

**DESERT TORTOISE TRANSLOCATION PLAN
SILVER STATE SOLAR SOUTH PROJECT
CLARK COUNTY, NEVADA**



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List of Acronyms

ACEC	Area of Critical Environmental Concern
Applicants	Silver State Solar Power South, LLC (Silver State) and Southern California Edison (SCE)
BLM	U.S. Bureau of Land Management
BO	Biological Opinion
I-15	Interstate 15
ROW	Right of Way
Service	U.S. Fish and Wildlife Service

1.0 INTRODUCTION

This translocation plan describes the proposed methods for translocation of desert tortoises (*Gopherus agassizii*) from the Silver State Solar South Project (Project or Proposed Action); also discussed are estimates of desert tortoise densities, health status; and details of proposed post-translocation monitoring, and reporting.

1.1 Project Location and Description

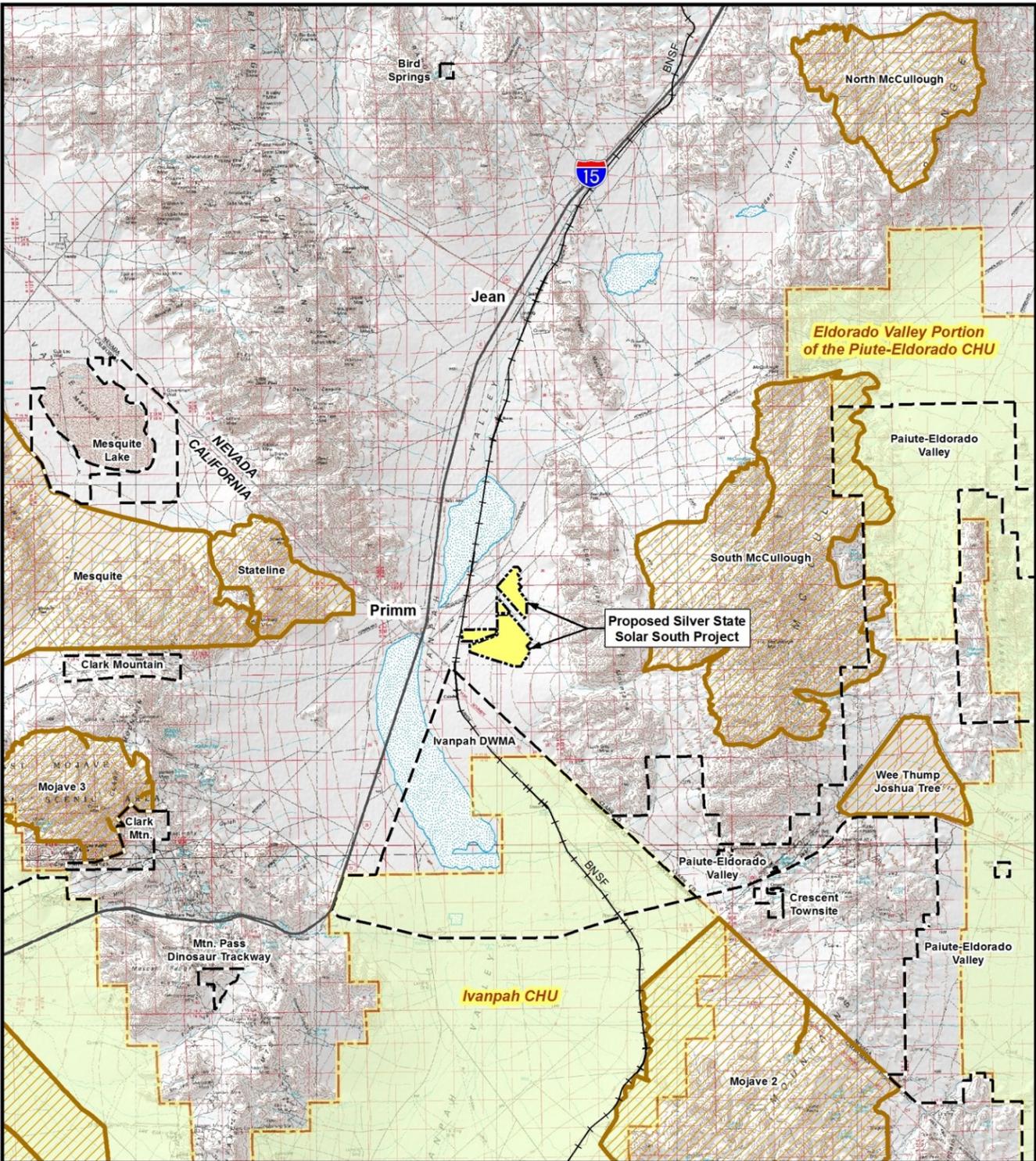
The Project (or Proposed Action) is the Bureau of Land Management's (BLM's) issuance of a right-of-way (ROW) grant for the Silver State Solar South Project that would authorize construction, operation, maintenance, and decommissioning of a commercial solar power-generating facility on a maximum of 2,427 acres of BLM-managed lands.

The Project is located in unincorporated Clark County within the northern Ivanpah Valley, less than one mile east of Primm, Nevada, and is located outside the boundaries of an Area of Critical Environmental Concern (ACEC), Desert Wildlife Management Area, Wilderness Area, or Service designated critical habitat unit for desert tortoise (Figure 1). The site is located east of Interstate 15 and Roach Lake and can be found on the Desert and Roach 7.5-Minute U.S. Geological Survey topographic quadrangles (Figure 2). The Project lies between the Lucy Gray Mountains and Roach Dry Lake. Existing developed areas within the immediate vicinity of the Project site are associated with linear features that cross and dissect the Ivanpah Valley including interstate 15 (I-15), Union Pacific Railroad, numerous overhead transmission lines and associated dirt roads, an underground petroleum line and associated dirt roads, and off-highway vehicle roads and race routes. Other existing developments within the immediate vicinity of the Project site include Primm (casinos, outlet mall, staff housing and support facilities), Nevada Energy Walter M. Higgins Generation Station, and the Silver State Solar North Project.

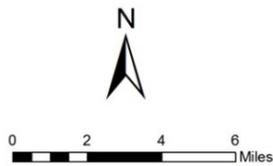
1.2 Goals and Objectives

The Project area has an existing population of desert tortoise (*Gopherus agassizii*), a state and federally protected species (Service 1990). In an effort to help minimize impacts to tortoise populations affected by habitat loss, translocation has been identified as a key management strategy (Service 2008). Here, translocation refers to moving tortoises outside of the Project boundary, and into recipient areas (which also possess existing desert tortoise populations). In an effort to select recipient sites which meet the criteria of U.S. Fish and Wildlife (Service) guidelines (Service 2010d) and best replicate the Project site, we have collected data on the Silver State Research Area, which encompasses the Project and the preferred recipient area, the Silver State Perimeter and Corridor, including:

- (1) Habitat
- (2) Desert tortoise densities, and
- (3) Prevalence of disease.



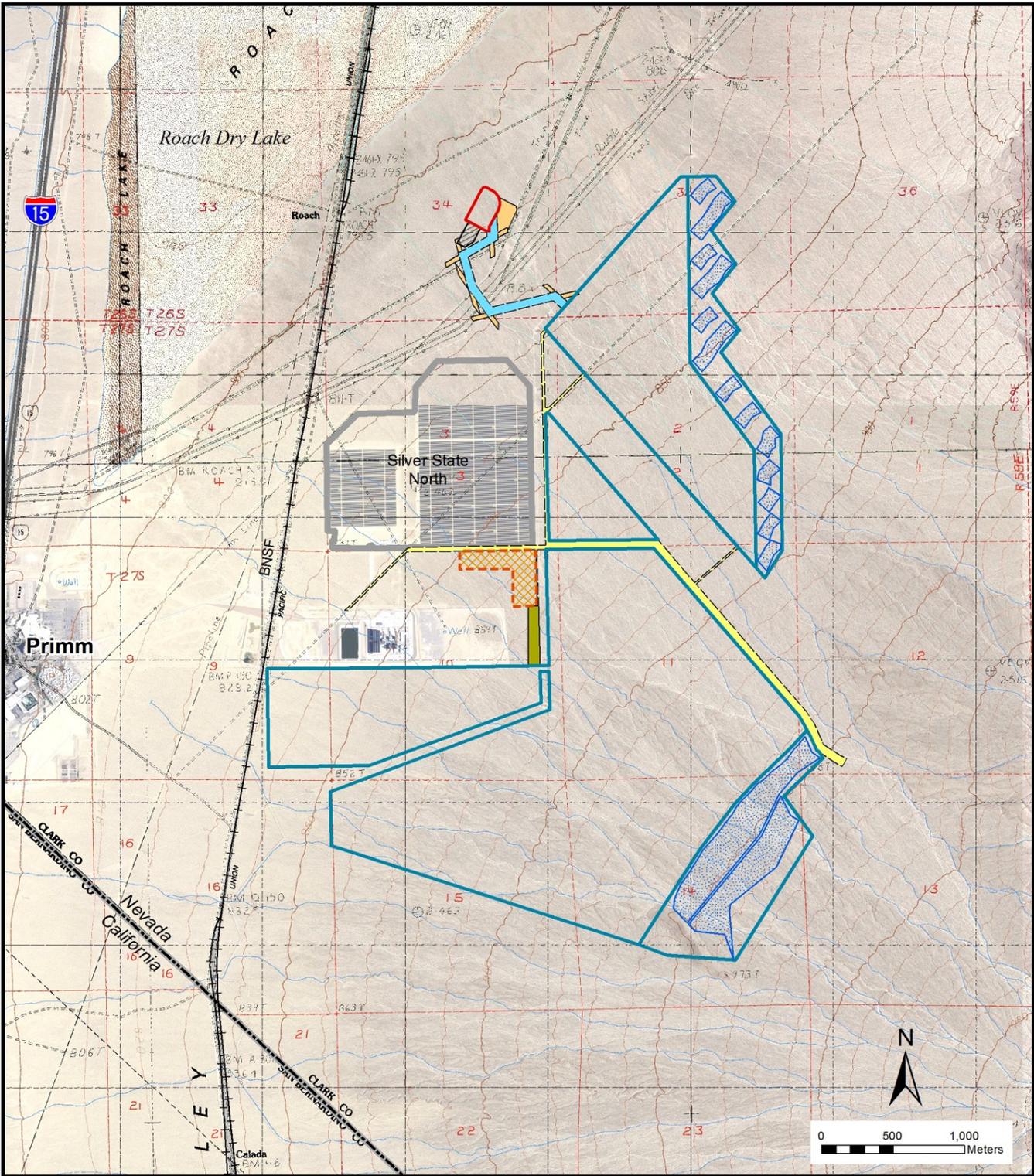
-  Silver State Solar South Proposed Project Boundary
-  Desert Tortoise Critical Habitat Unit (CHU)
-  Area of Critical Environmental Concern (ACEC)
-  Wilderness Area



SILVER STATE SOLAR SOUTH

Figure 1

Regional Vicinity



- | | | | |
|---|--|---|---------------------------------|
|  | Solar Field and Ancillary Facilities |  | SCE Switchyard Laydown Area |
|  | Drainage Control Dentention Basins |  | Temporary SCE Transmission Line |
|  | 220kV Transmission Line |  | SCE Telecom |
|  | Extension of Maintenance Road |  | Silver State North |
|  | Temporary Construction Mobilization and Laydown Area | | |
|  | SCE Switchyard | | |

SILVER STATE SOLAR SOUTH

Figure 2
Project Location

The objectives of this translocation plan are to provide:

- (1) Estimates of desert tortoise population density within the Project site, preferred and secondary recipient sites, and potential control site;
- (2) Detailed descriptions of translocation and monitoring methods used to minimize 'take' of desert tortoises during construction, operations, and maintenance phases of the Project;
- (3) Methods to minimize stress, disturbance, and injuries to translocated and resident tortoises.
- (4) Strategy for post-translocation monitoring and reporting to help maximize survivorship and evaluate the short term effectiveness of translocation.

1.3 Plan Overview

The following steps summarize the requirements for implementing translocation of desert tortoises. These steps are presented in the chronological order in which they have been or will be conducted and have been compiled from Service guidance (Service 2010c,d). They are listed here in order and under the section of this report where they are discussed. Those tasks listed under Section 2.0 and 3.0 have already been completed for the project site and corridor recipient site. Those discussed in Sections 4.0 and 5.0 are planned pre- and during Project construction, and for post-translocation monitoring. Data collection and reporting is discussed under each Section.

Section 2.0 Project Site Selection, Densities, and Health

1. Determine the need for translocation of desert tortoises
2. Estimate the number of desert tortoises that will be affected at the project site
3. Confirm tortoise densities at the Project site while *in situ* health assessment sampling is conducted

Section 3.0 Recipient Site Selection, Densities, and Health

4. Identify potential recipient sites
5. Estimate tortoise densities at agreed-upon recipient sites
6. Confirm tortoise densities at the recipient sites while *in situ* health assessment sampling is conducted

Section 4.0 Construction and Translocation Activities

7. Prepare the project site for translocation of desert tortoises
8. Construct and maintain project fencing, protocol clearance surveys of the project sites, and perform complete health assessments
9. Concurrence with results of complete health assessments and disposition plans and translocation of desert tortoise following results of disease testing

Section 5.0 Post-Translocation Monitoring and Adaptive Management

10. Implement post-translocation monitoring and adaptive management

2.0 PROJECT SITE SELECTION, DENSITIES, AND HEALTH

In an effort to minimize the impact on tortoise populations in the vicinity of the Project, site configuration focused on maximizing the corridor between the Lucy Grey Mountains and the Project's eastern perimeter. Tortoises currently found within the Project site are proposed to be translocated into this corridor area during the pre- and construction phases of the Project (see Section 4.0 and 5.0).

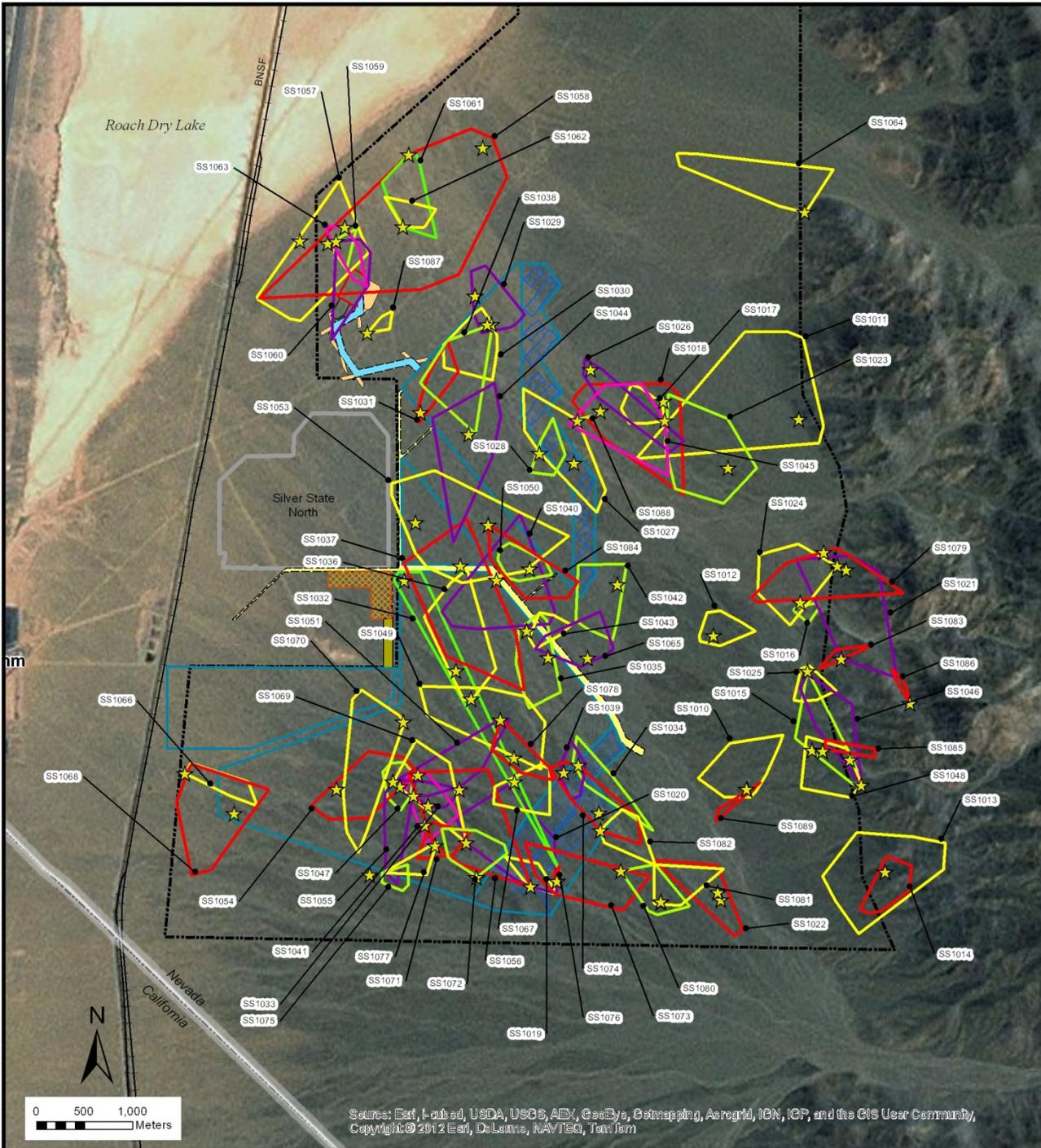
In spring 2012 line-intercept transects were conducted to obtain quantitative data on vegetative structure and substrate composition within the Project. Two perpendicular 100m transect lines were oriented NS and EW, and centered at 41 random points (Canfield 1941). Perennial plant species and height were recorded for all plants intersecting the lines, which also recorded soil type and substrate class, according to a soil texture triangle (Thien 1979). The landscape within the proposed Project boundary is characterized by a perennial vegetation structure typical of the Mojave Desert, with dominant shrubs being creosote bush (*Larrea tridentata*), white bursage (*Ambrosia dumosa*), and Yucca (*Yucca schidigera*).

Density estimates were calculated from live tortoise observations recorded during surveys (10-m wide belt transects) in 2011 and 2012. 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* (Service 2010a) and are presented in Table 1.

Table 1 Project Site Desert Tortoise Densities

Project Phase and Size (acres)	Point Estimate (# tortoises)	95% Confidence Interval (# tortoises)	Density Point Estimate (tortoises/mi ²)	Density Range Estimate (tortoises/mi ²)
Phase II (2,427)	44	17 to 115	13	5 to 33

Additionally, a research effort was initiated in Fall 2012 to locate, transmitter, and conduct health evaluations on tortoises in the Silver State Research Area, an area which includes and surrounds the Project site (Fig. 3; Service # TE-218901-3, BLM Wildlife Research Permit Case #NV-052-UA-12-08, NDOW#S35587). This effort has located and transmitterd approximately 80 adult desert tortoises. These animals were found by using the initial detection data from 2011 and 2012 surveys; additional tortoises have been added as they are encountered during radio tracking efforts. Once located, tortoises are marked with a unique ID, epoxy notching, transmitterd (Boarman et al. 1998), and given a health assessment and venipuncture (Service 2011) as per federal and state permits, and agency guidelines. Tortoises are radio tracked a minimum of once every two weeks using hand-held radio receivers (R-1000 Communication Specialist Inc. Orange, California, USA) and a Yagi-Uda directional hand-held antenna (Wildlife Materials International, Inc., Murphysboro, Illinois, USA) during the active season, and a minimum of once per month during the inactive season. This data was used to establish an activity area for each tortoise, and will coincidentally help inform the upcoming translocation effort (Figure 3). Furthermore, we have conducted repeated health evaluations on the tortoises, thus informing the disease prevalence in this region (Table 2). Surplus volumes of plasma and red blood cells were banked with the Service through San Diego Zoo Institute for Conservation Research, Desert Tortoise Conservation Center (Las Vegas, NV) if needed for future testing.



<p>★ Most Recent Tortoise Location</p> <p>□ Solar Field and Ancillary Facilities</p> <p>□ Drainage Control Detention Basins</p> <p>□ 220kV Transmission Line</p> <p>□ Extension of Maintenance Road</p> <p>□ Temporary Construction Mobilization and Laydown Area</p>		<p>□ SCE Switchyard</p> <p>▨ SCE Switchyard Laydown Area</p> <p>□ Temporary SCE Transmission Line</p> <p>□ SCE Telecom</p> <p>□ Silver State North</p> <p>□ Desert Tortoise Research Area</p>	
<p>SILVER STATE SOLAR SOUTH</p> <p>Figure 3</p> <p>Tortoise Core Use Areas- Roach Lake Corridor with Silver State Solar South Project</p>			

Table 2 Disease Results for Individual Tortoises in Silver State Research Area

Tortoise	Mycoplasma agassizii		Mycoplasma testudinium		Tortoise	Mycoplasma agassizii		Mycoplasma testudinium	
	Titer	Result	Titer	Result		Titer	Result	Titer	Result
SS1010	<32	Negative	<32	Negative	SS1046	<32	Negative	64	Positive
SS1011	<32	Negative	<32	Negative	SS1047	<32	Negative	<32	Negative
SS1012	<32	Negative	<32	Negative	SS1048	32	Suspect	64	Positive
SS1013	<32	Negative	64	Positive	SS1049	<32	Negative	<32	Negative
SS1014	<32	Negative	32	Suspect	SS1050	32	Suspect	32	Suspect
SS1015	<32	Negative	<32	Negative	SS1051	<32	Negative	32	Suspect
SS1016	<32	Negative	<32	Negative	SS1052	<32	Negative	<32	Negative
SS1017	<32	Negative	32	Suspect	SS1053	<32	Negative	<32	Negative
SS1018	<32	Negative	<32	Negative	SS1054	<32	Negative	<32	Negative
SS1019	<32	Negative	<32	Negative	SS1055	<32	Negative	<32	Negative
SS1020	<32	Negative	32	Suspect	SS1056	<32	Negative	<32	Negative
SS1021	<32	Negative	<32	Negative	SS1057	<32	Negative	32	Suspect
SS1022	<32	Negative	<32	Negative	SS1058	<32	Negative	<32	Negative
SS1022	<32	Negative	<32	Negative	SS1059	<32	Negative	<32	Negative
SS1023	<32	Negative	32	Suspect	SS1060	<32	Negative	<32	Negative
SS1024	<32	Negative	<32	Negative	SS1061	<32	Negative	32	Suspect
SS1026	<32	Negative	32	Suspect	SS1062	<32	Negative	<32	Negative
SS1027	<32	Negative	32	Suspect	SS1063	<32	Negative	<32	Negative
SS1028	<32	Negative	<32	Negative	SS1064	<32	Negative	32	Suspect
SS1029	<32	Negative	<32	Negative	SS1065	<32	Negative	32	Suspect
SS1030	<32	Negative	<32	Negative	SS1066	<32	Negative	<32	Negative
SS1031	<32	Negative	32	Suspect	SS1067	<32	Negative	<32	Negative
SS1032	<32	Negative	<32	Negative	SS1068	<32	Negative	64	Positive
SS1033	<32	Negative	<32	Negative	SS1069	<32	Negative	32	Suspect
SS1034	<32	Negative	<32	Negative	SS1070	<32	Negative	<32	Negative
SS1035	<32	Negative	<32	Negative	SS1071	<32	Negative	<32	Negative
SS1036	<32	Negative	64	Positive	SS1072	<32	Negative	128	Positive
SS1037	<32	Negative	<32	Negative	SS1073	<32	Negative	32	Suspect
SS1038	32	Suspect	<32	Negative	SS1074	<32	Negative	<32	Negative
SS1039	<32	Negative	<32	Negative	SS1075	<32	Negative	64	Positive
SS1040	<32	Negative	32	Suspect	SS1076	<32	Negative	<32	Negative
SS1041	<32	Negative	<32	Negative	SS1077	<32	Negative	32	Suspect
SS1042	<32	Negative	<32	Negative	SS1078	<32	Negative	<32	Negative
SS1043	<32	Negative	<32	Negative	SS1080	<32	Negative	<32	Negative
SS1044	<32	Negative	<32	Negative	SS1081	<32	Negative	32	Suspect
SS1045	<32	Negative	64	Positive					

This level of data collection and analysis would typically occur after the National Environmental Policy Act and Section 7 processes; however, the recent Service translocation guidance expressed that this information may be valuable in earlier stages of project development. Silver State Solar Power South, LLC, 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.

3.0 RECIPIENT AND CONTROL SITES

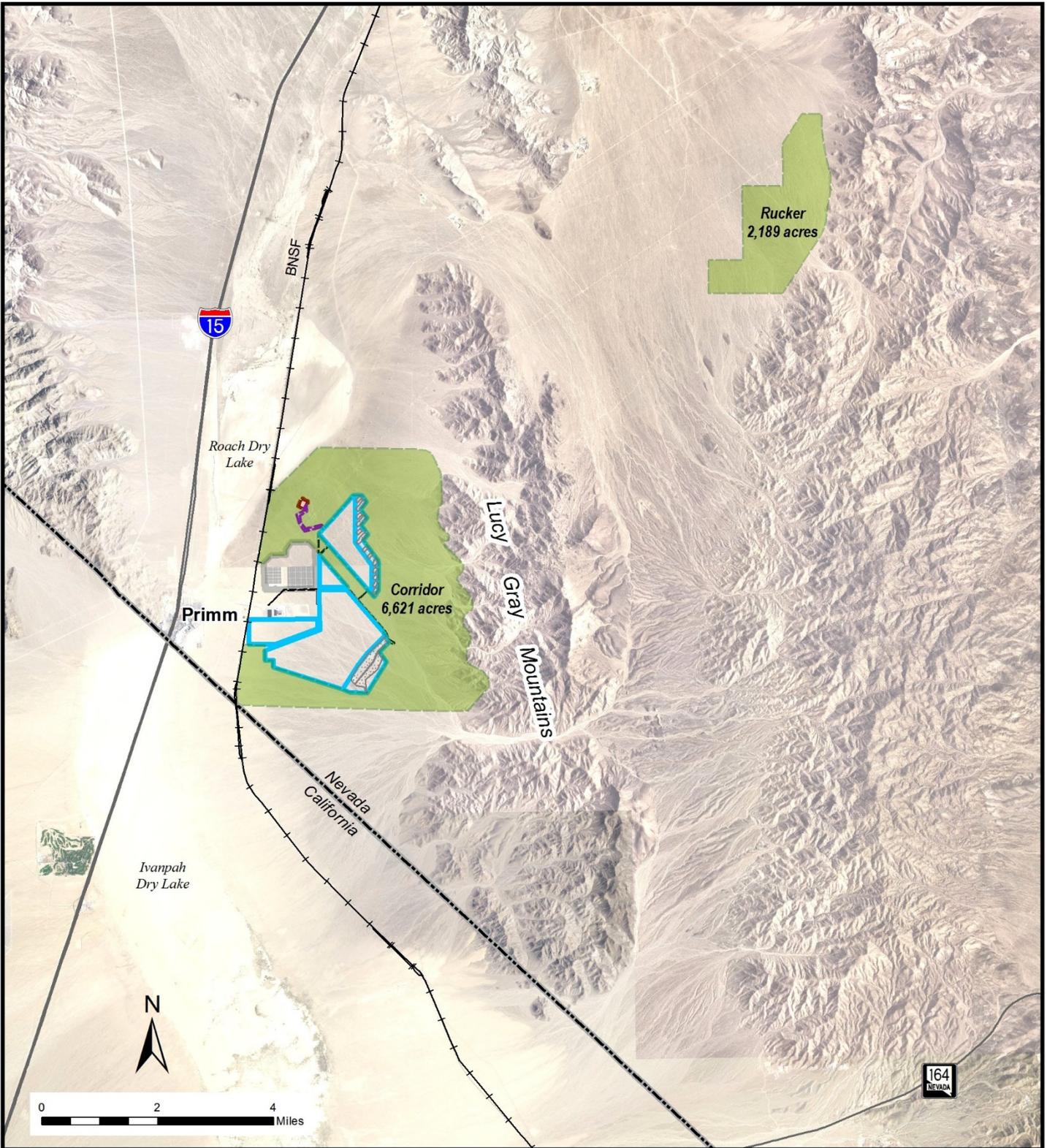
There are three proposed recipient sites, referred to as Corridor and Rucker (Figure 4) where desert tortoises from the Project site could be translocated. There will be a strong preference to translocate tortoises into the Corridor, which is an area with known desert tortoise densities, disease status and activity areas.

The recipient sites were evaluated using the general criteria outlined in *Translocation of Mojave Desert Tortoises from Project Sites: Plan Development Guidance* (Service 2010d) and summarized below. These criteria were used in an extensive effort in GIS to find all areas within 40km of the Project site that meet all or most of these criteria. All areas identified in this GIS effort were then field verified for presence of similar characteristics to the Project site, and additional criteria were also considered in the selection of potential recipient sites, with selected results shown in Table 3.

1. Supports desert tortoise habitat suitable for all life stages
2. Disease prevalence within the resident desert tortoise population is less than 20 per cent
3. Located a minimum 10 km from major unfenced roads or highways, where distances from roads may be reduced if the proposed action includes provisions to install and maintain desert tortoise exclusion fencing
4. Located within 40 km of the project site, with no natural barriers to movement between them, to ensure that desert tortoises at the two sites were likely part of a larger mixing population and possess similar genetic composition
5. 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
6. Contains no detrimental right-of-ways (ROWs) or other encumbrances
7. Will be managed for conservation so that potential threats from future impacts are precluded

Table 3 Additional criteria used in the selection of potential recipient sites.

Feature	Site		
	Project	Corridor	Rucker
Same Recovery Unit	-	Yes	Yes
Proximity to Project area	-	1 km	19 km
Access & roads	-	Moderate	Good
Human Uses	OHV racing	Few	Moderate
Human impact	Low	Low	Moderate
Cell service on site	Good	Good	No
Elevation Similarity	-	Good	Moderate
Vegetation similarity	-	Yes	Yes
Good Annual growth	-	Yes	Yes
Substrate similarity	-	Moderate	Yes
Caliche on site	Yes	Yes	Yes



-  Railroad
-  State Boundary
-  Proposed Recipient Site
-  Proposed Solar Field and Ancillary Facilities
-  Proposed Drainage Control Retention Basins
-  Proposed Maintenance Road Extension
-  Proposed 220kV Gen-Tie Corridor
-  Proposed SCE Switchyard

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Figure 4

**Project Boundary and
Proposed Recipient Sites**

3.1 Primary Recipient Site: Corridor

The Corridor lies to the east of the Project, and extends into the foothills of the Lucy Grey Mountain Range, and also includes the bordering area immediately surrounding the Project. The Corridor ranges in elevation from 700 – 1000 m with a vegetation community of *Larrea tridentata*, and *Yucca spp.* at lower elevations, and well-developed cactus scrub, including barrel cactus (*Ferocactus cylindraceus*) and buckhorn cholla (*Cylindropuntia acanthocarpa*) towards the foothills of the mountains. There are numerous deep washes emerging from the mountains, and diffusing through the landscape towards the Project. There are caliche bands embedded in the wash banks, and previous surveys of this area have located tortoises throughout this region.

The number of animals that could be placed in the Corridor site was determined based on using known densities from surveys, and the maximum density for the Eastern Mojave Recovery Unit from the Service's most recent translocation guidance (Service 2011). Overall, a maximum of approximately 100 animals could be translocated into the Corridor site without exceeding the 68% confidence interval of the mean density of the recovery unit (5.77 animals per sq km; Service 2011). Because most adult tortoises in the Project area and Corridor recipient site have been previously translocated and therefore known, it is unlikely that 100 animals would be translocated. However, because the maximum potential numbers using the Service's 2010 guidance for density is 115 (Table 1), the secondary recipient sites have been identified in the unlikely case that the actual number of adult tortoises exceeds the 100 that could be placed in the Corridor site. If the number of translocatees appears to be likely to reach 100 (for example, if the number of translocatees reached 80), surveys would begin at the secondary recipient sites presented below upon reaching that threshold.

3.2 Secondary Recipient Site: Rucker

Secondary recipient site Rucker is shown in Figure 4 and have not been surveyed for desert tortoise, although they have been preliminarily assessed through site visits. Surveys to confirm densities and conduct health assessments would be conducted prior to any use of these sites if more animals are found on the Project site than can be placed within the Corridor site.

Rucker

Rucker Site is located approximately 12 km north-east of the southern portion of Silver State, and is accessed via two well- maintained power line roads and a BLM route. The utility corridor is the main human use in the area, though there is some evidence of off-route OHV traffic. Grazing has occurred in the area, as evidenced by a corral just off-site. Elevations range from 975 – 1150 m, supporting similar vegetation to Silver State Solar South Project. *Larrea tridentata* dominates, *Yucca*, cacti, and bunchgrasses are all present, as are fall annuals. Substrates are a mix, similar to the Project area, with finer soils on the bajada, and increased rocky areas upslope. One wash bank caliche cave was observed with high potential for others to be located.

3.3 Bright Source Energy Control

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 solar farm; this data can then be compared to the translocated and recipient site populations. Selection criteria for the control site includes having similar

habitat to the recipient site, and not previously used as a recipient site. BrightSource Energy is currently monitoring 136 desert tortoises as controls nearby in the northern Ivanpah Valley as part of the Ivanpah Solar Electric Generating System Project (situated in San Bernardino County, California). In an effort to reduce direct impacts to desert tortoise populations in the region, the BrightSource control information will also be used for the Silver State South Project through BLM coordination.

4.0 TRANSLOCATION PROCEDURES

This section provides details of the following steps for translocation (in chronological order):

1. Passive exclusion during fence construction
2. Disposition plan and translocation of known individuals
3. Clearance Surveys
4. Disposition plan and translocation of additional individuals

For purposes of this plan, the tortoise active season is defined as April 1 to May 31 and September 1 to October 31. All other times of the year are referred to as outside the active season. “Known individuals” refers to any tortoise previously transmitterd during the research study in the Project area. “Additional individuals” refers to tortoises identified during clearance surveys not previously recorded or transmitterd within the project area.

The demographic research study currently underway has transmitterd 71 known individuals within the research area (shown on Figure 3). At least 43 of these tortoises have home ranges that overlap within the Project site boundaries.

In this plan, those known individuals whose home range and recorded activity is >50% *within* the Project are considered “translocatees,” and those whose home range and recorded activity is >50% *outside* the Project are called “residents” of the Corridor site. All additional individuals found within the project site would be called translocatees because their home range and activities patterns are not known.

Decisions related to performing health assessments and transmittering of additional individuals will be based on the criteria below in Table 4.

Table 4. Summary of Activities Based on MCL of Individual

MCL (mm)	Activities Completed			
	Mark	Transmitter	Visual Health Assessment	Venipuncture
< 180 (juvenile)	Yes	No*	Yes	No*
≥ 180 (adult)	Yes	Yes	Yes	Yes

* will be assessed on a case-by-case basis

All additional individuals (>180mm MCL) encountered within the Project boundaries will be given a unique identifier as provided by Service and transmitters applied. Transmitter fitting will be 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 Service guidance. These activities will also conform to restrictions of time of day, temperature, and total time handled as described in the *Desert Tortoise Field Manual* (Service 2009). These tortoises will be tracked via radio-telemetry using hand-held radio receivers (Communication Specialist Inc. and Titley brands) and directional hand-held antennae. Tracking schedules include at minimum weekly visits during the active season and biweekly (every other week) visits outside the active season throughout the construction phase of the Project. Transmitters

will remain on all individuals throughout the monitoring period and be replaced as necessary (Section 5.0).

Tortoises <180mm MCL will all be marked and transmittered on a case-by-case basis. Health assessments will be conducted to the extent possible for each juvenile based the size of the animal.

4.1 Passive Exclusion during Fence Construction

During the construction of the Project’s perimeter fence, an attempt will be made whenever possible to passively exclude all known individuals, or additional individuals found during fence construction, from the Project site using the guidelines in Table 4.

Table 4 Passive Exclusion during Fence Construction

Side of Fence Line	Season	Resident or Translocatee	Methods
Outside	Active or inactive	Resident or Translocatee	Leave animal outside fence and construct fence.
Inside	Inactive	Resident or Translocatee	Leave individual in burrow on Project until <i>Translocation of Known Individuals</i> (Section 4.2) in following active season.
Inside	Active	Resident	Attempt to passively exclude by leaving gap(s) in fence line. If the individual does not passively relocate within 2 weeks, then translocate and monitor as discussed under <i>Translocation of Known Individuals</i> (Section 4.2)
Inside	Active	Translocatee	Translocate and monitor as discussed under <i>Translocation of Known Individuals</i> (Section 4.2)

4.2 Disposition Plan and Translocation of Known Individuals

Most or all translocatees have already been monitored for a year as of September 2013, and tested for disease as part of the research effort. Health assessments have been completed for all known individuals in Fall 2012 and Spring 2013 (Table 2). If these results are greater than one year old at the time of translocation, a more recent health assessment will be completed and included in the disposition plan. Any tortoise showing severe injury or severe clinical signs of disease at the time of translocation would instead be transported to an agency-approved quarantine facility.

Disposition Plan

In order to utilize the most current and complete data available, a Disposition Plan addressing each of the known individuals to be translocated will be submitted to the Service as translocation dates approach. It is anticipated first group would be moved either in Spring of 2014 or Fall of 2014. Criteria identified below will inform and help determine specific locations for translocation. Maps with GIS layers will be the primary tool used to assemble the data and identify translocation localities for each group or individual.

Health Status

The Disposition Plan will identify the following information requested in the *Health Assessment Procedures for the Desert Tortoise: A Handbook Pertinent to Translocation* (Service 2011b) for each adult known individual to be translocated:

- ♦ Photographs of individual tortoises as specified on the health assessment data sheet;
- ♦ Health assessment data sheets and tables present in Service guidance for disposition plans; and
- ♦ Maps of the recipient site illustrating current distribution and health status of resident tortoises and proposed release sites of project-site tortoises.

Resident Tortoise Densities

Portions of the Corridor site were surveyed in 2011 and 2012. To determine the number and general disposition location for translocatees, the Corridor site was overlaid with a grid and densities determined within each grid square (Figure 5). Then the density of each grid square was determined and the number of animals that might be translocated there determined. Figure 5 shows a general example of how the translocatees would be distributed based on this information.

Social Groups and Spatial Relationships

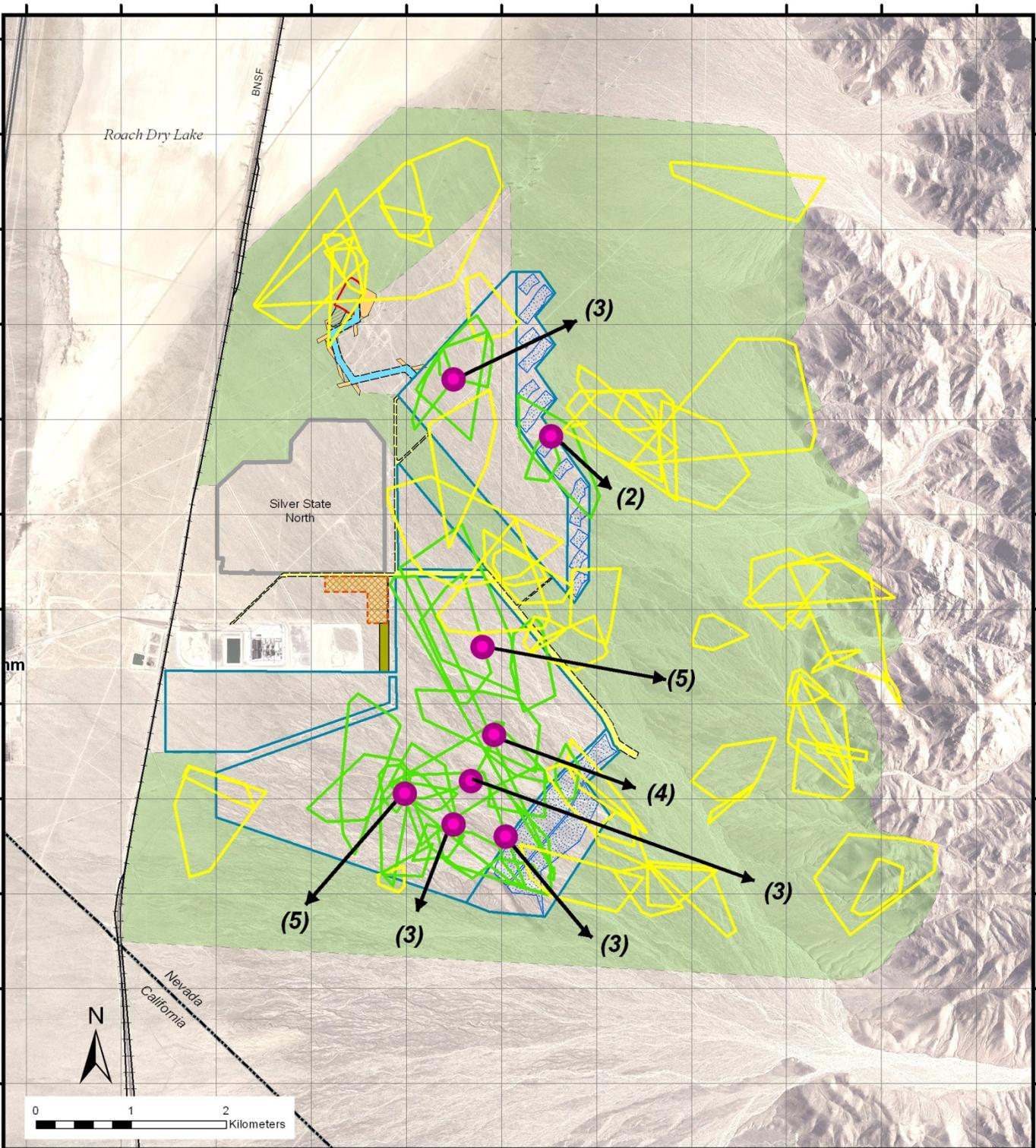
Desert tortoises are known to have social hierarchies within populations. Using up-to-date information at the time of translocation, tortoises with nearby home ranges will be presumed to be a cohort, and will preferentially be translocated in a manner which seeks to maintain some degree of social connectivity. To the extent feasible, known social groups and spatial relationships will be mimicked in the final Disposition Plan.

Shelter Site Type and Availability

During the course of investigating the project site and corridor areas it has become clear some tortoises preferentially select caliche caves for shelter during much of the year. When determining a release location for an individual tortoise, soil or caliche cave occupancy preference will be taken into account. Because of the impermanent nature of soil burrows and cave availability, prior to submitting the final Disposition Plan and determining exact areas of release, potential release sites will be re-investigated for existing burrows and caliche or rock caves that can be used for shelter sites. Known burrows are shown on Figure 6 that would be re-investigated. If insufficient shelter sites exist in an area to be used for translocation, burrows will be modified or created prior to translocation.

Predator Sign Densities

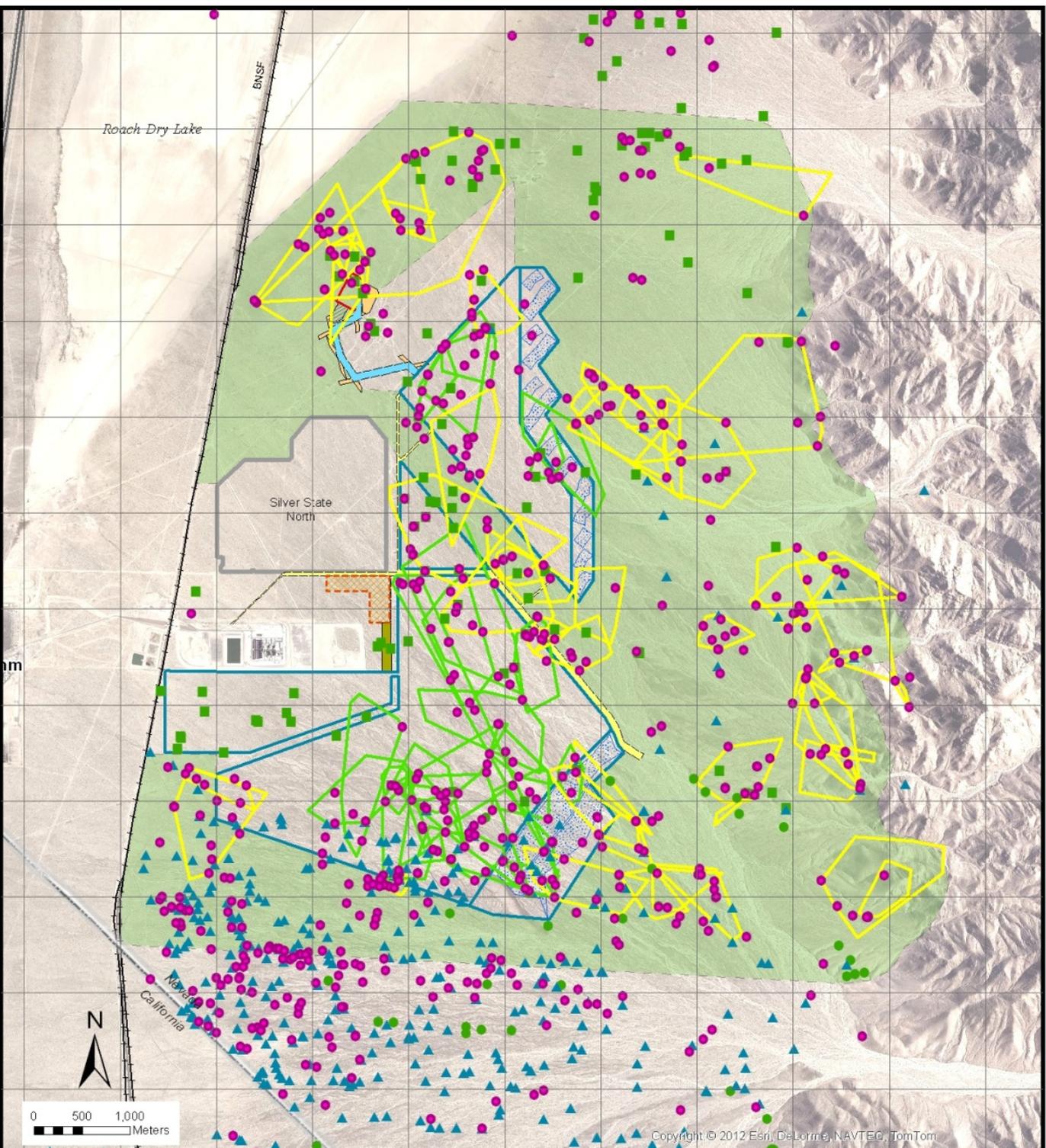
While surveying solar site and recipient areas in 2011 and 2012 predator sign data was recorded by Ironwood biologists. While some predator sign is expected across any desert landscape, areas where sign is concentrated may indicate a poor choice for placing a naive tortoise. Fresh sign will be noted during ground-truthing for shelter sites, and the Disposition Plan will include translocation sites preferentially located away from known areas of concentrated predator sign.



- (3) - Area and Direction of Translocation and Number of Tortoises
- Solar Field and Ancillary Facilities
- Drainage Control Detention Basins
- Extension of Maintenance Road
- Temporary Construction Mobilization and Laydown Area
- SCE Switchyard
- SCE Switchyard Laydown Area
- Temporary SCE Transmission Line
- SCE Telecom
- Silver State North
- Corridor Recipient Site

SILVER STATE SOLAR SOUTH

Figure 5
**Potential Translocation Areas-
 Roach Lake Corridor with
 Silver State Solar South Project**



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- | | |
|--|--|
| ● Currently Active Burrows | Temporary Construction Mobilization and Laydown Area |
| Burrow Condition, Burrow Type | SCE Switchyard |
| ● Good Caliche | SCE Switchyard Laydown Area |
| ▲ Good Soil | Temporary SCE Transmission Line |
| ■ Good - Unknown Type | SCE Telecom |
| □ Solar Field and Ancillary Facilities | Silver State North |
| ▒ Drainage Control Detention Basins | |

SILVER STATE SOLAR SOUTH

Figure 6
Active and Good Burrow Locations
Roach Lake Corridor with
Silver State Solar South Project

Translocation of Known Individuals Prior to Formal Clearance Surveys

The first translocation phase in each subsection of the Project will include known individuals. This translocation will follow installation of the perimeter fence and interior fencing creating these subsections. The translocation of known individuals is expected to include the majority of translocatees from each subsection since most animals in each area will have been transmittered and monitored for at least one year at the time of translocation. Subsequent clearance surveys (Section 4.4) would be conducted to find additional individuals and juveniles to be translocated.

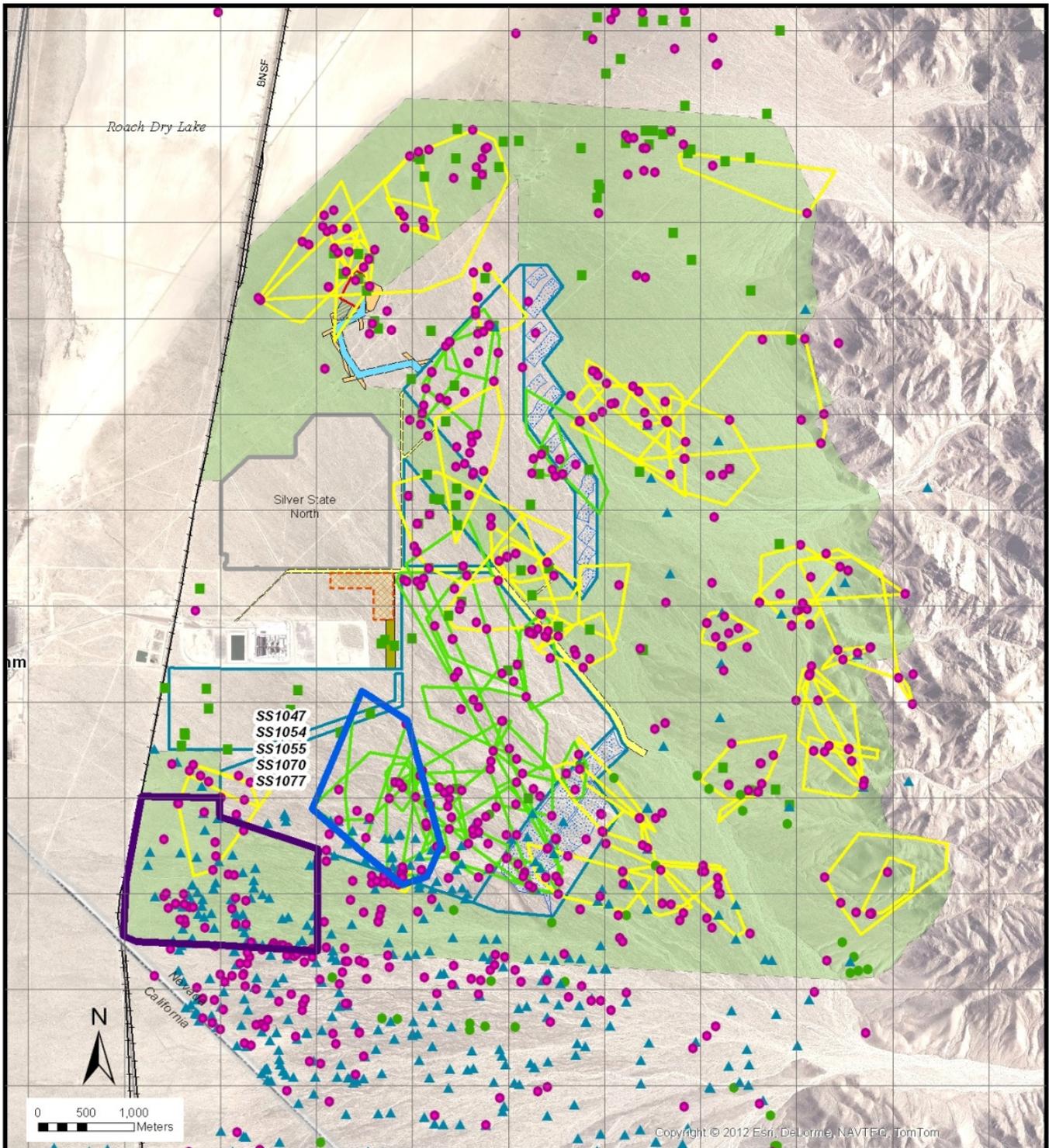
As identified in the Disposition Plan, known social groups of individuals would be translocated at the same time in similar proximity to their locations on the Project site. Every attempt would be made to find similar cover sites and habitat to that at the location of each individual on the Project site. Soils and scat may also be moved from the burrows on the Project site to cover sites in the release area.

Additional individuals or juveniles found during the translocation of the known individuals would be included in the Disposition Plan. Translocation of additional individuals and juveniles is discussed in Section 4.5.

Figure 7 shows an example of how site selection would occur if tortoises #1047, 1054, 1055, 1070, and 1077 were to be translocated with the current knowledge of social structure and burrow locations in the recipient area. However, conditions may change before the translocation due to events such as storms that alter current burrow conditions, new health information, and/or newly found individual tortoises that change our knowledge about social structure. For these reasons, individual disposition will be determined in a separate Disposition Plan created specifically for each animal at the time of its translocation.

4.3 Clearance Surveys

It is expected that the majority of adult tortoises occupying the Project site are known individuals and would be passively excluded during perimeter fencing activities, or translocated during the first translocation phase (Section 4.1 and 4.3). This section assumes clearance surveys are conducted during the active season. Clearance might also be attempted during the inactive season as discussed in Section



- | | |
|--|--|
| ● Currently Active Burrows | ▨ Drainage Control Detention Basins |
| Burrow Condition, Burrow Type | ▨ Temporary Construction Mobilization and Laydown Area |
| ● Good Caliche | ▨ SCE Switchyard |
| ▲ Good Soil | ▨ SCE Switchyard Laydown Area |
| ■ Good - Unknown Type | ▨ Temporary SCE Transmission Line |
| ▭ Current Cohort | ▨ SCE Telecom |
| ▭ Translocation Area | ▭ Silver State North |
| ▭ Solar Field and Ancillary Facilities | |

SILVER STATE SOLAR SOUTH

Figure 7

Sample Disposition Plan-
Roach Lake Corridor with
Silver State Solar South Project

Clearance surveys will be conducted after tortoise exclusion fencing is fully installed subsections of the Project. Surveys will be conducted in accordance with this plan, the Project's Biological Opinion, and the *Desert Tortoise Field Manual* (Service 2009). The following conditions will apply:

1. Clearance surveys will be conducted using belt transects at a maximum of 5 meter spacing, using tighter spacing if vegetation becomes denser or substrates extremely rocky (Service 2009). Clearance surveys will continue in each subsection until at least two consecutive perpendicular passes are completed without a desert tortoise or new active sign (additional individuals or juveniles, active burrows, recent scat, tracks or mating rings) being found, at which time construction may commence in that unit.
2. All desert tortoise scat will be collected and tracks or mating rings brushed out during each pass of the clearance surveys to facilitate locating desert tortoises that may have been missed on previous passes.
3. Clearance surveys will be scheduled to occur in the best temperature window hours to the extent feasible to maximize the likelihood of finding active juveniles.
4. When an additional individual is found during clearance surveys, biologists authorized for these activities under the Project's Biological Opinion (BO) will assign and apply a unique number and transmitter (>180mm individuals) to the tortoise and complete a detailed health assessment of the animal using current Service guidance.
5. Additional individuals found during clearance will be left *in situ* until a Disposition Plan is approved (Section 4.4) for their translocation.
6. All tortoise burrows within the cleared area will be completely and carefully excavated to ensure no additional adults, juveniles, or viable tortoise nests remain in the cleared area. If a viable nest is located procedures will follow those in the *Desert Tortoise Field Manual* (Service 2009).

4.4 Disposition Plan and Translocation of Additional Individuals

Although juveniles could be released to the Corridor site when found, additional adult individuals would remain *in situ* until their health results were received and a disposition plan approved. Any tortoise showing severe injury or severe clinical signs of disease at the time of translocation would instead be transported to an agency-approved quarantine facility.

After clearance surveys determine the additional individuals who will be translocated, a Disposition Plan addressing each of them will be submitted to the Service. The Disposition Plan and translocation of the additional individuals will follow the steps identified in Section 4.2 for known individuals.

4.5 Clearance during Inactive Season and Linear Project Components

4.5.1 Clearance during Inactive Season

There are several areas of the site where numerous surveys have not identified active desert tortoise sign, including the laydown area, Southern California Edison switchyard, and the portion of the Project site closest to the railroad (see Figure 2). In these areas, attempts may be made to conduct clearance surveys in these areas outside of the active season for desert tortoise.

If clearance is conducted outside of active season, these areas would be considered cleared *only* if two passes of transects (see Section 4.3) find no active desert tortoise sign (individuals, active burrows, recent scat, tracks or mating rings). If one portion of the area does support active desert tortoise sign, a temporary fence may be erected and another attempt at clearance made within the area that did not previously support active sign. If two such passes can be completed without finding any active sign, these areas could be released to construction during the inactive season.

4.5.2 Linear Project Components

This section applies to all linear components of the Project (e.g., access road, gen-tie line, water lines, and fence installation). Construction of linear components of the Project may occur at any time of the year (Service 2010). Any desert tortoises found during clearance of linear components will be moved out of harm's way following clearance and handling procedures outlined in the current *Desert Tortoise Field Manual* (Service 2009). Biological monitors will be on-site during all construction activities to ensure that tortoises and tortoise burrows along linear project components will be avoided. If a desert tortoise is found on linear project components, it 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. 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, ADAPTIVE MANAGEMENT, AND REPORTING

All activities related to monitoring will be conducted by Authorized Biologists as approved under the Project's BO 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 Monitoring

All transmitters translocated and previously-transmitted resident individuals related to the Project would be monitored for a minimum period of one year after the initial translocation date. The effectiveness monitoring program to be conducted by USGS may use some of the same individuals and would be performed for a duration specified under that study plan.

Transmitters will be changed as necessary throughout the monitoring period as necessary to maintain battery life. All tortoises will be evaluated prior to discontinuing telemetry; individual tortoises may remain in the monitoring program on a case-by-case basis to ensure their wellbeing (i.e. tortoises consistently found on a fence line, not digging their own burrows, or showing a low body condition score). Such individuals would remain transmitters and continue to be monitored for an additional year post-translocation. At the end of the monitoring period, coordination with BLM, USGS the Service, and NDOW will determine whether transmitters would be removed or the responsibility for the monitoring transferred to another agency.

Translocated tortoises will be monitored as follows:

- ♦ Once within 24 hours of release,
- ♦ Once daily for three weeks after release,
- ♦ Two to three times per week during active season (as defined by site-specific movement data),
- ♦ Twice per week during the less active summer season and once per week during winter inactive season,
- ♦ Individual translocated tortoises that display behaviors that otherwise endanger their wellbeing will be monitored more frequently and actions will be taken by Approved Biologists to aid survival of the individual tortoise.

Monitoring would be conducted as follows for those resident tortoises previously transmitted:

- ♦ A minimum of once per week during the active season for the first year post-translocation of tortoises into the recipient area
- ♦ A minimum of once per month during summer and winter inactive periods as defined by site-specific movement data.

Health assessments will be conducted for all transmitted individuals annually until the end of the monitoring period. Any health problems or mortalities observed will be reported to Service according to

the requirements in the Project BO. Fresh carcasses will be brought for necropsy as directed by the Service. Animals showing severe clinical signs of disease at any time will be removed to a facility as designated by the Service.

5.2 Adaptive Management

In addition to the specific project measures described herein, the Applicants are committed to an adaptive management approach that supports flexible decision making that can be adjusted based on factual findings and scientific data. Any adaptive management actions will be proposed by the Project's Authorized Biologist and/or 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 the BLM and Service. 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.

5.3 Reporting

Documentation of all activities will be compiled and data synthesized throughout the duration of translocation and monitoring. Findings, data, and recommendations will be submitted to Service and appropriate wildlife and/or permitting agencies as required in the Project's BO and Final Environmental Impact Statement. Minimum data requirements will conform to the current translocation health assessment guidance and (Service 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.

Following the completion of the monitoring period, a final report will be completed that will assess the overall success of the translocation and monitoring program. The final report will summarize all long-term monitoring activities, post-construction monitoring and will discuss any observed differences in individual behaviors; overall tracking of health assessments for each individual; and any adaptive management employed throughout the long-term monitoring period and an assessment of the success of each adaptive management strategy.

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