

EAGLE MOUNTAIN PUMPED STORAGE PROJECT

2016 DESERT TORTOISE SURVEY

Submitted to:

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1.0 Background

Eagle Crest Energy Company (ECE) proposes to develop the Eagle Mountain Pumped Storage Hydroelectric Project (Project) at the former Kaiser Mine at the base of the Eagle Mountains, approximately 16 km (10 mi) northwest of Desert Center, Riverside, California. The proposed Project will use two existing mining pits, pumping water from a lower pit/reservoir to an upper pit/reservoir during periods of low demand to generate energy during periods of high demand and as needed to maintain transmission system reliability. The Project was licensed by the Federal Energy Regulatory Commission (FERC) in 2014 and a U.S. Fish and Wildlife (USFWS) Biological Opinion and California Department of Fish and Wildlife (CDFW) Consistency Determination were issued in 2012 (USFWS 2012, CDFW 2012).

Comprehensive surveys for special-status plants and wildlife, including desert tortoise (*Gopherus agassizii*), were conducted on the alternative and final linear features in 2008, 2009, and 2010 (FERC 2011). At that time, we were unable to conduct surveys on the main project site (“Central Project Area” [CPA]) because it was owned by Kaiser, who would not permit access. Eagle Mountain LLC, an ECE affiliate, now owns the Kaiser Mine property. Consequently, and in accordance with the Project Biological Opinion (BO; United States Fish and Wildlife Service [USFWS] 2012) and Consistency Determination (CD; California Department of Fish and Wildlife [CDFW] 2012), we conducted desert tortoise surveys on the CPA in May 2016 to further evaluate the potential Project impacts to desert tortoises and refine, as appropriate, the approved mitigation measures (FERC 2011, 2012 and USFWS 2012). Further, because the surveys on the linear Project elements were six years old, we repeated those surveys.

2.0 Project Description and Setting

2.1 Project Facilities

Project details can be found in FERC (2011 and 2012), but the following narrative summarizes the facilities (Figure 2):

- The 1,101.5-acre hydropower plant or CPA includes: (1) two roller-compacted dams at the upper reservoir at heights of 60 feet and 120 feet; (2) an upper reservoir with capacity of 20,000 acre-feet; (3) a lower reservoir with capacity of 21,900 acre-feet; (4) inlet/outlet (I/O) structures; (5) water conveyance tunnels consisting of a 4,000-foot-long by 29-foot-diameter upper tunnel, 1,390-foot-long by 29-foot-diameter shaft, a 1,560-foot-long by 29-foot-diameter lower tunnel, four 500-foot-long by 15-foot-diameter penstocks leading to the powerhouse, and a 6,835-foot-long by 33-foot-diameter tailrace tunnel to the lower reservoir; (6) surge control facilities; (7) a 72-foot-wide, 150-foot-high, and 360-foot-long underground powerhouse with four Francis-type turbine units;

(8) water supply facilities including a reverse osmosis (RO) system; (9) access roads; and (10) appurtenant facilities.

- A double circuit, 500 kV transmission line will extend along the FERC recommended alternative, approximately 16.4 miles from the Project switchyard to the FERC-recommended new Interconnection Collector Substation (Red Bluff Substation) southeast of Desert Center, for interconnection to the Devers-Palo Verde 500-kV line owned by Southern California Edison (SCE). The total right-of-way (ROW) area required for permanent and temporary disturbance, based on a width of 200 feet, is 400.5 acres, including stub roads; at least 97.6 acres will be on lands previously developed for agriculture. Access will be via the existing access road for SCE's 161 kv transmission line, which is aligned with the Project transmission line for most of its route; stub roads will lead to the individual tower pads.
- A 15.3-mile long water pipeline will connect the CPA to three groundwater wells approximately 11 miles southeast of the CPA. The pipeline route lies along Kaiser Road, SCE's 161-kv line, Highway 177, or other existing development for its entire length. The construction ROW will be 60 feet, for a total of 55.6 acres of temporary surface disturbance, at least 34.7 acres of which will be on lands previously developed.

2.2 Environmental Setting

Central Project Area

The CPA lies within mountainous terrain in the footslopes of the Eagle Mountains and has been disturbed extensively by historic mining activity (Figure 2). Inactive open pits, tailings piles, and remnant tailings ponds exist throughout the site. Remnants of the structures associated with the previous iron mining - railhead, haul roads, and ore processing/refining facilities - still exist, though most of the ore processing and refining facilities have been removed. The lower reservoir is bordered by several bladed basins that appear to be composed primarily of clay, which both holds water during summer monsoons and provides no substrate for burrowing. Sparse regrowth of some shrubs, often non-native (e.g., tamarisk [*Tamarix* sp.]) occurs in most of these basins, while far less so in the rock and alluvium reservoirs. Tailings berms border most roads and basins on the CPA. Densely bouldery, tall and steep, they limit access for many terrestrial species to much of the CPA. The largely vacant and deteriorating town of Eagle Mountain (currently housing two caretakers) is a 460-acre townsite adjacent to the CPA. It still operates the Eagle Mountain School, which serves the rural Chuckwalla Valley and local communities. The town is serviced by public utilities, and a wastewater treatment plant located southeast of the town. Based on descriptions in an earlier Biological Assessment for the formerly proposed Kaiser Landfill (RECON 1992), and aerial photos (Google Earth Pro[®]), there are no changes in the amount of disturbed habitat in the past 25 years.

With the potential¹ exception of the brine ponds and a portion of the transmission line west of the brine ponds, all of the construction, including access roads, will occur in previously disturbed areas. There is little native habitat bordering the CPA except in the west, where Eagle Creek, a

¹ These may be moved to previously disturbed areas now that Eagle Mountain, LLC, owns the entire property and no the landfill project has been eliminated.

broad, cobbly wash, incises a cobbly alluvial fan south of the access road to the upper reservoir. Low mountains in this area occur adjacent to the Project footprint, although those to the north are heavily disturbed by historic mining. In the east, the nearest native habitat lies outside the Eagle Mountain, LLC, boundary, well beyond the Project footprint, and has been moderately disturbed by surface mining activities and construction of the Colorado River Aqueduct.

The proposed brine ponds are sited in the curve of the former railroad (Figure 2), immediately south of the townsite. This site is native, but patchily disturbed by old grading that accommodated the construction of the elevated railroad berm. The terrain comprises a gently undulating bajada with several large arboreal washes and many smaller channels that are blocked from entering and exiting the area by the railroad berm. Substrates are gravelly, with 10-20% cobbles and small boulders in the south, and broad, well-developed desert pavement in the northern third. Sonoran Creosote Bush Scrub (after Holland 1986) is the basic native plant community in the north; well-developed Desert Dry Wash Woodland characterizes the south. Aspect-dominant plants in the latter include creosote bush (*Larrea tridentata*) and blue palo verde (*Cercidium floridum*). Common shrubs in the woodland include desert lavender (*Hyptis emoryi*), indigo bush (*Psoralea schottii*), burro bush (*Ambrosia dumosa*), white rhatany (*Krameria bicolor*), and sweetbush (*Bebbia juncea*). The less riparian habitat in the north is dominated by creosote bush and burro bush, with less common brittlebush (*Encelia farinosa*) and diamond cholla (*Cylindropuntia ramosissima*). Foxtail cactus (*Coryphantha alversonii*), a California Native Plant Society (CNPS) watchlist species (CNPS 2016), is common throughout.

Linear Features

The linear features for the Project (water pipeline and transmission line) extend from the CPA, at the edge of the Eagle Mountains, into the adjacent Chuckwalla Valley, via a gently sloping bajada. As with the brine ponds site, Sonoran Creosote Bush Scrub and Desert Dry Wash Woodland intersect the linears. The variations of Sonoran Creosote Bush Scrub that occur in the Project vicinity are dominated by creosote bush and burro bush. Common elements variously include brittlebush, white rhatany, indigo bush, chollas (*Cylindropuntia echinocarpa*, *C. ramosissima*, and occasionally *C. bigelovii*), and ocotillo (*Fouquieria splendens*). Desert Dry Wash Woodland in the Project area is found on broad plains of contiguous, braided runnels (i.e., sheet flow) with intermittent, well-defined washes. For the latter, the wash banks and islands are densely vegetated with aphyllous or microphyllous trees, primarily blue palo verde and ironwood (*Olneya tesota*), with occasional to common smoke tree (*Psoralea spinosus*) and catclaw (*Senegalia greggii*). In the sheeting areas, the tree species typically found in arboreal drainages are, instead, aspect-dominant elements of the landscape and appear to be homogeneous across the landscape, forming a desert “woodland.” Other common wash associates – desert lavender, cheesebush (*Ambrosia salsola*), galleta grass (*Hilaria rigida*), desert peach (*Prunus fasciculatum*), chuparosa (*Justicia californica*), and jojoba (*Simmondsia chinensis*) grow in both the arboreal drainages as well as the less distinct runnels.

Drainage patterns reflect the local topography. Along the broad bajada traversed by the Project’s linear facilities, drainage is primarily characterized both by scattered, well-defined washes and networks of numerous narrow runnels (sheet flow). The former are several-yards-wide, sandy to cobbly drainages that carry periodic runoff to a regional drainage. They are often incised, from a half to several yards deep, and vegetated along the banks by both shrubs and trees. By contrast,

the numerous, shallow runnels are typically only a yard or less wide, 1 to a few inches deep, and irregularly vegetated by locally common shrub species. Where there is greater runoff into these runnels, arboreal elements commonly seen in the larger washes are also present, albeit in a stunted form. These small channels often fail to either flow or provide through-flow to larger drainages. Sheet flow is evident across those bajadas where overland flows result from a combination of heavy precipitation, low permeability surface conditions, and local topography; the substrates there tend to be more gravelly than non-sheeting habitats due to the hydrologic transport of materials. East of the Project in Chuckwalla Valley percolation into the plain or nearby playa occurs where slopes are negligible.

The presence of coarse particles in the substrate varies and is largely dependent on the proximity of the Project to mountains and attendant hydrologic forces. Hence, boulders and cobbles are common in the upper bajadas and toeslopes with smaller particles downslope. Desert pavement is intermittently present along the bajada. Soils generally range from soft sand to coarse-sandy loams. Elevations range from approximately 500 to 1,300 feet.

The majority of the lands immediately surrounding the Project are undeveloped, public lands managed by the BLM. However, several land uses exist in the Project vicinity (Figure 2), the most recent of which is the Desert Sunlight Solar Project along Kaiser Road, and the Red Bluff Substation. The small communities of Lake Tamarisk and Desert Center are located approximately nine and ten miles southeast of the CPA along the Kaiser Road; several individual, largely abandoned dwellings are scattered along the Project route. Other small developments in the Project vicinity include the Metropolitan Water District (MWD) pumping plant and Colorado River Aqueduct, two small airports, a small disposal site west of Lake Tamarisk, and several small gravel pits. Irrigated crops, especially jojoba, were previously farmed on approximately 5000 acres, fewer than 1000 acres remain in agricultural production, mostly for citrus and dates. The linears cross through several abandoned agricultural fields and no active fields.

The principal transportation network in the Project vicinity includes Interstate (I) 10, State Route (SR) 177, local paved roads and dirt roads. The abandoned Eagle Mountain Rail Line, which once serviced the Kaiser Iron Ore Mine operation, runs through the area from I-10 north to the CPA. Several existing transmission lines cross the Project vicinity

Joshua Tree National Park (JTNP or Park) surrounds the CPA on three sides; the Park boundary is located about 2 to 3 miles from the CPA (Figure 3-4). JTNP encompasses nearly 792,000 acres of land of which approximately 700,000 acres have been designated Wilderness.

3.0 METHODS

3.1 Desert Tortoise

On the linear Project elements, surveys adhered to the currently accepted, standardized FWS protocol: 100% coverage in the Right-of-Way (ROW; ~60 m [200 ft] for the transmission line, ~20 m [60 ft] for the pipeline) using 10 meter-wide transects, and a single buffer transect at 200, 400 and 600 m from the ROW, where tortoise habitat was present. Buffer surveys were

completed on all desert tortoise habitat except the few properties that were occupied or potentially occupied by people. (Those were mostly highly disturbed anyway.) No ROW or buffer surveys were conducted where agricultural, residential, or industrial development had intensively altered the surface, as these were not desert tortoise habitat.

The CPA presented a special situation because of the extensive surface disturbance from decades of intensive mining. All Project disturbance will occur on previously disturbed surfaces that are not tortoise habitat, with the exception of the brine ponds, some monitoring wells, and the transmission line. Even though tortoises might not inhabit most of the Project footprint, a remote possibility exists that tortoises might access the site from native habitats offsite and potentially be harmed during construction or operations. Generally, access is severely restricted by steep, slopes of cobble and boulder tailings. In some parts of the site, such as the lower reservoir, these tailings slopes plus contiguous piles of cobble and boulders onsite, and multiple poorly vegetated, graded basins render access to the construction areas highly unlikely. However, to maximize the evaluation of even occasional tortoise access to Project construction areas, we surveyed adjacent habitats that might be occupied. For the lower pit and associated construction roads, we completed 100% coverage surveys in the basin southeast of the construction area and lower pit (Figure 2). While well outside the construction footprint (including roads), this basin has relatively undisturbed native habitat and a couple of potential access points along the southwestern tailings pile. For comparison, we also conducted three buffer transects in the adjacent native habitat outside this basin. In the mountainous western portion of the CPA, tortoises may be present, especially south of the site, but at very low densities. The likelihood of occupation decreases onsite and continuing north, where the mountains become taller and steeper. We surveyed 100% of the best tortoise habitat in this area, the Eagle Creek drainage south of the Project footprint. Our surveys extended for roughly 500 m from the Project, and included following all channels into the mountains. We also walked two meandering transects in the mountains on both sides of the main access road to the upper reservoir, at roughly 200 m intervals (Figure 2). In the mountains west of the reverse osmosis system brine ponds site and railroad, we had intended to survey 100% of a fairly broad drainage that flows out of the mountains, but found that it had been entirely bladed and gravel imported during mining operations. There was no original topography or surface remaining. Hence, we only surveyed this area with buffer transects.

The brine ponds are currently sited in native habitat adjacent to both disturbed and native areas. We surveyed 100% of the brine pond site, extending this coverage beyond the brine ponds to the railroad to include those portions of the transmission line inside the railroad berm and to provide a more complete evaluation of tortoise presence in the vicinity of the brine pond (Figure 2).

All monitoring wells and their access roads that were not completely bladed were surveyed at 100% coverage.

During the surveys, all tortoise sign (tortoises, burrows, shells, scat, tracks, drinking depressions) observed was measured, mapped, and described relative to condition, age and, if possible, gender. No tortoises were touched. Any tortoises observed were assessed for size, gender and clinical health signs if this could be achieved without touching or otherwise harassing the tortoise, and the location (e.g., aboveground, visible in burrow, not visible in burrow) recorded. Shells and shell parts that were observed were evaluated relative to the cause of death, in addition to factors listed above. Current and recent weather conditions were recorded. All

incidental sightings of common ravens, other known tortoise predators, and other site features (e.g., anthropogenic influences) that could assist in the analysis of tortoise population impacts were recorded and mapped. Mapping was achieved using handheld Global Positioning System (GPS) units. All transect data were recorded on specially-designed forms (Attachment 1) and representative areas photographed. Surveys were conducted from 13-26 May when air temperatures were below 40° Celsius (104° Fahrenheit), in accordance with FWS (2010) survey protocols. All survey biologists were extremely experienced tortoise biologists: Alice Karl, Ph.D., lead biologist and principal investigator, Paul Frank, MaryAnn Hasskamp, Jenny Weidensee, Dave Focardi, and Art Schaub.

Lead personnel from USFWS and the Bureau of Land Management [BLM] approved these methods prior to the surveys (M. Massar, BLM, pers. comm. to G. Gillin, GEI Consultants, 2016).

3.2 Other Special-Status Species

While the focus of these surveys was on desert tortoises, we recorded observations of other special-status or protected species (Table 1), their sign (e.g., scat, tracks, bones, feathers, nests), and their habitats (e.g., water sources, nesting habitat) to augment observations from prior surveys. Due to the survey focus on ground surfaces, terrestrial species were the most likely to be seen (e.g., desert kit fox [*Vulpes macrotis*], burrowing owl [*Athene cunicularia*], desert bighorn sheep [*Ovis canadensis nelsoni*], American badger [*Taxidea taxus*]), but any avian species (e.g., golden eagle [*Aquila chrysaetos*], Swainson's hawk [*Buteo swainsoni*], loggerhead shrike [*Lanius ludovicianus*], summer tanager [*Piranga rubra*]) observed were recorded. There is already a substantial data set on terrestrial animals in the valley, and many are known to be in the Project area, so we limited our data collection to individuals of any species, bighorn sheep and burro deer scat, burrowing owl burrows, and kit fox den complexes (i.e., potential natal dens); the latter two were recorded in the 100% coverage areas only.

For plants, which do not exhibit the dynamic location changes exhibited by wildlife, observations were restricted to areas not previously surveyed. Further, since the rare Winter 2015-16 storms in the Project area resulted in negligible germination of herbaceous and annual species, these observations were limited to shrubs and the stouter herbaceous perennials (e.g., crucifixion thorn [*Castela emoryi*], Cove's cassia [*Senna covesii*], desert unicorn plant [*Proboscidea althaeifolia*], Las Animas colubrina [*Colubrina californica*], spiny abrojo [*Condalia globosa* var. *pubescens*], desert beardtongue [*Penstemon pseudospectabilis*]). Foxtail cactus, even though a CNPS List 4 species (watchlist), was not included because of its extreme commonness in the area.

3.3 Habitat Mapping and Special Habitats

The topography, drainage patterns, soils, substrates, plant cover, and aspect-dominant, common and occasional plant species were previously described and mapped on the linear Project elements during surveys from 2008 through 2010. Vegetation communities considered sensitive by Bureau of Land Management (BLM) or special by CDFW (e.g., rare California Natural Diversity Data Base [CNDDB] Natural Communities or those with a G or S rank 1-3) or otherwise special (i.e., potential habitat for special-status species) were recorded. This was continued in 2016 on all ROW and buffer transects, with the understanding that surveys for summer-blooming species, will be conducted by botanists when and if adequate summer

precipitation occurs, as described in the approved Special-Status Plants Protection Plan (ECE 2015a). At that time, any changes in special natural communities since 2010 also will be noted.

TABLE 1. Potential for Special Status Species to Occur on the Project¹

Species	Status ²			Habitat	Likelihood of Occurrence on the Project Site Based on Habitat, Known Occurrences, and Survey Results from All Years
	Federal	State	CNPS ³ or Other Organization		
Plants					
Abrams's Spurge (<i>Euphorbia abramsiana</i>)	---	---	2B.2	Sandy sites in Mojavean and Sonoran Desert scrubs in eastern California; 0-3000 ft	Possible along the water pipeline; fall flowering
Arizona Spurge (<i>Euphorbia arizonica</i>)	---	---	2B.3	Sandy flats in Sonoran Desert scrubs, below ~1000 ft	Possible along the water pipeline; not observed
Ayenia (<i>Ayenia compacta</i>)	---	---	2B.3	Sand and gravelly washes and canyons in desert scrubs, 450-3600 ft	Possible around the CPA; not observed.
California Ditch (<i>Ditaxis serrata</i> var. <i>californica</i>)	---	---	3.2	Sonoran Creosote Bush Scrub from 100 to 3000 ft	Observed on both linear ROWs
Coachella Valley Milkvetch (<i>Astragalus lentiginosus</i> var. <i>coachellae</i>)	E BLM Sensitive	---	1B.2	Loose to soft sandy soils, often in disturbed sites; 100 to 2200 ft	Highly unlikely – little to no habitat on Project and local reported populations appear to have been misidentified; not observed
Coue's Cassia (<i>Senna covesii</i>)	---	---	2B.2	Dry washes and slopes in Sonoran Desert scrubs; 1000 to 3500 ft	Possible, especially on the bajadas and on/near the CPA. Species not observed
Crucifixion Thorn (<i>Castela emoryi</i>)	---	---	2B.2	Mojavean and Sonoran Desert scrubs; typically associated with drainages	Observed on the water pipeline
Darlington's Blazing Star (<i>Menzelia puberula</i>)	---	---	2B.2	Creosote Bush Scrub, generally among boulders but also in open, sandy areas; 300-4000 ft.	Possible, especially near the mountains; not observed
Desert Beardtongue (<i>Penstemon psuedospectabilis psuedospectabilis</i>)	---	---	2B.2	Gravelly and rocky washes in Creosote Bush Scrub and Pinyon Juniper Woodland, often near mountains; below 6000 ft	Possible, especially near the mountains; not observed
Desert Sand-parsley (<i>Spermolepis gigantea</i>)	---	---	2B.1	Sonoran Desert scrub; known from only one site, near Hayfield Dry Lake, at 1200 ft; last seen in 1922	Highly unlikely; not observed

Species	Status ²			Habitat	Likelihood of Occurrence on the Project Site Based on Habitat, Known Occurrences, and Survey Results from All Years
	Federal	State	CNPS ³ or Other Organization		
Desert Unicorn Plant (<i>Proboscidea altheaefolia</i>)	---	---	4.3	Sandy areas in Sonoran Desert scrubs throughout southeastern California, below 3300 ft.	Observed near the well sites; possible throughout the valley
Dwarf Germander (<i>Teucrium cubense depressum</i>)	---	---	2B.2	Sandy soils, washes, playa edges, and fields in Sonoran Desert scrubs, below 1300 ft.	Possible on the water pipeline, in the valley; not observed
Flat-seeded Spurge (<i>Euphorbia platysperma</i>)	BLM Sensitive	---	1B.2	Sandy flats and dunes in Sonoran Desert scrubs; below 350 ft; may be extirpated in CA	Possible on the water pipeline, in the valley; not observed
Foxtail Cactus (<i>Coryphantha alversonii</i>)	---	---	4	Primarily rocky substrates between 250 and 4000 ft. Creosote Bush Scrub	Observed on both linear ROWs
Glandular Ditaxis (<i>Ditaxis claryana</i>)	---	---	2B.2	Sandy flats in Mojavean and Sonoran Creosote Bush scrubs in Imperial, San Bernardino, and Riverside counties; below 1500 ft	Possible; not observed
Harwood's Eriastrum (<i>Eriastrum harwoodii</i>)	---	---	1B.2	Range restricted to loose-sandy areas of eastern Riverside and San Bernardino counties	Unlikely due to lack of habitat; not observed
Harwood's Milkvetch (<i>Astragalus insularis</i> var. <i>harwoodii</i>)	---	---	2B.2	Dunes, windblown sands, and soft sands below 1200 ft., east and south of Desert Center	Unlikely, no apparent habitat; not observed
Jackass Clover (<i>Wislizenia refracta</i> var. <i>refracta</i>)	---	---	2B.2	Sandy washes, roadsides, flats; 1900 to 2700 ft	Unlikely due to lack of habitat; not observed
Las Animas Colubrina (<i>Colubrina californica</i>)	---	---	2B.3	Sonoran Creosote Bush Scrub, <3300 ft	Possible on/near the CPA; not observed.
Mesquite Neststraw (<i>Stylocline sonorensis</i>)	---	---	2A	Open sandy drainages; known from one site near Hayfield Spring; not seen since 1930 and presumed extinct in California	Highly unlikely; not observed
Orocopia Sage (<i>Saliva greatae</i>)	BLM Sensitive	---	1B.3	Mojavean and Sonoran Desert scrubs; gravelly/rocky bajadas, mostly near washes; below 3000 ft; only known west of the Project	Unlikely but possible near or on the CPA. Reported south of the CPA in earlier surveys but not observed in 2008 and 2009 on the linear ROWs
Roughstalk Witch Grass (<i>Panicum hirticaule hirticaule</i>)	---	---	2B.1	Silty depressions in Creosote Bush Scrub; 120-4000 ft.	Possible; not observed; summer-blooming annual.

Species	Status ²			Habitat	Likelihood of Occurrence on the Project Site Based on Habitat, Known Occurrences, and Survey Results from All Years
	Federal	State	CNPS ³ or Other Organization		
Sand Evening Primrose (<i>Chylisma arenaria</i>)	---	---	2B.2	Sandy washes, rocky slopes, Sonoran desert scrubs; below 1500 (3500?) ft	Poss ble; not observed
Slender Woolly-heads (<i>Nemacaulis denudata</i> var. <i>gracilis</i>)	---	---	2B.2	Dunes in coastal and Sonoran Desert scrubs, primarily in the Coachella Valley; below 1500 ft	No habitat; not observed
Spearleaf (<i>Matelea parvifolia</i>)	---	---	2B.3	Rocky ledges and slopes, 1000 to 6000 ft, in Mojave and Sonoran Desert scrubs	Poss ble near or on the CPA
Spiny Abrojo (<i>Condalia globosa</i> var. <i>pubescens</i>)	---	---	4.2	Sonoran Creosote Bush Scrub; 500 to 3300 ft	Poss ble; not observed
Invertebrates					
Cheeseweed Owlfly (<i>Oliarces clara</i>)	---	---	---	Creosote bush scrub in rocky areas	Poss ble, especially near the CPA
Amphibians					
Couch's Spadefoot (<i>Scaphiopus couchii</i>)	BLM Sensitive	SSC	---	Various arid communities in extreme southeastern California and east, south	Poss ble on entire Project; no artificial impoundments
Reptiles					
Desert Rosy Boa (<i>Charina trivirgata gracia</i>)	---	---	---	Rocky uplands and canyons; often near stream courses	Poss ble, especially near the CPA
Mojave Fringe-toed Lizard (<i>Uma scoparia</i>)	BLM Sensitive	SSC	---	Restricted to aeolian sandy habitats in the Mojave and northern Sonoran deserts	Does not occur on Project due to lack of habitat
Desert Tortoise (<i>Gopherus agassizii</i>)	T	T	---	Most desert habitats below approximately 5000 ft in elevation	Observed on linears in all years. On CPA in outlying areas only (brine ponds).
Birds					
American Peregrine Falcon (<i>Falco peregrinus anatum</i>)	Delisted BCC	Delisted Fully Protected	---	Dry, open country, including arid woodlands; nests in cliffs	Poss ble forager onsite, may nest in adjacent mts.; not observed
Bendire's Thrasher (<i>Toxostoma bendirei</i>)	BCC BLM Sensitive	SSC	ABC:WL BCC	Arid to semi-arid brushy habitats, usually with yuccas, cholla, and trees	Poss ble; not observed

Species	Status ²			Habitat	Likelihood of Occurrence on the Project Site Based on Habitat, Known Occurrences, and Survey Results from All Years
	Federal	State	CNPS ³ or Other Organization		
Burrowing Owl (<i>Athene cunicularia</i>)	BCC BLM Sensitive	SSC	---	Open, arid habitats	Observed. Habitat exists throughout the Project, although minimally on the CPA.
Crissal Thrasher (<i>Toxostoma crissale</i>)	---	SSC	---	Dense mesquite and willows along desert streams and washes	Unlikely; no habitat; not observed
Ferruginous Hawk (<i>Buteo regalis</i>)	BCC	WL	---	Arid, open country	Possible winter resident only
Gila Woodpecker (<i>Melanerpes uropygialis</i>)	BCC BLM Sensitive	E	---	Desert woodland habitats	Possible; not observed
Golden Eagle (<i>Aquila chrysaetos</i>)	BCC BLM Sensitive	WL Fully Protected	---	Open country; nests in large trees in open areas or cliffs	Possible forager on site, may nest in adjacent mts. Observed in 2008 and in focused Project surveys and surveys by others in Chuckwalla Valley.
Loggerhead Shrike (<i>Lanius ludovicianus</i>)	BCC	SSC	---	Arid habitats with perches	Common; observed
Mountain Plover (<i>Charadrius montanus</i>)	BCC BLM Sensitive	SSC	ABC:WLBCC	Dry upland habitats, plains, bare fields	Unlikely, but possible winter visitor to agricultural fields in the Project area
Northern Harrier (<i>Circus cyaneus</i>)	---	SSC	---	Open habitats; nests in shrubby pen land and marshes	Possible; not observed
Prairie Falcon (<i>Falco mexicanus</i>)	BCC	WL	---	Dry, open country, including arid woodlands; nests in cliffs	Likely forager on site, may nest in adjacent mts.; not observed
Short-eared Owl (<i>Asio flammeus</i>)	---	SSC	ABC:WLBCC	Open habitats: marshes, fields; nests on ground and roosts on ground and low poles	Possible winter visitor
Sonoran Yellow Warbler (<i>Dendroica petechia sonorana</i>)	BCC	SSC	---	Riparian habitats, woodlands, orchards	Possible - no habitat but reported at Kaiser town site reservoir; not observed during Project surveys
Summer Tanager (<i>Piranga rubra</i>)	---	SSC	---	Breeds in relatively dense riparian woodlands	No habitat on or adjacent to the Project; possible as a migrant.

Species	Status ²			Habitat	Likelihood of Occurrence on the Project Site Based on Habitat, Known Occurrences, and Survey Results from All Years
	Federal	State	CNPS ³ or Other Organization		
Swainson's Hawk (<i>Buteo swainsoni</i>)	BCC BLM Sensitive	T	---	Only known desert breeding sites are near the Sierra Nevadas in Lancaster, CA.	Observed migrating.
Vermilion Flycatcher (<i>Pyrocephalus rubinus</i>)	---	SSC	---	Wooded and shrubby sites near water, especially with willows, mesquite and cottonwoods	Highly unlikely except as transient - no habitat; not observed
Yellow-breasted Chat (<i>Icteria virens</i>)	---	SSC	---	Dense streamside thickets, willows; brushy hillsides and canyons	Highly unlikely except as transient - no habitat; transients observed in area on two previous surveys, but not observed during Project surveys
Mammals					
American Badger (<i>Taxidea taxus</i>)	---	SSC	---	Many habitats	Observed in multiple years.
Big Free-tailed Bat (<i>Nyctinomops macrotis</i>)	---	SSC	WBWG:MH	Cliffs and rugged rocky habitats in arid, country, also riparian woodlands	Possible forager on site, especially near mountains
Burro Deer (<i>Odocoileus hemionus eremicus</i>)	---	Game Species	---	Arboreal and densely vegetated drainages	Observed
California Leaf-nosed Bat (<i>Macrotus californicus</i>)	BLM Sensitive	SSC	WBWG:H	Lowland desert associate, found in caves, mines, tunnels and old buildings	Known from Kaiser Mine so possible near or on the CPA
Colorado Valley Woodrat (<i>Neotoma albigula venusta</i>)	---	---	---	Under mesquite in creosote bush scrub; southeastern California	Possible
Desert Bighorn Sheep (<i>Ovis canadensis nelsoni</i>)	BLM Sensitive	Fully Protected	---	In mountains and adjacent valleys in desert Scrub	Observed throughout the mountains on the CPA
Desert Kit Fox (<i>Vulpes macrotis</i>)	---	Protected Furbearer	---	Many desert habitats; widespread.	Common throughout the Project, especially on the linears; observed.
Mountain Lion (<i>Puma concolor browni</i>)	---	SSC	---	Colorado River bottomlands	Possible
Pallid Bat (<i>Antrozous pallidus</i>)	BLM Sensitive	SSC	WBWG:H	Several desert habitats	Possible, primarily near the CPA but also along the linears; detected on previous surveys

Species	Status ²			Habitat	Likelihood of Occurrence on the Project Site Based on Habitat, Known Occurrences, and Survey Results from All Years
	Federal	State	CNPS ³ or Other Organization		
Pocketed Free-tailed Bat (<i>Nyctinomops femorosaccus</i>)	---	SSC	WBWG:M	Variety of arid areas in pinyon-juniper woodland, desert scrubs, palm oases, drainages; always near rocky areas	Possible near the CPA
Spotted Bat (<i>Euderma maculatum</i>)	BLM Sensitive	SSC	WBWG:H	Arid scrub and grasslands, to coniferous forests, roosts in cliffs, forages along streams and in woodlands, fields	Possible near the CPA
Townsend's Big-eared Bat (<i>Corynorhinus townsendii</i>)	BLM Sensitive	Candidate T SSC	WBWG:H	Broad habitat associations. Roosts in caves and manmade structures; feeds in trees	Possible, primarily near the CPA and transmission line; detected on previous surveys
Western Mastiff Bat (<i>Eumops perotis californicus</i>)	BLM Sensitive	SSC	WBWG:H	Cliffs, trees, tunnels, buildings in desert scrub	Highly likely near/on the CPA; detected on previous surveys

1/ See text for method of determination of those species potentially in project area.

2/ Source: California Department of Fish and Game Wildlife and Habitat Data Analysis Branch, <http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/> (2016)

Applicable Status codes are as follows:

E	Endangered
T	Threatened
Federal C	Candidate species for listing
Federal SC	Species of Special Concern (species whose conservation status may be of concern to the USFWS, but have no official status [formerly C2 species])
Federal BCC	USFWS Bird of Conservation Concern
State SSC	CDFG Species of Special Concern (species that appear to be vulnerable to extinction)
State Protected	Species that cannot be taken without a permit from the CDFG
State Fully Protected	Species that cannot be taken without authorization from the Fish and Game Commission
State WL	Watchlist species: species that are not SSC, state-listed, or fully protected (Note: State WL species have not been included in this table if they have no other protection designation.)
BLM Sensitive	Species under review, rare, with limited geographic range or habitat associations, or declining. BLM policy is to provide the same level of protection as USFWS candidate species

3/ CNPS :
 Rank 1A - Plants presumed extinct in California
 Rank 1B - Plants rare and endangered in California and elsewhere
 Rank 2 - Plants rare and endangered in California but more common elsewhere
 Rank 3 - Plants about which CNPS needs more information
 Rank 4 - Plants of limited distribution
 (Note: CNPS lists 1 and 2 require CEQA consideration.)
 Decimal place extensions represent threats ranking, from seriously endangered in California (.1) to not very endangered in California (.3)

ABC:WLBCC = American Bird Conservancy United States Watchlist of Birds of Conservation Concern

WBWG = Western Bat Working Group (<http://wbwg.org>)

H – High Priority – These species should be considered the highest priority for funding, planning, and conservation actions.

M – Medium Priority – These species warrant closer evaluation, more research, and conservation actions of both the species

and the threats
L – Low Priority – Most of the existing data support stable populations of the species and that the potential for major changes in status is unlikely

4.0 RESULTS

4.1 Desert Tortoise

Central Project Area

Part of a single tortoise shell was found in the Eagle Creek drainage, approximately 350 m south of the construction access road and over 2 km from the upper reservoir (Figure 3-1, Table 2). It was the only tortoise sign found in the western part of the CPA. The habitat suggests that tortoises are present in low densities in this area. There is adequate forage potential, but Eagle Creek and the surrounding bench are very cobbly, resulting in relatively poor coversite potential due to difficult digging. Further, the wash banks have few solution cavities that would provide cover. The mountains are too angular-blocky to provide much coversite potential. In general, then, while mountainous topography and abundant washes often provide inviting habitat to tortoises, the cobbly nature of this particular alluvial fan and the boulder quality in the mountains would limit occupation.

The combined brine pond/transmission line survey area inside the railroad berm had a substantial number of sign: 1 tortoise, 9 burrows, 6 scat groups and the remains of 3 tortoises (Table 2, Figures 3-2 and 3-3). Most of the sign were actually found south of the brine ponds site, in and around the transmission line ROW. There were an additional two adult burrows, not used this year, in the buffer east of the railroad berm. The single tortoise results in a USFWS (2010) protocol computation of 2.5 tortoises >160 mm in carapace length (confidence interval: 0.43-14.13) (Attachment 2). Based on the distribution, size and age of the scat and burrows (Table 2), there is at least one adult tortoise and possibly up to four, plus one juvenile tortoise. There are four burrow groups with current year use. All are adult burrows, although quantifying the tortoises' lengths based on burrow width was not possible in most cases because of the burrowing substrate. However, the associated scat, plus independent scat groups were from a moderate sized adult: 16-19 mm wide. One scat was 22 mm wide, suggesting a large male. The two 13 mm wide scat in the southeastern part of the brine ponds area suggests the presence of a juvenile tortoise prior to 2016 (although we recognize that any single scat group may be anomalous). This area represents moderately good habitat for this region because of the incised topography, coversite potential and many drainages. The three groups of shells represent three distinct adult tortoises, two dying within the last four years and one dying more than four years ago; at least two were female. No obvious cause of death could be determined.

In the southeastern basin, 4 burrows, 5 scat groups and 1 shell were found. All were along the eastern berm where water has backed up for decades, creating a relatively lush area. Density cannot be determined via the USFWS (2010) protocol because no tortoises were found. Despite these limitations, the size, distribution and age of the burrows and scat suggest that one and possibly two tortoises may inhabit this area. One burrow had fresh tracks. Most of the scat and burrows suggest a moderate-sized adult, but one scat from 2015 was substantially larger, 24 mm wide, suggesting a large male. However, no other sign of a large tortoise was found. The scat and burrows from previous years suggest that the tortoise(s) have inhabited the basin for awhile. Whether they found entry into the basin or were trapped there when the tailings piles were built is unknown.

TABLE 2. Desert Tortoise and Other Special-Status Species Observed in 2016.

Taxon	Survey Area or Project Element	Species	Sign Type	UTM (NAD 83)			Class ¹	Further Description	Corresponding Map Number	
				Zone	Easting	Northing				
Desert Tortoise										
	Brine Ponds/Transmission Line Combined Area		Burrow	11	S	639546	3746174	2	300 mm wide; NTY scat (14 mm wide); at base of railroad berm	13
	Brine Ponds/Transmission Line Combined Area		Burrow	11	S	639598	3746240	2	360 mm wide; 22 mm TY scat 30 m from burrow; 16 mm NTY scat 8 m from burrow (i.e., 2 separate tortoises)	14
	Brine Ponds/Transmission Line Combined Area		Tortoise	11	S	639714	3746248	NA	Adult; in caliche cave	15
	Brine Ponds/Transmission Line Combined Area		Burrow	11	S	639829	3746238	3	350 mm; NTY scat (17 mm wide); in caliche cavity	16
	Brine Ponds/Transmission Line Combined Area		Burrow	11	S	639840	3746067	3	~400 mm wide; old scat (15 mm wide); in caliche cavity	17
	Brine Ponds/Transmission Line Combined Area		Burrow	11	S	639907	3746077	3	320 mm wide	18
	Brine Ponds/Transmission Line Combined Area		Burrow	11	S	639979	3746073	5	330 mm wide	19
	Brine Ponds/Transmission Line Combined Area		Burrow	11	S	640107	3746360	2	350 mm; wash bank	20
	Brine Ponds/Transmission Line Combined Area		Scat	11	S	640054	3746196	NTY 4	14 mm wide	21
	Brine Ponds/Transmission Line Combined Area		Shell/Shell Parts	11	S	640190	3746276	1-2 years	234 mm female; no trauma	22
	Brine Ponds/Transmission Line Combined Area		Shell/Shell Parts	11	S	640061	3746122	>4	Adult; bone fragments with one scute	23
	Brine Ponds/Transmission Line Combined Area		Shell/Shell Parts	11	S	640199	3746200	2-4 years	250 mm female; old chew marks (healed)	24
	Brine Ponds/Transmission Line Combined Area		Scat	11	S	639936	3745923	NTY 4	20 mm wide	26
	Brine Ponds/Transmission Line Combined Area		Scat	11	S	640010	3745883	TY 2	22 mm wide	27
	Brine Ponds/Transmission Line Combined Area		Scat (2)	11	S	640151	3745975	NTY 3	13 mm wide (large juvenile)	28

Taxon	Survey Area or Project Element	Species	Sign Type	UTM (NAD 83)			Class ¹	Further Description	Corresponding Map Number	
				Zone	Easting	Northing				
	Brine Ponds/Transmission Line Combined Area		Burrow	11	S	640137	3745890	2	310 mm wide	29
	Brine Ponds/Transmission Line Combined Area		Burrow	11	S	640158	3745862	2	330 mm wide; tracks and old scat; in wash bottom	30
	Brine Ponds/Transmission Line Combined Area		Scat (4)	11	S	640170	3745892	TY 2	19 mm wide	31
	Brine Ponds/Transmission Line Combined Area		Scat (4)	11	S	640207	3745888	TY 2	16 mm wide	32
	Eagle Creek		Shell/Shell Parts	11	S	637110	3747326	4 years	Estimated 200 mm; plastron only	1
	Southeastern Basin ²		Scat	11	S	643372	3747070	TY2, NTY3 and 4	16-18 mm; 6+ scat in two concentrations, 30 m apart, from this and last year	3
	Southeastern Basin		Burrow	11	S	643412	3747059	2	210 mm; about 60 m from Map Sign 03 (scat)	4
	Southeastern Basin		Burrow	11	S	643428	3747060	3	220 mm wide; with NTY scat; under boulders	5
	Southeastern Basin		Burrow	11	S	643435	3747053	1	~350 mm wide; with old scat and fresh tracks	6
	Southeastern Basin		Scat	11	S	643461	3746913	TY1/2 and NTY 3	16 and 19 mm wide	7
	Southeastern Basin		Burrow	11	S	643388	3746874	2	310 mm wide; in small wash under <i>Bebbia</i>	8
	Southeastern Basin		Scat	11	S	643476	3746795	NTY 3	16 mm wide	9
	Southeastern Basin		Scat	11	S	643480	3746629	NTY 3	14 mm wide	10
	Southeastern Basin		Shell/Shell Parts	11	S	643483	3746609	>4 years	Adult female	11
	Southeastern Basin		Scat	11	S	643442	3746336	NTY 3	24 mm wide; size suggests different tortoise (large male) than other scat in area	12
	Transmission Line Buffer		Burrow	11	S	640415	3746413	3	330 mm wide; in wash bank	2
	Transmission Line Buffer		Burrow	11	S	640429	3746349	3	290 mm wide; in wash bank	25
	Transmission Line Buffer		Shell/Shell Parts	11	S	641456	3745042	>4 years	Adult; 20% of carcass	33
	Transmission Line ROW		Shell/Shell Parts	11	S	656612	3731179	>4 years	Adult	35

Taxon	Survey Area or Project Element	Species	Sign Type	UTM (NAD 83)			Class ¹	Further Description	Corresponding Map Number	
				Zone	Easting	Northing				
.	Transmission Line ROW		Burrow	11	S	656581	3731033	2	240 mm; in wash bank	36
	Water Pipeline Buffer		Shell/Shell Parts	11	S	644948	3744902	>4 years	Adult male; 60% of shell, including most of plastron	34
Other Animals										
	Eagle Creek	American Badger	Individual	11	S	637302	3747135		In burrow, then exited and ran up wash	1
	Eagle Creek	Bighorn Sheep	Scat	11	S	637645	3747177			2
	Transmission Line Buffer	Bighorn Sheep	Scat	11	S	639263	3746816	Fresh and recent	Several piles on game trails	5
	Transmission Line Buffer	Loggerhead Shrike	Individual	11	S	639369	3747043	NA	Perched and calling	4
	Transmission Line Buffer	Bighorn Sheep	Scat	11	S	639433	3747626	Fresh and old	Common throughout the hills, especially high	3
	Transmission Line Buffer	Burrowing Owl	Individual	11	S	640726	3745951		Flew from wash bank	6
	Water Pipeline Buffer	Loggerhead Shrike	Individual	11	S	643365	3745194		Perched	7
	Transmission Line Buffer	Loggerhead Shrike	Individual	11	S	644154	3743495		Flying	8
	Transmission Line Buffer	Kit Fox	Den Complex	11	S	644736	3743801	3		9
	Water Pipeline Buffer	Kit Fox	Den Complex	11	S	646120	3744157	3		10
	Transmission Line Buffer	Loggerhead Shrike	Individual	11	S	646185	3742330		Flying locally	11
	Transmission Line Buffer	Loggerhead Shrike	Individual	11	S	647304	3742317		Flying	12
	Transmission Line ROW	Prairie falcon	Individual	11	S	649885	3738609		Fying locally	15
	Transmission Line ROW	Loggerhead Shrike	Individual	11	S	650693	3737742		Flying through ag field	16
Plants										
	Transmission Line ROW	Crucifixion Thorn	Not recorded	11	S	648549	3740062			13
	Transmission Line ROW	Crucifixion Thorn	Individual	11	S	648551	3740001		Immediately off access road	14
	Transmission Line Buffer	Crucifixion Thorn	Not recorded	11	S	653839	3734196		Excellent condition	17
	Transmission Line Buffer	Desert Unicorn Plant	Individual	11	S	654662	3733352		Newly emerged	18

1. For Key to Classes, see Attachment 1

2. The Southeastern Basin is outside the Project Footprint and therefore is not shown on figures as part of the Project.

Linear Features

Outside of the CPA region (i.e., including the combined brine ponds/transmission line area and buffers), only a handful of sign were observed: a single adult burrow of the current year and the remains of three adult tortoises dying over four years ago (Table 2, Figures 3-3 and 3-8). Interestingly, the two shells and single burrow we observed in 2016 were also observed in the earlier surveys. While density and distribution of tortoises cannot be determined from these very few data, they strongly indicate a very low tortoise density along the linear features.

4.2 OTHER SPECIES

Due to the focus on desert tortoises, the drought conditions, and truncation in the types of data we collected for other special-status species, this part of the survey should not be considered comprehensive. However, it supplements the data already collected.

Three crucifixion thorn populations were observed, all of which had been previously seen (Figure 4). One desert unicorn plant, a fairly common watchlist species and also a species that typically responds to summer rains rather than winter, was observed.

The sign or individuals of animals observed was typical for the area and included burrowing owl (individual), prairie falcon (individual), loggerhead shrike (individuals), kit fox (multi-entranced den complexes) and American badger (individual) (Figure 4). Bighorn sheep scat were commonly observed in the mountains.

5.0 DISCUSSION

The 2016 results confirmed earlier projections that no tortoise habitat was expected on the CPA footprint and the potential to affect transient tortoises was very low (FERC 2011). The brine ponds site, which is outside the main CPA, hosts tortoises in low numbers. This is not surprising given the habitat, the quality of which is somewhat better than we could determine previously from aerial photographs and earlier assessments (e.g., RECON 1992, USFWS 1993).

On the linears, earlier surveys estimated tortoise densities at 1.2 tortoises per square mile (FERC 2011). The 2016 data confirm very low densities.

Because of the survey results on the CPA, alterations in Project design may be warranted. The brine ponds are native woodland habitat that hosts 1-several tortoises and provides habitat for numerous desert riparian species. The ponds originally had been sited in this outlying area in order to “fit” around the Kaiser landfill. However, based on preliminary discussions at ECE, these ponds may be moved to more disturbed areas on the historic mine site, if further analysis concurs.

The results of the tortoise surveys, plus the assessment of the existing tailings piles and other habitat features, suggest that minor refinements to earlier analyses and resultant mitigation should be considered, including but not limited to:

- Wildlife Fencing - The locations and extent of protective fencing during and following construction, as detailed in the approved Wildlife Protection Plan (ECE 2015b), may be added or deleted.
- Habitat Compensation –The Project BO (USFWS 2012) estimated that the Project would acquire 90.3 total acres of desert tortoise habitat to compensate for habitat disturbed by construction. Re-evaluation of the acreage of disturbance is necessary based on the 2016 surveys, including but not limited to:
 - On the CPA, the Biological Assessment (BA; FERC 2011) estimated that 60.1 acres would be disturbed, 48.4 acres of which were the brine ponds. If the ponds are moved to currently disturbed sites, then the disturbance acreage would be substantially less.

The BA estimated that new roads on the CPA would disturb 5.7 acres. This is unlikely given the lack of tortoise habitat on the CPA.

- The acreage for the transmission line access road west of Kaiser Road will also require re-evaluation. Based on our surveys, there is no access road in the portion nearest the CPA, which is native, albeit disturbed, habitat. The BO also noted that the existing transmission line access road west of Kaiser would probably need upgrading because of the size of the transmission line compared to the existing 161 kV line. Also per the BO, tensioning and pulling sites would be re-evaluated along the entire transmission line.

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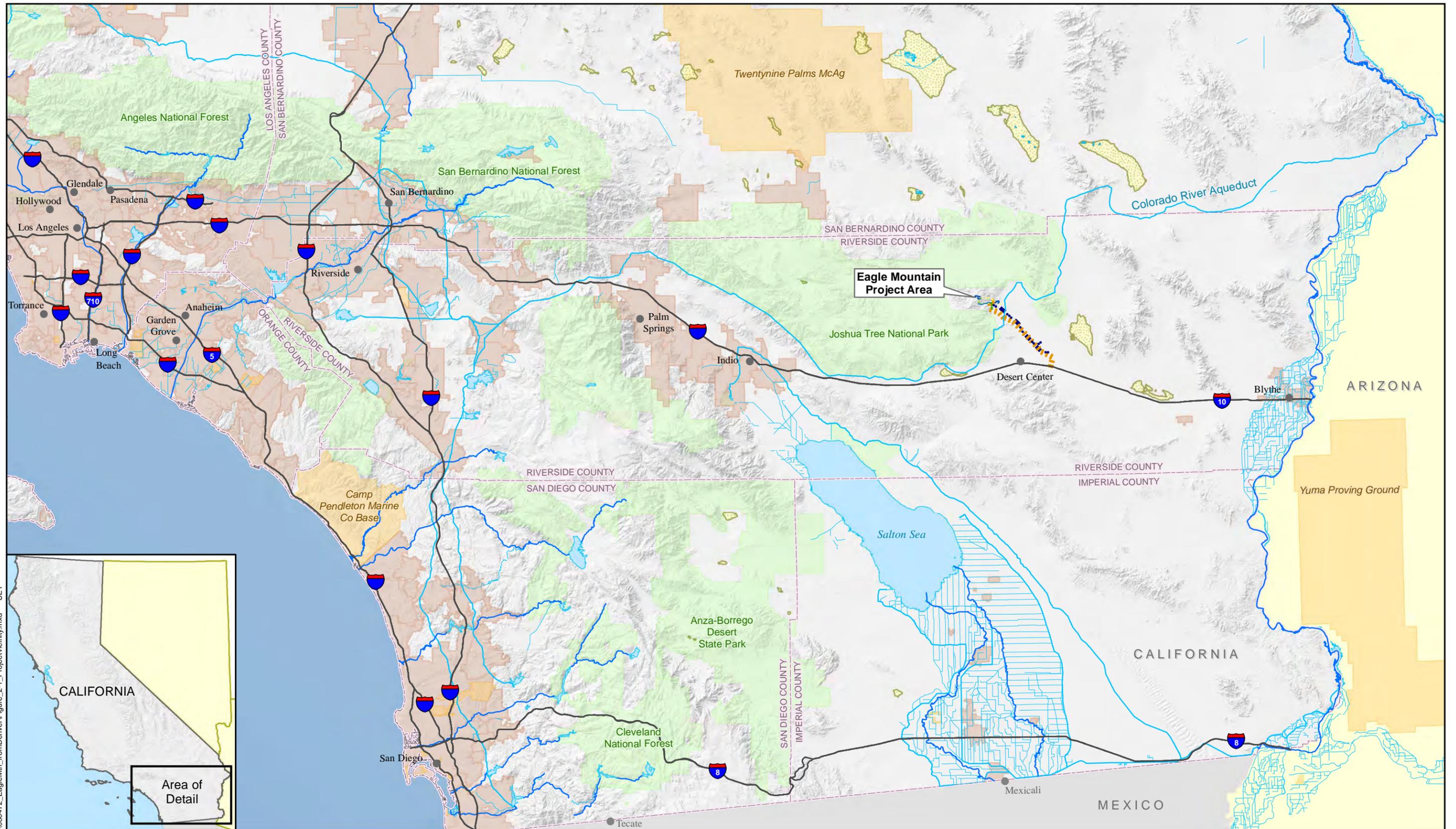
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FIGURES

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		City	County	Urban Area
		Major River	Playa	Military Land
		Major Canal, Aqueduct	Major Lake	State, National Park

Eagle Mountain Pumped Storage Project

Eastern Riverside County, California



PROJECT VICINITY

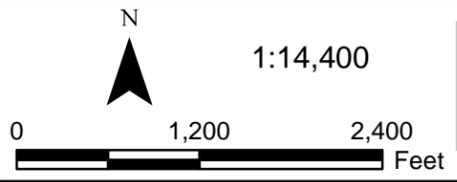
AUGUST 2016

Figure 1



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Transmission Line Reference Point	Water Supply Line	Project Boundary
Water Supply Pipeline Reference Point	Transmission Route	100% coverage
Mitigation Monitoring Network Well	Interconnection Substation	2 transects, 200m spacing
	Water Supply Well Area	3 transects, 200m spacing

Eagle Mountain Pumped Storage Project
Eastern Riverside County, California



2016 DESERT TORTOISE SURVEYS ON THE CPA
August 2016
Figure 2-1



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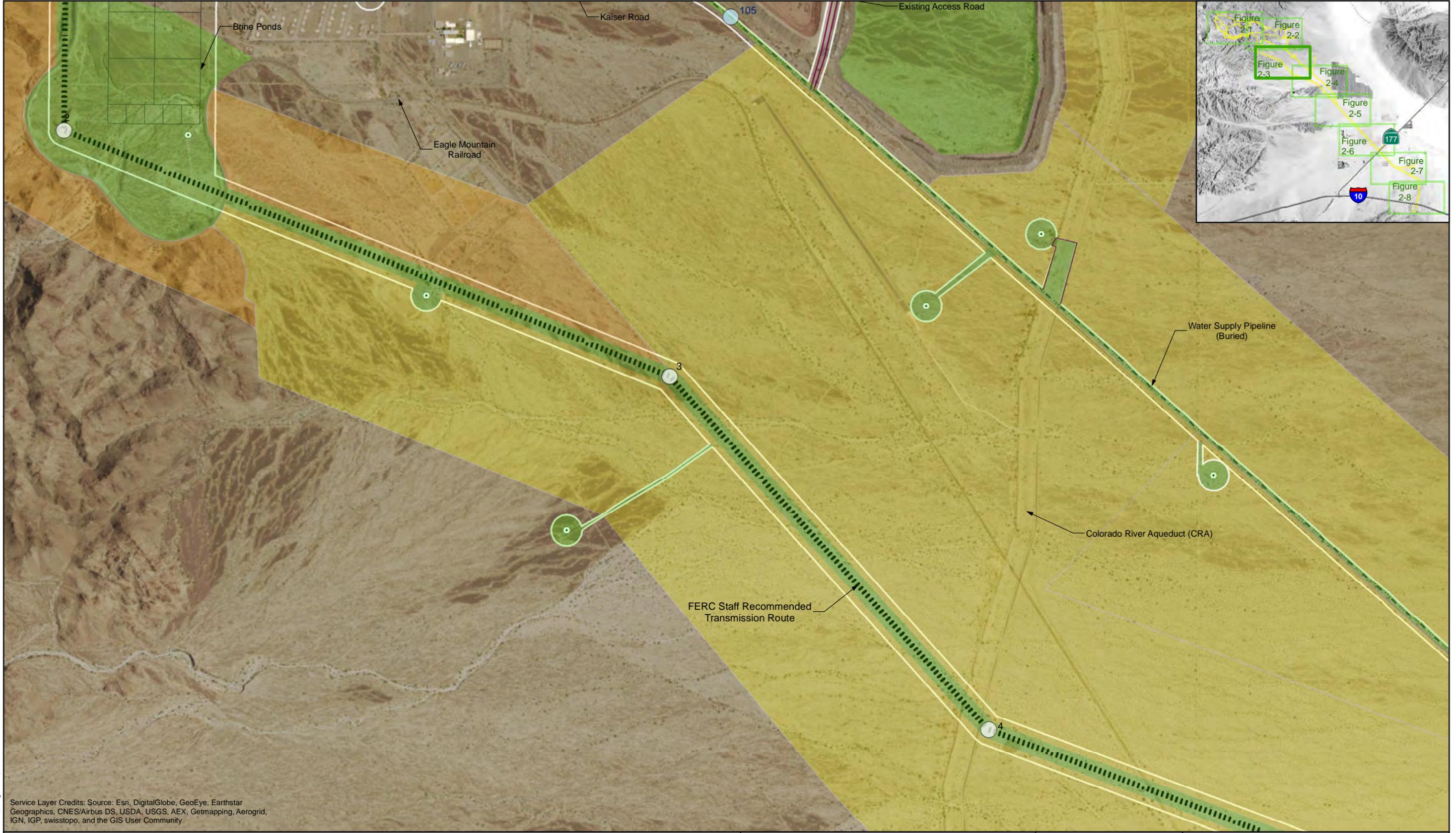


Transmission Line Reference Point	Water Supply Line	Project Boundary
Water Supply Pipeline Reference Point	Transmission Route	100% coverage
Mitigation Monitoring Network Well	Interconnection Substation	2 transects, 200m spacing
	Water Supply Well Area	3 transects, 200m spacing

Eagle Mountain Pumped Storage Project
Eastern Riverside County, California

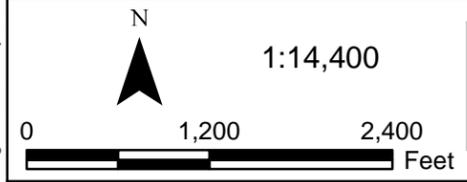


2016 DESERT TORTOISE SURVEYS ON THE CPA
August 2016
Figure 2-2



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- | | | |
|---|------------------------------|-----------------------------|
| ○ Transmission Line Reference Point | --- Water Supply Line | □ Project Boundary |
| ● Water Supply Pipeline Reference Point | ▬▬▬ Transmission Route | ■ 100% coverage |
| ○ Mitigation Monitoring Network Well | ▨ Interconnection Substation | ■ 2 transects, 200m spacing |
| | ▨ Water Supply Well Area | ■ 3 transects, 200m spacing |

Eagle Mountain Pumped Storage Project

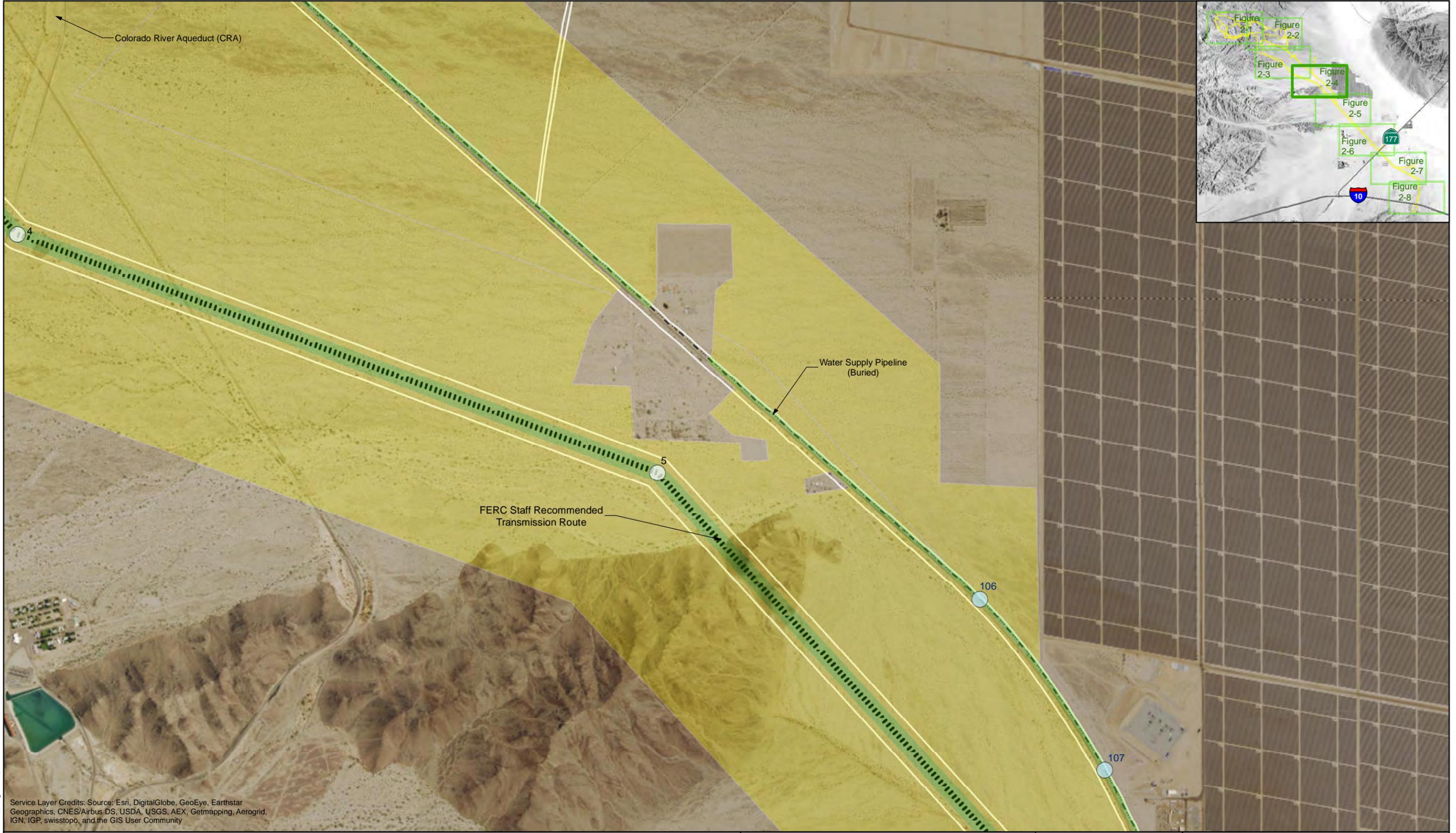
Eastern Riverside County, California



2016 DESERT TORTOISE SURVEYS ON THE CPA

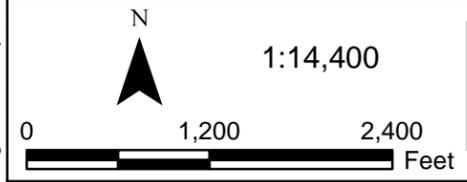
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Figure 2-3



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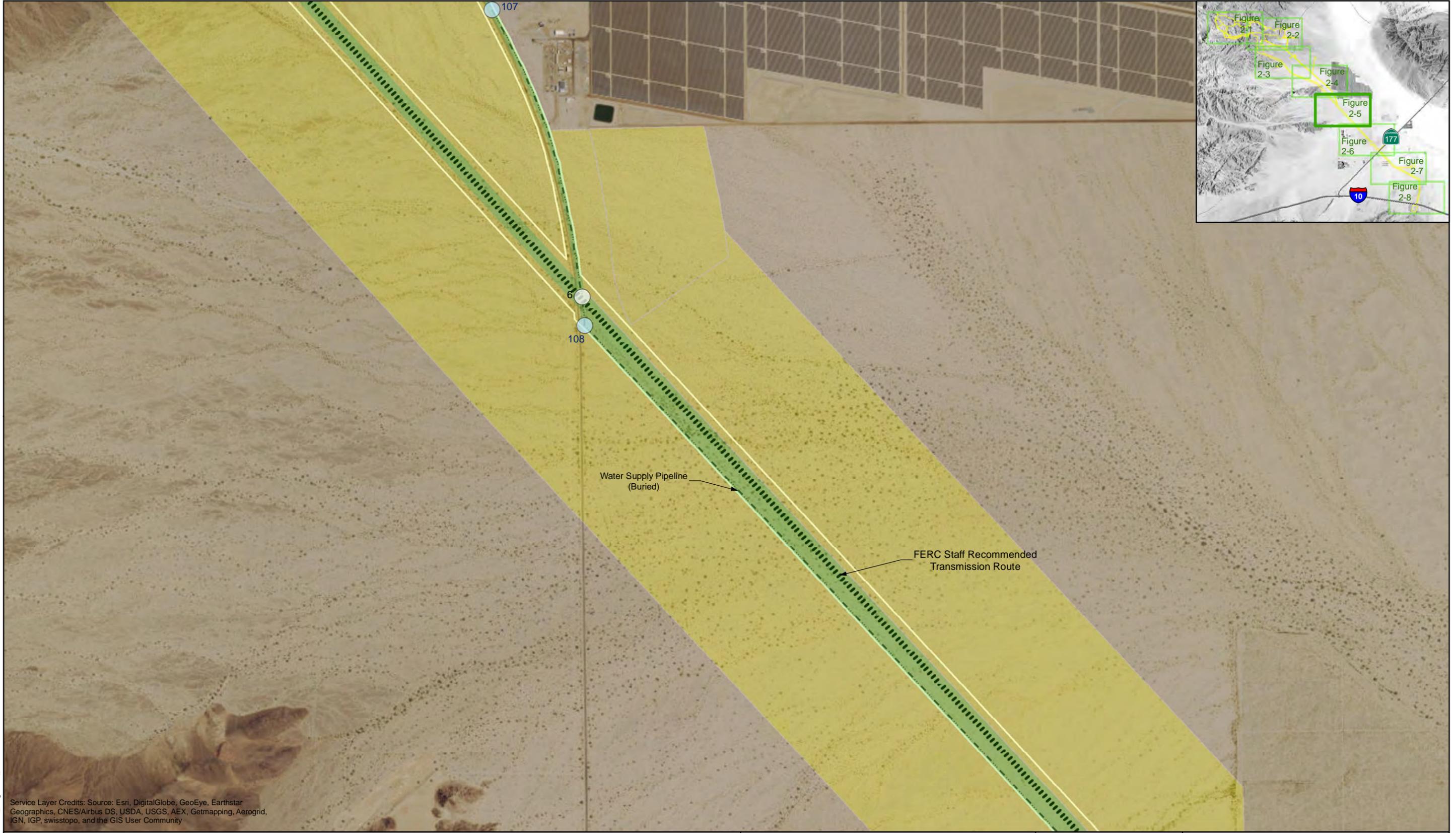


Transmission Line Reference Point	Water Supply Line	Project Boundary
Water Supply Pipeline Reference Point	Transmission Route	100% coverage
Mitigation Monitoring Network Well	Interconnection Substation	2 transects, 200m spacing
	Water Supply Well Area	3 transects, 200m spacing

Eagle Mountain Pumped Storage Project
Eastern Riverside County, California

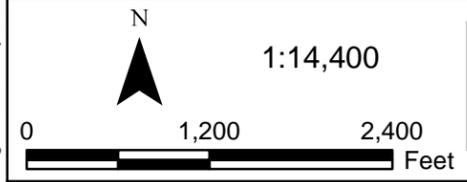


2016 DESERT TORTOISE SURVEYS ON THE CPA
August 2016
Figure 2-4



Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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Transmission Line Reference Point	Water Supply Line	Project Boundary
Water Supply Pipeline Reference Point	Transmission Route	100% coverage
Mitigation Monitoring Network Well	Interconnection Substation	2 transects, 200m spacing
	Water Supply Well Area	3 transects, 200m spacing

Eagle Mountain Pumped Storage Project
Eastern Riverside County, California

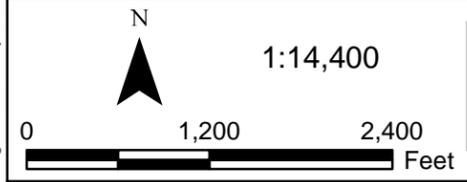


2016 DESERT TORTOISE SURVEYS ON THE CPA
August 2016
Figure 2-5



3-Aug-2016 Z:\Projects\080472_EagleMtn_fromDenver\ConstructionDisturbance.mxd SET

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

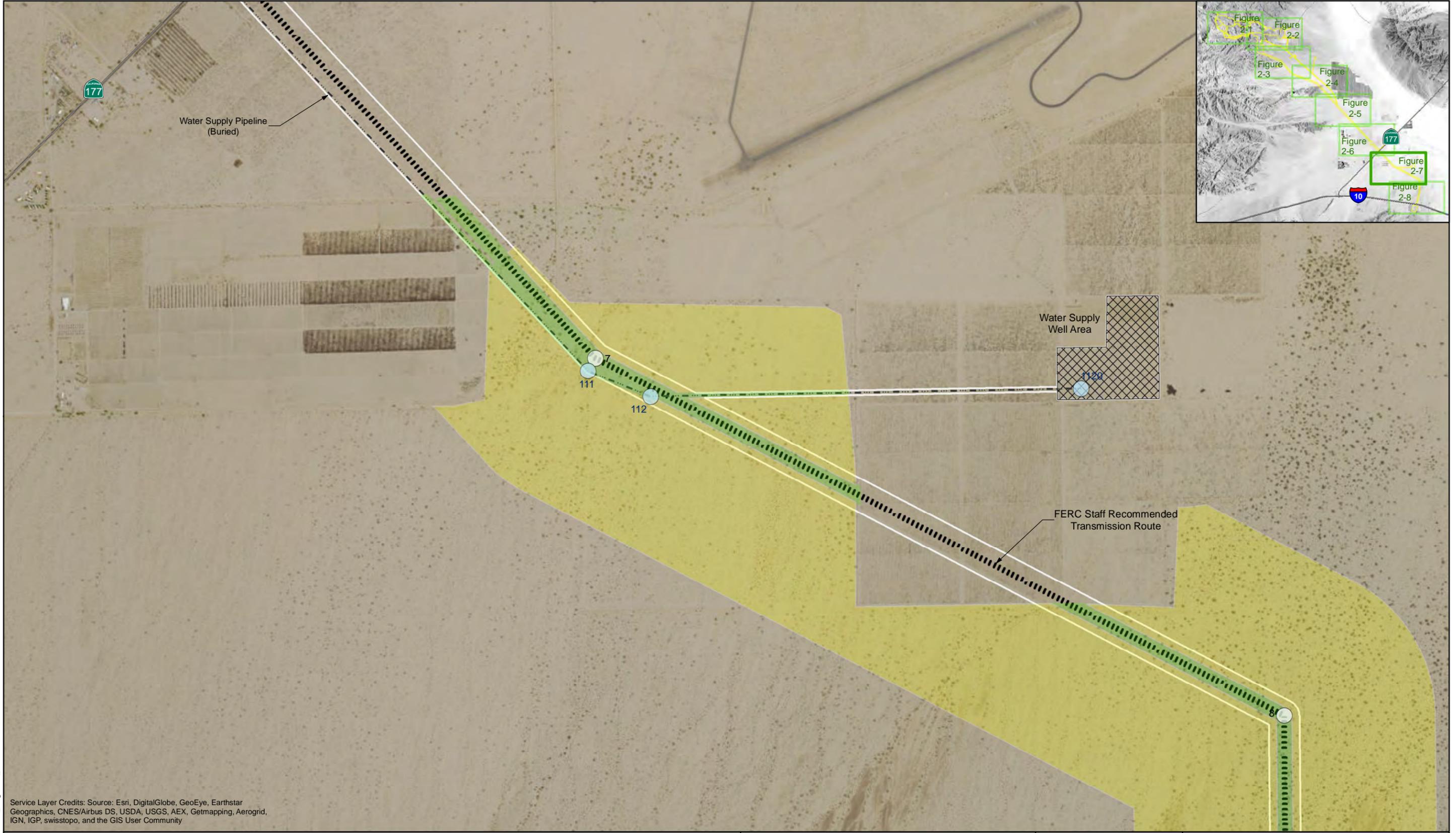


Transmission Line Reference Point	Water Supply Line	Project Boundary
Water Supply Pipeline Reference Point	Transmission Route	100% coverage
Mitigation Monitoring Network Well	Interconnection Substation	2 transects, 200m spacing
	Water Supply Well Area	3 transects, 200m spacing

Eagle Mountain Pumped Storage Project
Eastern Riverside County, California

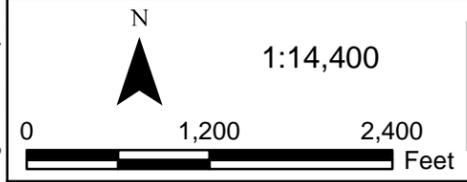


2016 DESERT TORTOISE SURVEYS ON THE CPA
August 2016
Figure 2-6



3-Aug-2016 Z:\Projects\080472_EagleMtn_fromDenver\ConstructionDisturbance.mxd SET

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

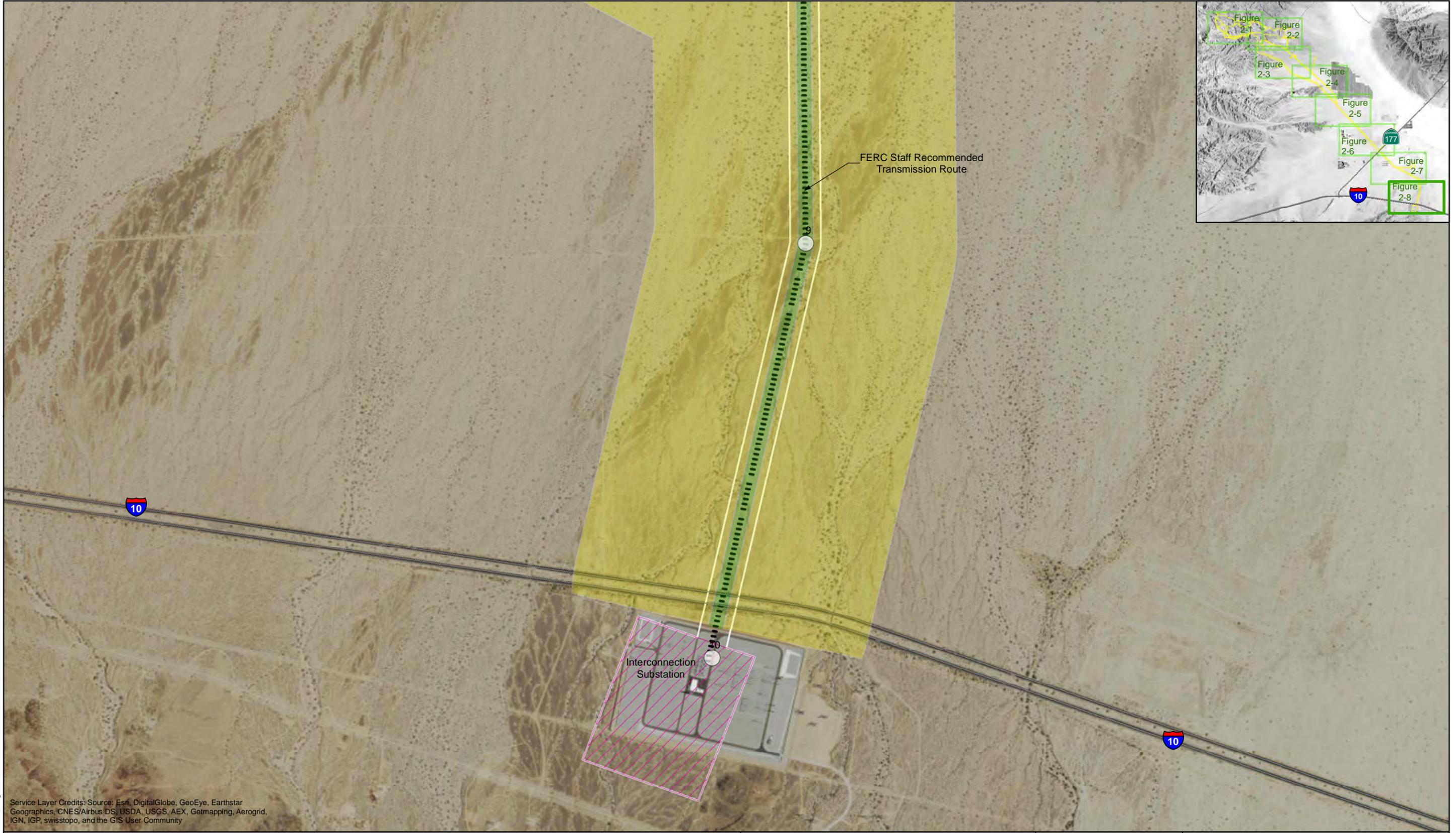


Transmission Line Reference Point	Water Supply Line	Project Boundary
Water Supply Pipeline Reference Point	Transmission Route	100% coverage
Mitigation Monitoring Network Well	Water Supply Well Area	2 transects, 200m spacing
		3 transects, 200m spacing

Eagle Mountain Pumped Storage Project
Eastern Riverside County, California

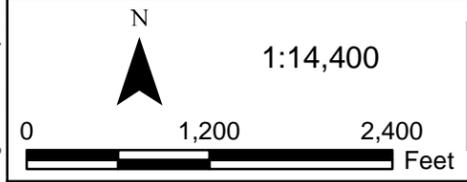


2016 DESERT TORTOISE SURVEYS ON THE CPA
August 2016
Figure 2-7



3-Aug-2016 Z:\Projects\080472_EagleMtn_fromDenver\ConstructionDisturbance.mxd SET

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

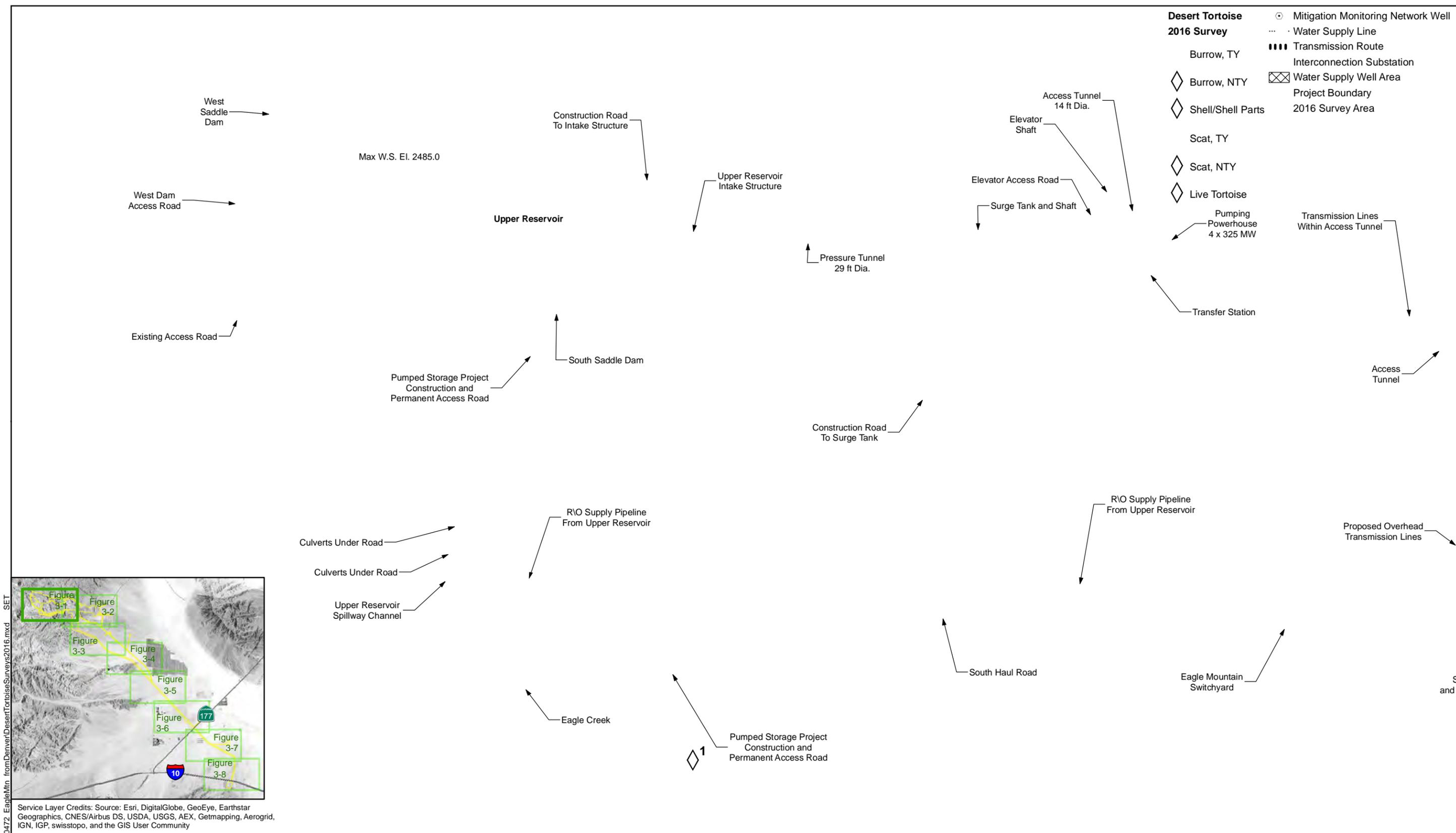


Transmission Line Reference Point	Water Supply Line	Project Boundary
Water Supply Pipeline Reference Point	Transmission Route	100% coverage
Mitigation Monitoring Network Well	Interconnection Substation	2 transects, 200m spacing
	Water Supply Well Area	3 transects, 200m spacing

Eagle Mountain Pumped Storage Project
Eastern Riverside County, California

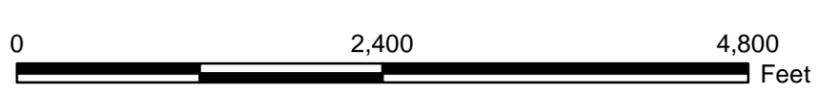


2016 DESERT TORTOISE SURVEYS ON THE CPA
August 2016
Figure 2-8



3Aug2016 Z:\Projects\080472 Eagle\Mtn fromDenver\DesertTortoiseSurvey2016.mxd SET

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



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Eagle Mountain Pumped Storage Project

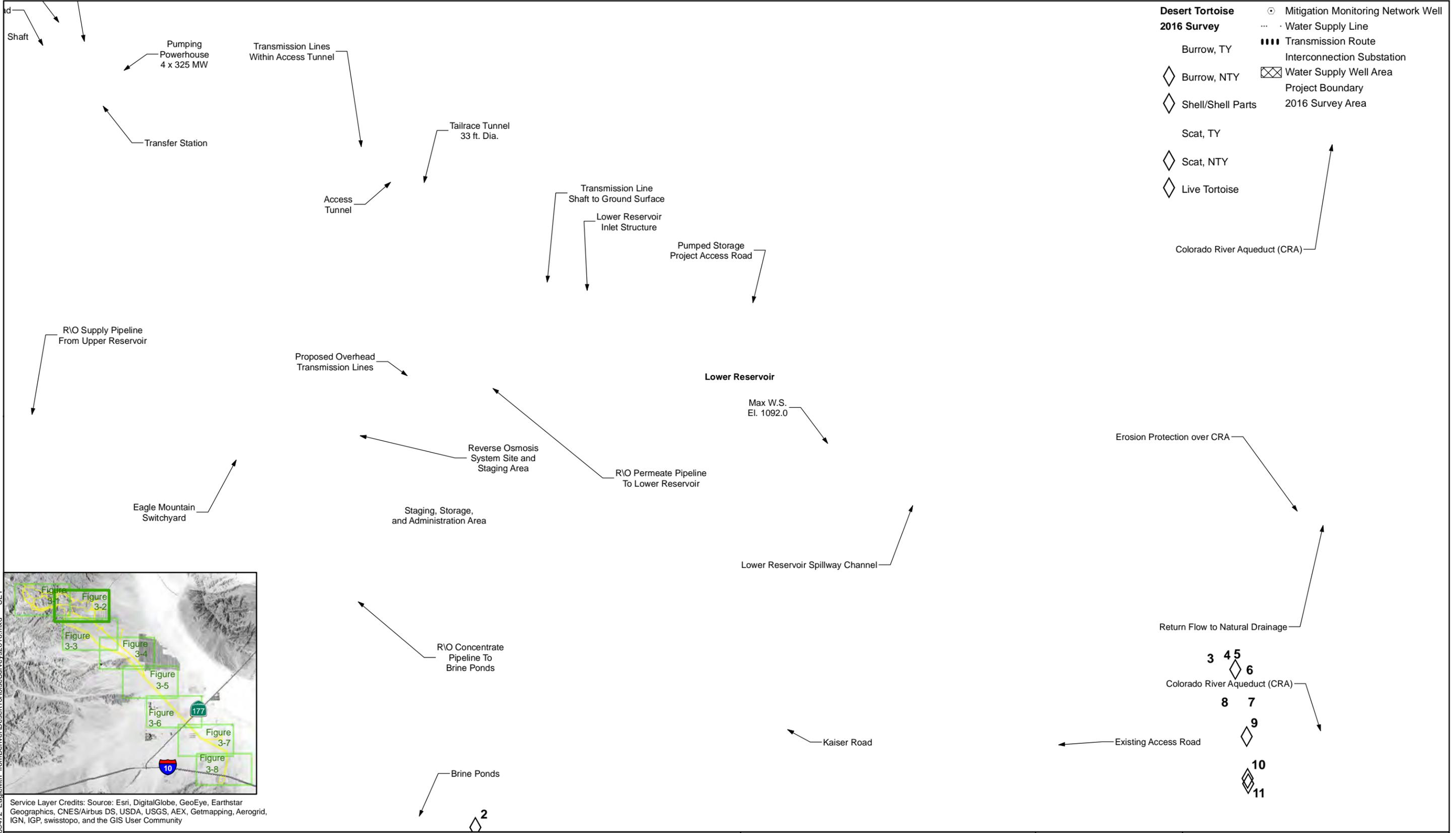
Eastern Riverside County, California



2016 DESERT TORTOISE SURVEY RESULTS

AUGUST 2016

Figure 3-1



3Aug2016 Z:\Projects\080472 Eagle\Mrn fromDenver\DesertTortoiseSurvey2016.mxd SET

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Eagle Mountain Pumped Storage Project

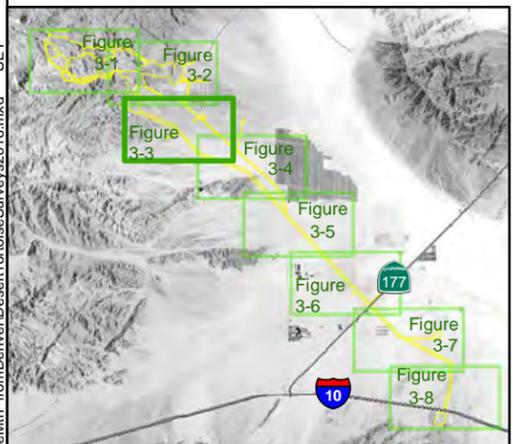
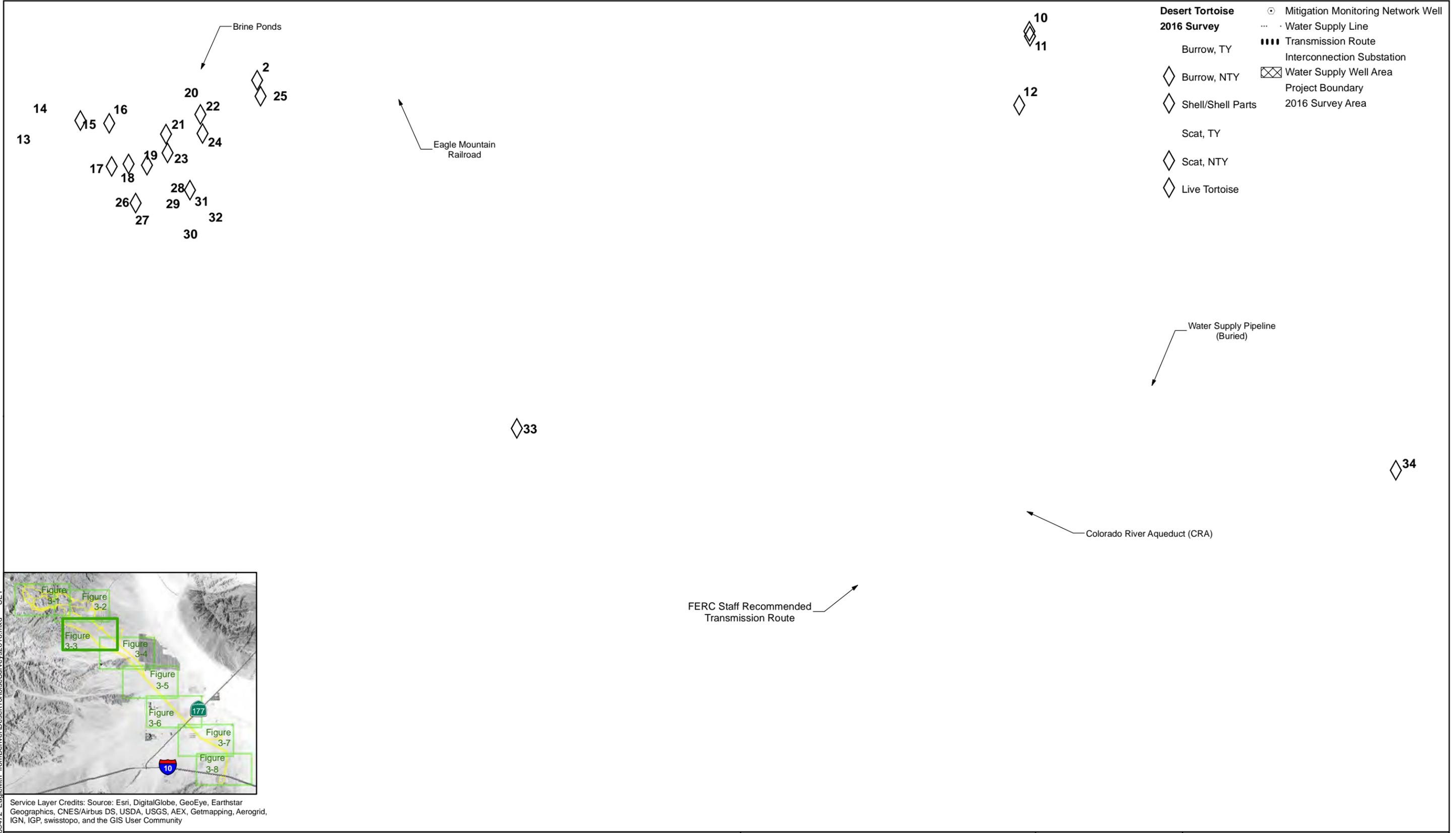
Eastern Riverside County, California



2016 DESERT TORTOISE SURVEY RESULTS

AUGUST 2016

Figure 3-2

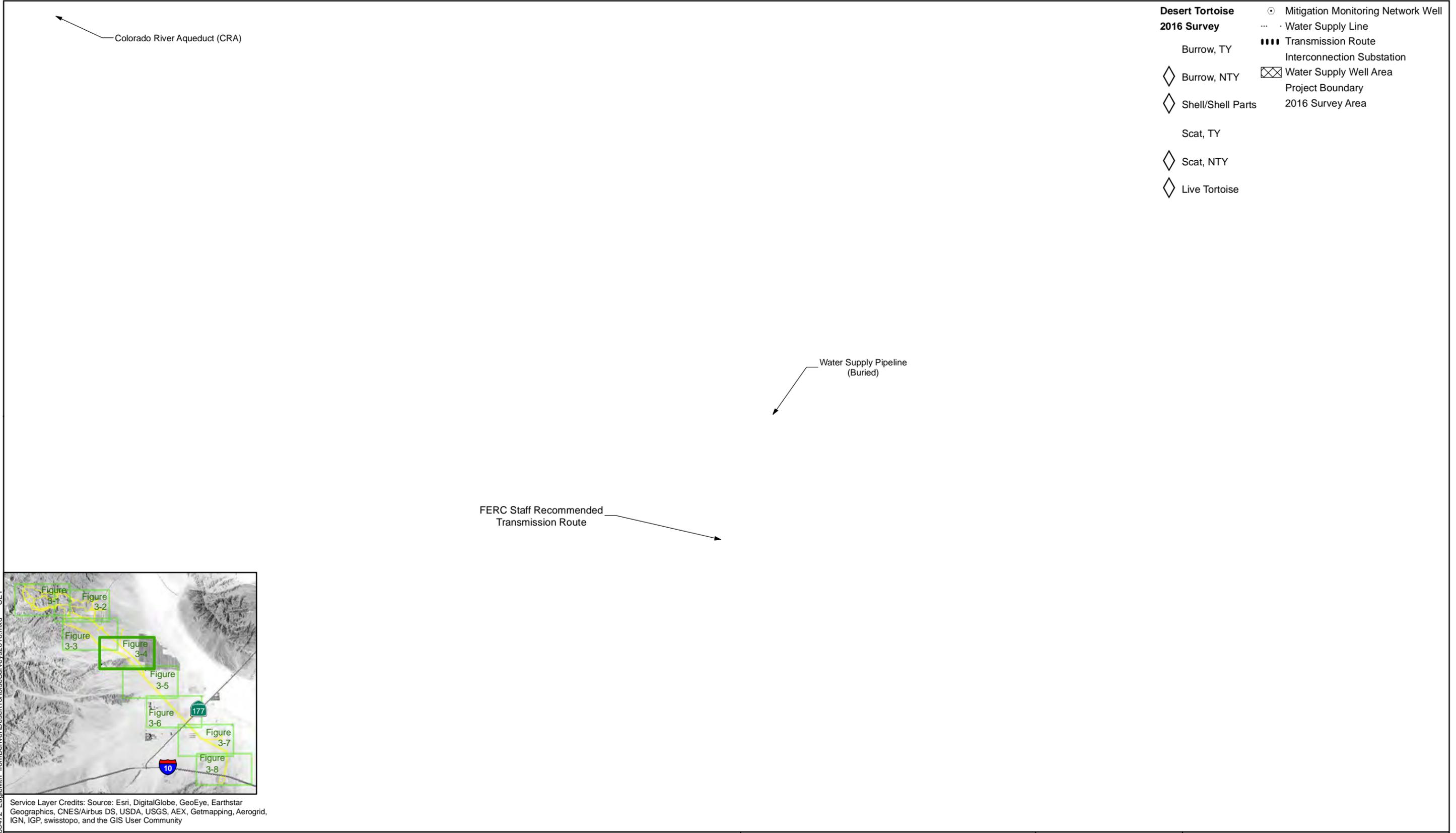


Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

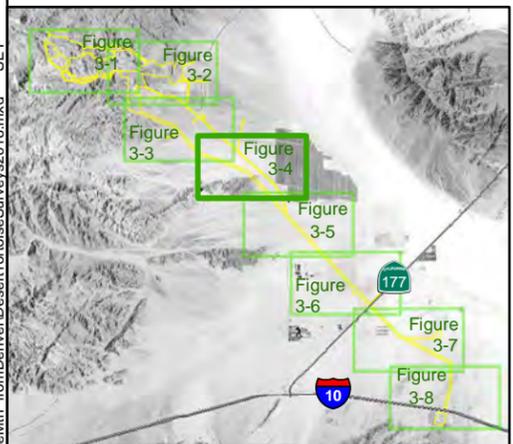
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Eagle Mountain Pumped Storage Project		2016 DESERT TORTOISE SURVEY RESULTS	
Eastern Riverside County, California		AUGUST 2016	Figure 3-3



- Desert Tortoise 2016 Survey**
- Burrow, TY
 - ◇ Burrow, NTY
 - ◇ Shell/Shell Parts
 - Scat, TY
 - ◇ Scat, NTY
 - ◇ Live Tortoise
 - Mitigation Monitoring Network Well
 - Water Supply Line
 - Transmission Route
 - Interconnection Substation
 - ⊠ Water Supply Well Area
 - ▭ Project Boundary
 - ▭ 2016 Survey Area



Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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Eagle Mountain Pumped Storage Project

Eastern Riverside County, California



2016 DESERT TORTOISE SURVEY RESULTS

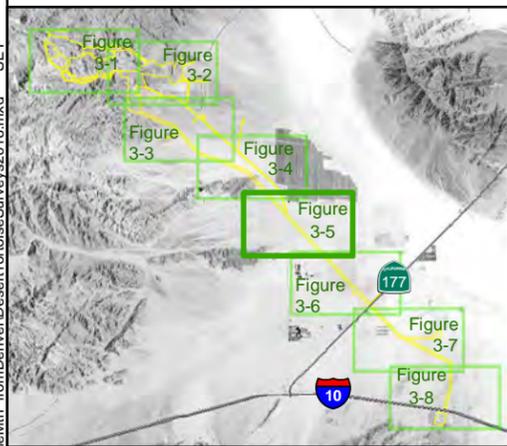
AUGUST 2016

Figure 3-4

- Desert Tortoise**
- 2016 Survey**
- Burrow, TY
- ◇ Burrow, NTY
- ◇ Shell/Shell Parts
- Scat, TY
- ◇ Scat, NTY
- ◇ Live Tortoise
- Mitigation Monitoring Network Well
- Water Supply Line
- Transmission Route
- Interconnection Substation
- ⊠ Water Supply Well Area
- Project Boundary
- 2016 Survey Area

Water Supply Pipeline
(Buried) →

← FERC Staff Recommended
Transmission Route



Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



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Eagle Mountain Pumped Storage Project

Eastern Riverside County, California



2016 DESERT TORTOISE
SURVEY RESULTS

AUGUST 2016

Figure 3-5

3Aug2016 Z:\Projects\080472 Eagle\Mrn fromDenver\DesertTortoiseSurveys2016.mxd SET

- Desert Tortoise 2016 Survey**
- Mitigation Monitoring Network Well
 - Water Supply Line
 - Transmission Route
 - Interconnection Substation
 - ◇ Burrow, TY
 - ◇ Burrow, NTY
 - ◇ Shell/Shell Parts
 - Scat, TY
 - ◇ Scat, NTY
 - ◇ Live Tortoise
 - ⊗ Water Supply Well Area
 - Project Boundary
 - 2016 Survey Area

FERC Staff Recommended Transmission Route

Water Supply Pipeline (Buried)

Water Supply Well Area

Water Supply Well Area



Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



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Eagle Mountain Pumped Storage Project

Eastern Riverside County, California



2016 DESERT TORTOISE SURVEY RESULTS

AUGUST 2016

Figure 3-6

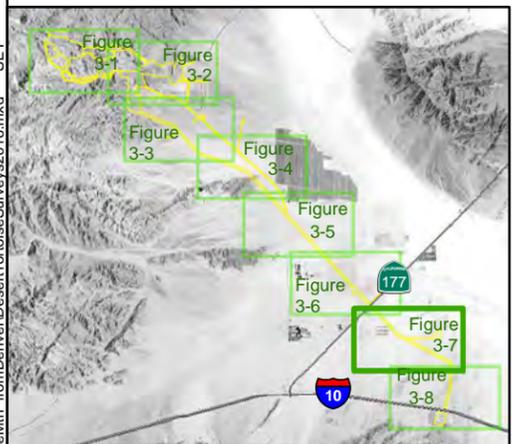
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- Desert Tortoise 2016 Survey**
- Burrow, TY
 - ◇ Burrow, NTY
 - ◇ Shell/Shell Parts
 - Scat, TY
 - ◇ Scat, NTY
 - ◇ Live Tortoise
- Mitigation Monitoring Network Well
 - Water Supply Line
 - Transmission Route
 - Interconnection Substation
 - ⊠ Water Supply Well Area
 - Project Boundary
 - 2016 Survey Area

Water Supply Pipeline (Buried)

Water Supply Well Area

FERC Staff Recommended Transmission Route



Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



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Eagle Mountain Pumped Storage Project

Eastern Riverside County, California



2016 DESERT TORTOISE SURVEY RESULTS

AUGUST 2016

Figure 3-7

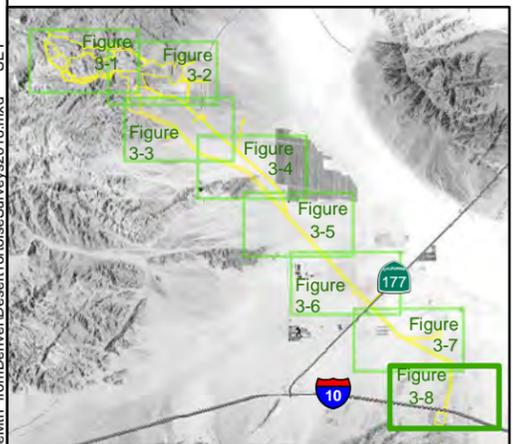
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- Desert Tortoise**
- 2016 Survey**
- Burrow, TY
- ◇ Burrow, NTY
- ◇ Shell/Shell Parts
- Scat, TY
- ◇ Scat, NTY
- ◇ Live Tortoise
- Mitigation Monitoring Network Well
- Water Supply Line
- Transmission Route
- Interconnection Substation
- ⊠ Water Supply Well Area
- Project Boundary
- 2016 Survey Area

FERC Staff Recommended
Transmission Route

◇ 35
36

Interconnection
Substation



Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



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Eagle Mountain Pumped Storage Project

Eastern Riverside County, California



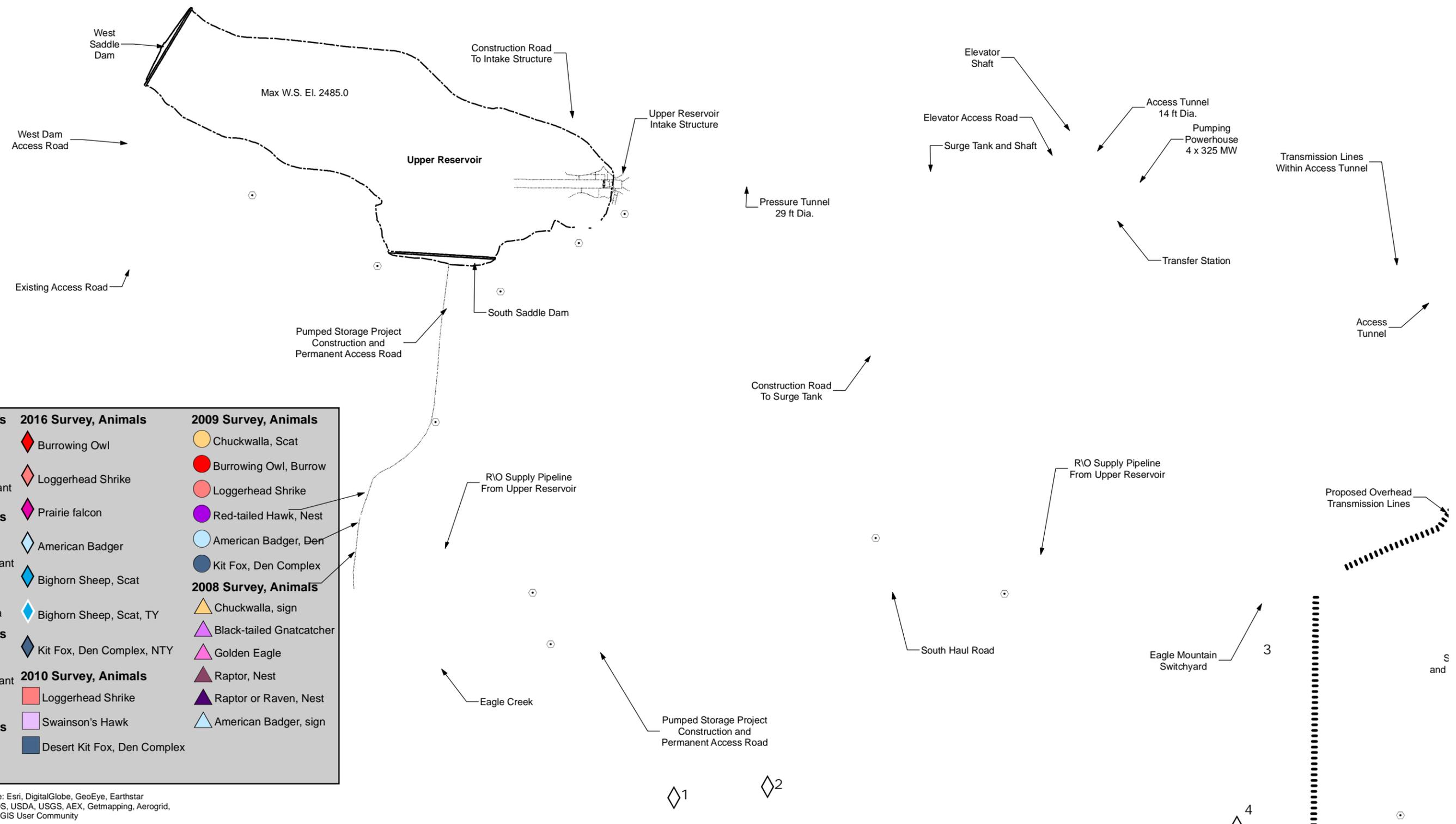
2016 DESERT TORTOISE
SURVEY RESULTS

AUGUST 2016

Figure 3-8

3Aug2016 Z:\Projects\080472 Eagle\Mtn fromDenver\DesertTortoiseSurveys2016.mxd SET

3-Aug-2016 Z:\Projects\080472_Eagle\Mtn_fromDenver\Plant\AnimalSurvey\All.mxd SET



2016 Survey, Plants	2016 Survey, Animals	2009 Survey, Animals
Crucifixion Thorn	Burrowing Owl	Chuckwalla, Scat
Desert Unicorn Plant	Loggerhead Shrike	Burrowing Owl, Burrow
2010 Survey, Plants	Prairie falcon	Loggerhead Shrike
Crucifixion Thorn	American Badger	Red-tailed Hawk, Nest
Desert Unicorn Plant	Bighorn Sheep, Scat	American Badger, Den
Foxtail cactus	Bighorn Sheep, Scat, TY	Kit Fox, Den Complex
Ribbed cryptantha	2008 Survey, Animals	Chuckwalla, sign
2009 Survey, Plants	Kit Fox, Den Complex, NTY	Black-tailed Gnatcatcher
Crucifixion Thorn	2010 Survey, Animals	Golden Eagle
Desert Unicorn Plant	Loggerhead Shrike	Raptor, Nest
Wiggins' Cholla	Swainson's Hawk	Raptor or Raven, Nest
2008 Survey, Plants	Desert Kit Fox, Den Complex	American Badger, sign
California Ditaxis		
Foxtail Cactus		

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

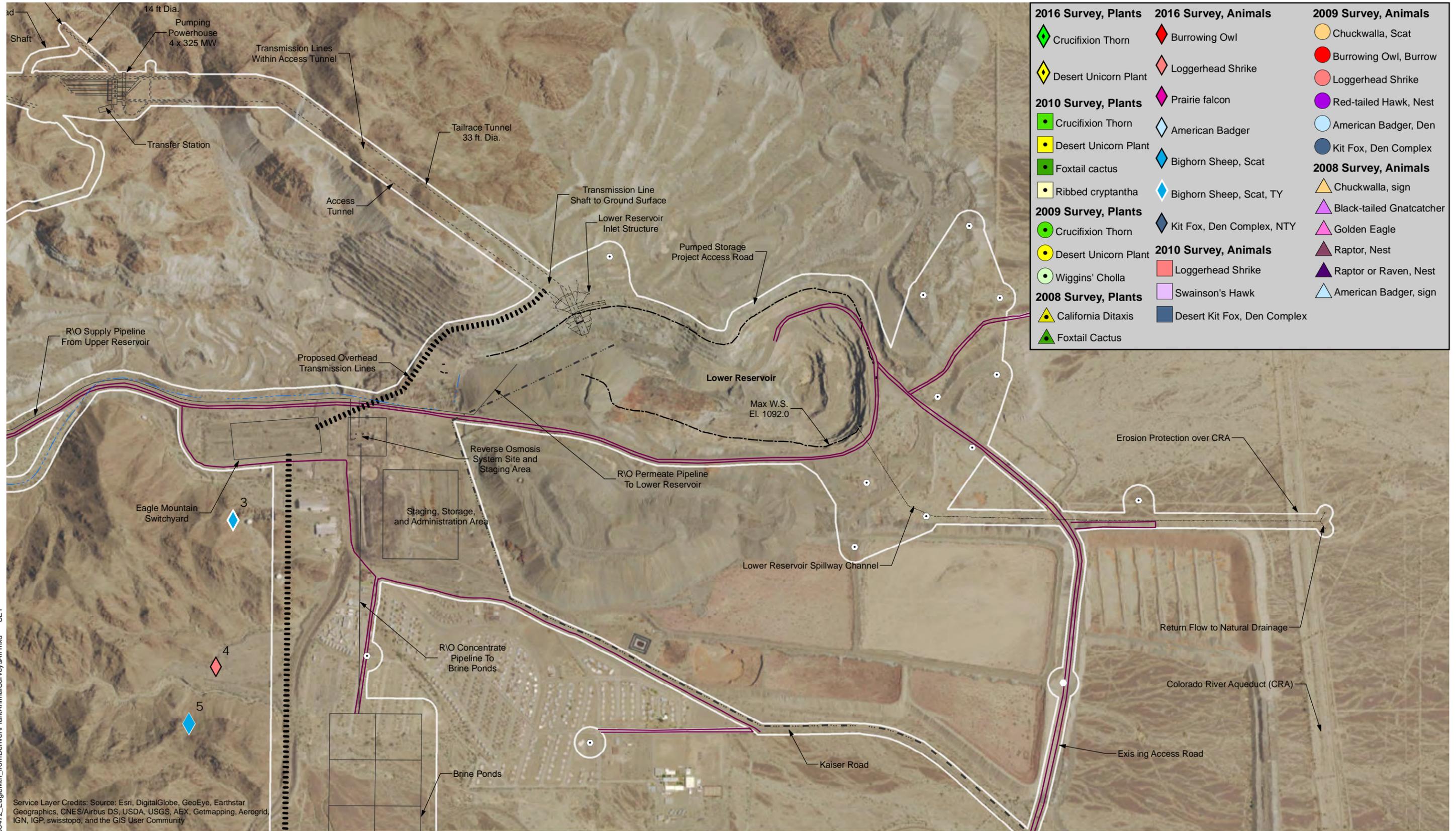
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N

- Mitigation Monitoring Network Well
- Water Supply Line
- Transmission Route
- Interconnection Substation
- Water Supply Well Area
- Project Boundary

Eagle Mountain Pumped Storage Project		PLANT AND ANIMAL SURVEY RESULTS FROM 2008, 2009, 2010 AND 2016
Eastern Riverside County, California		AUGUST 2016 Figure 4-1



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Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Scale: 1:14,400

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Legend:

- Mitigation Monitoring Network Well
- Water Supply Line
- Transmission Route
- Interconnection Substation
- Water Supply Well Area
- Project Boundary

Eagle Mountain Pumped Storage Project

Eastern Riverside County, California



PLANT AND ANIMAL SURVEY RESULTS FROM 2008, 2009, 2010 AND 2016

AUGUST 2016

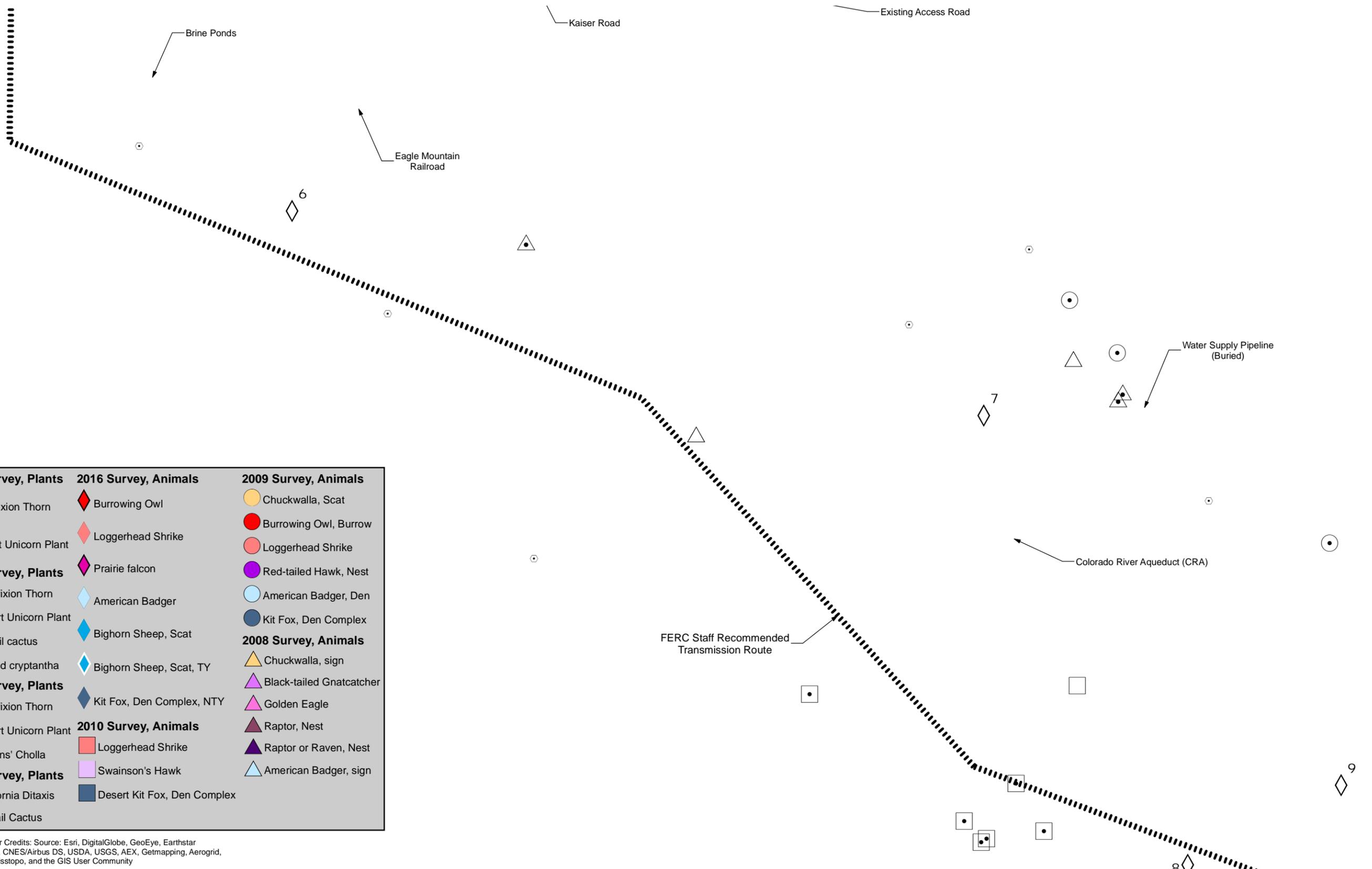
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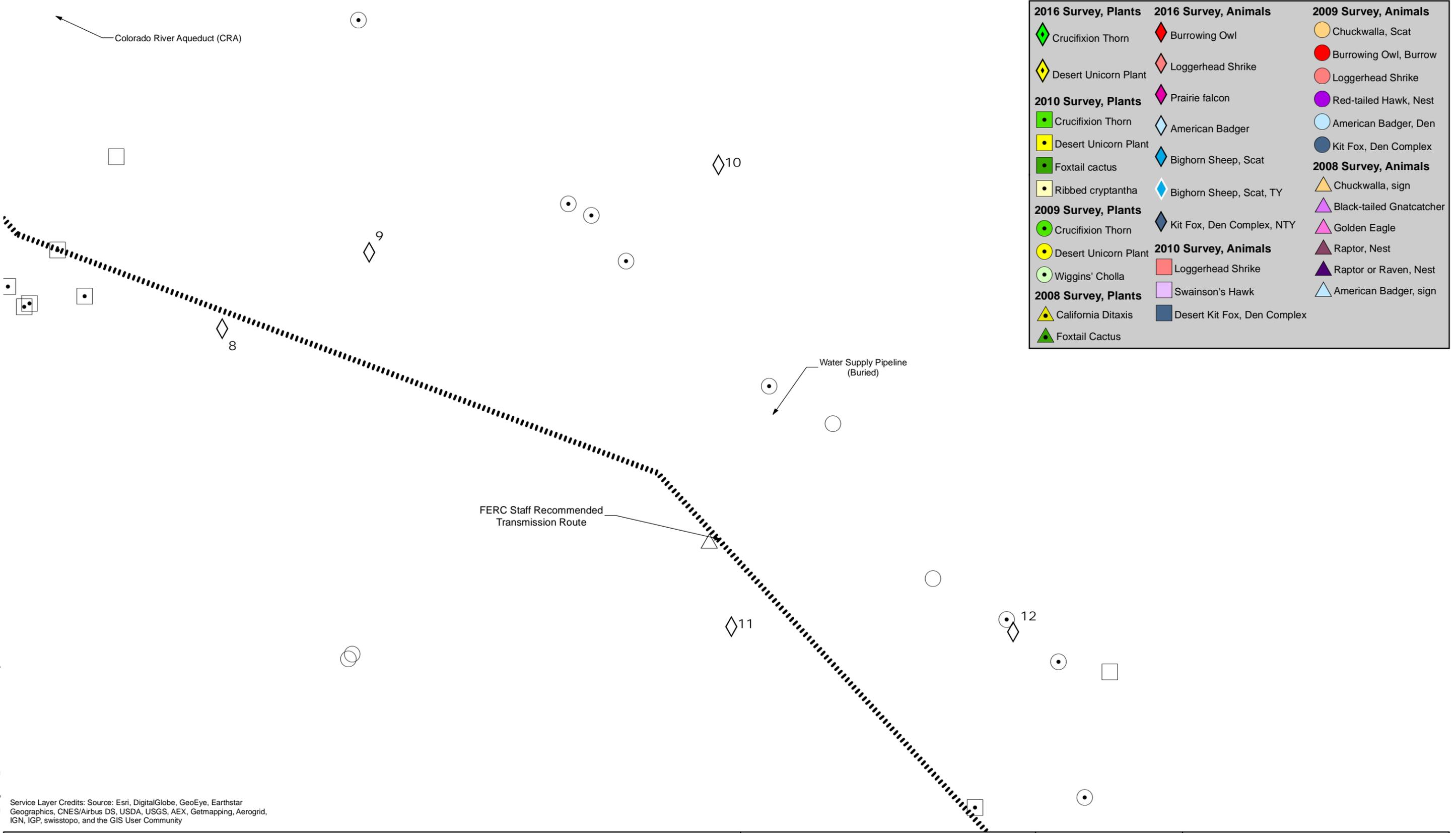
2016 Survey, Plants	2016 Survey, Animals	2009 Survey, Animals
Crucifixion Thorn	Burrowing Owl	Chuckwalla, Scat
Desert Unicorn Plant	Loggerhead Shrike	Burrowing Owl, Burrow
2010 Survey, Plants	Prairie falcon	Loggerhead Shrike
Crucifixion Thorn	American Badger	Red-tailed Hawk, Nest
Desert Unicorn Plant	Bighorn Sheep, Scat	American Badger, Den
Foxtail cactus	Bighorn Sheep, Scat, TY	Kit Fox, Den Complex
Ribbed cryptantha	Kit Fox, Den Complex, NTY	2008 Survey, Animals
2009 Survey, Plants	Loggerhead Shrike	Chuckwalla, sign
Crucifixion Thorn	Swainson's Hawk	Black-tailed Gnatcatcher
Desert Unicorn Plant	Desert Kit Fox, Den Complex	Golden Eagle
Wiggins' Cholla		Raptor, Nest
2008 Survey, Plants		Raptor or Raven, Nest
California Ditaxis		American Badger, sign
Foxtail Cactus		

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

 1:14,400	 Mitigation Monitoring Network Well		PLANT AND ANIMAL SURVEY RESULTS FROM 2008, 2009, 2010 AND 2016 AUGUST 2016 Figure 4-3
	 Water Supply Line		



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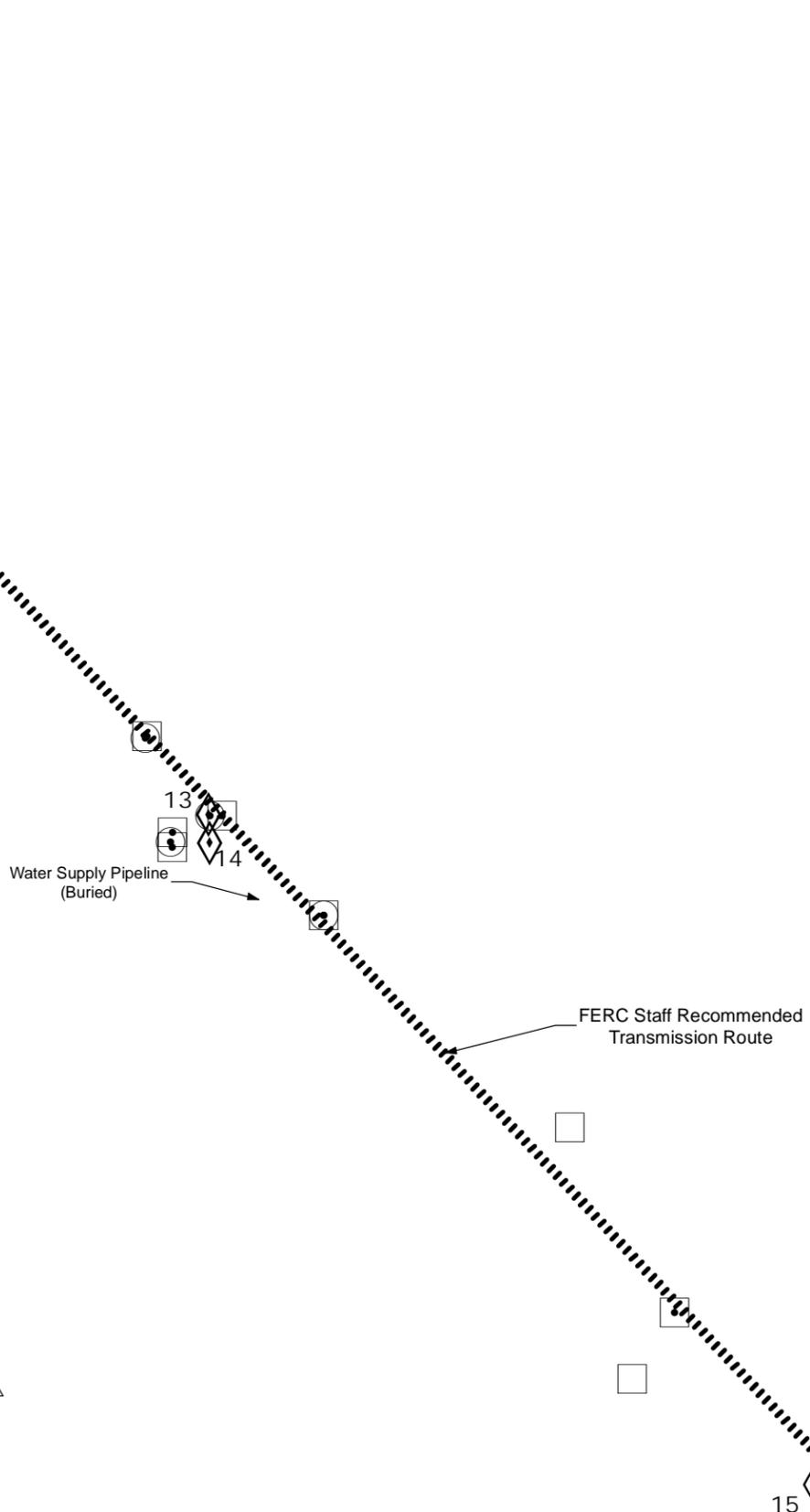
2016 Survey, Plants	2016 Survey, Animals	2009 Survey, Animals
Crucifixion Thorn	Burrowing Owl	Chuckwalla, Scat
Desert Unicorn Plant	Loggerhead Shrike	Burrowing Owl, Burrow
2010 Survey, Plants	Prairie falcon	Loggerhead Shrike
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Wiggins' Cholla		Raptor, Nest
2008 Survey, Plants		Raptor or Raven, Nest
California Ditaxis		American Badger, sign
Foxtail Cactus		

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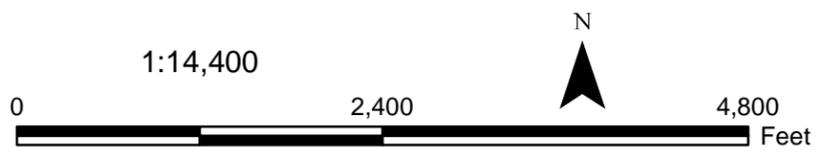
<p>1:14,400</p> <p>0 2,400 4,800 Feet</p>	<p>N</p>	<ul style="list-style-type: none"> Mitigation Monitoring Network Well Water Supply Line Transmission Route Interconnection Substation Water Supply Well Area Project Boundary 	<p>Eagle Mountain Pumped Storage Project</p> <hr/> <p>Eastern Riverside County, California</p>		<p>PLANT AND ANIMAL SURVEY RESULTS FROM 2008, 2009, 2010 AND 2016</p> <hr/> <p>AUGUST 2016 Figure 4-4</p>
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2016 Survey, Plants	2016 Survey, Animals	2009 Survey, Animals
Crucifixion Thorn	Burrowing Owl	Chuckwalla, Scat
Desert Unicorn Plant	Loggerhead Shrike	Burrowing Owl, Burrow
2010 Survey, Plants	Prairie falcon	Loggerhead Shrike
Crucifixion Thorn	American Badger	Red-tailed Hawk, Nest
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Ribbed cryptantha	Kit Fox, Den Complex, NTY	2008 Survey, Animals
2009 Survey, Plants	Black-tailed Gnatcatcher	Chuckwalla, sign
Crucifixion Thorn	Golden Eagle	Raptor, Nest
Desert Unicorn Plant	2010 Survey, Animals	Raptor or Raven, Nest
Wiggins' Cholla	Loggerhead Shrike	American Badger, sign
2008 Survey, Plants	Swainson's Hawk	
California Ditaxis	Desert Kit Fox, Den Complex	
Foxtail Cactus		



Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



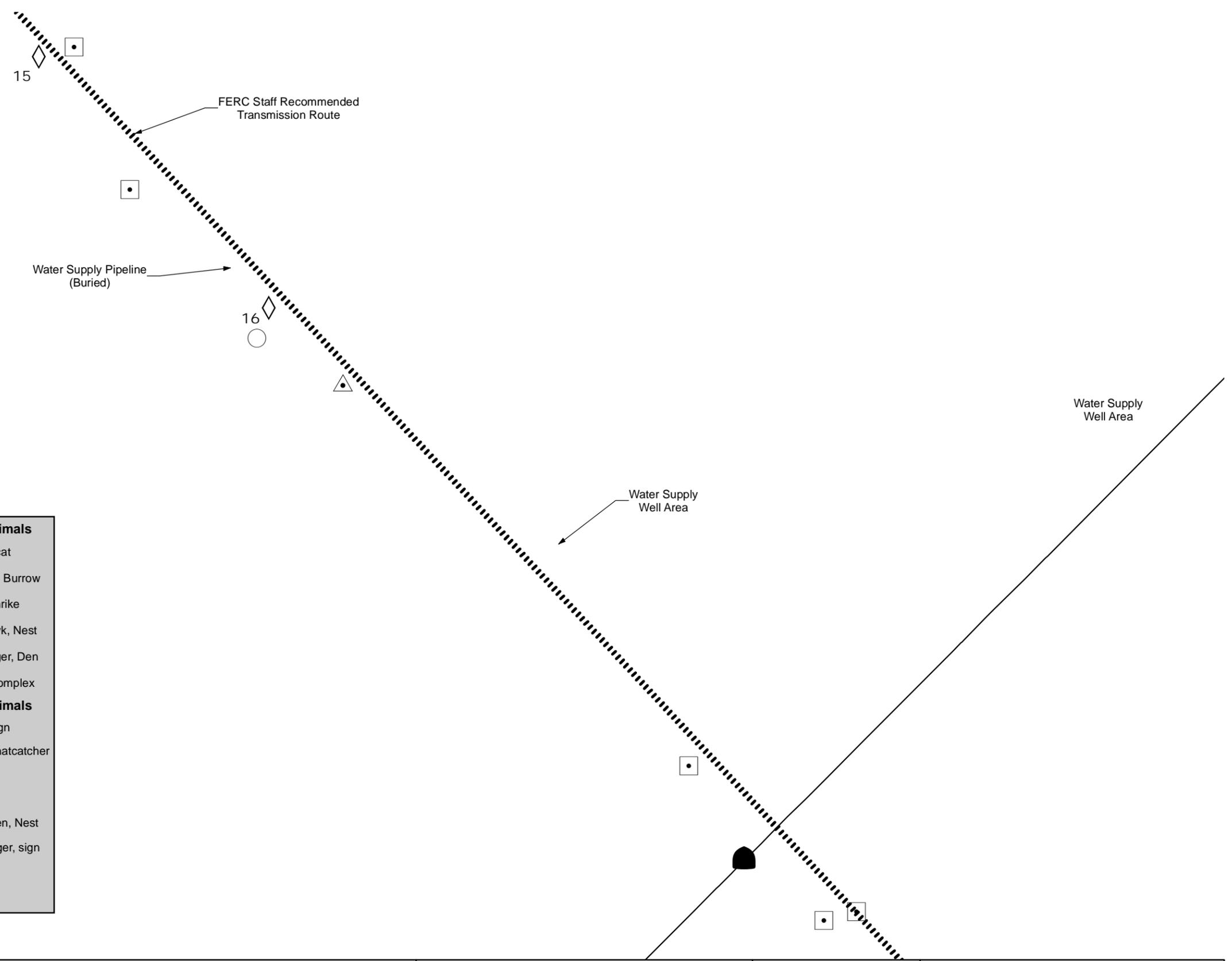
- Mitigation Monitoring Network Well
- Water Supply Line
- Transmission Route
- Interconnection Substation
- Water Supply Well Area
- Project Boundary

Eagle Mountain Pumped Storage Project
 Eastern Riverside County, California



PLANT AND ANIMAL SURVEY RESULTS FROM 2008, 2009, 2010 AND 2016
 AUGUST 2016 Figure 4-5

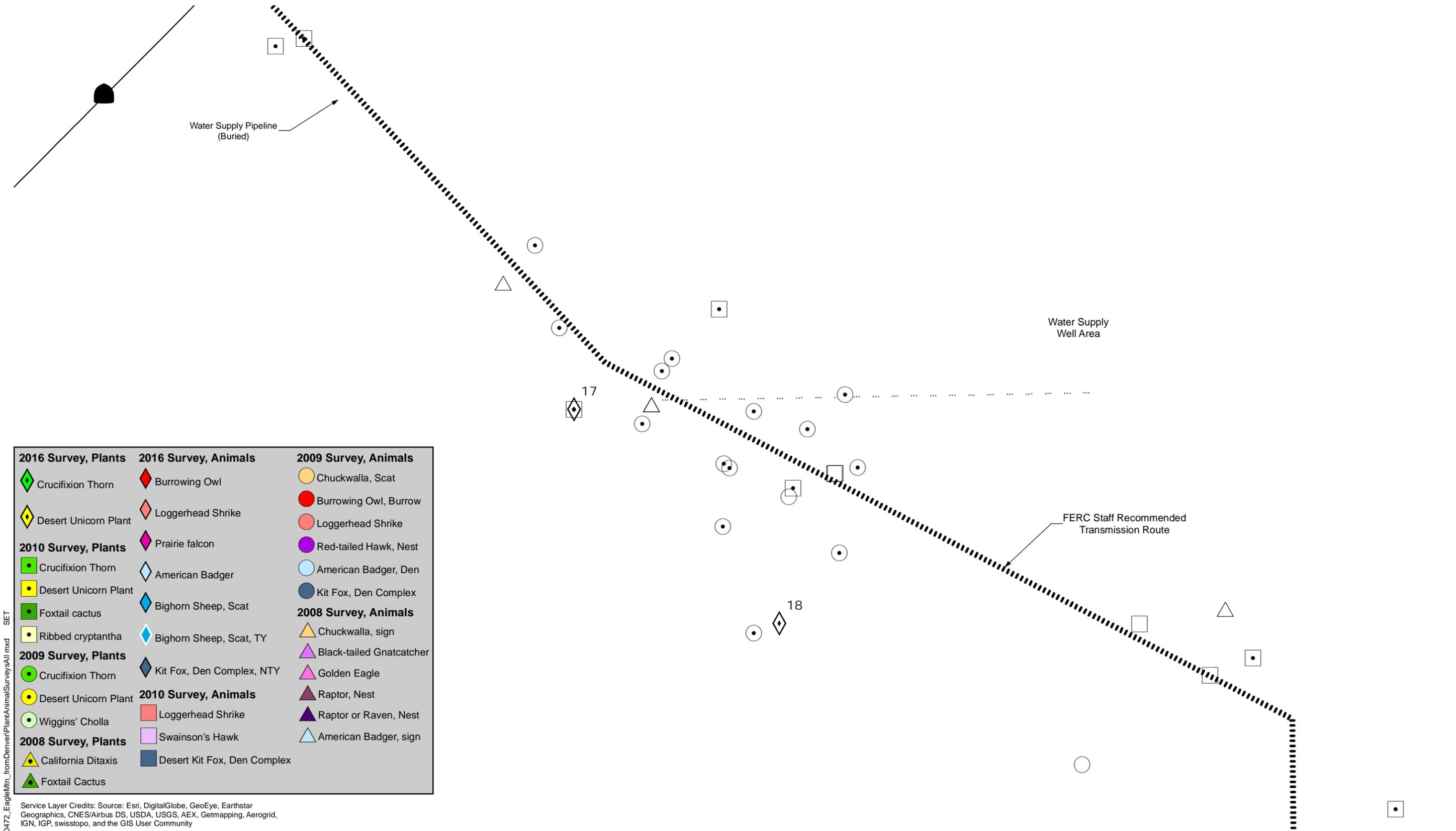
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2016 Survey, Plants	2016 Survey, Animals	2009 Survey, Animals
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Desert Unicorn Plant	Loggerhead Shrike	Burrowing Owl, Burrow
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Ribbed cryptantha	Kit Fox, Den Complex, NTY	2008 Survey, Animals
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Crucifixion Thorn	Swainson's Hawk	Black-tailed Gnatcatcher
Desert Unicorn Plant	Desert Kit Fox, Den Complex	Golden Eagle
Wiggins' Cholla		Raptor, Nest
2008 Survey, Plants		Raptor or Raven, Nest
California Ditaxis		American Badger, sign
Foxtail Cactus		

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

<p>1:14,400</p>		<ul style="list-style-type: none"> Mitigation Monitoring Network Well Water Supply Line Transmission Route Interconnection Substation Water Supply Well Area Project Boundary 	<p>Eagle Mountain Pumped Storage Project</p>		<p>PLANT AND ANIMAL SURVEY RESULTS FROM 2008, 2009, 2010 AND 2016</p>
			<p>Eastern Riverside County, California</p>		<p>AUGUST 2016</p>



2016 Survey, Plants	2016 Survey, Animals	2009 Survey, Animals
Crucifixion Thorn	Burrowing Owl	Chuckwalla, Scat
Desert Unicorn Plant	Loggerhead Shrike	Burrowing Owl, Burrow
2010 Survey, Plants	Prairie falcon	Loggerhead Shrike
Crucifixion Thorn	American Badger	Red-tailed Hawk, Nest
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Wiggins' Cholla		Raptor, Nest
2008 Survey, Plants		Raptor or Raven, Nest
California Ditaxis		American Badger, sign
Foxtail Cactus		

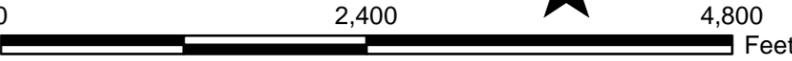
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

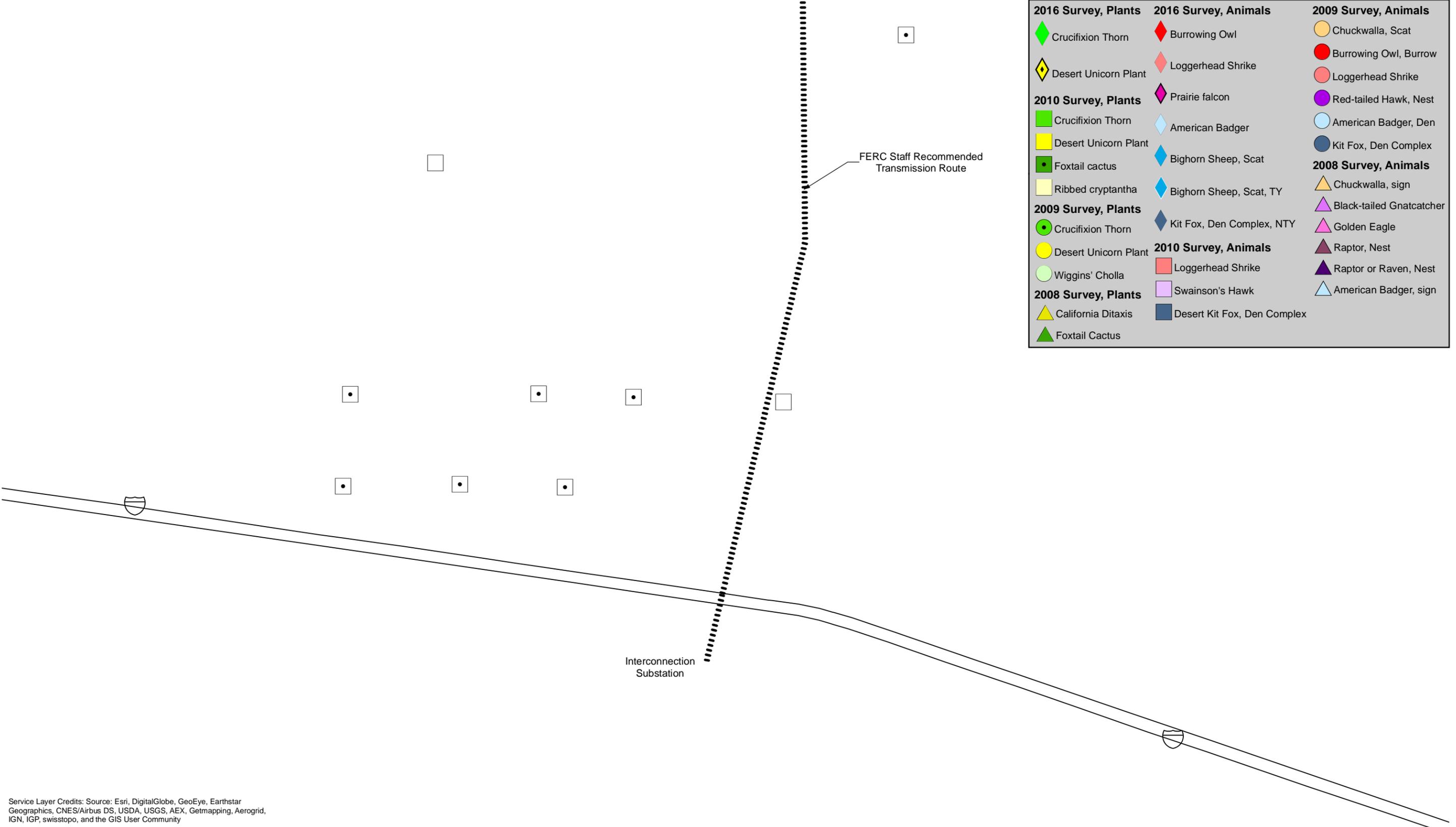
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<p>1:14,400</p>		<p>Eagle Mountain Pumped Storage Project</p>	<p>PLANT AND ANIMAL SURVEY RESULTS FROM 2008, 2009, 2010 AND 2016</p>
	<p>Eastern Riverside County, California</p>	<p>AUGUST 2016</p>	<p>Figure 4-7</p>

3-Aug-2016 Z:\Projects\080472_Eagle\Mtn_fromDenver\Plant\AnimalSurveys\All.mxd SET

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<p>1:14,400</p>  <p>0 2,400 4,800 Feet</p>	<p>N</p> 	<ul style="list-style-type: none">  Mitigation Monitoring Network Well  Water Supply Line  Transmission Route  Interconnection Substation  Water Supply Well Area  Project Boundary 	<p>Eagle Mountain Pumped Storage Project</p> <hr/> <p>Eastern Riverside County, California</p>		<p>PLANT AND ANIMAL SURVEY RESULTS FROM 2008, 2009, 2010 AND 2016</p> <hr/> <p>AUGUST 2016 Figure 4-8</p>
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2016 Survey, Plants	2016 Survey, Animals	2009 Survey, Animals
 Crucifixion Thorn	 Burrowing Owl	 Chuckwalla, Scat
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 Desert Unicorn Plant	 Bighorn Sheep, Scat	 American Badger, Den
 Foxtail cactus	 Bighorn Sheep, Scat, TY	 Kit Fox, Den Complex
 Ribbed cryptantha	 Kit Fox, Den Complex, NTY	2008 Survey, Animals
2009 Survey, Plants	 Crucifixion Thorn	 Chuckwalla, sign
 Desert Unicorn Plant	 Loggerhead Shrike	 Black-tailed Gnatcatcher
 Wiggins' Cholla	 Swainson's Hawk	 Golden Eagle
2008 Survey, Plants	 Desert Kit Fox, Den Complex	 Raptor, Nest
 California Ditaxis		 Raptor or Raven, Nest
 Foxtail Cactus		 American Badger, sign



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Eagle Mountain Pumped Storage Project

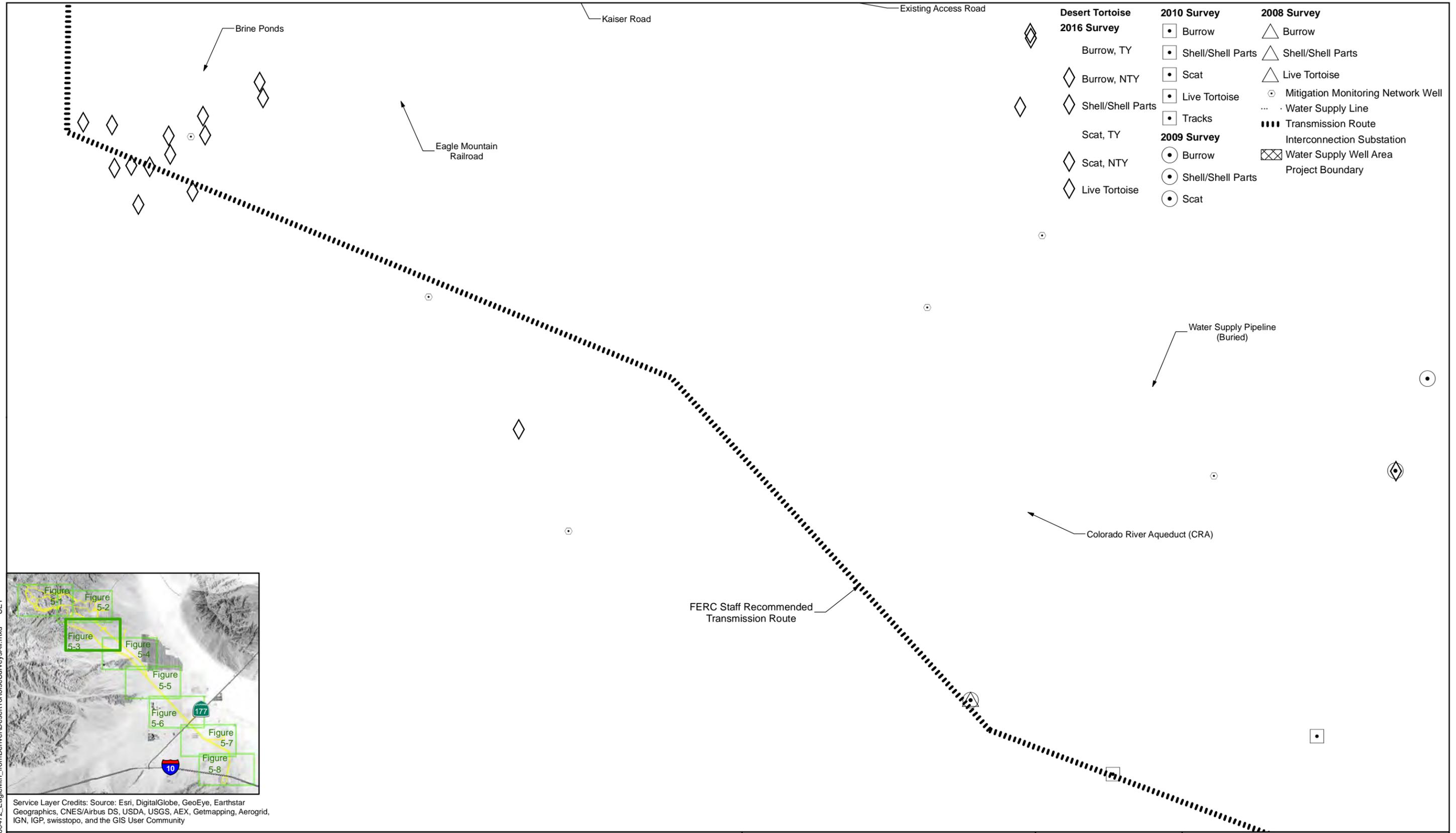
Eastern Riverside County, California



DESERT TORTOISE SURVEY RESULTS FROM 2008, 2009, 2010 AND 2016

AUGUST 2016

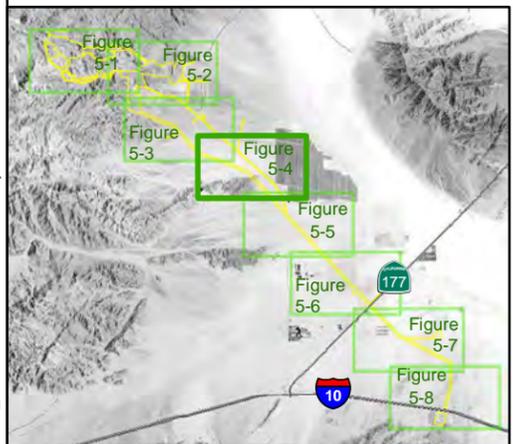
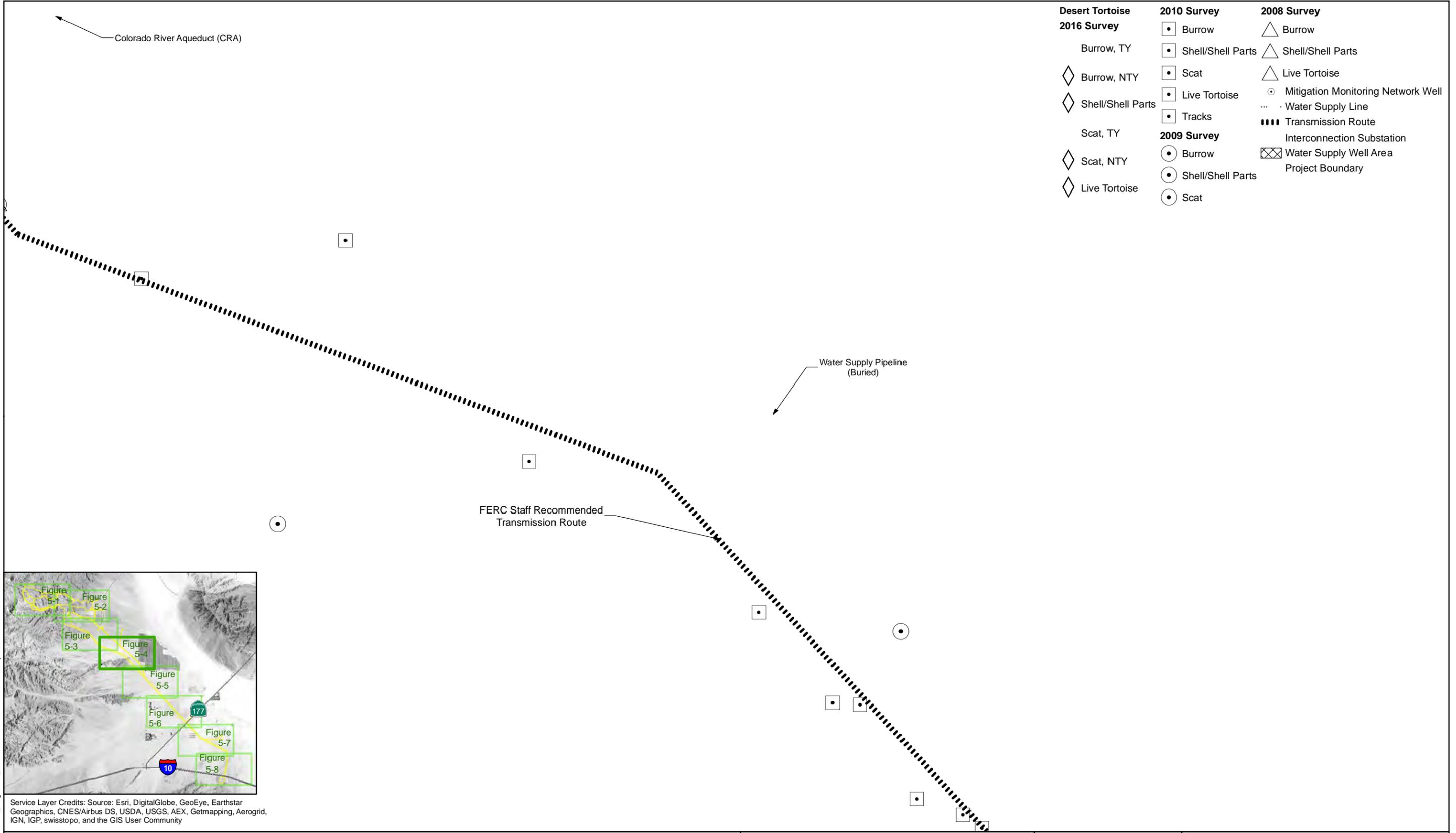
Figure 5-2



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			Eastern Riverside County, California		AUGUST 2016

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Eagle Mountain Pumped Storage Project

Eastern Riverside County, California



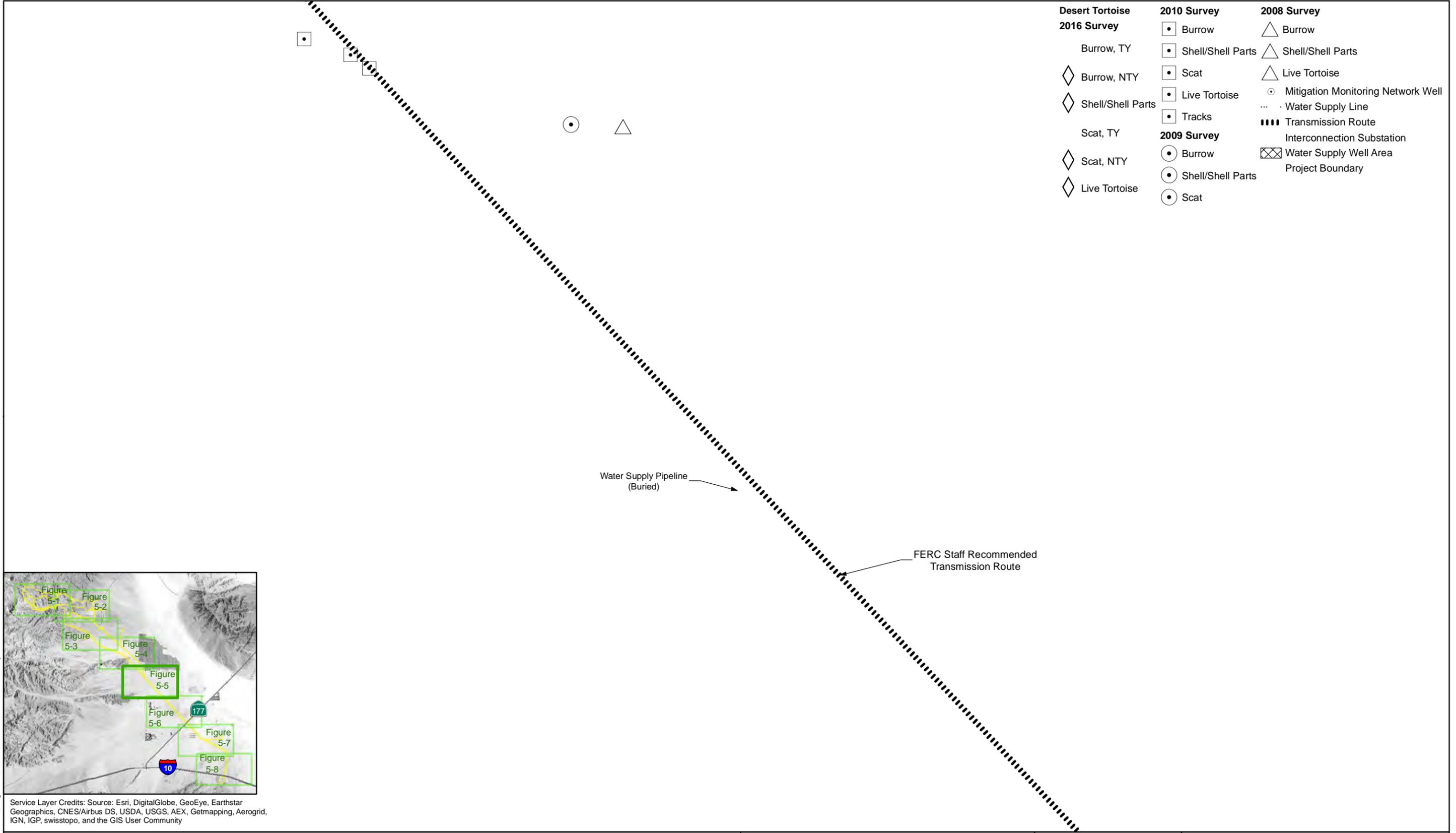
DESERT TORTOISE SURVEY RESULTS FROM 2008, 2009, 2010 AND 2016

AUGUST 2016

Figure 5-4

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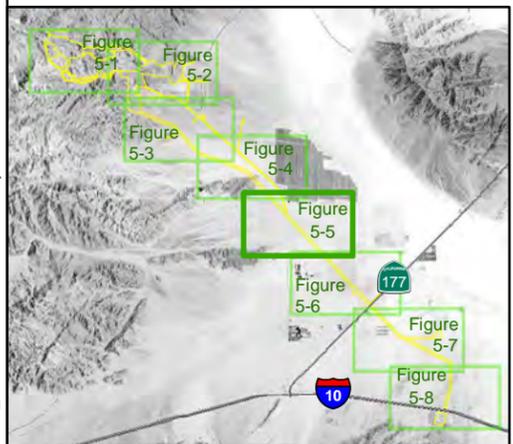
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Desert Tortoise	2010 Survey	2008 Survey
2016 Survey	□ Burrow	△ Burrow
Burrow, TY	□ Shell/Shell Parts	△ Shell/Shell Parts
◇ Burrow, NTY	□ Scat	△ Live Tortoise
◇ Shell/Shell Parts	□ Live Tortoise	○ Mitigation Monitoring Network Well
Scat, TY	□ Tracks	--- Water Supply Line
◇ Scat, NTY	● 2009 Survey	■■■ Transmission Route
◇ Live Tortoise	○ Burrow	□ Interconnection Substation
	○ Shell/Shell Parts	⊠ Water Supply Well Area
	○ Scat	— Project Boundary

Water Supply Pipeline (Buried)

FERC Staff Recommended Transmission Route



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Eagle Mountain Pumped Storage Project

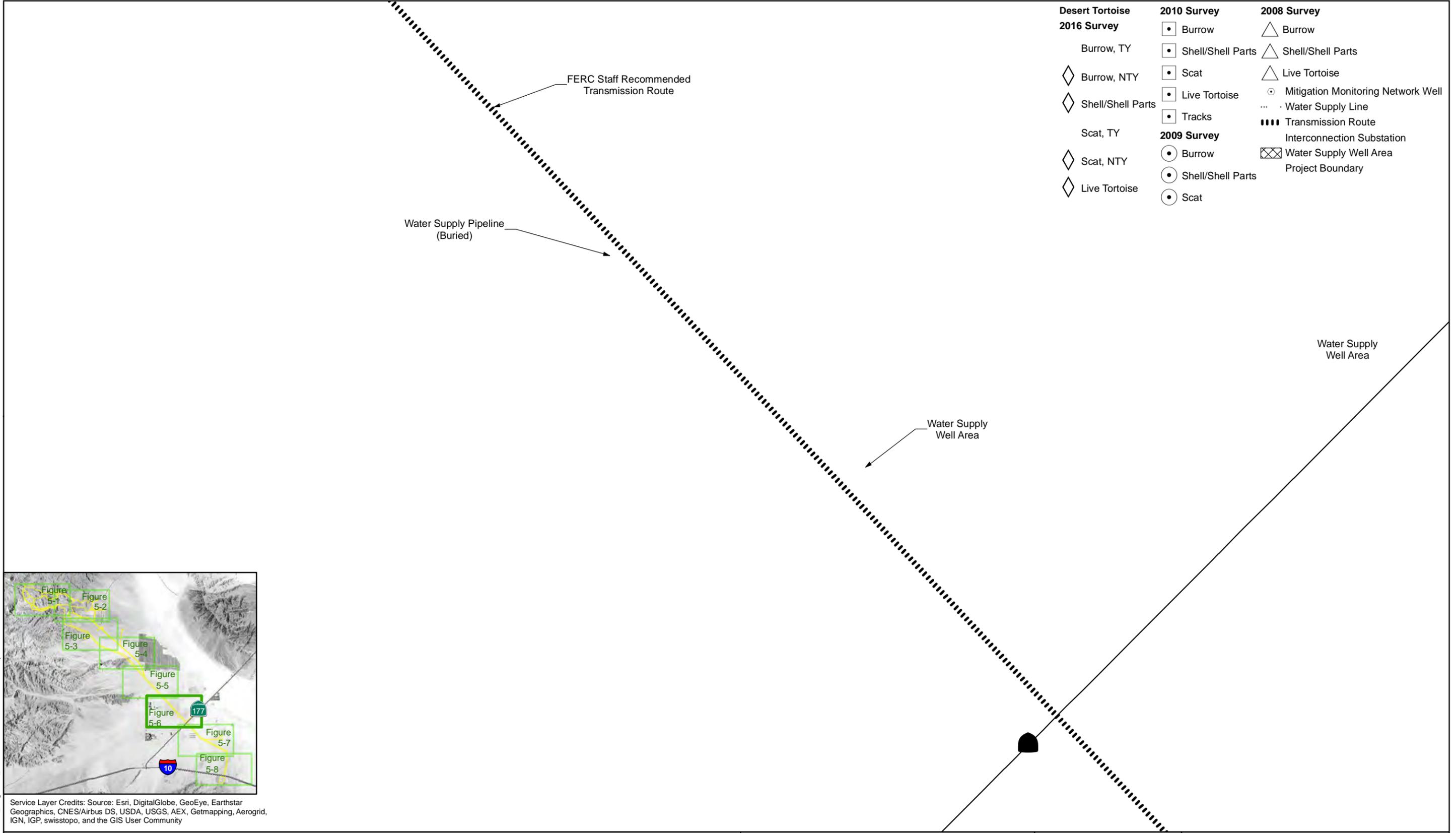
Eastern Riverside County, California



DESERT TORTOISE SURVEY RESULTS FROM 2008, 2009, 2010 AND 2016

AUGUST 2016

Figure 5-5



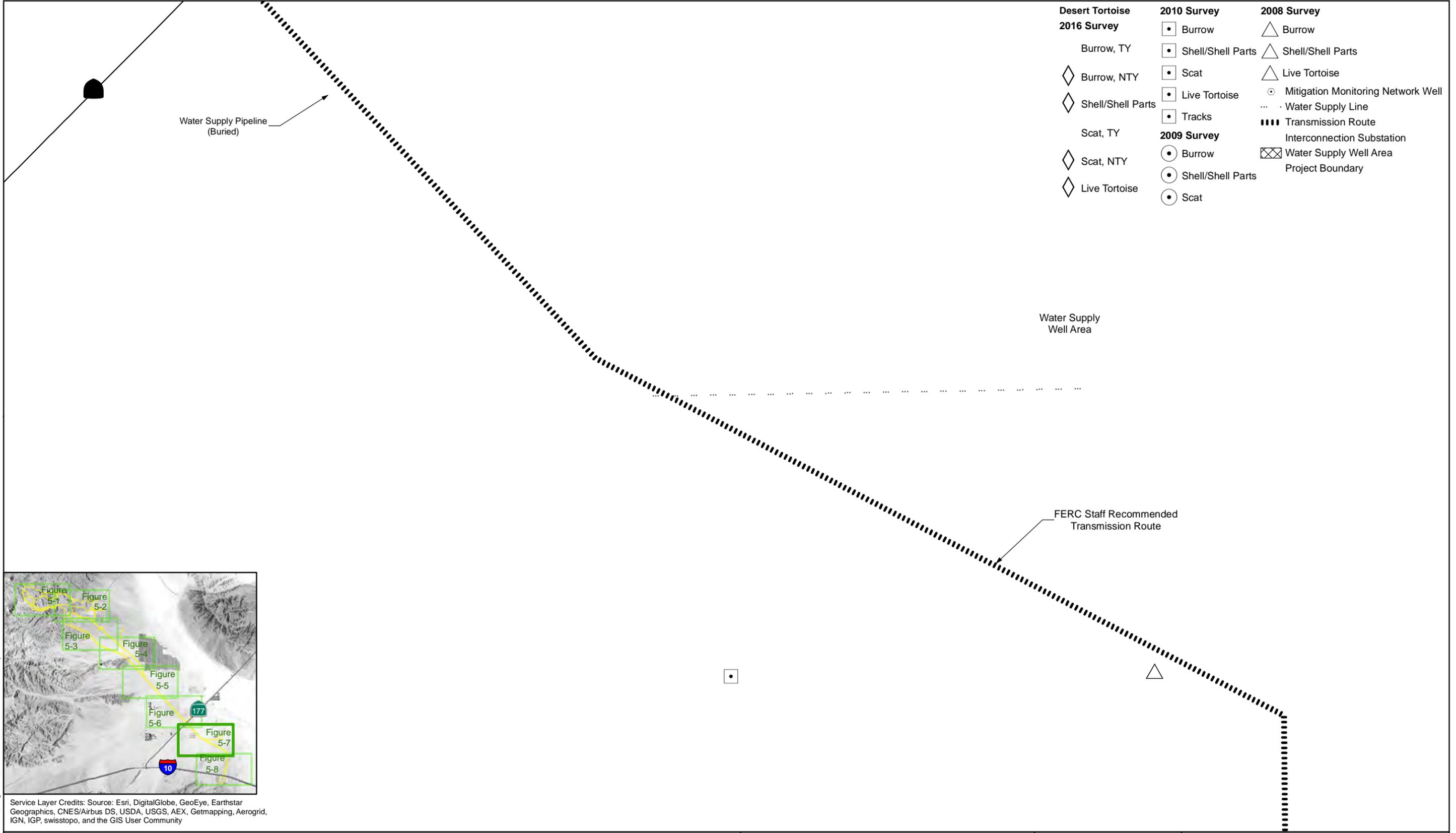
Desert Tortoise	2010 Survey	2008 Survey
2016 Survey	□ Burrow	△ Burrow
Burrow, TY	□ Shell/Shell Parts	△ Shell/Shell Parts
◇ Burrow, NTY	□ Scat	△ Live Tortoise
◇ Shell/Shell Parts	□ Live Tortoise	○ Mitigation Monitoring Network Well
Scat, TY	□ Tracks	· Water Supply Line
◇ Scat, NTY	● Burrow	▬ Transmission Route
◇ Live Tortoise	● Shell/Shell Parts	⊕ Interconnection Substation
	● Scat	⊗ Water Supply Well Area
		▭ Project Boundary



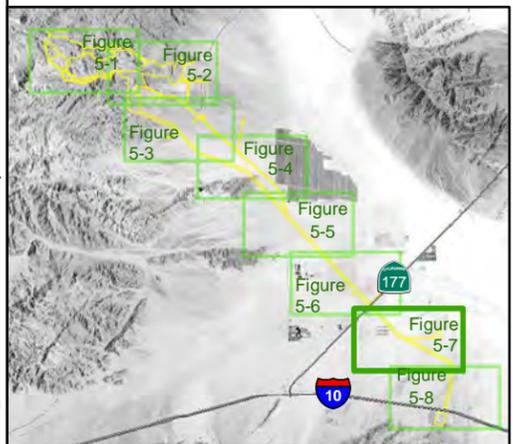
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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Desert Tortoise	2010 Survey	2008 Survey
2016 Survey	□ Burrow	△ Burrow
Burrow, TY	□ Shell/Shell Parts	△ Shell/Shell Parts
◇ Burrow, NTY	□ Scat	△ Live Tortoise
◇ Shell/Shell Parts	□ Live Tortoise	○ Mitigation Monitoring Network Well
Scat, TY	□ Tracks	--- Water Supply Line
◇ Scat, NTY	○ Burrow	■■■ Transmission Route
◇ Live Tortoise	○ Shell/Shell Parts	□ Interconnection Substation
	○ Scat	⊠ Water Supply Well Area
		— Project Boundary



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Eagle Mountain Pumped Storage Project

Eastern Riverside County, California



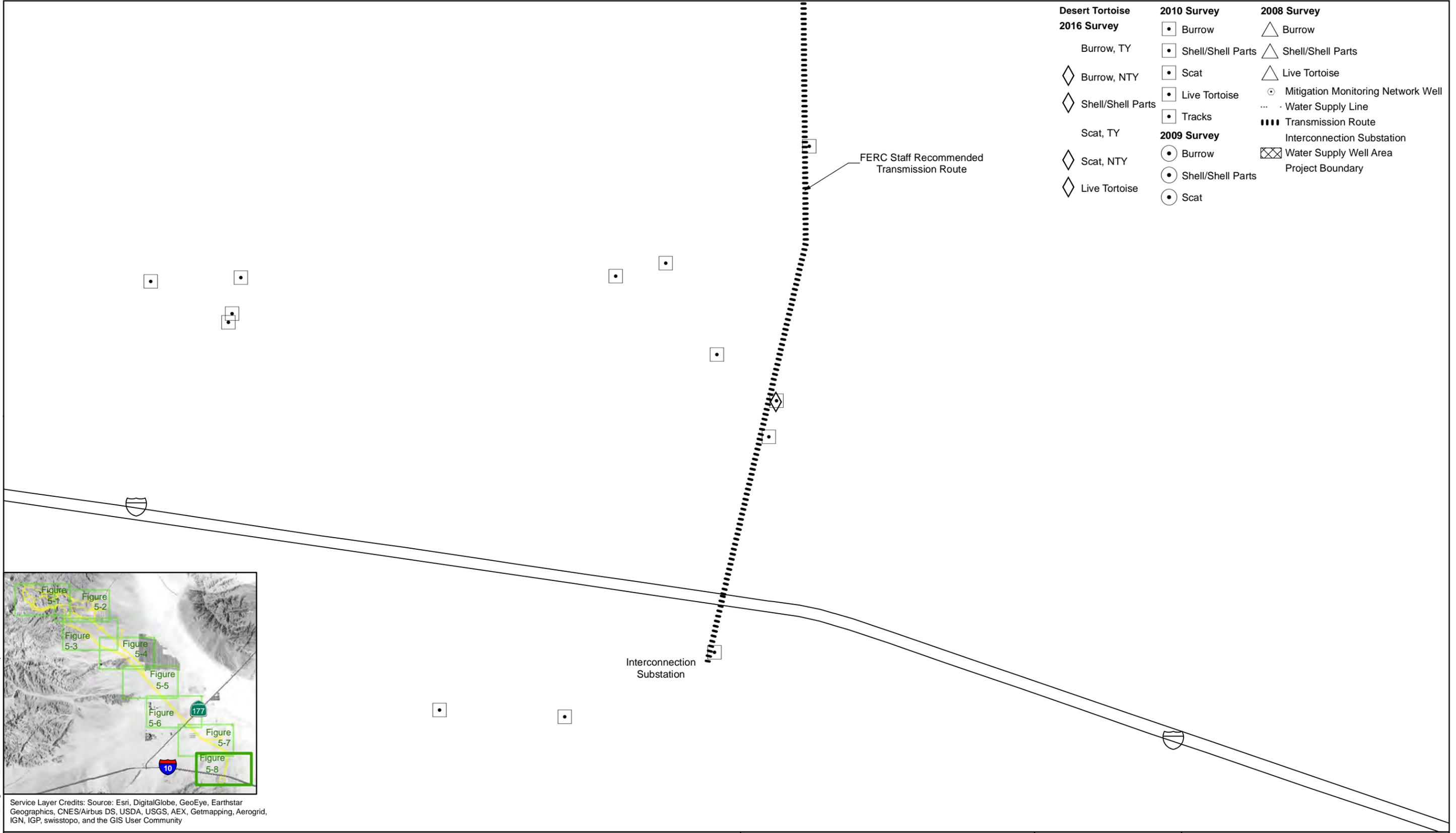
DESERT TORTOISE SURVEY RESULTS FROM 2008, 2009, 2010 AND 2016

AUGUST 2016

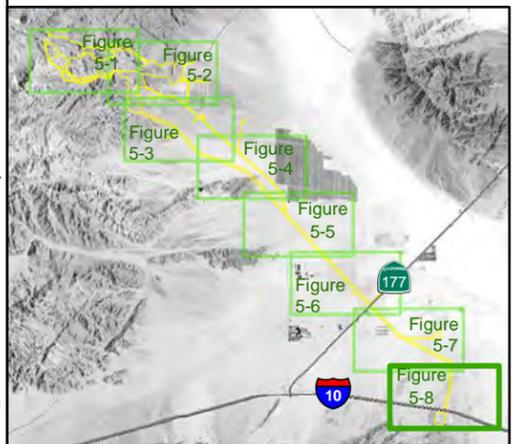
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Desert Tortoise	2010 Survey	2008 Survey
2016 Survey	□ Burrow	△ Burrow
Burrow, TY	□ Shell/Shell Parts	△ Shell/Shell Parts
◇ Burrow, NTY	□ Scat	△ Live Tortoise
◇ Shell/Shell Parts	□ Live Tortoise	○ Mitigation Monitoring Network Well
Scat, TY	□ Tracks	--- Water Supply Line
◇ Scat, NTY	● Burrow	■■■ Transmission Route
◇ Live Tortoise	● Shell/Shell Parts	□ Interconnection Substation
	● Scat	⊠ Water Supply Well Area
		— Project Boundary



Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



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Eagle Mountain Pumped Storage Project

Eastern Riverside County, California



DESERT TORTOISE SURVEY RESULTS FROM 2008, 2009, 2010 AND 2016

AUGUST 2016

Figure 5-8

Attachment 1

Sample Data Form and Key

KEY TO SIGN CLASSES (Source: Karl 1986)

BURROWS

- 1 - DEFINITELY TORTOISE - FRESH (TRACKS, TORTOISE INSIDE, FRESHLY DISTURBED SOIL ON MOUND/RUNWAY)
- 2 - DEFINITELY TORTOISE - USED THIS SEASON (CLEARED OF ANNUALS, BUT NO FRESHLY DISTURBED SOIL)
- 3 - DEFINITELY TORTOISE – NOT USED THIS SEASON (PROBABLY HAS ANNUALS GROWING IN RUNWAY)
- 4 - POSSIBLY TORTOISE – IN GOOD CONDITION BY UNSURE OF SPECIES USING BURROW
- 5 - DEFINITELY TORTOISE – DETERIORATED SUCH THAT IT WOULD REQUIRE SUBSTANTIAL REMODELING TO BE USABLE
- 6 - POSSIBLY TORTOISE – DETERIORATED

SCAT

- TY (This Year)** 1 - WET OR FRESH, DARK, ODORIFEROUS
- TY2** - DRIED, POSSIBLE GLAZE ON PART; UNEXPOSED SURFACES DARK BROWN; SLIGHT ODOR
- TY3** - DRIED, NO GLAZE; AT LEAST PARTIALLY FADED ON EXTERIOR; VERY SLIGHT ODOR
- NTY (Not This Year)** 3- DRIED, NO GLAZE; AT LEAST PARTIALLY FADED ON EXTERIOR; NO ODOR (DISTINGUISHES FROM TY3)
- NTY4**- DRIED, LOOSENING, PALE OR BLEACHED

CARCASSES – GENERAL INDICATORS FOR TIME SINCE DEATH

- <1 YR** - UNEXPOSED SCUTES NORMAL COLOR AND SHEEN, ADHERE TIGHTLY. EXPOSED SCUTES PALING AND MAY BE LIFTING OR OFF. UNEXPOSED BONE WAXY AND SOLID.
- 1-2 YRS** - UNEXPOSED SCUTES NORMAL COLOR WITH SLIGHT SHEEN, MOSTLY TIGHTLY ATTACHED. EXPOSED SCUTES SLIGHTLY PALE WITH NO SHEEN AND NO TO SLIGHT GROWTH RING PEELING. NO ODOR. UNEXPOSED BONE SILKY.
- 2-3 YRS** - UNEXPOSED SCUTES PALE AND WITHOUT SHEEN BUT NO GROWTH RING PEELING. EXPOSED SCUTES PALE WITH SLIGHT PEELING. SCUTES LOOSE, OFF AND/OR TIGHT. BONE SUTURES GENERALLY TIGHT.
- 4 YRS** - UNEXPOSED SCUTES NORMAL COLOR TO SLIGHTLY PALE, NO SHEEN, NO PEELING. EXPOSED SCUTES LOOSE, PALE, DULL, WITH MODERATE PEELING. SUTURES SEPARATING AND BONE SURFACE IS FISSURED, EDGES ARE ROUGHENED (FISSURED UNDER HAND LENS) AND CHIP FAIRLY EASILY
- >>4 YRS**- DISARTICULATED AND DISARTICULATING. BONE EDGES CHIP AND CRUMBLE EASILY. SCUTES ARE PEELING AND CURLED

Attachment 2

USFWS (2010) Protocol Calculation

for the

Combined Brine Pond/Transmission Line Survey Area

Table 3. USFWS Desert Tortoise Pre-Project Survey Guidance	
What is the estimated number of tortoises and associated 95% confidence interval for the action area?	
INSTRUCTIONS Use this tab when all your transects were of equal length.	
Enter the appropriate values from the survey into the yellow cells below. The number of tortoises and associated 95% confidence interval for the action area will be calculated.	
N =	2.5
Lower 95%CI =	0.43
Upper 95%CI =	14.13
Total action area (acres)	127
Prob that a tort is above ground given winter rainfall (Pa from Table 2) =	0.640
Total length of transects walked (L, km) =	52
Transect length (km)	1
Number of transects walked (k) =	52
Number of tortoises found during surveys (n) =	1
Transects all the same length	
Number of tortoises (n_i)	Number of transects on which (n_i) tortoises were.
0	51
1	1
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0