square miles, then the density of remaining habitat would increase to 13.0 adult tortoises per square mile, a 6.6% increase. Based on these calculations, the post-translocation densities within the potential outside-home-range dispersal area would not be expected to exceed the maximum density limit of 15 adult tortoises per square mile as described in the USFWS translocation guidelines (USFWS 2011a).

3.2.2 Stateline North Recipient Site (Alternative)

The Stateline North Recipient Site [approximately 3.9 square miles (2,500 acres)] is located within BLM-managed land approximately 1.9 kilometers (1.2 miles) north of the Project, extending up the alluvial fan towards the foothills of the Clark Mountain Range and Stateline Pass. The site is contiguous with the

Perimeter Recipient Site; however, based on its distance from the Project it is proposed for outside-home-range translocation. The site supports Creosote Bush-White Bursage plant associations, similar to habitats found on the Project. The terrain is rockier than lower portions of the alluvial fan. The landscape contains numerous ephemeral washes, many with caliche banks. These washes and caliche banks contain numerous burrows suitable for tortoise use. Evidence of tortoise use within the caliche washes observed was low under baseline conditions

The site is free of land encumbrances and a portion of it is located within the Stateline Wilderness Area, which offers long-term conservation value. Although paved roads exist within ten miles of the site, these roads do not pose a major threat to resident and translocated tortoises because this population would be effectively bounded by the Clark Mountain Range, Stateline Hills, Ivanpah Dry Lake and the Stateline Project site. Additional tortoise exclusion fencing may be appropriate along the western edge of developed properties in Primm. Graded dirt roads occur within the site including those associated with existing transmission lines (running east-west) and one BLM open route heading north over Stateline Pass that borders the Wilderness Area. Vehicular traffic is relatively low on these roads; however, it does present a degree of threat to resident and translocated tortoises.

Baseline tortoise densities within Stateline North Recipient Site were calculated to be approximately seven tortoises per square mile based on full-coverage survey a data obtained in 2011. Due to low densities and the presence of washes and caliche banks containing burrows suitable for tortoise use, this site has the potential to serve as a viable recipient site. A recent study performed at the Large Scale Translocation Site located across the Stateline Hills in Nevada found that, between five weeks and six months following translocation, tortoises released in washes containing caliche burrows were significantly closer to their initial release site than those released into upland (flat) portions of the bajada (Germano et. al 2012).

Tortoises translocated to the Stateline North Recipient Site would be expected to show an affinity to the existing caliche washes; however, there is a possibility that they would exhibit wide post-translocation movements (USFWS 2011a). The pre- and post-translocation density information described in the previous section would also apply to the Stateline North Recipient Site.

3.2.3 Mesquite Recipient Site (Alternative)

The Mesquite Recipient Site [approximately 4.0 square miles (2,580 acres)] is located in San Bernardino County, on the north side of the Clark Mountain Range, approximately 10 kilometers (6.2 miles) from the Project site. This site is proposed for potential outside-home-range translocation. Full coverage protocol desert tortoise surveys were conducted during April 2012 and the site was assessed according to current USFWS guidelines. Mesquite is located more than 10 kilometers (6.2 miles) from major unfenced paved roads. The Clark Mountain Range represents an obstacle for tortoise movement, but current models indicate that this range is not a complete barrier to north and south movement thus the tortoise populations at the Project site are likely connected to a certain degree with the populations in Mesquite Valley. There is access to the site by vehicle over the Stateline Pass on BLM roads, and also through Nevada via the Sandy Valley Road to Kingston Road. The site contains no existing right-of-ways,

right-of-way proposals, or other encumbrances. Mesquite also borders the Mesquite and Stateline Wilderness Areas.

Mesquite supports two distinct habitats: Mixed Saltbush Series and Creosote Bush-White Bursage Series. The Mixed Saltbush Series is located in the small area on the northwest portion of the site that borders Mesquite Dry Lake. This area consists of sand dunes with Mesquite thickets scattered throughout the friable soil from the edge of the lakebed transitioning into the Creosote Bush-White Bursage Series. The habitat similarity to the Project site makes the Mesquite Recipient site suitable for all life stages of the desert tortoise. Although there are no unnatural attractions to predators in the area, there is a history of grazing, wild burro presence, and a natural predator presence in the area.

Based on live tortoise records derived from 2012 full-coverage surveys, the Mesquite Recipient Site (full site as delineated) is estimated to support a density of approximately twenty-three tortoises per square mile, which exceeds the USFWS maximum post-translocation density (USFWS 2011a). Tortoises were found to be in groups and there are large areas that contained no live tortoise observations and thus have lower densities. The use of this site would require specific delineation of lower density areas suitable for translocation.

3.2.4 East Lake Recipient Site (Alternative)

The East Lake Recipient Site [approximately 2.0 square miles (1,300 acres)] is provided as an alternative outside-home-range recipient site. Full-coverage protocol surveys were completed spring of 2012. The site is located in San Bernardino County, along the east side of Ivanpah Dry Lake, in the lower west bajada of the Lucy Gray Mountain Range approximately 5 kilometers (3.1 miles) from the Project. The site is best accessed from the Union Pacific Railroad right-of-way road that intersects East Primm Boulevard. East Lake Alternate recipient site is less than 10 kilometers (6.2 miles) from the I-15 corridor, but overall is isolated from significant human traffic and disturbances by Ivanpah Dry Lake. Most of the recipient site habitat is Creosote Bush-White Bursage with increasing cactus and yucca presence at the higher elevations on the alluvial fan. In the area of the site close to Ivanpah Dry Lake, the habitat transitions from Creosote Bush-White Bursage into Mixed Saltbush. This habitat is similar to the Project and survey results indicate that it is suitable for all life stages of the desert tortoise. The railroad represents an unnatural, semi-permeable barrier to desert tortoise movement. Several culverts under the railroad are suitable for tortoise use. The railroad presents a potential threat to desert tortoises through direct mortality of strikes from passing trains and indirectly through raven subsidies and impaired connectivity. The railroad right-of-way fence does not currently contain tortoise exclusion fencing. Use of the East Lake Recipient site would require coordination and cooperation with the Union Pacific Railroad to protect resident and translocated tortoises from direct mortality on the tracks and to reduce raven subsidies.

Based on live tortoise records derived from 2012 full-coverage surveys, the East Lake Recipient Site is estimated to support a density of approximately 7 tortoises per square mile, which is less than half of the USFWS maximum post-translocation density limit, which is 15 tortoises per square mile (USFWS 2011a). Based on this density, the East Lake Recipient Site could receive approximately 15 translocated

adult tortoises without exceeding the USFWS maximum post-translocation density limit of fifteen adult tortoises per square mile. Tortoise exclusion fencing would be necessary along the railroad right-of-way and along southern and northern boundaries. This would keep translocated tortoises from moving into areas of increase threats near Primm or the railroad and create a separation from the control site population.

3.3 Control Site

The purpose of the control site is to observe and record the movements, behaviors, and mortality of tortoises within an area with no impact from the projects, so that these data can be compared to data recorded for the translocated desert tortoise population and the recipient site resident population. Selection criteria for the control site included:

- Similar habitat to the recipient site;
- Not previously used as a recipient site;
- Minimum distance of 10km (6 miles) from the recipient site or have fencing or other movement barrier between sites

The proposed control site would be located within occupied desert tortoise habitat (Creosote Bush-White Bursage), approximately 5 kilometers (3.1 miles) east of the Project along the southeast edge of Ivanpah Dry Lake north of Nipton Road. The proposed control site has not been used as a recipient site to any known previous projects. Approximately 3.1 square miles (2,000 acres) to 5.8 square miles (3,700 acres) are expected to support the necessary control population based on estimated number of translocated adult tortoises and recorded densities within the control site. Tortoise densities were found to be greater east of the railroad in the mid-elevation alluvial fan and estimated to be greater than twenty-five adult tortoise per square mile. Twenty-eight adult tortoises were identified within 1,700 acres surveyed in 2012. If a 1:1 ratio of translocated-to-control animals are not found within the 1,700-acre area that was previously surveyed, then additional tortoises for the control group would be located in the southeast direction in an effort to obtain a contiguous control population. Although the proposed control group would be approximately one mile north of the existing ISEGS control group, there would be some potential for slight mixing with the ISEGS control population; however, a distinct group of tortoises would be monitored for each project. It is not proposed that the same individual tortoises would serve as control animals for both projects. The identified populations in Mesquite and Stateline North sites as described above could also serve as potential control groups if they are not used as recipients sites.

4.0 TRANSLOCATION METHODS

This section provides details of in situ monitoring and health assessments already performed on thirty-four tortoises within the action area. Future plans for *in situ* monitoring, health assessments, and translocation methods for all tortoises are also described.

4.1 *In Situ* Monitoring

As described in Section 2.4.1, the demographic research study currently underway constitutes the initial *in situ* monitoring effort for translocation purposes. Thirty-four adult tortoises have been fitted with radio transmitters under the 10(a) research permit. All adult tortoises were given a unique identifier (provided by USFWS) when transmitters were applied. Transmitter fitting was performed by permitted individuals following methods, including handling and temperature restrictions, provided in *Review of Radio Transmitter Attachment Techniques for Chelonian Research and Recommendations for Improvement* (Boarman et al. 1998) and the most recent USFWS translocation guidance. These activities also conformed to restrictions of time of day, temperature, and total time handled as described in the *Desert Tortoise Field Manual* (USFWS 2009). Prior to fitting of transmitters, tortoise were weighed and measured [by midline carapace length (MCL)]. These tortoises are being tracked via radio-telemetry using hand-held radio receivers (Communication Specialist Inc. and Titley brands) and directional hand-held antennae. Tracking schedules include at a minimum weekly visits during the active season and monthly visits during the inactive season.

All future transmitter fitting and telemetry tracking would be performed with consistent methods as previously described. Subadult and juvenile tortoises will also be fitted with transmitters and included as part of the monitored population following approval of the translocation plan and receipt of project permits. Transmitters will remain on all individuals throughout the monitoring period and be replaced as necessary (Section 5.0).

Transmittered tortoises will be tracked regularly to ensure tortoise well-being and comply with permit stipulations. Any unmarked tortoises located within the project footprint during the active season will be marked and transmittered, and monitored. Unmarked tortoises outside the project footprint will be marked but only transmittered on a case-by case basis.

Data from tracking events is being compiled and home ranges described through movements of the tortoises. Home range and core use area locations will inform the proposed disposition of each individual tortoise. Habitat and burrow type data is also being collected as part of the ongoing demographic study.

4.2 Health Assessments

Health Assessments were performed during fall 2012 on transmittered tortoises by individuals permitted by the USFWS and CDFG. Blood samples were submitted to the Mycoplasma Research Laboratory, University of Florida (Gainesville, FL) to be tested using an enzyme-linked immunoabsorbent

assay (ELISA) antibodies to *Mycoplasma agassizii* and *M. testudenium,* Geographic Information System (GIS) was used to provide a spatial assessment of disease status for *M. agassizii*. A table of current serology results for both *M. agassizii* and *M. testudenium* are in Table 3. Additional samples were banked with USFWS through San Diego Zoo Institute for Conservation Research, Desert Tortoise Conservation Center (Las Vegas, NV).

Table 3 - Serology Results - Fall 2012

Tortoise ID	M. agassizii		M. testudenium	
	Titer	Result	Titer	Result
SL400	<32	Negative	<32	Negative
SL401	<32	Negative	<32	Negative
SL402	<32	Negative	32	Suspect
SL403	<32	Negative	32	Suspect
SL404	<32	Negative	<32	Negative
SL405	<32	Negative	32	Suspect
SL406	<32	Negative	32	Suspect
SL407	<32	Negative	128	Positive
SL408	<32	Negative	<32	Negative
SL409	<32	Negative	<32	Negative
SL410	<32	Negative	<32	Negative
SL411	<32	Negative	64	Positive
SL412	<32	Negative	32	Suspect
SL413	<32	Negative	<32	Negative
SL414	<32	Negative	32	Suspect
SL415	<32	Negative	64	Positive
SL416	<32	Negative	32	Suspect
SL417	<32	Negative	<32	Negative
SL418	<32	Negative	<32	Negative
SL419	<32	Negative	<32	Negative
SL420	32	Suspect	<32	Negative
SL421	<32	Negative	32	Suspect
SL422	<32	Negative	<32	Negative
SL423	<32	Negative	<32	Negative
SL424	<32	Negative	<32	Negative
SL425	<32	Negative	32	Suspect
SL426	<32	Negative	32	Suspect
SL427	<32	Negative	64	Positive
SL428	<32	Negative	128	Positive
SL429	<32	Negative	64	Positive
SL430	<32	Negative	32	Suspect
SL431	<32	Negative	32	Suspect
SL432	<32	Negative	<32	Negative
SL433	<32	Negative	64	Positive

Preliminary ELISA test results indicate the probable background low-level presence of *M. agassizii* within the Stateline population, one tortoise was found to have a 32 titer for the antibodies. This result is classified as suspect and the tortoise will be retested and monitored for seroconversions. The location where the suspect tortoise was sampled lies on the boundary between the project site and the Perimeter Recipient Site. Test results for *M. testudenium* were more varied in 2012. Nineteen tortoises sampled returned suspect (titer of 32), 4 low level positive (titer 64), and 3 positive titers (128) from a total of 31 samples. *M. testudenium* is a less understood organism and University of Florida recommends interpreting results with caution.

Additional tortoises not assessed in fall of 2012 within the project site, recipient site, or control site would be assessed as described above in subsequent years during authorized periods. At a minimum, annual health assessments will be performed on tortoises that are not translocated within one year of a previous assessment date. In order to provide the most up-to-date health and disease information, a full and complete data set, and to be consistent with post-translocation data collection requirements, spring and fall blood sampling will be attempted pre-translocation.

On the day prior to or day of translocation, an additional visual health assessment (no serology testing) would be conducted. Observations would be referenced against *Algorithm for Evaluating if Desert Tortoises are Suitable for Translocation* (Appendix G of the USFWS Health Assessment Procedures: USFWS 2011b). The purpose of this assessment is to confirm that the tortoise would be suitable for translocation. If a tortoise that was initially approved for translocation does not qualify based on the algorithm at the time of the final assessment, it will not be translocated as originally planned. The disposition of such tortoises would be reevaluated with the USFWS. Further serology and assessments could be performed to confirm disease status of such tortoises, and quarantine may be utilized.

On the day of translocation, standard data requirements from the Desert Tortoise Recovery Office (DTRO) will be recorded, which include the following information for any desert tortoises handled: 1) locations (narrative and maps) and dates of observation; 2) general condition and health, including injuries, state of healing and whether desert tortoise voided their bladders; 3) location moved from and location moved to (using GPS technology); 4) gender, carapace length, and diagnostic markings (i.e., identification numbers or marked lateral scutes); 5) ambient temperature when handled and released; and 6) digital photograph of each handled desert tortoise.

4.3 Quarantine Guidelines

Tortoises will remain *in situ* (within the fenced project area and, where applicable, fenced interior unit) until test results are received. Any individual tortoise that exhibits severe clinical signs of Upper Respiratory Tract Disease (URTD) will be transported for quarantine containment to an agency-approved facility that adheres to the USFWS translocation guidance (USFWS 2011a) and subject to further assessment and/or treatment (desert tortoises that are rehabilitated may be eligible for subsequent release). The approved facility will be established through further coordination with the USFWS and CDFG. Any proposed facility outside the State of California will require CDFG's prior written consent. If

deemed necessary, *ex situ* quarantine pens will be constructed within Project site according to husbandry procedures in accordance with the most recent USFWS guidance (USFWS 2011a). The pens will be at least 6m × 6m (19ft × 19ft) for adult tortoises and 2m x 2m (6ft x 6ft) for juvenile tortoises. A veterinarian-approved husbandry plan will direct care of desert tortoises while in quarantine. Penned tortoises will be monitored regularly, and the quarantine period will not exceed 18 months.

Coordination with the USFWS, CDFG, and the approved facility will be initiated prior to commencing clearance surveys to facilitate prompt transport of severely symptomatic tortoises, as necessary. Tortoises will only be prepared for transport by individuals authorized for these activities. Preparation for transport will include hydrating the animal according to current USFWS guidelines and placing the tortoise in a new clean, ventilated protective container and placing it in the interior of the vehicle. The vehicle transporting the tortoise will be in good working order with working air conditioning and the driver will keep the container with the animal inside the vehicle at all times with temperatures remaining under 27 degrees Celsius (°C) or 80 degrees Fahrenheit (°F) until it is removed.

4.4 Procedures and Timing

This section describes the steps to be taken to obtain final approval of the translocation process and approach to construction implementation. The following discussion is generally listed in order of sequence in terms of the anticipated timing of events. For timing purposes, the tortoise active season is defined as April 1 to May 31 and September 1 to October 31 and the tortoise inactive season is defined as June 1 to August 31 and November 1 to March 31.

4.4.1 Recipient Site Authorization

Densities of the recipient sites have been estimated based on site-specific surveys. Only those portions of the proposed recipient sites that support densities lower than the post-translocation density limits per the USFWS translocation guidance (USFWS 2011a) would be considered for use. Information on disease prevalence from the tortoise population being monitored *in situ* for Stateline and ISEGS-monitored tortoises would be referenced. No animals will be translocated to the recipient site until serological test confirms that disease prevalence within the recipient site is not significantly higher than within project site itself or other contiguous habitat within the Ivanpah Valley. Because translocated desert tortoises are known to disperse from initial release sites, to further reduce the potential for disease transmission, translocated desert tortoises will be placed a minimum distance of 1.5 km (0.9 mi) from resident desert tortoises that have tested positive for *M. agassizii*.

Health assessment results for the Perimeter Recipient Site are described in Section 4.2 and indicate that disease status within the resident population is not significantly higher than within project site itself or other contiguous habitat within the Ivanpah Valley. Additional heath assessment results for tortoises within the Perimeter Recipient Site and alternative recipient sites (as determined through agency coordination) would be submitted to USFWS and CDFG. Recipient site authorization prior to conducting clearance surveys is preferred in order to perform the initial translocation effort (described in Section 4.4.6.1). If the Perimeter Recipient Site is determined to not be suitable for use due to disease

prevalence, then the alternative recipient sites will be surveyed and tortoises will subsequently undergo health assessments.

The number of tortoises within the project footprint will be confirmed prior to construction through continued monitoring and clearance surveys. However, if the number of adult tortoises found within the Project site is higher than the point estimate and greater than the authorized recipient site can support without exceeding post-translocation limits per USFWS guidance, then an alternative recipient site would be surveyed and tortoises will subsequently undergo health assessments. The specific alternative recipient site to be surveyed would be determined through coordination through the BLM, USFWS and CDFG; however, the proposed order of recipient sites outlined in this plan would be (1) Perimeter, (2) Stateline North, (3) East Lake, and (4) Mesquite based on proximity to Project site and baseline density data.

4.4.2 Translocation Review Package

After desert tortoises have been tested for disease, a Translocation Review Package (TRP) addressing each of the identified tortoises will be submitted to USFWS and CDFG at least two weeks in advance of planned translocation. The TRP will identify the specific procedure and location for each juvenile, subadult, and adult desert tortoise to be translocated, including:

- Disposition plan;
- Summary information for resident tortoises within the recipient-site;
- Photographs of individual tortoises as specified on the health assessment data sheet;
- Health assessment data sheets;
- Recipient-site density information;
- Maps of the recipient site illustrating distribution and health status of resident tortoises and proposed release sites of project-site tortoises;
- Maps of the project site and all project phases illustrating distribution and health status of project-site tortoises and proposed release sites; and
- Any other project-specific information that supports or clarifies translocation decisions.

Translocations will occur in spring (April 1 through May 31) or fall (September 1 and September 30) if weather conditions are favorable and approved by USFWS and CDFG. Translocations after September 30 will only occur under favorable weather conditions, with approval from USFWS and CDFG.

All translocations will take place between 0700 and 1600 hours. Translocation will occur when temperatures range from 18-30°C (65-85°F) and are not forecasted to exceed 32°C (90°F) within 3 hours of release. Forecasted daily low temperatures should not be cooler than 10°C (50°F) for one week post-release. Temperatures will be taken at approximately two inches above ground in a recently shaded area.

Individual desert tortoises will be hydrated according to agency guidance or protocols and then be transported to their release sites within the agreed upon recipient site in clean, ventilated protective containers. If these containers are re-used, they will be disinfected according to existing protocols. All

individuals will be released at unoccupied shelter sites such as soil burrows, spaces within rock outcrops, caliche caves, or the shade of shrubs. Release locations will be identified ahead of time and spatial patterns between tortoises will be maintained as consistently as possible to those found on the Project. Tortoises found in close proximity to each other on the Project will be released in the same area in the same proximity.

If a tortoise nest is suspected or found, the eggs will be carefully moved together and placed in a replacement nest created by an Authorized Biologist for the project at the appropriate recipient site. The replacement nest location(s) will be protected from potential predators using techniques agreed upon by the BLM, USFWS, and CDFG. Tortoise nest locations and resulting hatchlings and juveniles would be included in the long-term monitoring program. It is not proposed that eggs, hatchlings, or juveniles will placed in pens.

4.4.3 Staging Area

The establishment of the staging area would be the first step in the construction process. The following procedures will be followed to facilitate the siting and development of the construction staging area. Tortoise locations and movement patterns will be well documented via ongoing *in situ* monitoring. The location and dimensions of the staging area would be sited in a way to avoid occupied habitat (i.e., near the dry lake bed) in order to minimize the potential of encountering live tortoises. Therefore, the establishment of the staging area is proposed to occur during either the active or inactive tortoise season, yet in some cases methods would differ seasonally as specified below.

The construction staging area will be fenced with temporary desert tortoise exclusion fencing. Known tortoise locations will be avoided during interior fence planning. These fencing activities will be treated as a linear project component and all applicable conditions would apply (Section 4.4.7). A qualified biological monitor will monitor all fencing activities. All fencing will be checked and repaired (if necessary) on a daily basis to ensure its integrity and identify any tortoises that may be fence-walking.

Clearance surveys within the construction staging area will be conducted using belt transects at 4.6 meter (15 foot) spacing, using tighter spacing if vegetation becomes denser. If at least two complete perpendicular passes are completed without a desert tortoise or new active tortoise sign being found, development of the construction staging area will continue as planned.

If a tortoise is found in a burrow during the inactive season, an attempt to shift the boundaries of the staging area to avoid the occupied burrow will be implemented. If this is not feasible, the occupied burrow will be fenced with temporary exclusion fencing at a distance of 100 meters (328 feet) from the burrow to provide sufficient space for the individual until the following active season. The tortoise within the fenced exclusion area will be monitored periodically until the animal becomes active at which time it will be fitted with a transmitter. If a desert tortoise is found above ground during the inactive season, it will be fitted with a transmitter and left *in situ* and monitored until the tortoise settles into a burrow. Once the burrow has been identified and the tortoise becomes inactive, then the exclusion area

would be established or the staging area boundary shifted as previously described. Any tortoise identified during the inactive season would eventually undergo health assessments and be included in the initial group of translocated tortoises as described in Section 4.4.6.1.

If a tortoise is found within the staging area during the active season then an effort to passively exclude tortoises would be employed to minimize handling and harassment. Fence installation would proceed in a coordinated manner based on information provided by the Authorized Biologist. Under direction from the Authorized Biologist, gaps may be left in the fence to allow for tortoises to move outside the staging area and then closed once tortoises are passively excluded.

4.4.4 Perimeter Fence Installation

The perimeter fence and associated desert tortoise exclusion fencing will be established around the Project. These fencing activities will be treated as a linear project component (Section 4.4.7). A qualified biological monitor will monitor all fencing activities. All fencing will be checked and repaired (if necessary) on a daily basis to ensure its integrity and identify any tortoises that may be fence-walking.

If the Perimeter Recipient Site (or portion thereof) is authorized by the USFWS prior to perimeter fence installation, then an effort to passively exclude fence line tortoises from the Project site would be employed to minimize handling and harassment. Tortoise locations and movement patterns will be well documented via ongoing in situ monitoring. Fence line tortoises would be defined as those that occupy home ranges that overlap the proposed fence line alignment. A Translocation Review Package that specifically addresses fence line tortoises would be submitted to USFWS for approval prior to fence installation. Fence line tortoises would be tracked regularly in the days leading up to fence installation. Fence installation would proceed in a coordinated manner based on information provided by the Authorized Biologist. Under direction from the Authorized Biologist, gaps may be left in the fence to allow for tortoises to move outside the Project site and then closed once tortoises are passively excluded. As previously stated, all fencing will be checked and repaired (if necessary) on a daily basis to ensure its integrity and identify any tortoises that may be fence-walking.

If the Perimeter Recipient Site (or portion thereof) is authorized by the USFWS prior to perimeter fence installation, all tortoises without transmitters that are incidentally found above ground during fence installation will be given a unique identifier and fitted with a transmitter. Tortoises incidentally found inside (Project side) of the fence line would remain on the inside and be considered a translocatee. Tortoises found outside (recipient side) of the fence line would remain on the outside and be considered a resident of the recipient site population. All tortoises would subsequently undergo health assessments and be monitored *in situ*.

If a previously translocated tortoise from the ISEGS project site is located within the Project site at the time of perimeter fence installation, then the aforementioned passive exclusion approach would be the first course of action. If this approach is not successful, then the ISEGS translocated tortoise(s) would be included in the first translocation effort and proposed to be placed in the habitat between both projects.

Prior movement data for each ISEGS tortoise would be reviewed and taken into account when selecting the appropriate disposition site.

4.4.5 Interior Fence Installation

The Project will be fenced into interior units with temporary desert tortoise exclusion fencing. Tortoise locations and movement patterns will be well documented via ongoing *in situ* monitoring. Known tortoise locations will be avoided during interior fence planning. These fencing activities will be treated as a linear project component and all associated conditions would apply (Section 4.4.7). A qualified biological monitor will monitor all fencing activities. All fencing will be checked and repaired (if necessary) on a daily basis to ensure its integrity and identify any tortoises that may be fence-walking. All tortoises without transmitters that are incidentally found above ground during the active season will be given a unique identifier, fitted with a transmitter, undergo health assessments, monitored *in situ*, and be included in the first translocation group.

4.4.6 Translocation and Clearance Surveys

4.4.6.1 Initial Translocation

Following installation of the perimeter fence, a Translocation Review Package that specifically addresses tortoises that have been monitored *in situ* prior to clearance surveys would be submitted to USFWS for approval. The initial translocation group is expected to include the majority of all translocated adult tortoises.

4.4.6.2 Clearance Surveys

These surveys will be conducted once fencing is completed in any interior unit. Clearance surveys performed within the Solar Facility, excluding those already mentioned in relation to the staging area, will be conducted during the active season only. These activities will be conducted in accordance with this plan, and recent guidance from USFWS including materials from health and blood drawing training courses, and the *Desert Tortoise Field Manual* (USFWS 2009). The following conditions will apply:

a) Clearance surveys will be conducted using belt transects at a minimum of 4.6 meter (15 foot) spacing, using tighter spacing if vegetation becomes denser (USFWS 2009). Clearance surveys will continue in each unit until at least two consecutive perpendicular passes are completed in a unit without a desert tortoise or new active sign being found, at which time construction may commence in that unit.

b) When an unmarked tortoise is found during clearance surveys, an Authorized Biologist will:
    - Place a transmitter on individuals larger than 120mm;
    - Assign and apply a unique number to the tortoise;
    - Complete a detailed health assessment of the animal; and
    - Collect a blood sample for serology testing.

c) Tortoises found during clearance will be left *in situ* where they were found.

d) Any tortoise showing severe clinical signs of disease will be transported to an agency-approved quarantine as described in Section 4.3.

e) All tortoise burrows within the cleared area shall be completely and carefully excavated to ensure no viable tortoise nest remain in the cleared area. If a viable nest is located procedures shall follow those in Section 4.4.2.

4.4.6.3 Subsequent Translocation Phases

It is expected that the large majority of adult tortoises occupying the Project site would be passively removed or translocated during the initial translocation effort. Tortoises of any size found during clearance surveys of remaining units would be addressed in separate a Translocation Review Package (TRP). Every effort will be made to minimize the number of TRPs submitted to the USFWS and CDFG for review and approval by combining the results of clearance surveys within multiple units into one TRP.

4.4.7 Linear Project Components

As linear components of the Project, construction of the access road, gen-tie line, water line, or fence installation may occur at any time of the year (USFWS 2010). Any desert tortoises found during clearance of linear facilities should be moved out of harm's way following clearance and handling procedures outlined in the current *Desert Tortoise Field Manual* (USFWS 2009). An approved recipient site will not be required for tortoises encountered within linear project components. In addition, tortoise found during linear project components that are not at the time being monitored *in situ* would not be subject to transmittering, tracking, or serology testing as described in Section 4.1 and 4.2. Tortoises would undergo visual health assessments to determine if they exhibit severe clinical signs of disease. The following measures would apply to all linear project components.

- Within 30 days prior to construction, a survey will be conducted along each portion of the line and all active desert tortoise sign mapped and communicated to the Lead Biological Monitor and site-specific biological monitor(s).

- Biological monitors will be on-site during all construction activities to ensure that active burrows and live tortoises along linear project components will be avoided by project construction and facilities.

- Tortoise burrows that cannot be avoided along linear project components will be excavated ahead of construction by authorized biologists using hand tools to assure it is not occupied or a containing a nest. If this occurs during the inactive season and a tortoise is found in the burrow, then the tortoise will be relocated to an unoccupied nearby burrow or artificial burrow. If this occurs during the active season, and a tortoise is found in the burrow, then the tortoise would be relocated to a location under the shade of a nearby shrub, an unoccupied nearby burrow, or artificial burrow.

- If a desert tortoise is found on linear project components, adverse effects will be avoided by allowing the tortoise to passively traverse the site while construction in the immediate area is halted. If the tortoise does not move out of harm's way after approximately 20 minutes, an Authorized Biologist for the Project can move the animal out of harm's way within 500 m of the disturbance area. The Authorized Biologist will be responsible for taking appropriate measures to ensure that any desert tortoise moved in this manner is not exposed to temperature extremes which could be harmful to the animal.

- Vehicles parked in desert tortoise habitat will be inspected immediately prior to being moved. If a tortoise is found beneath a vehicle, the Authorized Biologist will be contacted to move the animal from harm's way, or the vehicle will not be moved until the desert tortoise leaves of its own accord.

5.0 MONITORING AND REPORTING

All activities related to monitoring will be conducted by Approved and/or Authorized Biologists identified in the project Biological Opinion and associated authorizations. Standardized data sheets and/or digital data recorders will be used to record individual tortoise locations, behavior, obvious health indications (not full health assessment but limited assessment of obvious clinical signs), behavior, interactions with other animals, burrow locations, etc. during all monitoring activities.

5.1 Construction Monitoring

Following installation of the desert tortoise exclusion fencing for both the permanent site fencing and temporary fencing, the fencing will be checked and repaired, as necessary, on a daily basis to ensure its integrity. If desert tortoises were moved during fence construction, permanent and temporary fencing will be inspected at least once per day for the first 7 days to ensure a recently moved tortoise has not been trapped within or is pacing the fence. Thereafter, permanent fencing will be inspected monthly and during and within 24 hours following all major rainfall events. A major rainfall event is defined as one for which flow is detectable within the fenced drainage. Any damage to the fencing will be temporarily repaired as quickly as possible to keep desert tortoises out of the project area, and permanently repaired within 48 hours of observing damage. Inspections of permanent security fencing will occur for the life of the project.

All unsecured site entrances and equipment moving outside the desert tortoise exclusion fence will be monitored by biological monitors. If any additional desert tortoises are located within the fenced area, the translocation process described in Section 4.4.6 will be followed and project activities will temporarily cease in that area with clearance surveys recommencing until no tortoises are found during additional clearance surveys. All tortoises being held *in situ* will be monitored at least

- Once a day during first week
- Once a week for the following three weeks
- Twice per month until the Translocation Review Package is approved and the individual is translocated

5.2 Long-Term Monitoring

All translocated desert tortoises and an equal number (in equal gender ratios) of resident individuals at the recipient site and control site will be monitored on a long-term basis, initially by the project proponent for a period of 5 years after the initial translocation date and then by the wildlife agencies for another 25-year duration. The effectiveness monitoring program inclusive of demographic studies, translocation effects, and connectivity assessments would be performed for a duration acceptable to the BLM, USFWS, and CDFG.

5.2.1 Project Proponent

Transmitters will be changed as necessary throughout the monitoring period as necessary to maintain battery life. At the end of the 5-year monitoring period, coordination with USFWS and CDFG will be necessary to transfer data and materials.

Translocated desert tortoises will be monitored as follows:

- Once within 24 hours of release
- A minimum of twice weekly for the first two weeks after release
- A minimum of once a week during the active season for the 5-year monitoring period
- Once every other week during the inactive season for the duration of the 5-year monitoring period

Resident and control desert tortoises should be monitored for the 5-year monitoring period as follows:

- A minimum of once a week from March through early November; and
- A minimum of once every other week from November through February

Health assessments will be conducted for all transmittered translocated individuals annually prior to overwintering and subsequent to overwintering. A health assessment will also be completed for each translocated individual at the end of the 5-year monitoring period. Any health problems or mortalities observed will be reported to USFWS and CDFG verbally within 48 hours of discovery or via email within 5 business days thereafter and will include unique identifier, location, suspected health issue and/or cause of death (if known). Fresh carcasses will be brought for necropsy as directed by USFWS and CDFG. Animals showing severe clinical signs of disease at any time will be addressed following the guidelines provided in Section 4.3 of this plan.

5.2.2 Wildlife Agencies

Long-term monitoring funds, assessed at the rate of $36,000 per translocated, resident, and control adult tortoise included in the initial monitoring program, will be deposited into a specified account. These funds will contribute to monitoring costs for up to a 30-year total duration. Monitoring responsibility by the project proponent will conclude at the end of the agreed upon initial monitoring period.

5.3 Reporting

Reporting During Translocation and Long-Term Monitoring

Documentation of all activities will be compiled and data synthesized throughout duration of translocation and monitoring. Findings, data, and recommendations will be submitted to USFWS and appropriate wildlife and/or permitting agencies monthly for translocation and quarterly for long-term monitoring. The Field Contact Representative will send e-mails prior to the 5th day of the month summarizing the translocation activities performed the previous month. These e-mails will be sent to the project biologists at BLM, USFWS, and CDFG. Minimum data requirements will conform to the current translocation health assessment guidance and (USFWS 2011a). All activities will be recorded on standardized data sheets and/or on digital data recorders. All data will be incorporated into a database according to the project-specific effectiveness-monitoring program.

Annual Reports

During the period of long-term monitoring, all information related to translocation and monitoring for the previous calendar year will be compiled by the Field Contact Representative and submitted along with all annual report information to the appropriate contact at the BLM on or before January 15 for the preceding calendar year so that the February 1 deadline for annual reports to USFWS can be met. Annual reports will summarize all long-term monitoring activities conducted during the previous calendar year including health assessments, vegetation monitoring and any adaptive management employed. Annual project reports submitted to USFWS and CDFG by BLM will contain detailed information on these translocations including all information recorded.

Final Report

Following the completion of the fifth year of monitoring, a final report will be completed that will assess the overall success of the monitoring program. The final report will summarize all long-term monitoring activities for five years of post-construction monitoring and will discuss any observed differences in individual or group behaviors in the translocated, recipient, and/or control populations; overall tracking of health assessments for each individual; an overview of the 5-years of vegetation monitoring; and any adaptive management employed throughout the long-term monitoring period and an assessment of the success of each adaptive management strategy (see Section 5.5).

5.4 Roles and Responsibilities

Stateline will appoint an Field Contact Representative (FCR) and Authorized Biologists (AB) who will be responsible for the implementation of all desert tortoise translocation activities.. If at any time a change is proposed to the FCR, Stateline will obtain concurrence with the experience of new personnel from BLM, USFWS, and CDFG.

5.5 Adaptive Management

In addition to the specific project measures described below, Stateline is committed to an adaptive management approach that supports flexible decision making and can be adjusted as the effects of the Action are better understood, including achievement of the purpose and goals of this plan (Section 1.0). Any adaptive management actions will be proposed by the Project's FCR in response to specific management issues that arise that pose a threat to translocated or recipient tortoises. Adaptive management strategies will be coordinated with BLM, USFWS, and CDFG. If there are concerns regarding immediate threat to a tortoise, adaptive management decisions will be made in the field with phone calls to agency personnel made within 24 hours to describe the actions taken. If the situation does not pose an immediate threat to one or more tortoises, agencies will be notified of proposed adaptive management decisions via e-mail and field personnel will wait up to one week for concurrence or additional direction and response from agency personnel before actions are taken.

Stateline evaluated a larger study area when determining the siting of the Project. Areas of large washes, DWMA, CHU, and known or modeled higher desert tortoise density were avoided when siting the Project. Project design has incorporated features to reduce adverse effects to desert tortoise, including:

- Limiting vegetation disturbance and grading to the smallest area possible
- Working closely with Project biologists to improve desert tortoise exclusion features such as fencing and gates

During the construction and the operations and maintenance (O&M) phases of the project, the following best management practices (BMPs) will be incorporated to reduce adverse effects to desert tortoise:

1. Speed limits on all unpaved areas of the Project will be a maximum of 15 miles per hour.
2. No dogs or firearms will be allowed on the project site during construction or O&M.
3. Construction and O&M activities will be limited to daylight hours to the extent possible.
4. Trash will always be contained within raptor and raven-proof receptacles and removed from the site frequently, including trash collected in vehicles in the field.
5. Water required for construction purposes will be transported throughout the site in enclosed water trucks.
6. Water sources for the project (such as wells) will be checked periodically by biological monitors to ensure they are not creating open water sources through by leaking or consistently overfilling trucks.
7. All vehicles leaking fuel or other liquids will be immediately removed to the staging area and repaired – all First Solar construction equipment will carry spill materials and all spills will be cleaned up promptly and disposed of correctly. Construction vehicles will be equipped with spill response kits; and spill response equipment will also be kept on-site.
8. A formal Worker Environmental Awareness Program will be completed for every individual on all Project components. This Program will include formal classroom training. All individual completing

training will sign a sign-in sheet and receive wallet cards and stickers to show they have completed this training. The training will include the following information and include photos of all resources:

a. Discussion of the desert ecosystem, vegetation and wildlife communities on the project site
b. Discussion of desert tortoise ecology and known tortoise activity found on the Project components being constructed
c. Legal drivers, permitting, and penalties related to avian and bat protection
d. Project-specific desert tortoise protection measures
e. Worker responsibilities and biological monitor responsibilities, including the authority for biological monitors to halt project activities

Post-construction activities will avoid disturbing areas of native vegetation adjacent to the project site. In addition, any restoration and reclamation activities that take place during the decommissioning phase of the Project will take into account vegetation appropriate to support desert tortoise.

Results of long-term monitoring will be used to aid in making management decisions for the Project. Should adaptive management become necessary for any reason, the FCR for the Project will immediately inform the key personnel of the conditions causing management concern and possible avenues to correct these conditions. All key personnel for the Project will agree on the scope and direction of adaptive management actions prior to them being implemented except in the case of immediate threat to one or more desert tortoise. In cases of immediate threat, the FCR will direct activities to avoid or minimize the immediate threat and contact the key personnel within 3 days afterwards with information on the threat and actions taken to avoid or minimize the impacts, as well as actions recommended to avoid similar threats in the future.

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