

**Focused Survey for Agassiz's Desert Tortoise,  
Habitat Assessments for Burrowing Owl and Mohave Ground Squirrel, and  
General Biological Resource Assessment for  
El Mirage Flight Operations Facility Expansion, a  
160-acre± Site plus Access Road (APNs 0457-041-02 & -04), in  
San Bernardino County, California**

(U.S. Geological Survey 7.5' Shadow Mountains and Shadow Mountains SE quadrangles,  
Township 6 North, Range 7 West, a portion of the West ½ of Section 11, S.B.B.&M.)

**Job#:** 16-017

**Prepared by:**

Circle Mountain Biological Consultants, Inc.  
P.O. Box 3197  
Wrightwood, California 92397  
PH: (760) 249-4948  
FAX: (760) 249-4948  
Website: [www.circlemountainbiological.com](http://www.circlemountainbiological.com)  
Emails: [ed.larue@verizon.net](mailto:ed.larue@verizon.net)  
[sharon\\_dougherty@circlemountainbiological.com](mailto:sharon_dougherty@circlemountainbiological.com)  
Contacts: Ed LaRue, Sharon Dougherty

**Prepared for:**

General Atomics Aeronautical Systems, Inc.  
25500 East Avenue R8  
Palmdale, California 93591  
PH: (760) 388-8102  
FAX: (661) 233-6001  
Email: [richard.mcrae@ga-asi.com](mailto:richard.mcrae@ga-asi.com)  
Contact: Dick McRae

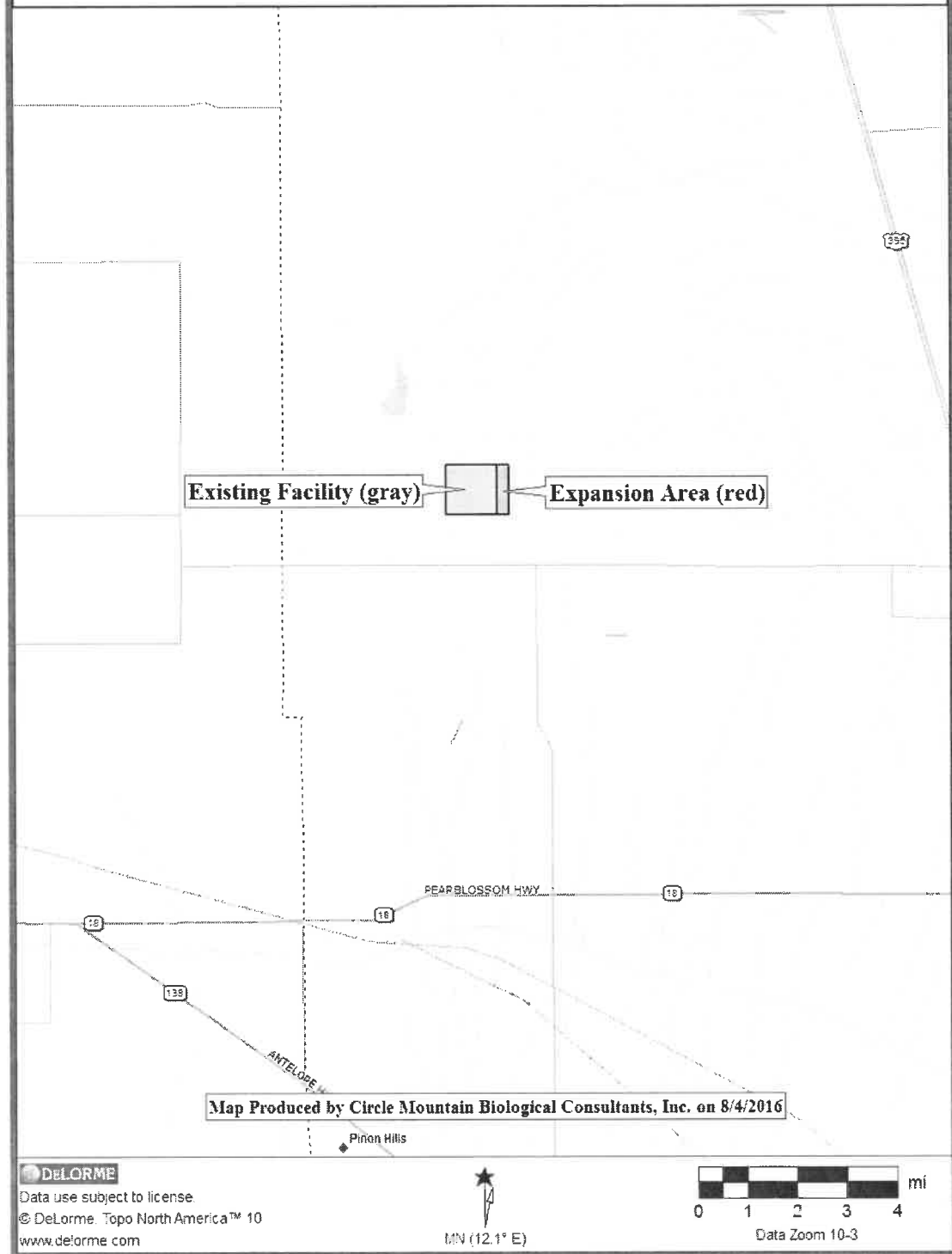
I hereby certify that the statements furnished herein, including attached exhibits, present the data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief. Field work conducted for this assessment was performed by me or under my direct supervision. I certify that I have not signed a nondisclosure or consultant confidentiality agreement with the project applicant or applicant's representative and that I have no financial interest in the project.



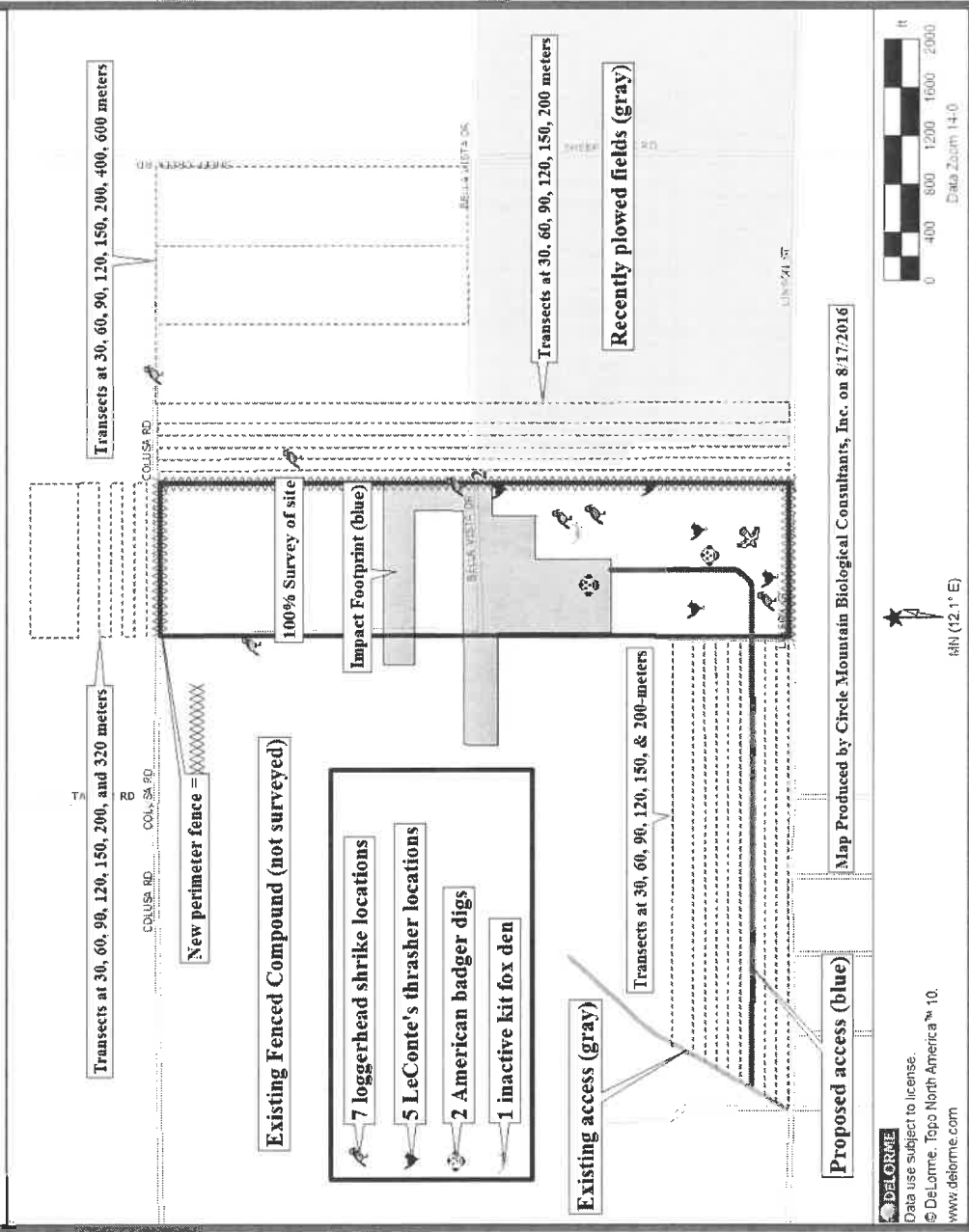
Circle Mountain Biological Consultants, Inc.  
Author and Field Investigator: Edward L. LaRue, Jr.

August 2016

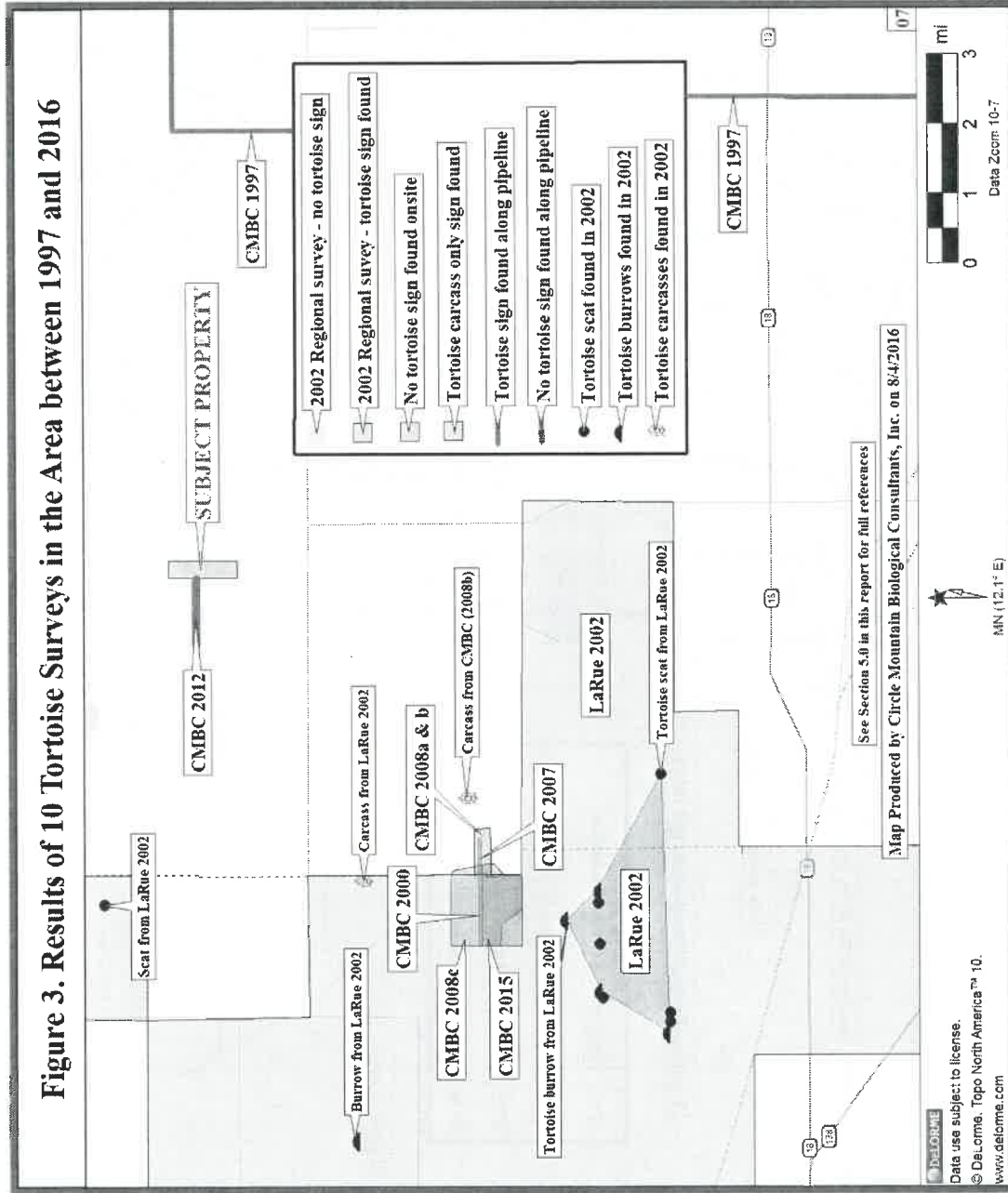
**Figure 1. El Mirage Flight Operations Facility: Vicinity Map**



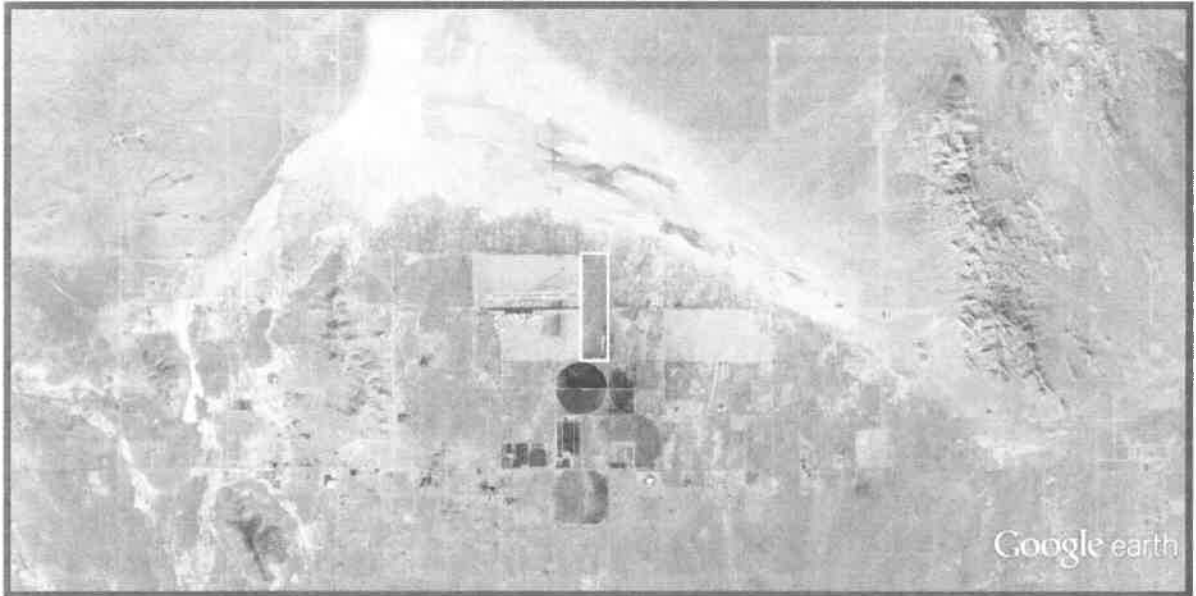
**Figure 2. El Mirage Flight Operations Facility: Transect and Special Status Species Locations**



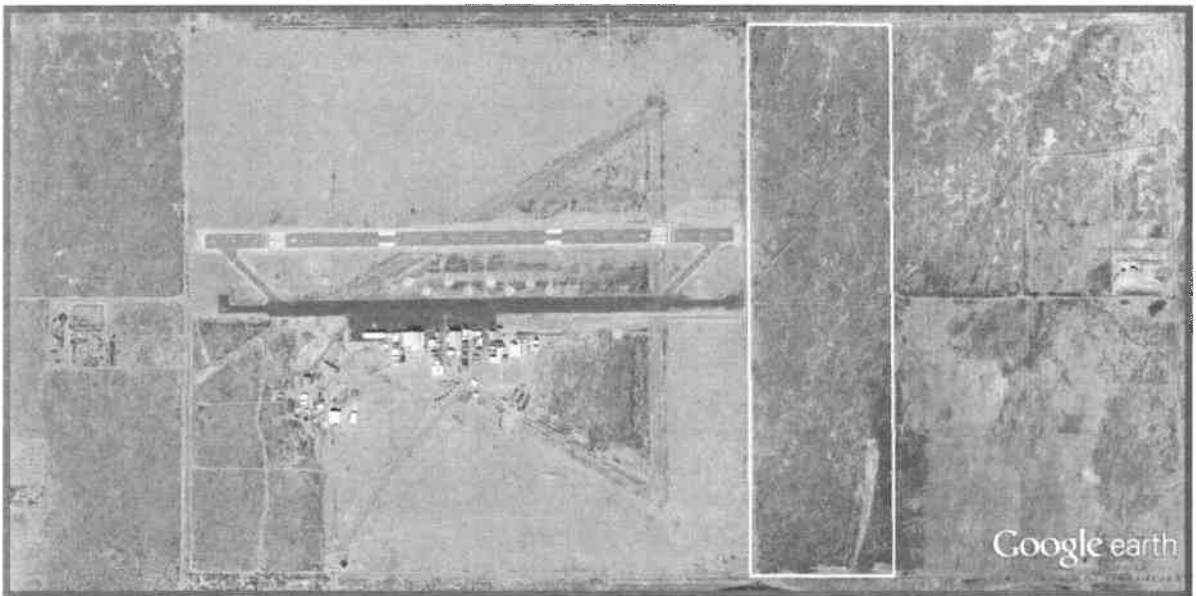
**Figure 3. Results of 10 Tortoise Surveys in the Area between 1997 and 2016**



**Figure 4. El Mirage Flight Operations Facility Expansion Area:  
Aerial Photograph (©2016 Google)**

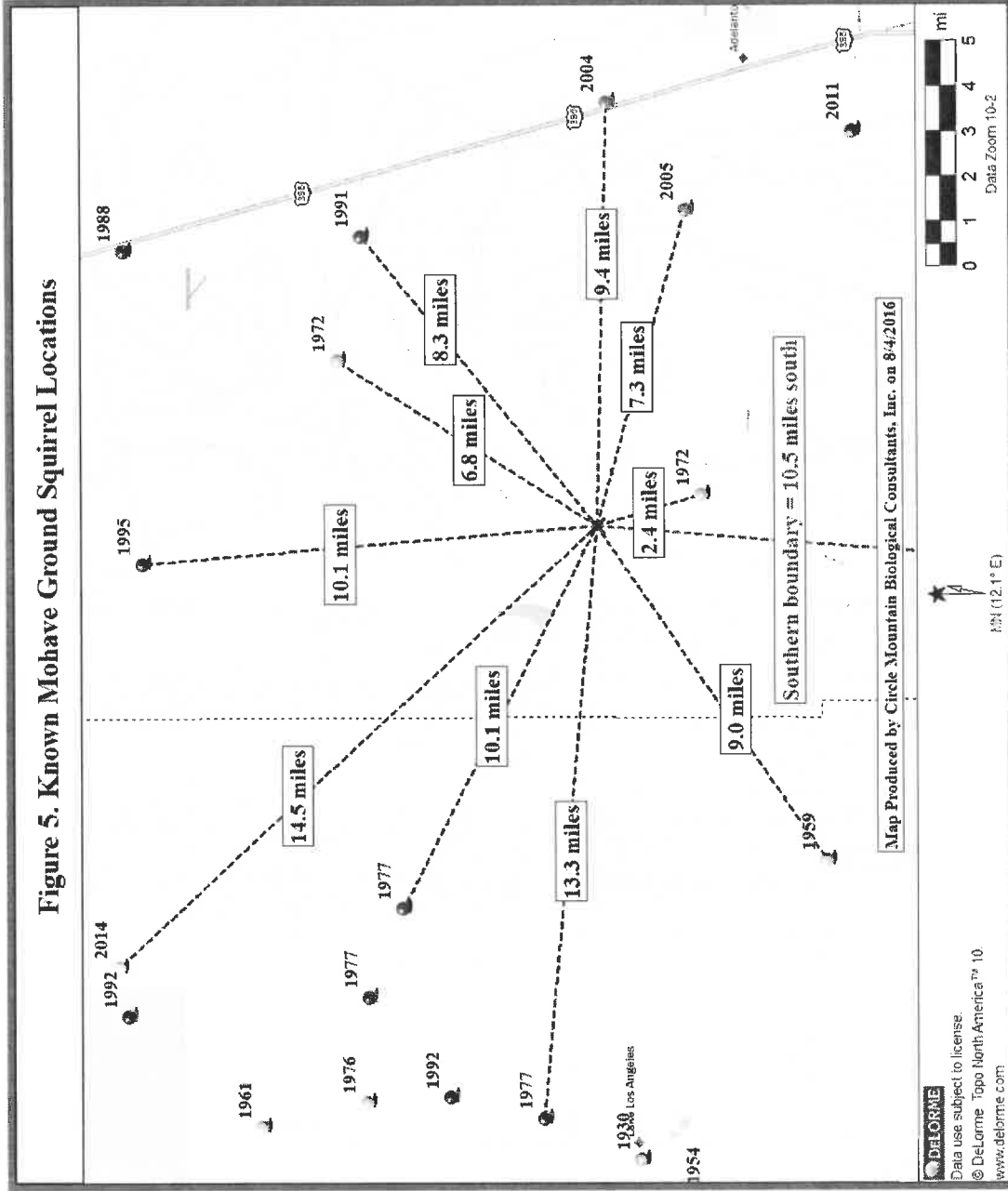


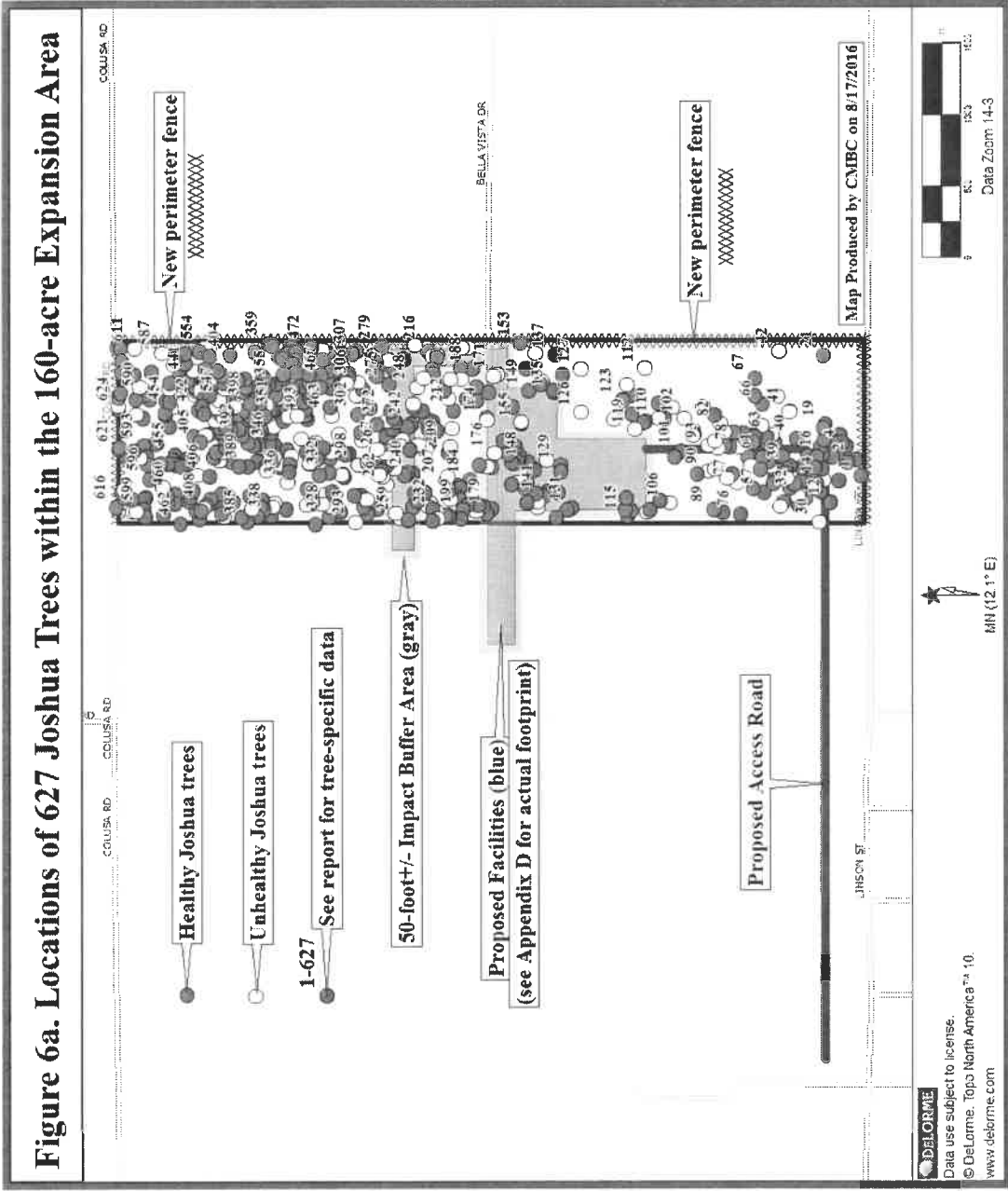
Regional aerial view from approximately 10 miles elevation (Image date 1/1/2015).



Enlarged aerial view from approximately 12,450 feet elevation (Image date 1/1/2015).

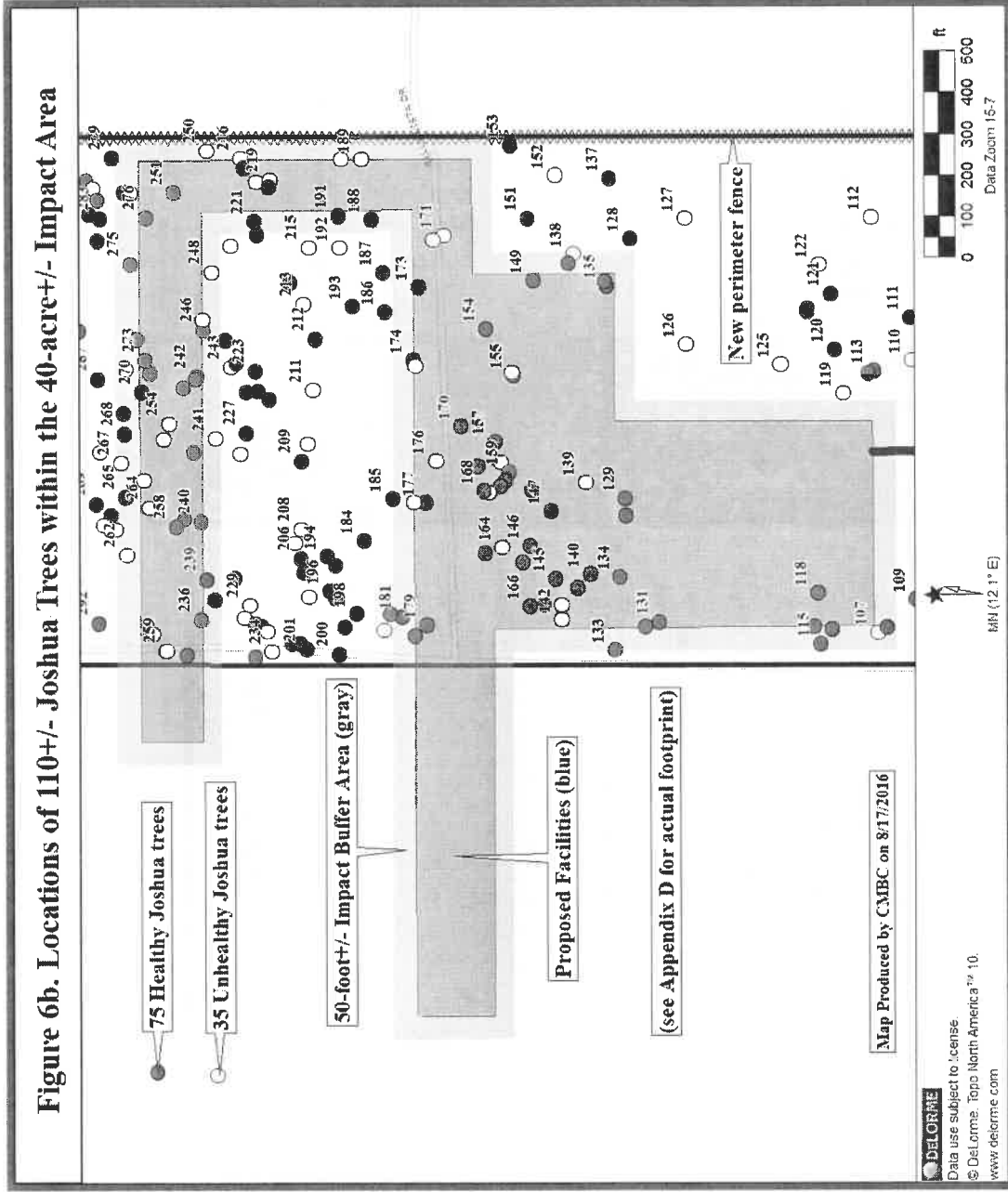
**Figure 5. Known Mohave Ground Squirrel Locations**





**Figure 6a. Locations of 627 Joshua Trees within the 160-acre Expansion Area**

**Figure 6b. Locations of 110+/- Joshua Trees within the 40-acre+/- Impact Area**





## Executive Summary

Circle Mountain Biological Consultants, Inc. was contacted by General Atomics Aeronautical Systems, Inc. to perform a focused survey for Agassiz's desert tortoise, habitat assessments for burrowing owl and Mohave ground squirrel, and a general biological resource assessment on a 160-acre± site located in San Bernardino County, California. APNs 0457-041-02 & -04 comprise a 160-acre± site located one mile north of El Mirage Road, with Linson Street along the south boundary and Colusa Road along the north boundary; the site is accessed from the south by El Mirage Airport Road.

For a total of 64 hours, on 1, 2, and 3 August 2016, Ed LaRue and Sharon Dougherty of CMBC and subcontractor, Patricia Seamount, surveyed the site and adjacent areas as described herein. Within the 160-acre expansion area, this entailed a survey of 160 transects, spaced at 10-meter intervals and oriented in an east-west direction. As depicted in Figure 2, zone of influence transects were surveyed for detection of tortoise sign and burrowing owls at 30-meter intervals for both proposed facilities and the access road.

Based on DeLorme Topo USA® 10.0 software, elevations on the subject property range from approximately 875 meters (2,870 feet) at the south boundary down to 867 meters (2,845 feet) along the northern boundary. Terrain is relatively flat. Soils are comprised of loose, sandy loam that is somewhat sandier along the western boundary. No USGS-designated blue-line streams occur onsite. The 38 plant species identified during the survey, including 33 onsite and 5 in adjacent areas, are listed in Appendix A. Given the proximity of the expansion area to El Mirage Lake, it is vegetated by saltbush scrub with an overstory of Joshua trees. The 10 reptile, 20 bird, and 10 mammal species identified during the survey are listed in Appendix B.

Based on the absence of tortoise sign onsite and in adjacent areas, and available information reviewed for this habitat assessment, CMBC concludes that tortoises are absent from the subject property and adjacent areas surveyed during these studies. As such, no impacts are anticipated and no mitigation measures are recommended.

Based on the field survey and habitat assessment, CMBC concludes that none of the following special status species reported from the region will be adversely affected by site development: Burrowing owl, prairie falcon, or American badger. As such, no adverse impacts have been identified and no mitigation measures are recommended.

Those species either identified during the current survey or for which suitable habitats are present include LeConte's thrasher, loggerhead shrike, and Mohave ground squirrel. There is suitable nesting and foraging habitat for both of these special status bird species. Given the information discussed herein, CMBC concludes there is some potential for Mohave ground squirrel to occur in eastern expansion areas but not in western barren areas associated with the new access road. At the time of this writing, the Proponent intends to complete a protocol trapping survey within eastern expansion impact areas in the 2017 trapping season.

Based on field studies and the project footprint, we estimate that about 125 Joshua trees may be impacted by the 40-acre± proposed expansion area (e.g., 28-acre impact area plus 12-acre buffer area within 50 feet of facilities). This includes 110 trees associated with facilities and 15 along the access road. So, 20 percent± of the Joshua trees (125 of 627 trees) may be affected by the proposed project. The Proponent has experience salvaging and transplanting Joshua trees with previous expansion projects at the nearby Gray Butte facility, and intends to implement those same salvage and transplantation techniques for the El Mirage expansion.

If it is necessary to commence project construction between March 15 and September 15, a qualified biologist should survey all shrubs and structures within the project site for nesting birds, prior to project activities (including construction and/or site preparation). The two special status bird species known to occur within eastern expansion areas, including LeConte's thrasher and loggerhead shrike, will predictably benefit from these measures.

## Table of Contents

Figure 1. El Mirage Flight Operations Facility: Vicinity Map.....	i
Figure 2. Site Map with Transect and Special Status Species Locations.....	ii
Figure 3. Results of 10 Tortoise Surveys in the Area between 1997 and 2016 .....	iii
Figure 4. Aerial Photograph with Transect Locations ( <sup>©2016</sup> Google™ Earth).....	iv
Figure 5. Known Mohave Ground Squirrel Locations.....	v
Figure 6a. Locations of 627 Joshua Trees within the 160-acre Expansion Area.....	vi
Figure 6b. Locations of 110± Joshua Trees within the 40-acre± Impact Area.....	vii
Executive Summary.....	viii
1.0. Introduction.....	1
1.1. Purpose and Need for Study .....	1
1.2. Project Description.....	1
2.0. Methods.....	2
2.1. Literature Review.....	2
2.2. Field Survey.....	2
3.0. Results.....	5
3.1. Common Biological Resources.....	5
3.1.1. Common Flora .....	5
3.1.2. Common Fauna.....	6
3.2. Uncommon Biological Resources.....	6
3.2.1. Desert Tortoise.....	6
3.2.2. Other Special Status Species.....	8
3.3. Other Protected Biological Resources .....	12
4.0. Conclusions and Recommendations .....	13
4.1. Impacts to Agassiz’s Desert Tortoise and Proposed Mitigation.....	13
4.2. Impacts to Other Biological Resources and Proposed Mitigation .....	15
5.0. Literature References .....	16
Appendix A. Plant Species Detected .....	20
Appendix B. Animal Species Detected.....	22
Appendix C. Photographic Exhibits (see Figure 7 for exhibit locations).....	
Appendix D. Project Map and Proposed Project Narrative Description .....	
Appendix E. Data for 627 Joshua Trees found within the 160-acre Project Area.....	

**Focused Survey for Agassiz's Desert Tortoise,  
Habitat Assessments for Burrowing Owl and Mohave Ground Squirrel, and  
General Biological Resource Assessment for  
El Mirage Flight Operations Facility Expansion, a  
160-acre± Site plus Access Road (APNs 0457-041-02 & -04), in  
San Bernardino County, California**

**1.0. Introduction**

1.1. Purpose and Need for Study. Circle Mountain Biological Consultants, Inc. (CMBC) was contacted by Mr. Dick McRae on behalf of General Atomics Aeronautical Systems, Inc. (Proponent) to perform a focused survey for Agassiz's desert tortoise (*Gopherus agassizii*), habitat assessments for burrowing owl (*Athene cunicularia*) and Mohave ground squirrel (*Xerospermophilus mohavensis*), and a general biological resource assessment on a 160-acre± site located in San Bernardino County, California (see Figures 1 and 2). Given the location of the site in an unincorporated portion of the county, this report has been prepared according to County of San Bernardino's *Report Protocol for Biological Assessment Reports* (County of San Bernardino 2006).

As the California Environmental Quality Act (CEQA) Lead Agency, the County of San Bernardino, Public and Support Services Group, Land Use Services Department, Advance Planning Division (County) is required to complete an initial study to determine if site development will result in any adverse impacts to rare biological resources. The information may also be useful to federal and State regulatory agencies, including U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW), respectively, if the Lead Agency asks them to assess impacts associated with proposed development.

Results of CMBC's focused tortoise survey, burrowing owl and Mohave ground squirrel habitat assessments, and general biological resource assessment are intended to provide sufficient baseline information to these agencies to determine if impacts will occur and to identify mitigation measures, if any, to offset those impacts.

1.2. Project Description. APNs 0457-041-02 & -04 comprise a 160-acre± site located one mile north of El Mirage Road, with Linson Street along the south boundary and Colusa Road along the north boundary; the site is accessed from the south by El Mirage Airport Road (see Figures 1 and 2). Figure 4 shows that the existing facility and proposed expansion both occur south of El Mirage (dry) Lake. The two 80-acre parcels recently acquired by the Proponent will be used to expand existing operations, which are situated immediately west of the subject property within a square-mile section of land.

A detailed project description and graphic showing proposed facilities locations were provided by Mr. McRae and are included in Appendix D of this report. The legal description for the subject property is Township 6 North, Range 7 West, the West ½ of Section 11, S.B.B.&M.

## 2.0. Methods

2.1. Literature Review. CMBC consulted materials included in our library to determine the nearest tortoise locations and other special status plant and animal species that have been reported from the vicinity of the subject property. Of particular relevance given their proximity to the subject property are eight site-specific focused tortoise surveys and one regional survey (LaRue 2002) located from immediately east of the proposed expansion area (CMBC 2012) to between 6 and 13 miles east and southeast (CMBC 1997). These surveys were performed between 1997 (CMBC 1997) and 2015 (CMBC 2015), and, along with the subject property, are mapped in Figure 3. These and other materials used in the completion of this report are listed in Section 5.0, below.

### 2.2. Field Survey.

2.2.1. *Survey and Habitat Assessment Protocols.* For **Agassiz's desert tortoise**, CMBC generally followed the survey protocol first identified by the USFWS (1992) and recently revised (USFWS 2010) for their detection. USFWS (2010) protocol recommends that transects be surveyed at 30-foot (10-meter) intervals throughout all portions of a given parcel. If neither tortoises nor sign are encountered during *action area* surveys and the project, or any portion of project, is  $\leq 0.8 \text{ km}^2$  (200 acres) or linear, three additional 30-foot (9 meters) belt transects at 655-foot (200 meters), 1,310-foot (400 meters), and 1,970-foot (600 meters) intervals parallel to and/or encircling the project perimeter should be surveyed.

The *action area* is defined by regulation as all areas to be affected directly or indirectly and not merely the immediate area involved in the action (50 CFR §402.02). For this site, the action area is considered to be the 160-acre parcel because this larger parcel will effectively contain all proposed facilities and a 50-foot buffer area, which combined are estimated to occupy 40 acres $\pm$ . Indirect impacts to areas outside the 160-acre subject property will effectively be contained within the perimeter fence that will be installed as part of facilities construction.

Like the USFWS 1992 and 2009 protocols that recommended seasonal restrictions for completing tortoise surveys, the USFWS 2010 protocol recommends that tortoise surveys should occur in the April-to-May and September-to-October time frames, with a few exceptions. Given this seasonal restriction, Ed LaRue of CMBC contacted agency biologists, Mr. Ray Bransfield of the USFWS and Mr. Ali Aghili of CDFW, for permission to conduct the surveys in August rather than wait until the September-October time frame. Written concurrence was granted to CMBC from both Mr. Bransfield and Mr. Ali in an email dated 28 July 2016, which is available upon request.

For **burrowing owl**, the CDFG (2012) [currently "CDFW"] survey protocol recommends transects be surveyed at 30-meter intervals throughout a given site, with five additional transects surveyed at 30-meter intervals out to 150 meters in adjacent areas in potential habitat (i.e., excluding areas substantially developed for commercial, residential, and/or industrial purposes). With its narrower transect intervals, the tortoise survey is sufficient to cover the site for burrowing owl. The focus of the survey is to find and inspect all

burrows sufficiently large to be used by burrowing owls. UTM coordinates would have been collected for all such burrows had any been found. Importantly, this methodology is considered a formal *habitat assessment* for presence of burrowing owls, which can be conducted any time of the year. Had burrowing owl sign been found, which it was not, it would have then been necessary to perform breeding burrowing owl surveys during the spring and summer as outlined in CDFG (2012).

For **Mohave ground squirrel**, some jurisdictions have recently required that habitat assessments be performed by individuals certified by CDFW for trapping the species. Ed LaRue who performed and supervised the fieldwork and drafted this assessment possesses a Mohave ground squirrel Memorandum of Understanding with CDFW, dated 11 April 2012 as an attachment to scientific collecting permit (SC-001544), which expired on 30 April 2016 [a provisional extension was granted by CDFW's Environmental Scientist, Scientific Collecting Permit Coordinator, Justin Garcia in an email to LaRue on 9 December 2015, which is available upon request]. The primary assessment herein asks the following questions: (1) Is the site within the range of the species? (2) Is there native habitat with a relatively diverse shrub component? And, (3) is the site surrounded by development and therefore isolated from potentially occupied habitat?

*2.2.2. Field Survey Methods.* For a total of 64 hours, on 1, 2, and 3 August 2016, Ed LaRue and Sharon Dougherty of CMBC and subcontractor, Patricia Seamount, surveyed the site and adjacent areas as described herein. Within the 160-acre expansion area, this entailed a survey of 160 transects, spaced at 10-meter intervals and oriented in an east-west direction. As depicted in Figure 2, zone of influence transects were surveyed for detection of tortoise sign and burrowing owls at 30-meter intervals out to 150 meters, plus 200 and 320 meters to the north, and 200, 400, and 600 meters to the east. Additional transects (i.e., 400 and 600 meters) were not surveyed to the north due to barren surfaces of El Mirage lakebed. Peripheral transects were not surveyed to the south where active agriculture occurs.

As depicted in Figures 2 and in Appendix D, there is also a new access road that would run through the existing facility, connecting the existing paved access road with the new facilities in the expansion area. As shown in various figures and particularly Exhibits 11 and 12, the area through which this new road will be constructed is essentially barren, devoid of perennial shrubs. As such, transects to detect burrowing owl were surveyed in this area, including three transects at 10-meter intervals within the proposed road right-of-way, three 30-meter transects to the south, five 30-meter transects to the north, and one 200-meter transect to the north (see Figure 2 for locations of transects).

Given that this assessment is intended, in part, to determine habitat suitability for Mohave ground squirrel, each of the three surveyors also tallied the larger rodent burrows observed within 5 meters either side of the transect centerline along all transects, both within the expansion area and along the access road. Only active burrows larger than about two inches in diameter were tallied. Although Mohave ground squirrel burrows cannot be differentiated from other rodent burrows (e.g., kangaroo rat, antelope ground squirrel, etc.) (Leitner and LaRue 2014), the prevalence of burrows within the expansion area and along the access road are an indicator of habitat suitability for small, burrowing mammals.

Each surveyor recorded information relative to the Joshua trees along their respective transects for the entire 160-acre site (see Figures 6a and 6b). These data (see Appendix E) included tree height in feet, relative condition (healthy versus unhealthy), number of trunks, and Universal Transverse Mercator (UTM) coordinates (North American Datum – NAD 83) for each tree or clump of trees. The spatial data allows us to determine the trees that are likely to be impacted by development of the facilities (Figure 6b), and the health data gives the Proponent an idea of how many of the trees may be successfully transplanted or not.

As transects were surveyed, LaRue kept tallies of observable human disturbances encountered on each of his transects. The results of this method provide *encounter rates* for observable human disturbances. For example, two roads observed on each of 10 transects would yield a tally of 20 roads (i.e., two roads encountered 10 times). Habitat quality, adjacent land uses, and this disturbance information are discussed below in Section 3.2 relative to the potential occurrence of Agassiz’s desert tortoise and other special status species on and adjacent to the subject property.

Weather conditions at the beginning and ending of each survey day included temperatures [measured approximately 2.5 inches (5 centimeters) above the ground], percent cloud cover, and average wind speeds as measured by a hand-held Kestrel® weather and wind speed meter. These data are reported in the following table.

<b>Table 1. Weather Data for Three Survey Days</b>				
<b>Date (2016)</b>	<b>Time</b>	<b>Temp (°F)</b>	<b>% Cloud</b>	<b>Wind (mph)</b>
August 1	0630	72	0	1 ↑ 2 SE
August 1	1700	102	0	8 ↑ 15 W
August 2	0630	70	0	2 ↑ 3 E
August 2	1730	104	5	7 ↑ 9 SW
August 3	0900	90	2	4 ↑ 7 W
August 3	1130	100	5	6 ↑ 8
<b>3 days</b>	<b>0630 ↑ 1730</b>	<b>70 ↑ 104°F</b>	<b>0 ↑ 5%</b>	<b>1 ↑ 15 variable</b>

All plant and animal species identified during the surveys were recorded in field notes and are listed in Appendices A and B, respectively. A Garmin® hand-held, global positioning system (GPS) unit was used to survey straight transects and record Universal Transverse Mercator (UTM) coordinates (North American Datum – NAD 83) for property boundaries, rare species locations, Joshua tree locations, and other pertinent information. A digital camera was used to take representative photographs (Appendix C), with locations and directions of exhibits shown in Figure 7. ©2016 Google™ Earth was accessed via the internet to provide recent aerial photographs of the subject property and surrounding areas (Figure 4).

### 3.0. Results

3.1. Common Biological Resources. The common plant and animal species identified during the survey are influenced by multiple factors such as elevation, topography, soil substrates, and adjacent land uses. Based on DeLorme Topo USA® 10.0 software, elevations on the subject property range from approximately 875 meters (2,870 feet) at the south boundary down to 867 meters (2,845 feet) along the northern boundary. Terrain is relatively flat. Soils within the expansion area are comprised of loose, sandy loam that is somewhat sandier along the western boundary; those along the proposed access road are somewhat more compacted. No USGS-designated blueline streams occur in either area.

3.1.1. *Common Flora.* The 38 plant species identified during the survey, including 33 onsite and 5 in adjacent areas, are listed in Appendix A. Given the proximity of the expansion area to El Mirage Lake, it is vegetated by saltbush scrub with an overstory of Joshua trees (*Yucca brevifolia*). The dominant perennial species throughout the expansion area are spiny saltbush (*Atriplex confertifolia*), allscale (*Atriplex polycarpa*), four-winged saltbush (*Atriplex canescens*), Nevada joint-fir (*Ephedra nevadensis*), and Joshua tree. The shrubs are relatively dense to the south with allscale and four-winged saltbush more common, becoming sparser to the north, where spiny saltbush is dominant.

Somewhat less abundant perennial plants include Torrey's sea-blight (*Suaeda moquinii*), rubber rabbitbrush (*Chrysothamnus nauseosus*), cottonthorn (*Tetradymia glabrata*), peach thorn (*Lycium cooperi*), Anderson's boxthorn (*Lycium andersonii*), desert goldenhead (*Acamptopappus sphaerocephalus*), budsage (*Artemisia spinescens*), bush peppergrass (*Lepidium fremontii*), winter fat (*Krascheninnikovia lanata*), and several dead silver chollas (*Cylindropuntia echinocarpa*).

Native annual species that were identified include chinch weed (*Pectis papposa*), forget-me-knot (*Cryptantha micrantha*), Mohave silver-scale (*Atriplex argentea*), woolly star (*Eriastrum* sp.), sunbonnets (*Loeseliastrum* c.f. *matthewsii*), rigid spineflower (*Chorizanthe rigida*), and spotted buckwheat (*Eriogonum maculatum*). Given a bladed area near the southeast corner, several older roads that are no longer used by vehicles (see bottom half of Figure 4), and adjacent agricultural fields to the east and south, there are a number of native and non-native weed species prevalent in these areas. These species include white tumbleweed (*Amaranthus albus*), bassia (*Bassia hyssopifolia*), Russian thistle (*Salsola tragus*), red-stemmed filaree (*Erodium cicutarium*), red brome (*Bromus madritensis* ssp. *rubens*), split-grass (*Schismus* sp.), and five species of non-native mustards (*Descurainia pinnata*, *Descurainia sophia*, *Hirschfeldia incana*, *Sisymbrium altissimum*, and *Sisymbrium irio*).

Unlike the expansion area described above, the proposed access road would occur in areas that have been substantially altered by previous agricultural uses. There are a few allscale and four-winged saltbush shrubs near the west end of the access road, otherwise the entire area is barren except for non-native weed species. Russian thistle is, by far, the most common plant in the ruderal (= highly degraded) fields. Other common non-native plants or native weed species include red-stemmed filaree, split-grass, tansy mustard, London rocket, chinch weed, and annual bur-sage (*Ambrosia acanthicarpa*), which was not identified in saltbush areas.



3.1.2. *Common Fauna*. The 10 reptile, 20 bird, and 10 mammal species identified during the survey are listed in Appendix B. Lizards commonly observed during the surveys included side-blotched lizard (*Uta stansburiana*), western whiptail (*Cnemidophorus tigris*), and desert spiny lizards (*Sceloporus magister*), the latter of which were mostly observed in Joshua trees. Several species were only detected by diagnostic scat or tracks, including desert horned lizard (*Phrynosoma platyrhinos*), desert iguana (*Dipsosaurus dorsalis*), sidewinder (*Crotalus cerastes*), and Mojave rattlesnake (*Crotalus scutulatus*). Several species were only infrequently observed, including zebra-tailed lizards (*Callisaurus draconoides*) mostly to the north, long-nosed leopard lizard (*Gambelia wislizenii*), and red racer (*Masticophis flagellum piceus*).

The 20 bird species observed include those that were confirmed to nest onsite, including cactus wren (*Campylorhynchus brunneicapillus*), western kingbird (*Tyrannus verticalis*), great-horned owl (*Bubo virginianus*), common raven (*Corvus corax*); and those that likely nest onsite, including California quail (*Callipepla californica*), mourning dove (*Zenaida macroura*), common barn owl (*Tyto alba*), Say's phoebe (*Sayornis saya*), sage sparrow (*Amphispiza belli*), ladder-backed woodpecker (*Picoides scalaris*), northern mockingbird (*Mimus polyglottos*), and house finch (*Carpodacus mexicanus*).

Ten mammal species were mostly detected by diagnostic signs. Small burrowing mammals included antelope ground squirrel (*Ammodramus leucurus*), Botta pocket gopher (*Thomomys bottae*), kangaroo rat (*Dipodomys* sp.), and pocket mouse (*Perognathus* sp.) (a dead one was found). Medium-sized mammals included Audubon cottontail (*Sylvilagus audubonii*) and black-tailed hare (*Lepus californicus*). Common predators included coyote (*Canis latrans*), bobcat (*Lynx rufus*), and kit fox (*Vulpes macrotis*), for which several abandoned dens were observed.

### 3.2. Uncommon Biological Resources.

3.2.1. *Agassiz's Desert Tortoise*. A significant paper was published in June 2011 (Murphy et al. 2011) whereby the "desert tortoise" of the Mojave Desert was split into two species, including *G. agassizii*, referred to as "Agassiz's desert tortoise," and a newly described species, *G. morafkai*, referred to as "Morafka's desert tortoise," which occurs in the Sonoran Desert. According to Murphy et al. (2011), "...this action reduces the distribution of *G. agassizii* to only 30% of its former range. This reduction has important implications for the conservation and protection of *G. agassizii*, which may deserve a higher level of protection." Agassiz's desert tortoise is the threatened species that occurs in the region surrounding the subject property.

No tortoise sign was found either onsite or in adjacent areas during this focused, protocol survey for the species (U.S. Fish and Wildlife Service 1992, 2010). Based on the absence of tortoise sign on the subject property, in adjacent areas, and reported from the region (see Figure 3), CMBC concludes that the Agassiz's desert tortoise is absent from the subject property and adjacent survey areas. There are no suitable habitats to the west inside the fenced compound, to the south where active agricultural fields have eliminated suitable habitats, or east of the southern half of the site, which is comprised on barren agricultural lands. Given the small amounts of native habitat between the site and El Mirage Lake to the north and undeveloped lands east of the north half of the site, the expansion area is mostly isolated from potentially occupied habitats, with limited immigration potential.

Encounter rates for observable human disturbances included (in descending order of prevalence) 12 off-highway vehicle tracks, 18 newer dump sites, 20 older dump sites, 22 perforated targets, 22 skeet shooting targets, 27 spent rifle cartridges, 38 domestic dog signs, 95 older bladed roads, and 303 spent shotgun shells. Although there is potential to hunt game such as mourning doves, California quail, and cottontails there is also extensive evidence of target shooting that has historically occurred throughout the site. Rusty cans and miscellaneous metal objects common in older dump sites (Exhibit 3) show evidence of being used as both shotgun and rifle targets.

Vehicle use is relatively uncommon; most of the vehicle tracks occur along the southern boundary of the site; most of the older dirt roads are overgrown and are not currently used by vehicles. Some of the dump sites are associated with the southern agricultural area, which supports a dairy farm located farther south. There are both old cow dung dumps and bleached bones of miscellaneous farm animals that have been dumped, particularly on southern portions of the site.

Given these observations, although expansion area-portions of the site are relatively isolated from occupied habitats as described above, they are not so disturbed as to be considered unsuitable for tortoises. Even so, no tortoise sign was found, and tortoises are presumed to be absent from the expansion area. All areas inside the existing fenced compound have been bladed and no longer support any suitable habitat for desert tortoises.

As depicted in Figure 3, CMBC personnel have surveyed eight sites and one larger region within approximately 13 miles of the subject property. No tortoise sign was found on seven of the nine sites, including the runway located immediately west (CMBC 2012) and the six surveys at nearby Gray Butte (CMBC 2000, 2007, 2008a, 2008b, 2008c, and 2015). While working for the Bureau of Land Management (BLM) in 2002, LaRue instigated a regional tortoise survey to the east and south, which is shown as gray in Figure 3. The nearest tortoise sign in this area included a tortoise carcass 4.7 miles southwest, a tortoise scat approximately 5.0 miles west, and a burrow 8.3 miles southwest (Figure 3). In 2008, CMBC (2008b) found the carcass of an adult tortoise that died sometime in 2007 approximately 4.5 miles south of the expansion area. Ray Bransfield provided the results of the High Desert Corridor, which was surveyed in 2011. The nearest positive evidence of tortoise included a scat 3.1 miles to the southeast and a burrow 4.9 miles to the southwest.

The County (2004) requires that habitat categories designated by the U.S. Bureau of Land Management (1989) be identified in all Agassiz's desert tortoise technical reports. Although habitat categories apply only to public lands administered by the BLM, regulatory agencies typically determine habitat compensation ratios based on the nearest BLM habitat categories (U.S. Bureau of Land Management 2005, 2006). With the formulation of the West Mojave Plan (U.S. Bureau of Land Management 2005) and its formal adoption through a Record of Decision (U.S. Bureau of Land Management 2006), all lands that are outside Desert Wildlife Management Areas, including the subject property, are characterized as Category 3 Habitat, which is the lowest priority management area for viable populations of the Agassiz's desert tortoise.

The site is not found within Agassiz's desert tortoise critical habitat, which was designated in 1994 (U.S. Fish and Wildlife Service 1994a) nor is it within a Desert Wildlife Management Area as recommended in the Desert Tortoise (Mojave Population) Recovery Plan (U.S. Fish and Wildlife Service 1994b) and formally adopted in March 2006 as a result of the West Mojave Plan Record of Decision (U.S. Bureau of Land Management 2006). The nearest such areas are the Fremont-Kramer Critical Habitat Unit and Desert Wildlife Management Area, which are located approximately 6.0 miles east of the site.

3.2.2. *Other Special Status Species.* U.S. Fish and Wildlife Service (2008), California Department of Fish and Wildlife (CDFW 2016a, 2016b, 2016c), and California Native Plant Society (CNPS 2016) maintain lists of animals and/or plants considered rare, threatened, or endangered, which are collectively referred to as "special status species." Special status species identified on-site during the current survey included prairie falcon, LeConte's thrasher, loggerhead shrike, and American badger. Each of the bird species discussed below is considered a Bird of Conservation Concern by the USFWS (2008) and/or a Bird Species of Special Concern by the CDFW (2016a).

**Burrowing owl** is one of the focal species specifically sought during field studies. Diagnostic signs of this species include regurgitated pellets with small reptile and/or mammal bones, or those that are primarily composed of insect parts. There may also be distinctive feathers, zygodactyl (x-shaped) tracks, and whitewash, although fecal material deposited away from burrows may be from other bird species. Although pellets and feathers are sufficiently distinctive that they may be identified away from burrows, it is one or more of these signs at sufficiently large burrows that are the most definitive means of determining burrowing owl use of a given site.

In the case of the subject property, there was no evidence of burrowing owl. Burrowing owls do not create their own burrows; rather they find existing burrows, which they may slightly modify in order to occupy. Typical existing burrows used by burrowing owls include abandoned kit fox dens, both active and inactive tortoise burrows, deeper badger digs, and inactive California ground squirrel burrows. There were only several badger digs and abandoned kit fox dens and otherwise no suitably large burrows to accommodate burrowing owls.

The expansion area is too densely vegetated by saltbush scrub to be suitable for burrowing owls, which prefer relatively open areas, including fallow agricultural fields that provide enhanced visibility. Areas inside the existing compound are sufficiently barren to be suitable, but none of the 244 individual burrows and colonial burrow complexes (Exhibit 10) observed along the 11 transects associated with the proposed access road was large enough to accommodate burrowing owls. Similarly, no burrowing owl sign was found in 2012 when CMBC surveyed numerous transects in suitable habitats within the runway expansion area surveyed at that time. There are fallow agricultural fields east of the south half of the site but these are too recently disked to be suitable and maybe considered sterile, as they lack rodent burrows.

Burrowing owls have been observed or detected at the nearby Gray Butte facility, between 5.0 and 6.0 miles southwest of the subject property (CMBC 2007, 2008a, and 2008b). Given this information, CMBC concludes that burrowing owls are absent from the expansion area, adjacent areas to the north and east, and survey areas adjacent to the proposed access road within the existing fenced compound.

One **prairie falcon** (*Falco mexicanus*) was observed within the expansion area and have been observed during two of the six surveys performed at Gray Butte, some five miles to the southwest (CMBC 2008a, 2015). There are suitable foraging habitats throughout both the existing facility and expansion areas but no suitable nesting substrates on either site.

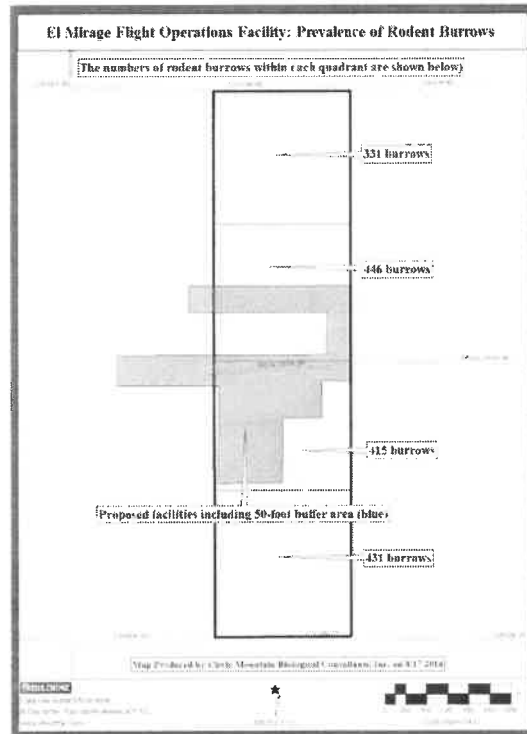
Given their mobility, it is not known how many **LeConte's thrashers** (*Toxostoma lecontei*) occurred within the expansion area during the present surveys; five specific locations were recorded and are depicted in Figure 2, including the observation of a pair near the east-central boundary. Four LeConte's thrashers were observed at the Gray Butte facility in 2015 (CMBC 2015). There are both suitable nesting and foraging habitats throughout the eastern expansion areas for LeConte's thrashers, but none along the access road right-of-way within the existing fenced compound.

Like LeConte's thrashers, **loggerhead shrike** (*Lanius ludovicianus*) is a similarly mobile species that was detected at seven different locations within the expansion area, as depicted in Figure 2. It is a relatively common species in the region, having been observed on six of the nine surveys depicted in Figure 3 (CMBC 2000, 2008a, 2008b, 2008c, 2015, and the subject property). Foraging habitats occur both in the vegetated expansion area and semi-barren existing facility, and Joshua trees are ideal nesting substrates for the species.

**American badger** (*Taxidea taxus*) is designated as a California Species of Special Concern by CDFW and does not have a federal designation. Two digs characteristic of badgers were found on the southern half of the expansion area, as depicted in Figure 2. This suggests that badgers are present but not particularly common onsite and in adjacent areas vegetated by saltbush scrub. They would not occur in barren areas where the new access road would be constructed.

**Mohave ground squirrel** is designated as a Threatened species by the California Fish and Game Commission and is not federally listed. In spite of two petitions, one in 1993 and another in 2005, to list the Mohave ground squirrel as a federally Endangered species, the USFWS ruled in both instances that listing was not warranted at those times. In recent years, the CDFW has considered three criteria in assessing potential impacts to the Mohave ground squirrel (Adrienne Disbrow, personal communication to CMBC in 2004): (1) Is the site within the range of the species? (2) Is there native habitat with a relatively diverse shrub component? (3) Is the site surrounded by development and therefore isolated from potentially occupied habitats?

As mentioned in the methods section, each of the surveyors tallied larger rodent burrows observed along their transects, which allows us to determine the prevalence of burrows throughout the site relative to impact areas. In the following figure, one can see that there are relatively more burrows on the southern three-quarters of the site with somewhat fewer burrows on the northern quarter. This may be due to differences in soil proximate to El Mirage Lake compared to farther away, although this is only speculation. In any case, the proposed facilities would definitely be in areas where rodent burrows are common.



The three surveyors also tallied rodent burrows observed along the 12 transects surveyed within and adjacent to the right-of-way of the proposed access road (in Figure 2 the red lines show transect locations adjacent to the blue line where the access road is proposed). A total of 80 burrows was found within the access road right-of-way, which Mr. McRae indicated would be approximately 24 feet wide with 10-foot wide shoulders on either side. A total of 164 burrows was found along the other nine transects surveyed in adjacent areas.

Although the average density of burrows in vegetated areas within the expansion area (calculated at 0.008 burrows per linear foot) is not significantly different from the average density of burrows in barren areas where the access road would be constructed (0.005 burrows per linear foot), the types of burrows are very different. Most of the burrows in the expansion area are individual holes likely belonging to antelope ground squirrels. Whereas, most of the burrows in barren areas along the access road are colonial, with multiple openings (Exhibit 10), likely belonging to kangaroo rats.

Figure 5 shows known locations of Mohave ground squirrels relative to the subject property (CDFW 2016a) and the suspected range of the species (Gustafson 1993; U.S. Bureau of Land Management 2005). The nearest reported occurrence was approximately 2.4 miles south where a squirrel was found in 1972. Other proximate occurrences have been 6.8 miles northeast (1972), 7.3 miles southeast (2005), and 8.3 miles northeast (1991), so the subject property is surrounded by historically-occupied habitats. When a line is drawn to connect the known occurrences to determine the approximate range of the species, the site is approximately 10.5 miles north of the extrapolated southern boundary (U.S. Bureau of Land Management 2005), or approximately 10.5 miles inside the suspected species range.

Even though Mohave ground squirrels have historically been found throughout the area, recent trapping studies show that they may be disappearing from the southern part of their range including the area surrounding the subject property. For example, no Mohave ground squirrels were captured along the entire length of the nearby High Desert Corridor (Don Mitchell, ECORP, personal communication to LaRue). Dr. Phil Leitner (2015) has shown that no Mohave ground squirrels have been captured during all but one (shown by the ■ symbol below) of the protocol trapping surveys performed in the region, as shown in the following diagram taken from his study (where ★ shows the approximate location of the proposed expansion):



Mohave ground squirrel has been reported between 1,800 feet (549 meters) and 5,600 feet (1,707 meters) elevation from a wide range of habitats including creosote bush scrub, saltbush scrub as occurs within the expansion area, Joshua tree woodland, juniper woodland, and Mohave mixed woody scrub (U.S. Bureau of Land Management 2005), so habitats within the expansion area are considered to be suitable. At 2,850-feet (869 meters) elevation, the site is well within the known elevational range of the species. There is a relatively moderate level of diversity of native perennial plants, with about 13 shrub species identified.

In the northern part of the range, winter fat and spiny hop-sage are ecologically important shrubs for Mohave ground squirrel (U.S. Bureau of Land Management 2005). The three surveyors tallied eight winter fat and no spiny hop-sage within the expansion area. Neither of these species is common enough to be considered a dominant perennial plant within the expansion area. In any case, the presence of these plants does NOT imply that the Mohave ground squirrel occurs. There are no data to suggest that these plants are important to the species in the south as they appear to be in the Coso Range, near the northern extent of the Mohave ground squirrel known range.

Finally, contiguous lands to the north and east of the north half of the expansion area are considered suitable habitat, whereas all areas within the existing facility to the west, south where there is active agriculture and farming, and east of the south half, which are bladed and lack rodent burrows, are not considered suitable. So, there is habitat connectivity to the northeast and northwest, between the subject property and El Mirage Lake (the lakebed is not habitat).

Given the above information, CMBC concludes that the Mohave ground squirrel could occur within the 160 acres comprising the eastern expansion areas but is absent from barren areas within the existing compound where the access road would be developed.

### 3.3. Other Protected Biological Resources.

At the County level, the San Bernardino County Development Code was revised and adopted on 12 April 2007. Chapter 88.01 Plant Protection and Management, Section 88.01.020 states, "The provisions of this Chapter apply to the removal and relocation of regulated trees or plants and to any encroachment (for example, grading) within the protected zone of a regulated tree or plant on all private land within the unincorporated areas of the County and on public lands owned by the County, unless otherwise specified..."

Section 88.01.060 Desert Native Plant Protection states, "This Section provides regulations for the removal or harvesting of specified desert native plants in order to preserve and protect the plants and to provide for the conservation and wise use of desert resources..."

Section 88.01.060(c) Regulated Desert Native Plants states, "The following desert native plants or any part of them, except the fruit, shall not be removed except under a Tree or Plant Removal Permit in compliance within Section 88.01.050 (Tree or Plant Removal Permits):

- (1) The following desert native plants with stems two inches or greater in diameter or six feet or greater in height:
  - (A) *Dalea spinosa* (smoke tree).
  - (B) All species of the genus *Prosopis* (mesquites).
- (2) All species of the family *Agavaceae* (century plants, nolinias, yuccas).
- (3) Creosote Rings, 10 feet or greater in diameter.
- (4) All Joshua trees.
- (5) Any part of the following species, whether living or dead:
  - (A) *Olneya tesota* (desert ironwood).
  - (B) All species of the genus *Prosopis* (mesquites).
  - (C) All species of the genus *Cercidium* (palo verdes)."

At the State level, the 1998 Food and Agricultural Code, Division 23: California Desert Native Plants, Chapter 3: Regulated Native Plants, Section 80073 states: The following native plants, or any parts thereof, may not be harvested except under a permit issued by the commissioner or the sheriff of the county in which the native plants are growing:

- (a) All species of the family Agavaceae (century plants, nolinias, yuccas).
- (b) All species of the family Cactaceae (cacti), except for the plants listed in subdivisions (b) and (c) of Section 80072 (i.e., saguaro and barrel cacti), which may be harvested under a permit obtained pursuant to that section.
- (c) All species of the family Fouquieriaceae (ocotillo, candlewood).
- (d) All species of the genus *Prosopis* (mesquites).
- (e) All species of the genus *Cercidium* (palo verdes).
- (f) *Senegalia (Acacia) greggii* (catclaw acacia).
- (g) *Atriplex hymenelytra* (desert holly).
- (h) *Dalea (Psoralea) spinosa* (smoke tree).
- (i) *Olneya tesota* (desert ironwood), including both dead and live desert ironwood.

Joshua tree is the only living plant species included in one or both of the above lists that was observed on the subject property. Both of the silver cholla cacti observed were dead although there is some chance that smaller individual plants that were not observed may occur.

#### 4.0. Conclusions and Recommendations

4.1. Impacts to Agassiz's Desert Tortoise and Proposed Mitigation. Based on the absence of tortoise sign onsite and in adjacent areas, and available information reviewed for this habitat assessment, CMBC concludes that tortoises are absent from the subject property and adjacent areas surveyed during these studies. As such, no impacts are anticipated and no mitigation measures are recommended.

According to USFWS (2010) pre-project survey protocol the results of this survey will remain valid for the period of one year, or until 3 August 2017, after which time, if the site has not been developed (or at least brushed) in the interim, another survey would be required to confirm the absence of tortoises on-site.

Regardless of survey results and conclusions given herein, tortoises are protected by applicable State and federal laws, including the California Endangered Species Act and Federal Endangered Species Act, respectively. As such, if a tortoise is found onsite at the time of construction, all activities likely to affect that animal(s) should cease and the regulatory agencies (USFWS and CDFW) should be contacted to determine appropriate steps.

Importantly, nothing given in this report, including recommended mitigation measures, is intended to authorize the incidental take of tortoises during site development. Such authorization must come from the appropriate regulatory agencies, including CDFW (i.e., authorization under section 2081 of the Fish and Game Code) and USFWS [i.e., authorization under section 10(a)(1)(B) of the Federal Endangered Species Act].



Finally, it has been CMBC's since 1994 to NOT submit technical reports to either the USFWS or the CDFW unless asked to do so by the Proponent. However, the Proponent is advised of the following three conditions identified in January 2010 in the USFWS' revised pre-project survey protocol and assumes responsibility for implementing (or not) these recommendations:

- Occurrence of either live tortoises or tortoise sign (burrows, scats, and carcasses) in the action area indicated tortoise presence and therefore requires formal consultation with USFWS.
- If neither tortoises nor tortoise sign are encountered during the action area surveys, as well as project perimeter surveys where appropriate, please contact your local USFWS office. Informal consultation with the USFWS may be required even though no tortoises or sign are found during surveys.
- Please submit a copy of the original data sheets with results of the survey to the local USFWS office within 30 days of survey completion.

In an email to the regulatory agencies on 29 July 2016, CMBC indicated, as a follow-up to the Technical Assistance provided by agency biologists on 28 and 29 July 2016, that General Atomics would be advised to provide copies of this technical report to Brian Croft of the USFWS and Heather Weiche of CDFW for their records and information. Again, it is up to the proponent to follow this advice, or not.

#### 4.2. Impacts to Other Biological Resources and Proposed Mitigation.

*4.2.1 Other Special Status Species.* Based on the field survey and habitat assessment, CMBC concludes that none of the following special status species reported from the region will be adversely affected by site development: Burrowing owl, prairie falcon, or American badger. As such, no adverse impacts have been identified and no mitigation measures are recommended.

Those species either identified during the current survey or for which suitable habitats are present include LeConte's thrasher, loggerhead shrike, and Mohave ground squirrel. There is suitable nesting and foraging habitat for both of these special status bird species. Measures to avoid or mitigate impacts are given below in Section 4.2.2.b.

Although a focused Mohave ground squirrel trapping survey was not performed, CMBC assessed habitats and reviewed available information to provide a professional opinion as to the presence or absence of this species on the subject property. Given the information discussed herein, CMBC concludes there is some potential for Mohave ground squirrel to occur in eastern expansion areas but not in western barren areas associated with the new access road. At the time of this writing, the Proponent intends to complete a protocol trapping survey within eastern expansion impact areas in the 2017 trapping season.

#### 4.2.2. *Other Protected Biological Resources.*

4.2.2.a. Protected Plants. It is within the scope of this focused survey and general resource assessment to provide necessary baseline data and a proposed program to minimize and mitigate impacts to protected native desert plants. As such, this report may be considered a Desert Native Plant Assessment to identify the numbers and locations of Joshua trees found within impact areas to be in compliance with the California Native Plant Protection Act. Based on field studies and the project footprint provided by Mr. Cary Packer of General Atomics, we estimate that about 125 Joshua trees may be impacted by the 40-acre± proposed expansion area (e.g., 28-acre impact area plus 12-acre buffer area within 50 feet of facilities). This includes 110 trees associated with facilities (see Figure 6b) and 15 along the access road. So, 20%± of the Joshua trees (125 of 627 trees) may be affected by the proposed project. The Proponent has experience salvaging and transplanting Joshua trees with previous expansion projects at the nearby Gray Butte facility, and intends to implement those same salvage and transplantation techniques for the El Mirage expansion.

4.2.2.b. Bird Nests. Sections 3503, 3503.5, and 3513 of the California Fish and Game Code prohibit take of all birds and their active nests, including raptors and other migratory nongame birds (As listed under the Migratory Bird Treaty Act). Typically, CDFW requires that vegetation not be removed from a project site between March 15 and September 15 to avoid impacts to nesting birds. If it is necessary to commence project construction between March 15 and September 15, a qualified biologist should survey all shrubs and structures within the project site for nesting birds, prior to project activities (including construction and/or site preparation).

Surveys should be conducted at the appropriate time of day during the breeding season, and surveys would end no more than three days prior to clearing. CDFW is typically notified in writing prior to the start of the surveys. Documentation of surveys and findings should be submitted to the CDFW within ten days of the last survey. If no nesting birds were observed project activities may begin. If an active bird nest is located, the plant in which it occurs should be left in place until the birds leave the nest. No construction is allowed near active bird nests of threatened or endangered species.

The two special status bird species known to occur within eastern expansion areas, including LeConte's thrasher and loggerhead shrike, will predictably benefit from these measures. LeConte's thrashers may nest in numerous places including Joshua trees and larger shrubs, particularly four-winged saltbush. Loggerhead shrikes are more likely to nest in Joshua trees but will nest in larger four-winged saltbush shrubs as well. In April 2016, LaRue found a loggerhead shrike nest in a five-foot tall four-winged saltbush in nearby Palmdale.

## 5.0. Literature References

- Beauchamp, R. 1986. *A Flora of San Diego County, California*. Sweetwater River Press. National City, CA.
- California Department of Fish and Game (CDFG). 2009. Protocols for surveying and evaluating impacts to special status native plant populations and natural communities. California Natural Resources Agency, Department of Fish and Game, 24 November 2009. Sacramento, CA.
- California Department of Fish and Game. 2012. Staff report on burrowing owl mitigation. 7 March 2012 memo replacing 1995 staff report, State of California Natural resources Agency, Department of Fish and Game. Sacramento, CA.
- California Department of Fish and Wildlife (CDFW). 2016a. Electronic database of rare plant and animal species reported to the California Natural Diversity Database. Sacramento, CA.
- California Department of Fish and Wildlife. 2016b. Special Vascular Plants, Bryophytes, and Lichens List. Plant species list published and periodically updated by California Natural Diversity Database. Dated January 2016. Sacramento, CA. 126 pp.
- California Department of Fish and Wildlife. 2016c. Special Animals. Animal species list published and periodically updated by California Natural Diversity Database. Dated January 2016. Sacramento, CA. 51 pp.
- California Native Plant Society (CNPS), Rare Plant Program. 2016. Inventory of rare and endangered plants (online edition, v8-02). California Native Plant Society, Sacramento, CA. Website <http://www.rareplants.cnps.org>.
- Circle Mountain Biological Consultants. 1997. Mojave River Pipeline, Reach 1A, San Bernardino County, California: Final monitoring and compliance report. Unpublished report prepared for Mojave Water Agency. Job #97-010. Wrightwood, CA.
- Circle Mountain Biological Consultants. 2000. Gray Butte Flight Test Facility, Los Angeles County, California: Focused desert tortoise survey and Mohave ground squirrel habitat assessment. Unpublished report prepared by Ed LaRue for P & D Environmental Consultants. Job#00-009. Wrightwood, CA.
- Circle Mountain Biological Consultants, Inc. 2007. Focused survey for desert tortoise and western burrowing owl, habitat evaluation for Mohave ground squirrel, and general biological resource assessment on the Gray Butte Runway Project, a 17.8-acre± site near the community of El Mirage (APNs 3200-171-01, -08, -09, -11, -12, -13, & -14, and 3200-211-01), Los Angeles and San Bernardino Counties, California. Unpublished report prepared for General Atomics and Aeronautical Systems, Inc. Job #07-065. Wrightwood, CA.

- Circle Mountain Biological Consultants, Inc. 2008a. Mohave ground squirrel trapping data (no report) for the Gray Butte Facility on 100 acres± near El Mirage, San Bernardino and Los Angeles counties, California. Unpublished data collected on behalf of Sundance Biology during Mohave ground squirrel trapping between 17 March 2008 and 11 July 2008. Job #08-011. Wrightwood, CA.
- Circle Mountain Biological Consultants, Inc. 2008b. Focused survey for desert tortoise and general biological resource assessment for the Gray Butte Facility runway extension project, Los Angeles and San Bernardino Counties, California. Unpublished report prepared for General Atomics and Aeronautical Systems, Inc. Job #08-025. Wrightwood, CA.
- Circle Mountain Biological Consultants, Inc. 2008c. Focused survey for desert tortoise and western burrowing owl and general biological resource assessment for the Gray Butte Facility, Los Angeles and San Bernardino Counties, California. Unpublished report prepared for General Atomics and Aeronautical Systems, Inc. Job #08-030. Wrightwood, CA.
- Circle Mountain Biological Consultants, Inc. 2012. Focused survey for Agassiz's desert tortoise, habitat assessments for burrowing owl and Mohave ground squirrel, and general biological resource assessment for a proposed runway at the General Atomics Aeronautical Systems Facility in the community of El Mirage, San Bernardino County, California. An unpublished report prepared on behalf of General Atomics Aeronautical Systems, Inc. Job #12-016. Wrightwood, CA.
- Circle Mountain Biological Consultants, Inc. 2013. Desert tortoise detection in the Morongo Basin on 270 sites between 1989 and 2013. Unpublished report presented as a technical paper at the 2013 Desert Tortoise Council Symposium. Wrightwood, CA.
- Circle Mountain Biological Consultants, Inc. 2015. Environmental survey of developed area for Gray Butte Flight Operation Facilities, Los Angeles County, California. An unpublished report prepared on behalf of General Atomics. Job #15-016.
- County of San Bernardino (County). 2004. Standards for assessing impacts to the desert tortoise and Mohave ground squirrel. Unpublished protocol provided by the County of San Bernardino, Public and Support Services Group, Land Use Services Department, Advance Planning Division, dated December 2004. San Bernardino, CA.
- County of San Bernardino. 2006. Report protocol for biological assessment reports. Unpublished protocol provided by the County of San Bernardino, Public and Support Services Group, Land Use Services Department, Advance Planning Division, dated 31 August 2006. San Bernardino, CA.

- Gustafson, J. 1993. A status review of the Mohave ground squirrel (*Spermophilus mohavensis*). California Department of Fish and Game (Sacramento), Wildlife Management Division, Nongame Bird and Mammal Section Report 93-9, 104 pp. plus appendices. Sacramento, CA.
- Hickman, J. Editor. 1993. *The Jepson Manual: Higher Plants of California*. University of California Press. Berkeley, CA.
- Holland, R. 1986. Preliminary descriptions of the terrestrial natural communities of California. California Department of Fish and Game. Sacramento, CA.
- Ingles, L. 1965. *Mammals of the Pacific States: California, Oregon, Washington*. Stanford University Press. Stanford, CA.
- Jaeger, E. 1969. *Desert Wild Flowers*. Stanford University Press. Stanford, CA.
- LaRue, E. 2002. Focused surveys for desert tortoise along 141 linear miles of transects located in western San Bernardino and eastern Los Angeles counties. Unpublished data (no report) collected by Steve Boland, Jim Buffington, Sharon Dougherty, Tanya Egan, Mike Green, Ed LaRue, Mike Radakovich, Cynthia Stretch, and Mercy Vaughn between 2 and 16 March 2002 on behalf of the West Mojave Plan. Wrightwood, CA.
- Leitner, P. and E. LaRue. 2014. Surveys for and excavations of suspected Mohave ground squirrel burrows. Unpublished report prepared on behalf of California Department of Fish and Wildlife. California State University, Stanislaus, Endangered Species Recovery Program, Turlock, California, and Circle Mountain Biological Consultants, Inc., Wrightwood, California. 4 pp.
- Munz, P. 1974. *A Flora of Southern California*. University of California Press. Berkeley, CA.
- Murphy, R. W., K. H. Berry, T. Edwards, A. E. Leviton, A. Lathrop, and J. D. Riedle. 2011. The dazed and confused identity of Agassiz's desert tortoise, *Gopherus agassizii* (Testudines, Testudinidae) with the description of a new species, and its consequences for conservation. *ZooKeys* 113: 39–71.
- Sawyer, J. and T. Keeler-Wolf. 1995. *A Manual of California Vegetation*. California Native Plant Society. Sacramento, CA.
- Sibley, D. 2000. National Audubon Society, the Sibley Guide to Birds. First Edition. New York, N.Y.
- Stebbins, R. 2003. *A Field Guide to Western Reptiles and Amphibians*. Third Edition. The Peterson Field Guide Series. Houghton Mifflin Company. New York, NY.

- U.S. Bureau of Land Management. 1989. Map produced by BLM for the California Desert Conservation Area, dated January 1989, showing desert tortoise Category 1, 2, and 3 Habitats in California. Riverside, CA.
- U.S. Bureau of Land Management. 2005. Final Environmental Impact Report and Statement for the West Mojave Plan, a Habitat Conservation Plan and California Desert Conservation Area Plan Amendment. Moreno Valley, CA.
- U.S. Bureau of Land Management. 2006. Record of Decision: West Mojave Plan, Amendment to the California Desert Conservation Area Plan, dated March 2006. Sacramento, CA.
- U.S. Fish and Wildlife Service (USFWS). 1992. Field survey protocol for any nonfederal action that may occur within the range of the desert tortoise. Ventura, CA.
- U.S. Fish and Wildlife Service. 1994a. Endangered and threatened wildlife and plants; determination of critical habitat for the Mojave population of the desert tortoise. Federal Register 55(26):5820-5866. Washington, D.C.
- U.S. Fish and Wildlife Service. 1994b. Desert Tortoise (Mojave Population) Recovery Plan. U.S. Fish and Wildlife Service, Portland, OR. Pp. 73, plus appendices.
- U.S. Fish and Wildlife Service. 2008. Birds of Conservation Concern. Division of Migratory Bird Management. Arlington, VA.
- U.S. Fish and Wildlife Service. 2010. Preparing for any action that may occur within the range of the Mojave desert tortoise (*Gopherus agassizii*). USFWS Desert Tortoise Recovery Office. Reno, NV.

## Appendix A. Plant Species Detected

The following plant species were identified on-site or in adjacent areas (i.e., signified by “+”) during the general biological inventory described in this report. Those plant species that are protected by pertinent State ordinances are highlighted in red and signified by “(SC)” following the common name.

### GNETAE

#### **Ephedraceae**

*Ephedra nevadensis*

### ANGIOSPERMAE: DICOTYLEDONES

#### **Amaranthaceae**

\**Amaranthus albus*

#### **Asteraceae**

*Acamptopappus sphaerocephalus*

+*Ambrosia acanthicarpa*

*Artemisia spinescens*

\**Bassia hyssopifolia*

*Chrysothamnus nauseosus*

+*Isocoma acradenia*

*Pectis papposa*

*Tetradymia glabrata*

#### **Boraginaceae**

+*Amsinckia tessellata*

*Cryptantha micrantha*

#### **Brassicaceae**

\**Descurainia pinnata*

\**Descurainia sophia*

\**Hirschfeldia incana*

*Lepidium fremontii*

\**Sisymbrium altissimum*

\**Sisymbrium irio*

#### **Cactaceae**

*Cylindropuntia echinocarpa*

### GNETAE

#### **Joint-fir family**

Nevada joint-fir

### DICOT FLOWERING PLANTS

#### **Amaranth family**

White tumbleweed

#### **Sunflower family**

Desert goldenhead

Annual bur-sage

Budsage

Bassia

Rubber rabbitbrush

Goldenbush

Chinch weed

Cottonthorn

#### **Borage family**

Fiddleneck

Forget-me-not

#### **Mustard family**

Tansy

Flixweed

Short-pod mustard

Bush peppergrass

Tumble mustard

London rocket

#### **Cactus family**

Silver cholla (SC; only 2 dead ones)

**Chenopodiaceae**  
*Atriplex argentea*  
*Atriplex canescens*  
*Atriplex confertifolia*  
*Atriplex polycarpa*  
*Krascheninnikovia lanata*  
\**Salsola tragus*  
*Suaeda moquinii*

**Geraneaceae**  
+\**Erodium cicutarium*

**Polemoniaceae**  
*Eriastrum* sp.  
*Loeseliastrum* c.f. *matthewsii*

**Polygonaceae**  
*Chorizanthe rigida*  
*Eriogonum maculatum*

**Solanaceae**  
*Lycium andersonii*  
*Lycium cooperi*

**Tamaricaceae**  
+\**Tamarix ramosissima*

ANGIOSPERMAE: MONOCOTYLEDONES

**Liliaceae**  
*Yucca brevifolia*

**Poaceae**  
*Achnatherum hymenoides*  
\**Bromus madritensis* ssp. *rubens*  
\**Schismus* sp.

**Goosefoot family**  
Mohave silver-scale  
Four-winged saltbush  
Spiny saltbush  
Allscale  
Winter fat (8 tallied along transects)  
Russian thistle  
Torrey's sea-blight

**Geranium family**  
Red-stemmed filaree

**Phlox family**  
Woolly star  
Sunbonnets

**Buckwheat family**  
Rigid spineflower  
Spotted buckwheat

**Nightshade family**  
Anderson's box-thorn  
Peach thorn

**Tamarisk family**  
Tamarisk

MONOCOT FLOWERING PLANTS

**Lily family**  
Joshua tree (SC)

**Grass family**  
Indian ricegrass  
Red brome  
Split-grass

\* - indicates a non-native (introduced) species.

c.f. - compares favorably to a given species when the actual species is unknown.

Some species may not have been detected because of the seasonal nature of their occurrence. Common names are taken from Beauchamp (1986), Hickman (1993), Jaeger (1969), and Munz (1974).



## Appendix B. Animal Species Detected

The following animal species were detected during the general biological inventory described in this report. Special status animal species are highlighted in red and signified by “(SC)” following the common names. Those only found in adjacent areas are signified by “+.”

### REPTILIA

#### Iguanidae

*Dipsosaurus dorsalis*  
*Callisaurus draconoides*  
*Gambelia wislizenii*  
*Sceloporus magister*  
*Uta stansburiana*  
*Phrynosoma platyrhinos*

#### Teiidae

*Cnemidophorus tigris*

#### Colubridae

*Masticophis flagellum piceus*

#### Viperidae

*Crotalus cerastes*  
*Crotalus scutulatus*

### AVES

#### Accipitridae

*Buteo jamaicensis*

#### Falconidae

*Falco mexicanus*

#### Phasianidae

*Callipepla californica*

#### Columbidae

*Streptopelia decaocto*  
*Zenaida macroura*

#### Tytonidae

*Tyto alba*

#### Strigidae

*Bubo virginianus*

### REPTILES

#### Iguanids

Desert iguana  
Zebra-tailed lizard  
Long-nosed leopard lizard  
Desert spiny lizard  
Common side-blotched lizard  
Desert horned lizard

#### Whiptails

Western whiptail

#### Colubrids

Red racer

#### Vipers

Sidewinder  
Mojave rattlesnake

### BIRDS

#### Hawks, eagles, harriers

Red-tailed hawk

#### Falcons

Prairie falcon (SC)

#### Grouse and quail

California quail

#### Pigeons and doves

Eurasian collared-dove  
Mourning dove

#### Barn Owls

Common barn owl

#### Typical owls

Great horned owl

**Camprimulgidae**

*Chordeiles acutipennis*  
*Phalaenoptilus nuttallii*

**Picidae**

*Picoides scalaris*

**Tyrannidae**

*Sayornis saya*  
*Tyrannus verticalis*

**Alaudidae**

*Eremophila alpestris*

**Corvidae**

*Corvus corax*

**Troglodytidae**

*Campylorhynchus brunneicapillus*

**Mimidae**

*Mimus polyglottos*  
*Toxostoma lecontei*

**Laniidae**

*Lanius ludovicianus*

**Emberizidae**

*Amphispiza belli*

**Fringillidae**

*Carpodacus mexicanus*

**MAMMALIA****Leporidae**

*Lepus californicus*  
*Sylvilagus audubonii*

**Sciuridae**

*Ammospermophilus leucurus*

**Geomyidae**

*Thomomys bottae*

**Nightjars**

Lesser nighthawk  
Common poorwill

**Woodpeckers**

Ladder-backed woodpecker

**Tyrant flycatchers**

Say's phoebe  
Western kingbird

**Larks**

Horned lark

**Crows and jays**

Common raven

**Wrens**

Cactus wren

**Mockingbirds and thrashers**

Northern mockingbird  
LeConte's thrasher (SC)

**Shrikes**

Loggerhead shrike (SC)

**Sparrows, warblers, tanagers**

Sage sparrow

**Finches**

House finch

**MAMMALS****Hares and rabbits**

Black-tailed hare  
Audubon cottontail

**Squirrels**

Antelope ground squirrel

**Pocket gophers**

Botta pocket gopher

**Heteromyidae***Perognathus* sp.*Dipodomys* sp.**Canidae***Canis latrans**Vulpes macrotis***Mustelidae***Taxidea taxus***Felidae***Lynx rufus***Pocket mice**

Pocket mouse

Kangaroo rat

**Foxes, wolves and coyotes**

Coyote

Kit fox

**Weasels and skunks**

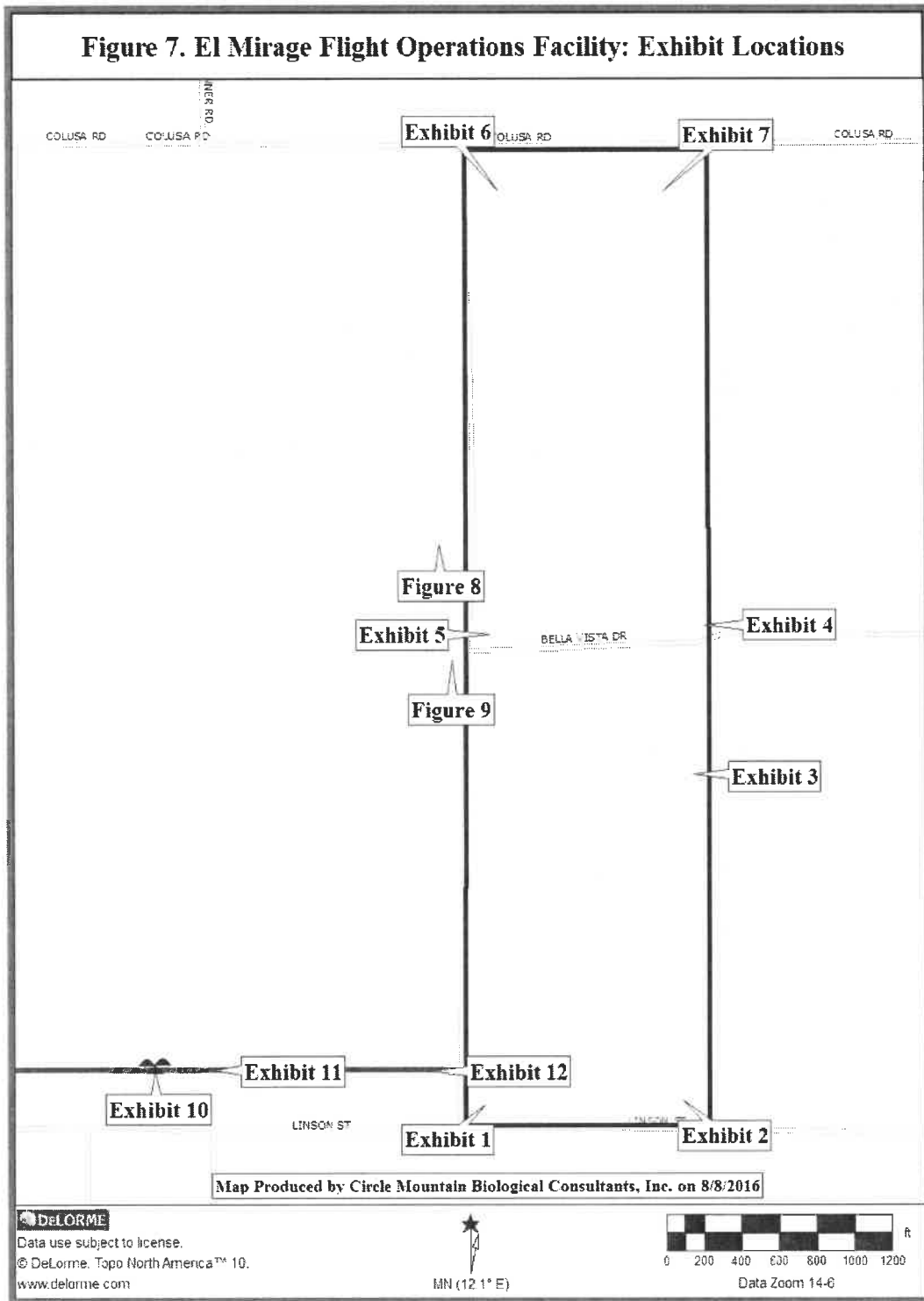
American badger (SC)

**Cats**

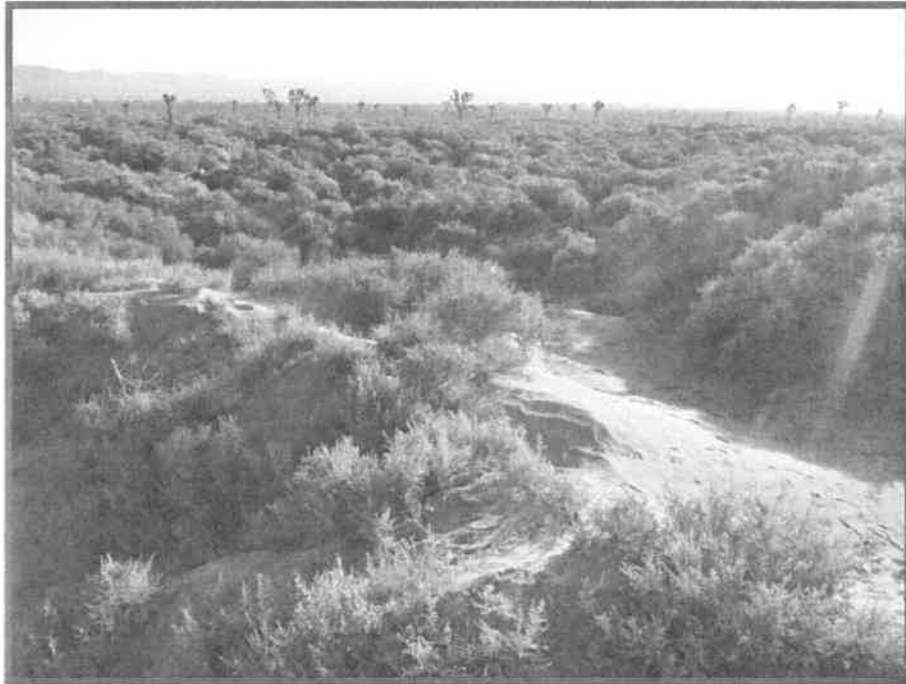
Bobcat

Nomenclature follows Stebbins, *A Field Guide to Western Reptiles and Amphibians* (2003), third edition; Sibley, National Audubon Society, the Sibley Guide to Birds (2000), first edition; and Ingles, *Mammals of the Pacific States* (1965), second edition.

Appendix C. Photographic Exhibits



Locations of the 12 photographic exhibits on the next six pages are depicted in Figure 7.



**Exhibit 1.** Expansion Area: View from the southwest corner of the site, facing northeast (see Figure 7 for locations and directions of photographs).



**Exhibit 2.** View from the southeast corner of the parcel, facing northwest.



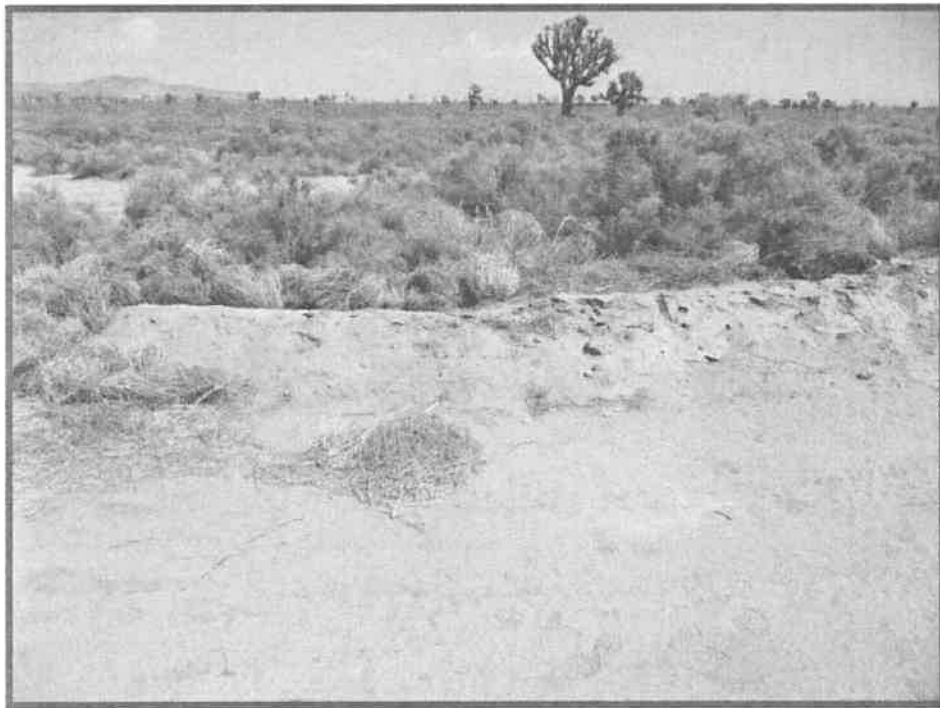
**Exhibit 3.** Expansion Area: One of the “old dump” sites found in the Expansion Area.



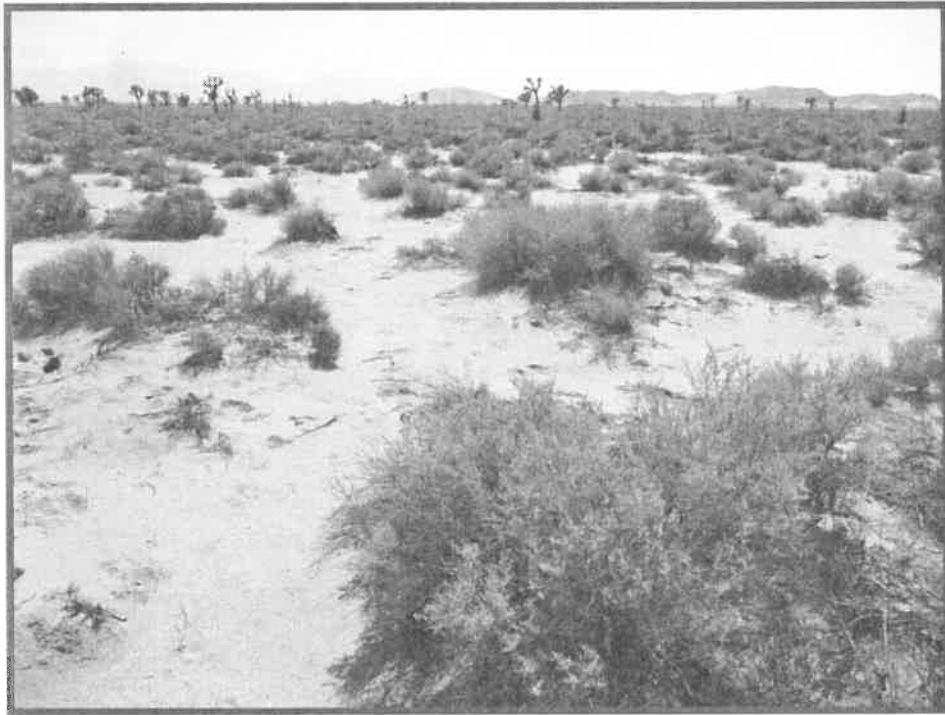
**Exhibit 4.** View from the east-central boundary of the site, facing west.



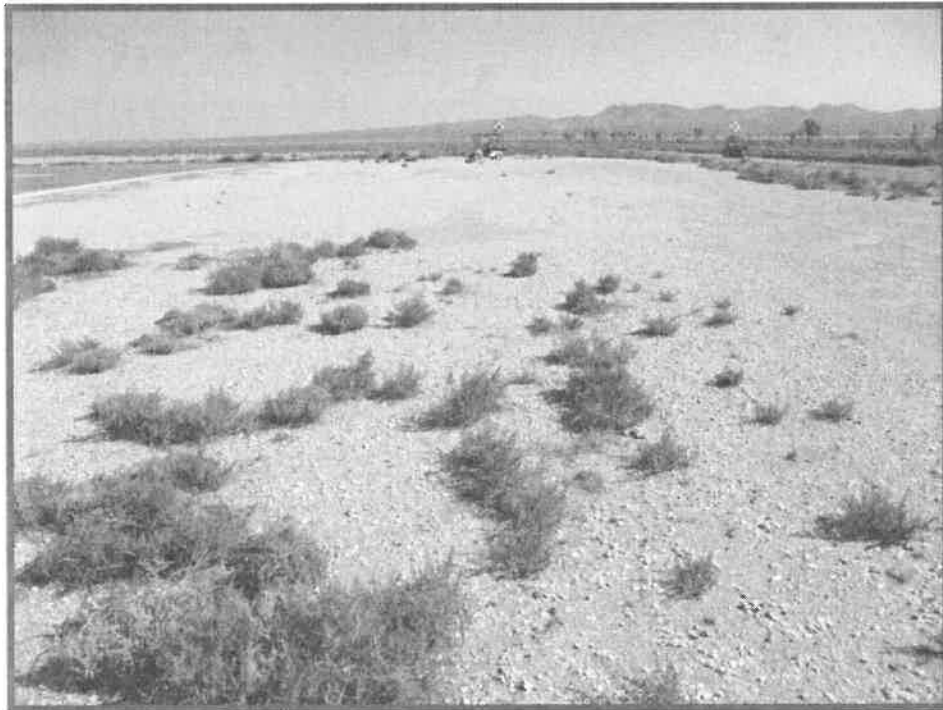
**Exhibit 5.** Expansion Area: View from the west-central boundary of the site, facing east.



**Exhibit 6.** View from the southeast corner of the parcel, facing northwest.



**Exhibit 7.** Expansion Area: View from the southeast corner of the parcel, facing northwest.

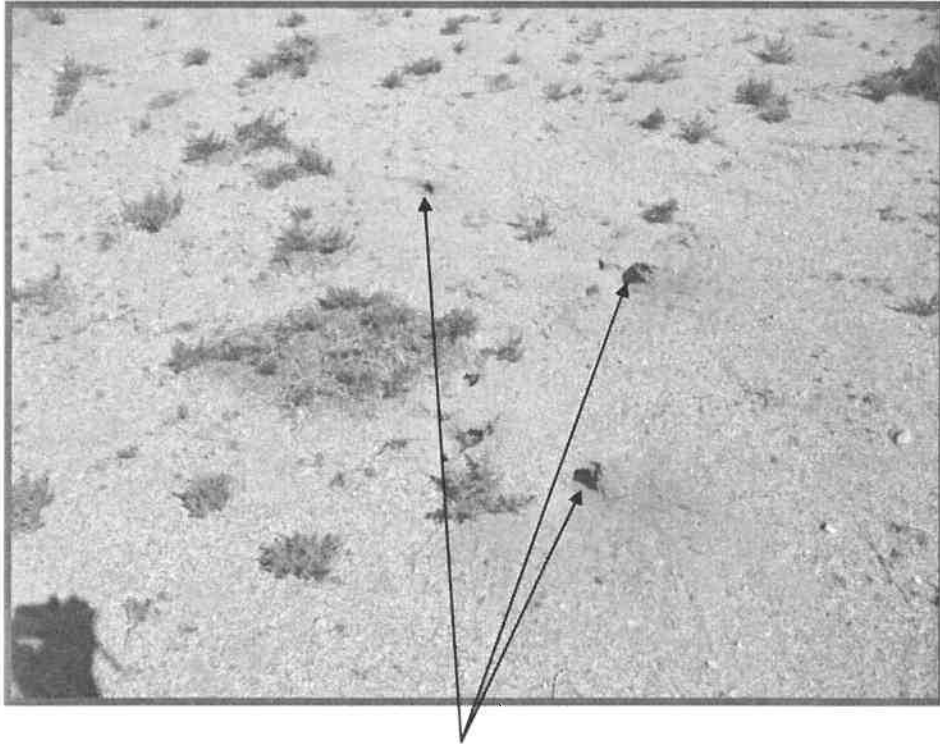


**Exhibit 8.** Runway: View from east end of runway, facing north into the expansion area.





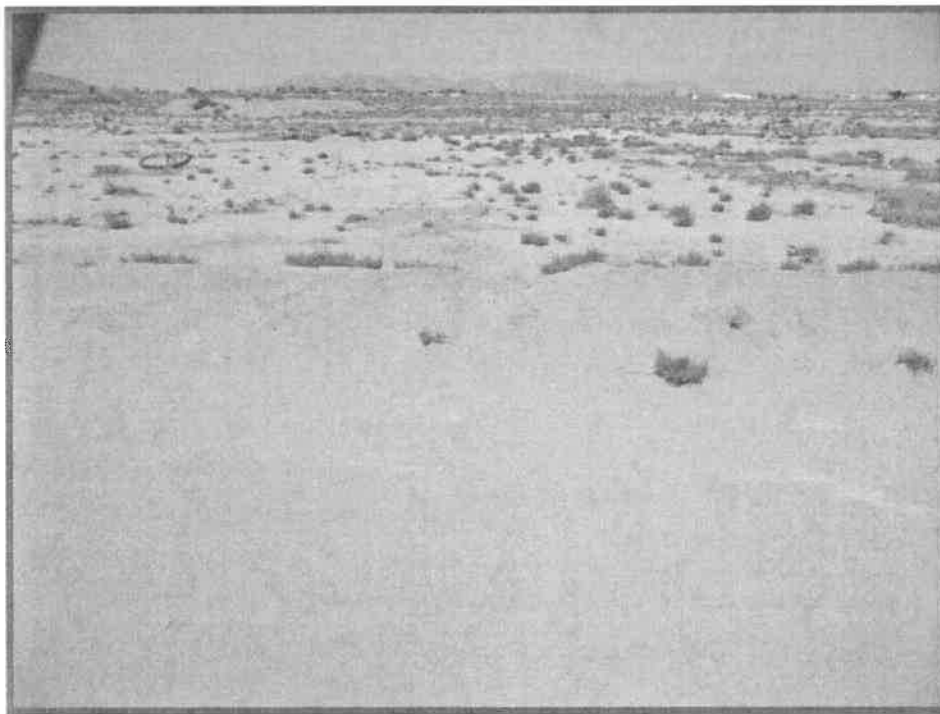
**Exhibit 9.** Taxiway: View from east end of taxiway, facing north into the expansion area.



**Exhibit 10.** New Access: Colonial rodent burrows found in barren area of new access road.



**Exhibit 11.** View from near the center of the proposed Access Road, facing west.



**Exhibit 12.** View from east end of the proposed Access Road, facing west.

## **Appendix D. Project Map and Proposed Project Narrative Description**

The requisite descriptive information for biological technical reports following the bold font below was provided, verbatim, in a letter to CMBC, dated 27 March 2006, from Matthew Slowik, Senior Associate Planner with the County. The information that then follows, including project description and map, were provided via email to CMBC by General Atomics representative, Richard McRae, on 1 August 2016:

### **Proposed Project Narrative Description**

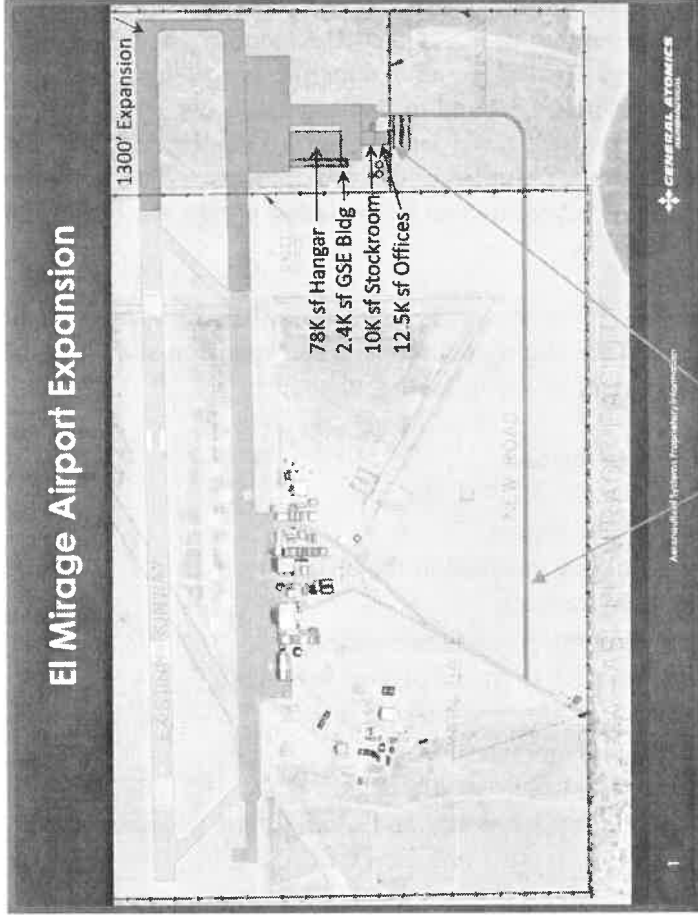
“The ‘narrative project description’ for all biological reports shall include (at a minimum) and not be limited to: a) identification of the project (i.e., Tentative Tract Map #, Tentative Parcel Map #, Conditional Use Permit #, Planned Development #, etc.), b) the number of proposed lots (for tentative tract maps and tentative parcel maps), c) the amount of square feet (for commercial, industrial and/or institutional uses), d) the mix of uses (and square footage), if it is mixed use development, e) the number of proposed units, if it is an apartment, condominium, or multi-family development, and so forth. An adequate ‘narrative project description’ is required to be included within the biological survey report.”

General Atomics is purchasing the two 80-acre parcels adjacent to their El Mirage Flight Operations Facility in order to expand the flight operations. The expansion shown in the aerial image on the next page is comprised of the following elements:

- Extend existing runway 1300’ to the east.
- Extend existing ramp approximately 2000’ to the east.
- Construct a 78,000 square foot (sf) hangar.
- Construct a 12,500 sf office building attached to the hangar.
- Construct a 10,000 sf stockroom building.
- Construct a 2,400 sf Ground Support Equipment building.
- Construct an entry road that ties back to the El Mirage main gate.
- Add 265,000 sf of asphalt for ramp area and parking lots.
- Drill water well and add fire pump and water tank.
- Bring in Edison and Gas Company utility supply lines.
- Add perimeter fence on three sides (east, north, and south) of the new property.

### **Project Map**

“All biological survey reports are required to include a copy of the project map. ‘The project map’ is not a vicinity map, nor is it a copy of the USGS map with the site outlined. ‘The project map’ is, for example: 1) the tentative tract map, 2) the tentative parcel map, 3) the conditional use permit (site plan), 4) the Planned Unit Development (site plan), and so forth. ‘The project map’ is required to be included within (and made part of) the biological survey report.”



Proposed facilities, located east and south of existing facilities, are shown in blue.

## Appendix E. Data for 627 Joshua Trees found within the 160-acre Project Area

In the following table, “healthy” is used to signify those trees showing green color, good vigor, intact structure, and lack of stress, whereas “unhealthy” trees tend to be light green or yellowish, lack good vigor, may have broken and/or dead limbs, and show other signs of stress, such as blackened tips. Depending on height and other constraints, “healthy” trees are more likely to survive after professional transplantation and maintenance than “unhealthy” trees.

Heights were estimated to the nearest foot rather than measured. Some trees have small “pups,” less than one foot tall, located at the bases of the trees, which were not tallied. So, for those trees with multiple trunks (e.g., “2 trunks” in column 2), each of the smaller trunks was at least two feet tall. In these cases, only the height of the tallest tree trunk of a given bunch of trees is reported. UTM coordinates are given in North American Datum 83 (NAD 83). Numbers in the 1<sup>st</sup> and 6<sup>th</sup> columns correspond to Figure 6b.

Descriptive Data for 627 Joshua Trees									
No.	Height	Health	Easting	Northing	No.	Height	Health	Easting	Northing
1	14 feet	Healthy	445854	3830708	28	12 feet	Unhealthy	445829	3830804
2	11 feet	Healthy	445890	3830719	29	11 feet	Healthy	445808	3830824
3	12 feet 2 trunks	Healthy	445883	3830736	30	3 feet 2 trunks	Unhealthy	445758	3830796
4	9 feet	Healthy	445919	3830737	31	5 feet	Healthy	445793	3830839
5	3 feet	Healthy	445943	3830752	32	2 feet	Unhealthy	445820	3830837
6	14 feet	Healthy	445929	3830762	33	2 feet	Unhealthy	445813	3830839
7	13 feet 5 trunks	Healthy	445927	3830748	34	21 feet	Healthy	445843	3830834
8	3 feet	Healthy	445924	3830764	35	6 feet	Healthy	445829	3830856
9	14 feet	Healthy	445902	3830758	36	16 feet	Healthy	445837	3830846
10	8 feet	Healthy	445896	3830768	37	8 feet 2 trunks	Healthy	445872	3830831
11	12 feet	Healthy	445844	3830754	38	4 feet	Healthy	445881	3830825
12	11 feet	Healthy	445798	3830772	39	12 feet	Healthy	445877	3830856
13	12 feet	Healthy	445822	3830792	40	6 feet	Healthy	445934	3830843
14	16 feet	Unhealthy	445846	3830784	41	3 feet	Healthy	445994	3830855
15	10 feet	Healthy	445871	3830789	42	3 feet	Unhealthy	446122	3830877
16	8 feet	Healthy	445902	3830789	43	3 feet	Unhealthy	446027	3830880
17	9 feet	Healthy	445918	3830792	44	3 feet	Unhealthy	445993	3830856
18	2 feet	Healthy	445933	3830785	45	4 feet	Healthy	445925	3830887
19	9 feet	Healthy	445966	3830783	46	5 feet	Healthy	445897	3830871
20	12 feet	Healthy	445958	3830786	47	4 feet	Healthy	445870	3830864
21	6 feet	Healthy	446112	3830786	48	16 feet	Healthy	445869	3830882
22	7 feet	Healthy	445898	3830820	49	7 feet	Healthy	445869	3830883
23	14 feet 2 trunks	Healthy	445895	3830800	50	4 feet	Healthy	445856	3830881
24	4 feet	Healthy	445881	3830824	51	6 feet	Healthy	445861	3830866
25	9 feet	Healthy	445873	3830805	52	3 feet	Unhealthy	445849	3830869
26	15 feet 2 trunks	Healthy	445841	3830819	53	4 feet	Healthy	445851	3830887
27	6 feet	Healthy	445837	3830801	54	24 feet	Unhealthy	445852	3830862

Descriptive Data for 627 Joshua Trees									
No.	Height	Health	Easting	Northing	No.	Height	Health	Easting	Northing
55	4 feet	Healthy	445799	3830870	91	2 feet	Unhealthy	445871	3831014
56	14 feet	Unhealthy	445791	3830876	92	2 feet	Unhealthy	445917	3831007
57	5 feet	Healthy	445821	3830910	93	2 feet	Unhealthy	445923	3831027
58	4 feet	Healthy	445840	3830891	94	4 feet	Unhealthy	445932	3831013
59	4 feet	Unhealthy	445876	3830897	95	5 feet	Healthy	445987	3831014
60	3 feet 2 trunks	Healthy	445886	3830900	96	14 feet	Unhealthy	446007	3831038
61	7 feet 2 trunks	Healthy	445895	3830915	97	2 feet	Unhealthy	445956	3831060
62	3 feet	Healthy	445926	3830903	98	7 feet	Healthy	445946	3831058
63	4 feet 2 trunks	Unhealthy	445944	3830893	99	2 feet	Unhealthy	445944	3831060
64	18 feet 2 trunks	Healthy	445940	3830905	100	12 feet	Healthy	445861	3831052
65	2 feet	Unhealthy	445965	3830913	101	20 feet	Healthy	445909	3831086
66	13 feet	Healthy	446010	3830913	102	3 feet 2 trunks	Unhealthy	445980	3831079
67	19 feet 2 trunks	Healthy	446063	3830929	103	2 feet	Unhealthy	446004	3831103
68	9 feet	Healthy	446026	3830929	104	2 feet	Healthy	445898	3831100
69	5 feet	Healthy	445943	3830934	105	3 feet	Healthy	445979	3831122
70	8 feet	Healthy	445939	3830930	106	10 feet 3 trunks	Unhealthy	445800	3831110
71	9 feet	Healthy	445928	3830933	107	11 feet	Unhealthy	445781	3831159
72	5 feet	Healthy	445897	3830945	108	13 feet	Healthy	445784	3831153
73	2 feet	Unhealthy	445879	3830937	109	12 feet 2 trunks	Healthy	445805	3831132
74	12 feet	Healthy	445870	3830919	110	2 feet	Unhealthy	445982	3831133
75	8 feet	Healthy	445829	3830935	111	13 feet	Healthy	446013	3831135
76	14 feet	Healthy	445774	3830961	112	5 feet	Unhealthy	446088	3831162
77	3 feet	Unhealthy	445843	3830966	113	5 feet	Healthy	445974	3831161
78	3 feet	Unhealthy	445918	3830963	114	15 feet	Healthy	445972	3831165
79	8 feet	Healthy	445933	3830951	115	14 feet 3 trunks	Healthy	445772	3831201
80	10 feet 2 trunks	Healthy	445947	3830955	116	14 feet	Healthy	445783	3831193
81	8 feet	Healthy	445949	3830974	117	7 feet 2 trunks	Healthy	445785	3831206
82	7 feet	Unhealthy	445968	3831001	118	9 feet	Healthy	445810	3831203
83	16 feet 2 trunks	Unhealthy	445951	3830993	119	2 feet	Unhealthy	445958	3831183
84	3 feet	Healthy	445918	3830984	120	12 feet 2 trunks	Healthy	445990	3831190
85	11 feet	Healthy	445921	3830994	121	4 feet	Healthy	446031	3831192
86	6 feet	Healthy	445859	3830979	122	1 foot	Unhealthy	446053	3831200
87	2 feet	Unhealthy	445853	3830988	123	4 feet	Healthy	446020	3831209
88	14 feet	Healthy	445778	3830999	124	13 feet	Healthy	446018	3831209
89	4 feet	Healthy	445784	3831018	125	6 feet	Unhealthy	445980	3831228
90	3 feet 2 trunks	Unhealthy	445868	3831026	126	1 foot	Unhealthy	445995	3831297

Descriptive Data for 627 Joshua Trees									
No.	Height	Health	Easting	Northing	No.	Height	Health	Easting	Northing
127	5 feet	Unhealthy	446088	3831297	167	5 feet	Healthy	445841	3831447
128	3 feet	Healthy	446073	3831338	168	11 feet	Healthy	445887	3831447
129	16 feet 3 trunks	Healthy	445881	3831343	169	3 feet	Healthy	445905	3831452
130	17 feet	Healthy	445868	3831343	170	7 feet	Healthy	445935	3831464
131	11 feet	Healthy	445789	3831319	171	4 feet	Unhealthy	446076	3831475
132	2 feet	Healthy	445786	3831329	172	1 foot	Unhealthy	446073	3831483
133	11 feet	Healthy	445769	3831352	173	3 feet	Healthy	446038	3831494
134	10 feet	Healthy	445823	3831348	174	9 feet	Healthy	445984	3831498
135	10 feet	Healthy	446038	3831356	175	3 feet	Unhealthy	445980	3831496
136	7 feet	Healthy	446041	3831357	176	7 feet 4 trunks	Unhealthy	445910	3831482
137	12 feet 2 trunks	Healthy	446117	3831353	177	14 feet	Healthy	445879	3831490
138	5 feet	Unhealthy	446062	3831380	178	8 feet 3 trunks	Unhealthy	445880	3831498
139	3 feet	Unhealthy	445893	3831372	179	14 feet	Healthy	445788	3831490
140	10 feet	Healthy	445825	3831370	180	7 feet	Healthy	445780	3831499
141	12 feet 2 trunks	Healthy	445815	3831379	181	6 feet	Healthy	445794	3831508
142	2 feet	Unhealthy	445792	3831391	182	10 feet	Unhealthy	445785	3831521
143	5 feet	Healthy	445803	3831404	183	10 feet	Healthy	445796	3831517
144	2 feet	Unhealthy	445803	3831391	184	9 feet	Healthy	445851	3831535
145	5 feet	Healthy	445822	3831395	185	5 feet	Healthy	445882	3831514
146	16 feet	Healthy	445846	3831414	186	2 feet	Healthy	446020	3831519
147	11 feet	Healthy	445872	3831398	187	14 feet	Healthy	446049	3831520
148	13 feet	Healthy	445887	3831412	188	6 feet	Healthy	446088	3831528
149	3 feet	Healthy	446042	3831410	189	18 feet 3 trunks	Unhealthy	446133	3831534
150	2 feet	Healthy	446055	3831384	190	1 foot	Unhealthy	446133	3831549
151	6 feet	Healthy	446088	3831414	191	9 feet	Healthy	446091	3831552
152	10 feet	Unhealthy	446120	3831393	192	2 feet	Unhealthy	446068	3831551
153	10 feet	Healthy	446142	3831426	193	5 feet	Healthy	446024	3831542
154	3 feet	Healthy	446007	3831445	194	7 feet	Healthy	445840	3831562
155	3 feet	Healthy	445972	3831425	195	12 feet 2 trunks	Healthy	445833	3831556
156	4 feet	Unhealthy	445975	3831426	196	6 feet	Healthy	445814	3831560
157	5 feet	Healthy	445923	3831439	197	4 feet	Healthy	445809	3831556
158	3 feet	Unhealthy	445908	3831434	198	3 feet	Healthy	445797	3831541
159	5 feet	Healthy	445901	3831429	199	3 feet	Healthy	445787	3831550
160	10 feet	Healthy	445894	3831432	200	11 feet	Healthy	445767	3831554
161	12 feet	Healthy	445890	3831435	201	10 feet 2 trunks	Healthy	445771	3831577
162	4 feet	Healthy	445890	3831435	202	7 feet	Healthy	445775	3831582
163	2 feet	Unhealthy	445886	3831443	203	5 feet	Healthy	445775	3831588
164	2 feet 2 trunks	Unhealthy	445846	3831434	204	8 feet	Unhealthy	445810	3831575
165	6 feet	Healthy	445834	3831419	205	4 feet	Healthy	445828	3831579
166	4 feet	Healthy	445802	3831414	206	6 feet	Healthy	445838	3831581

Descriptive Data for 627 Joshua Trees									
No.	Height	Health	Easting	Northing	No.	Height	Health	Easting	Northing
207	10 feet 4 trunks	Unhealthy	445850	3831585	247	2 feet	Unhealthy	446015	3831651
208	15 feet	Unhealthy	445860	3831580	248	2 feet	Unhealthy	446050	3831644
209	5 feet	Healthy	445910	3831580	249	1 foot	Unhealthy	446070	3831630
210	16 feet	Unhealthy	445923	3831575	250	1 foot	Unhealthy	446140	3831647
211	2 feet	Unhealthy	445963	3831571	251	12 feet	Healthy	446109	3831672
212	4 feet	Healthy	446000	3831569	252	10 feet 2 trunks	Healthy	445971	3831657
213	3 feet	Unhealthy	446026	3831577	253	7 feet	Healthy	445965	3831666
214	4 feet	Healthy	446042	3831587	254	3 feet	Unhealthy	445939	3831676
215	6 feet	Unhealthy	446068	3831573	255	20 feet	Unhealthy	445927	3831680
216	2 feet	Unhealthy	446134	3831622	256	5 feet	Healthy	445917	3831659
217	8 feet 2 trunks	Healthy	446127	3831620	257	16 feet 2 trunks	Healthy	445868	3831666
218	18 feet 3 trunks	Unhealthy	446117	3831611	258	4 feet	Healthy	445862	3831672
219	5 feet	Unhealthy	446118	3831601	259	1 foot	Unhealthy	445771	3831680
220	12 feet	Healthy	446113	3831602	260	8 feet	Healthy	445767	3831665
221	4 feet	Healthy	446087	3831613	261	10 feet	Unhealthy	445783	3831690
222	14 feet	Healthy	446077	3831611	262	8 feet	Unhealthy	445842	3831708
223	7 feet	Healthy	445977	3831613	263	1 foot 2 trunks	Unhealthy	445861	3831716
224	3 feet	Healthy	445962	3831611	264	13 feet	Unhealthy	445877	3831691
225	10 feet	Healthy	445961	3831620	265	3 feet	Healthy	445884	3831709
226	12 feet	Healthy	445956	3831603	266	8 feet 2 trunks	Unhealthy	445897	3831695
227	4 feet	Healthy	445931	3831620	267	21 feet	Unhealthy	445910	3831712
228	2 feet	Unhealthy	445916	3831624	268	6 feet	Healthy	445931	3831710
229	3 feet	Unhealthy	445804	3831618	269	3 feet	Healthy	445946	3831710
230	3 feet	Healthy	445788	3831610	270	5 feet	Healthy	445962	3831697
231	20 feet	Unhealthy	445795	3831622	271	12 feet	Healthy	445976	3831691
232	11 feet	Unhealthy	445785	3831605	272	2 feet	Unhealthy	445979	3831708
233	8 feet	Healthy	445790	3831615	273	2 feet	Healthy	445985	3831694
234	2 feet	Unhealthy	445770	3831602	274	19 feet	Healthy	446001	3831700
235	8 feet	Healthy	445765	3831615	275	3 feet	Healthy	446056	3831704
236	5 feet	Healthy	445793	3831654	276	10 feet	Healthy	446090	3831693
237	6 feet	Healthy	445808	3831644	277	12 feet	Healthy	446109	3831709
238	8 feet	Healthy	445824	3831629	278	1 foot	Unhealthy	446109	3831703
239	4 feet	Healthy	445823	3831650	279	19 feet	Healthy	446135	3831717
240	7 feet	Healthy	445866	3831654	280	7 feet	Healthy	446118	3831736
241	2 feet	Unhealthy	445928	3831642	281	1 foot	Unhealthy	446113	3831731
242	8 feet 2 trunks	Healthy	445973	3831656	282	14 feet	Healthy	446104	3831728
243	1 foot	Unhealthy	445980	3831630	283	3 feet	Healthy	446090	3831726
244	11 feet 2 trunks	Healthy	445983	3831627	284	4 feet	Healthy	446093	3831734
245	12 feet	Healthy	446000	3831635	285	3 feet	Healthy	446074	3831728
246	3 feet	Healthy	446007	3831651	286	6 feet 2 trunks	Healthy	446007	3831743
					287	3 feet	Healthy	445971	3831729



Descriptive Data for 627 Joshua Trees									
No.	Height	Health	Easting	Northing	No.	Height	Health	Easting	Northing
288	22 feet 3 trunks	Unhealthy	445918	3831727	324	3 feet	Healthy	445859	3831797
289	5 feet	Healthy	445879	3831731	325	6 feet	Unhealthy	445865	3831802
290	9 feet	Healthy	445871	3831720	326	2 feet	Healthy	445819	3831776
291	19 feet 2 trunks	Unhealthy	445864	3831725	327	12feet 2 trunks	Healthy	445784	3831806
292	5 feet	Healthy	445791	3831730	328	11 feet 2 trunks	Healthy	445774	3831830
293	7 feet	Unhealthy	445763	3831774	329	20 feet 2 trunks	Unhealthy	445797	3831826
294	13 feet	Healthy	445780	3831749	330	1 foot	Unhealthy	445823	3831834
295	7 feet	Healthy	445795	3831757	331	3 feet	Healthy	445828	3831823
296	4 feet	Healthy	445820	3831763	332	18 feet	Healthy	445868	3831829
297	3 feet	Unhealthy	445812	3831749	333	3 feet	Healthy	445899	3831827
298	6 feet	Unhealthy	445886	3831767	334	3 feet	Healthy	445919	3831811
299	5 feet	Healthy	445889	3831750	335	1 foot	Unhealthy	445914	3831822
300	22 feet	Unhealthy	445939	3831759	336	2 feet	Unhealthy	445849	3831916
301	15 feet 2 trunks	Healthy	445953	3831762	337	3 feet	Healthy	445792	3831921
302	2 feet	Healthy	445992	3831768	338	14 feet	Healthy	445777	3831951
303	3 feet	Unhealthy	446034	3831767	339	18 feet	Unhealthy	445805	3831943
304	1 foot	Unhealthy	446034	3831770	340	6 feet	Healthy	445881	3831932
305	5 feet	Healthy	446048	3831757	341	10 feet	Healthy	445882	3831941
306	16 feet 3 trunks	Unhealthy	446062	3831766	342	1 foot	Unhealthy	445886	3831930
307	3 feet	Healthy	446127	3831769	343	3 feet	Healthy	445894	3831947
308	6 feet 3 trunks	Healthy	446122	3831778	344	12 feet 2 trunks	Unhealthy	445906	3831942
309	10 feet	Healthy	446122	3831800	345	1 foot	Healthy	445901	3831953
310	1 foot	Unhealthy	446094	3831798	346	16 feet	Healthy	445929	3831944
311	12 feet 2 trunks	Healthy	446079	3831787	347	2 feet	Healthy	445930	3831954
312	5 feet	Healthy	446077	3831800	348	2 feet	Healthy	445954	3831950
313	15 feet 3 trunks	Unhealthy	446077	3831796	349	6 feet	Unhealthy	445969	3831945
314	16 feet 2 trunks	Healthy	446074	3831802	350	17 feet	Unhealthy	445798	3831947
315	3 feet	Healthy	446073	3831786	351	21 feet	Healthy	446000	3831935
316	8 feet	Healthy	446062	3831799	352	2 feet	Healthy	445981	3831924
317	5 feet	Healthy	446063	3831794	353	15 feet 3 trunks	Healthy	446003	3831952
318	2 feet	Unhealthy	446061	3831790	354	3 feet	Healthy	446034	3831940
319	5 feet 3 trunks	Unhealthy	445952	3831807	355	17 feet	Healthy	446059	3831938
320	2 feet	Healthy	445930	3831779	356	6 feet	Healthy	446059	3831955
321	5 feet	Healthy	445909	3831787	357	7 feet	Healthy	446112	3831926
322	5 feet	Healthy	445907	3831796	358	12 feet	Healthy	446119	3831934
323	6 feet	Healthy	445865	3831800	359	5 feet	Healthy	446143	3831954

Descriptive Data for 627 Joshua Trees									
No.	Height	Health	Easting	Northing	No.	Height	Health	Easting	Northing
360	9 feet 2 trunks	Healthy	446143	3831951	401	5 feet	Healthy	446053	3831998
361	3 feet	Healthy	446139	3831948	402	8 feet	Healthy	446053	3832003
362	11 feet	Healthy	446127	3831984	403	4 feet	Healthy	446071	3832006
363	2 feet	Healthy	446075	3831969	404	9 feet	Healthy	446120	3832037
364	2 feet	Healthy	446067	3831963	405	2 feet	Healthy	445936	3832102
365	5 feet	Healthy	446055	3831978	406	3 feet	Healthy	445862	3832082
366	17 feet	Healthy	446048	3831966	407	8 feet 2 trunks	Healthy	445814	3832081
367	3 feet	Healthy	446030	3831973	408	3 feet	Healthy	445801	3832091
368	21 feet	Unhealthy	446015	3831959	409	16 feet	Unhealthy	445797	3832094
369	20 feet 2 trees	Healthy	446013	3831975	410	12 feet	Healthy	445789	3832101
370	16 feet	Healthy	445990	3831963	411	9 feet	Healthy	445771	3832104
371	16 feet 2 trunks	Healthy	445959	3831971	412	7 feet 2 trunks	Healthy	445790	3832111
372	18 feet	Healthy	445947	3831975	413	12 feet	Healthy	445811	3832128
373	3 feet 3 trunks	Unhealthy	445943	3831982	414	10 feet	Healthy	445817	3832124
374	2 feet	Healthy	445929	3831977	415	9 feet 2 trunks	Healthy	445818	3832124
375	16 feet	Healthy	445927	3831987	416	3 feet	Unhealthy	445866	3832107
376	3 feet	Unhealthy	445898	3831960	417	2 feet	Healthy	445889	3832130
377	9 feet	Healthy	445894	3831979	418	8 feet	Healthy	445887	3832132
378	7 feet	Healthy	445893	3831982	419	11 feet	Healthy	445901	3832119
379	5 feet	Healthy	445883	3831963	420	4 feet	Healthy	445899	3832132
380	2 feet	Unhealthy	445876	3831961	421	3 feet	Healthy	445949	3832115
381	3 feet	Healthy	445811	3831970	422	6 feet	Healthy	446005	3832104
382	12 feet	Healthy	445792	3831967	423	12 feet	Unhealthy	446037	3832110
383	13 feet	Healthy	445795	3831975	424	14 feet	Healthy	446045	3832109
384	14 feet	Healthy	445776	3831981	425	15 feet	Healthy	446056	3832113
385	12 feet	Healthy	445765	3832004	426	5 feet	Healthy	446068	3832021
386	17 feet	Healthy	445774	3832015	427	10 feet	Healthy	446033	3832040
387	2 feet	Unhealthy	445793	3831991	428	22 feet	Unhealthy	446011	3832027
388	3 feet	Healthy	445821	3831997	429	8 feet	Healthy	445998	3832044
389	3 feet 2 trunks	Healthy	445883	3832001	430	17 feet	Healthy	445978	3832025
390	16 feet	Healthy	445928	3831989	431	4 feet	Healthy	445983	3832044
391	2 feet	Healthy	445933	3832000	432	12 feet 4 trunks	Healthy	445964	3832029
392	16 feet 2 trunks	Healthy	445950	3832013	433	12 feet	Healthy	445963	3832029
393	2 feet	Healthy	445966	3832012	434	3 feet	Healthy	445963	3832019
394	6 feet	Healthy	445983	3831990	435	14 feet	Healthy	445962	3832038
395	19 feet	Healthy	445982	3832010	436	3 feet	Healthy	445944	3832046
396	10 feet	Healthy	445990	3831995	437	11 feet	Healthy	445893	3832037
397	12 feet	Healthy	446002	3832010	438	5 feet	Healthy	445884	3832020
398	14 feet	Healthy	446017	3831995	439	1 foot	Healthy	445807	3832033
399	3 feet	Healthy	446046	3832004	440	22 feet	Unhealthy	445777	3832052
400	2 feet	Healthy	446043	3832012	441	4 feet	Healthy	446074	3832122

Descriptive Data for 627 Joshua Trees									
No.	Height	Health	Easting	Northing	No.	Height	Health	Easting	Northing
442	4 feet 2 trunks	Healthy	445798	3832043	482	2 feet	Unhealthy	445802	3831843
443	2 feet	Healthy	446066	3832127	483	8 feet	Healthy	445803	3831865
444	2 feet	Unhealthy	446090	3832113	484	12 feet	Healthy	445758	3831859
445	2 feet	Healthy	446103	3832131	485	4 feet	Unhealthy	445801	3831876
446	1 foot	Healthy	446125	3832133	486	9 feet	Healthy	445806	3831863
447	5 feet	Healthy	446114	3832154	487	13 feet	Healthy	445832	3831869
448	10 feet 6 trunks	Unhealthy	446102	3832156	488	9 feet	Healthy	445833	3831875
449	8 feet	Healthy	446074	3832147	489	1 foot	Unhealthy	445888	3831869
450	7 feet	Healthy	446061	3832147	490	2 feet 2 trunks	Unhealthy	445891	3831870
451	15 feet 2 trunks	Healthy	446063	3832145	491	8 feet	Healthy	445913	3831876
452	1 foot	Healthy	446053	3832152	492	5 feet	Unhealthy	445943	3831886
453	15 feet 2 trunks	Healthy	446043	3832148	493	21 feet 4 trunks	Healthy	445983	3831875
454	3 feet	Unhealthy	446010	3832163	494	7 feet	Healthy	445991	3831878
455	4 feet	Healthy	445909	3832155	495	14 feet	Healthy	446005	3831879
456	4 feet	Healthy	445898	3832160	496	16 feet	Healthy	446020	3831881
457	8 feet 2 trunks	Healthy	445889	3832155	497	3 feet	Healthy	446032	3831871
458	10 feet	Healthy	445885	3832143	498	1 foot	Unhealthy	446040	3831866
459	5 feet	Healthy	445832	3832117	499	4 feet	Healthy	446042	3831867
460	6 feet	Healthy	445826	3832156	500	13 feet	Healthy	446054	3831886
461	2 feet	Healthy	445804	3832157	501	18 feet	Healthy	446061	3831871
462	19 feet	Healthy	445761	3832144	502	1 foot	Healthy	446079	3831870
463	4 feet	Unhealthy	445991	3831822	503	17 feet	Unhealthy	446134	3831865
464	5 feet	Healthy	446008	3831825	504	18 feet	Healthy	446136	3831866
465	4 feet	Healthy	446050	3831823	505	8 feet	Healthy	446133	3831898
466	18 feet	Healthy	446071	3831924	506	12 feet	Healthy	446135	3831906
467	18 feet	Healthy	446068	3831832	507	3 feet	Healthy	446126	3831911
468	3 feet	Healthy	446087	3831830	508	3 feet	Healthy	446126	3831914
469	4 feet	Unhealthy	446115	3831812	509	3 feet	Healthy	446124	3831904
470	12 feet	Healthy	446123	3831829	510	8 feet	Healthy	446123	3831910
471	17 feet	Unhealthy	446132	3831841	511	2 feet	Healthy	446125	3831897
472	19 feet	Unhealthy	446137	3831863	512	7 feet	Healthy	446112	3831925
473	20 feet	Healthy	446135	3831864	513	6 feet	Healthy	446109	3831896
474	4 feet	Healthy	446110	3831840	514	8 feet	Healthy	446101	3831905
475	8 feet	Healthy	446077	3831845	515	18 feet	Healthy	446084	3831898
476	19 feet	Healthy	446052	3831847	516	2 feet	Healthy	446080	3831925
477	2 feet	Unhealthy	445935	3831856	517	7 feet	Healthy	446049	3831905
478	3 feet	Healthy	445928	3831861	518	22 feet	Healthy	446006	3831917
479	4 feet	Healthy	445922	3831840	519	4 feet	Unhealthy	445989	3831914
480	3 feet	Healthy	445898	3831854	520	18 feet 4 trunks	Unhealthy	445992	3831893
481	2 feet	Healthy	445862	3831850	521	9 feet	Healthy	445917	3831917

Descriptive Data for 627 Joshua Trees									
No.	Height	Health	Easting	Northing	No.	Height	Health	Easting	Northing
522	14 feet 8 trunks	Unhealthy	445907	3831908	560	2 feet	Unhealthy	446047	3832098
523	2 feet	Healthy	445887	3831912	561	9 feet	Healthy	446030	3832092
524	10 feet	Healthy	445871	3831914	562	3 feet	Healthy	446036	3832082
525	4 feet	Healthy	445782	3832057	563	2 feet	Healthy	446012	3832096
526	14 feet	Healthy	445802	3832063	564	3 feet	Healthy	445997	3832093
527	10 feet	Healthy	445810	3832050	565	3 feet	Healthy	445951	3832086
528	5 feet	Healthy	445826	3832057	566	1 foot	Unhealthy	445951	3832089
529	12 feet	Healthy	445898	3832058	567	2 feet	Healthy	445936	3832102
530	18 feet	Unhealthy	445898	3832061	568	3 feet	Healthy	445862	3832082
531	4 feet	Healthy	445903	3832072	569	8 feet 2 trunks	Healthy	445814	3832081
532	5 feet	Healthy	445903	3832074	570	3 feet	Healthy	445801	3832091
533	1 foot	Unhealthy	445914	3832055	571	16 feet	Unhealthy	445797	3832094
534	3 feet	Healthy	445914	3832068	572	10 feet	Healthy	445782	3832182
535	6 feet	Healthy	445926	3832049	573	8 feet	Healthy	445807	3832172
536	2 feet	Healthy	445943	3832051	574	10 feet	Healthy	445822	3832173
537	8 feet	Healthy	445958	3832072	575	4 feet 2 trunks	Healthy	445839	3832181
538	10 feet	Healthy	445957	3832057	576	4 feet	Unhealthy	445841	3832182
539	12 feet	Healthy	445968	3832061	577	6 feet	Healthy	445890	3832171
540	8 feet	Healthy	445968	3832046	578	3 feet	Healthy	445888	3832186
541	3 feet 2 trunks	Unhealthy	445982	3832068	579	14 feet	Healthy	445935	3832195
542	15 feet	Healthy	445996	3832061	580	4 feet	Healthy	445969	3832166
543	1 foot	Unhealthy	445988	3832051	581	12 feet	Healthy	445995	3832177
544	18 feet	Unhealthy	446008	3832057	582	8 feet	Healthy	446000	3832177
545	17 feet	Unhealthy	446011	3832068	583	1 foot	Healthy	446024	3832175
546	8 feet	Healthy	446002	3832046	584	12 feet	Healthy	446022	3832167
547	3 feet	Healthy	446026	3832053	585	10 feet	Unhealthy	446052	3832167
548	2 feet	Unhealthy	446026	3832061	586	12 feet	Healthy	446064	3832167
549	18 feet	Unhealthy	446050	3832049	587	8 feet	Unhealthy	446127	3832182
550	8 feet	Healthy	446062	3832053	588	14 feet	Healthy	446087	3832205
551	14 feet 2 trunks	Healthy	446078	3832055	589	13 feet	Healthy	446028	3832210
552	17 feet 3 trunks	Healthy	446087	3832064	590	4 feet	Healthy	446039	3832219
553	3 feet	Unhealthy	446139	3832081	591	8 feet	Healthy	445988	3832222
554	2 feet	Unhealthy	446138	3832091	592	14 feet	Healthy	445933	3832198
555	5 feet	Healthy	446128	3832103	593	12 feet 2 trunks	Healthy	445930	3832222
556	6 feet	Healthy	446119	3832080	594	8 feet	Healthy	445905	3832216
557	3 feet	Healthy	446091	3832091	595	4 feet	Healthy	445889	3832213
558	15 feet	Healthy	446059	3832093	596	14 feet 5 trunks	Healthy	445858	3832211
559	3 feet	Healthy	446046	3832082	597	5 feet	Healthy	445818	3832218

<b>Descriptive Data for 627 Joshua Trees</b>				
<b>No.</b>	<b>Height</b>	<b>Health</b>	<b>Easting</b>	<b>Northing</b>
598	5 feet	Healthy	445814	3832222
599	3 feet	Healthy	445794	3832223
600	2 feet	Unhealthy	445778	3832218
601	3 feet	Healthy	445778	3832221
602	20 feet	Unhealthy	445790	3832245
603	13 feet	Unhealthy	445790	3832238
604	3 feet	Healthy	445814	3832247
605	2 feet 2 trunks	Unhealthy	445905	3832229
606	3 feet	Healthy	445917	3832242
607	4 feet	Unhealthy	445998	3832236
608	8 feet	Healthy	446028	3832238
609	3 feet	Unhealthy	446056	3832228
610	14 feet 3 trunks	Healthy	446082	3832242
611	13 feet 2 trunks	Unhealthy	446138	3832239
612	6 feet	Healthy	446140	3832278
613	14 feet	Healthy	446137	3832270
614	2 feet	Healthy	446110	3832268
615	6 feet 3 trunks	Healthy	446085	3832269
616	8 feet	Healthy	445798	3832282
617	2 feet	Healthy	445818	3832264
618	8 feet	Healthy	445831	3832270
619	1 foot	Unhealthy	445836	3832265
620	4 feet	Healthy	445911	3832263
621	3 feet	Healthy	445922	3832275
622	15 feet 2 trunks	Healthy	445926	3832274
623	12 feet	Healthy	445962	3832262
634	2 feet	Healthy	446008	3832276
625	9 feet	Unhealthy	446016	3832275
626	10 feet	Healthy	446032	3832275
627	4 feet	Healthy	446042	3832271

