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ATTACHMENTS 5.4-B– 5.6-A
TO PROPONENT'S ENVIRONMENTAL ASSESSMENT

ATTACHMENT 5.4-B: SPECIAL-STATUS PLANT SPECIES WITH THE POTENTIAL TO OCCUR

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Common Name	Scientific Name	Listing Status[1]	Habitat Preferences, Distribution Information, and Additional Notes	Flowering Phenology	Life Form	Potential to Occur in the Survey Area
Alkali-sink goldfields	*Lasthenia chrysantha*	1B.1	This species occurs in vernal pools at elevations between 0 and 655 feet (CNPS 2023).	February to April	Annual herb	Suitable habitat and conditions for this species are not present within the survey area. This species has not been documented within 5 miles of the survey area based on California Natural Diversity Database (CNDDB) records (California Department of Fish and Wildlife [CDFW] 2023) and was not observed during field surveys. **No Potential**
Brittlescale	*Atriplex depressa*	1B.2	This species occurs in chenopod scrub, meadows and seeps, playas, valley and foothill grasslands, and vernal pools at elevations between 5 and 1,050 feet (CNPS 2023).	April to October	Annual herb	Marginal habitat and conditions for this species are present within the survey area. This species has not been documented within 5 miles of the survey area based on CNDDB records (CDFW 2023) and was not observed during field surveys. **No Potential**

[1] Explanation of federal, state, and local listing codes:

Federal listing codes:
-FE: Federally listed as endangered

State listing codes:
-SE: State-listed as endangered

California Native Plant Society (CNPS) California Rare Plant Ranks (CRPRs):
-1B: Plants that are rare, threatened, or endangered in California or elsewhere
-2B: Plants that are rare, threatened, or endangered in California but more common elsewhere

CRPR Threat Codes:
-0.1: Plants that are seriously threatened in California (over 80 percent of occurrences threatened; high degree and immediacy of threat)
-0.2: Plants that are moderately threatened in California (20 to 80 percent of occurrences threatened; moderate degree and immediacy of threat)

Common Name	Scientific Name	Listing Status[1]	Habitat Preferences, Distribution Information, and Additional Notes	Flowering Phenology	Life Form	Potential to Occur in the Survey Area
Chaparral ragwort	*Senecio aphanactis*	2B.2	This species occurs in chaparral, cismontane woodlands, and coastal scrub at elevations between 50 and 2,625 feet (CNPS 2023).	January to May	Annual herb	Marginal habitat and conditions for this species are present within the survey area. This species has been documented between 1 and 5 miles of the survey area based on CNDDB records (CDFW 2023) but was not observed during field surveys. **Low Potential**
Hall's tarplant	*Deinandra halliana*	1B.2	This species occurs in chenopod scrub, cismontane woodland, valleys, and foothill grasslands at elevations between 855 and 3,115 feet (CNPS 2023).	March, April to May	Annual herb	Marginal habitat and conditions for this species are present within the survey area. This species has been documented between 1 and 5 miles of the survey area based on CNDDB records (CDFW 2023) but was not observed during field surveys. **Low Potential**
Heartscale	*Atriplex cordulata* spp. *cordulata*	1B.2	This species occurs in chenopod scrub, meadows and seeps, and valleys and foothill grasslands at elevations between 0 and 1,835 feet (CNPS 2023).	April to October	Annual herb	Marginal habitat and conditions for this species are present within the survey area. This species has not been documented within 5 miles of the survey area based on CNDDB records (CDFW 2023) and was not observed during field surveys. **No Potential**
Lesser saltscale	*Atriplex minuscula*	1B.1	This species occurs in chenopod scrub, playas, valleys, and foothill grasslands at elevations between 50 and 655 feet (CNPS 2023).	May to October	Annual herb	Marginal habitat and conditions for this species are present within the survey area. This species has not been documented within 5 miles of the survey area based on CNDDB records (CDFW 2023) and was not observed during field surveys. **No Potential**

Common Name	Scientific Name	Listing Status[1]	Habitat Preferences, Distribution Information, and Additional Notes	Flowering Phenology	Life Form	Potential to Occur in the Survey Area
Lost Hills crownscale	*Atriplex coronate* spp. *vallicola*	1B.2	This species occurs in chenopod scrub, valleys, foothill grasslands, and vernal pools at elevations between 165 and 2,085 feet.	April to September	Annual herb	Marginal habitat and conditions for this species are present within the survey area. This species has been documented between 0.25 and 1 mile of the survey area based on CNDDB records (CDFW 2023) but was not observed during field surveys. **Moderate Potential**
Munz's tidy-tips	*Layia munzii*	1B.2	This species occurs in chenopod scrub, valleys, and foothill grasslands at elevations between 490 and 2,295 feet (CNPS 2023).	March to April	Annual herb	Marginal habitat and conditions for this species are present within the survey area. This species has been documented between 1 and 5 miles of the survey area based on CNDDB records (CDFW 2023) but was not observed during field surveys. **Low Potential**
Pale-yellow layia	*Layia heterotricha*	1B.1	This species occurs in cismontane woodland, coastal scrub, pinyon and juniper woodlands, valleys, and foothill grasslands at elevations between 985 and 5,595 feet (CNPS 2023).	March to June	Annual herb	Marginal habitat and conditions for this species are present within the survey area. This species has been documented between 1 and 5 miles of the survey area based on CNDDB records (CDFW 2023) but was not observed during field surveys. **Low Potential**
Palmate-bracted bird's-beak	*Chloropyron palmatum*	FE, SE, 1B.1	This species occurs in chenopod scrub, valleys, and foothill grasslands at elevations between 15 and 510 feet (CNPS 2023).	May to October	Annual herb	Marginal habitat and conditions for this species are present within the survey area. This species has not been documented within 5 miles of the survey area based on CNDDB records (CDFW 2023) and was not observed during field surveys. **No Potential**

Common Name	Scientific Name	Listing Status[1]	Habitat Preferences, Distribution Information, and Additional Notes	Flowering Phenology	Life Form	Potential to Occur in the Survey Area
Panoche pepper-grass	*Lepidium jaredii* spp. *album*	1B.2	This species occurs in valley and foothill grasslands at elevations between 605 and 2,445 feet (CNPS 2023).	February to June	Annual herb	Marginal habitat and conditions for this species are present within the survey area. This species has been documented between 0.25 and 1 mile of the survey area based on CNDDB records (CDFW 2023) but was not observed during field surveys. **Moderate Potential**
Recurved larkspur	*Delphinium recurvatum*	1B.2	This species occurs in chenopod scrub, cismontane woodland, valleys, and foothill grasslands at elevations between 10 and 2,590 feet (CNPS 2023).	March to June	Perennial herb	Marginal habitat and conditions for this species are present within the survey area. This species has not been documented within 5 miles of the survey area based on CNDDB records (CDFW 2023) and was not observed during field surveys. **No Potential**
San Joaquin woollythreads	*Monolopia congdonii*	FE, 1B.2	This species occurs in chenopod scrub, valleys, and foothill grasslands at elevations between 195 and 2,625 feet (CNPS 2023).	February to May	Annual herb	Marginal habitat and conditions for this species are present within the survey area. This species has been documented between 1 and 5 miles of the survey area based on CNDDB records (CDFW 2023) but was not observed during field surveys. **Low Potential**
Sanford's arrowhead	*Sagittaria sanfordii*	1B.2	This species occurs in marshes and swamps at elevations between 0 and 2,135 feet (CNPS 2023).	May to October	Perennial herb	Suitable habitat and conditions for this species are not present within the survey area. This species has not been documented within 5 miles of the survey area based on CNDDB records (CDFW 2023) and was not observed during field surveys. **No Potential**

Common Name	Scientific Name	Listing Status[1]	Habitat Preferences, Distribution Information, and Additional Notes	Flowering Phenology	Life Form	Potential to Occur in the Survey Area
Showy golden madia	*Madia radiata*	1B.1	This species occurs in cismontane woodlands, valleys, and foothill grasslands at elevation between 80 and 3,985 feet (CNPS 2023).	March to May	Annual herb	Marginal habitat and conditions for this species are present within the survey area. This species has been documented between 1 and 5 miles of the survey area based on CNDDB records (CDFW 2023) but was not observed during field surveys. **Low Potential**

ATTACHMENT 5.4-C: SPECIAL-STATUS WILDLIFE SPECIES WITH THE POTENTIAL TO OCCUR

ATTACHMENT 5.4-C: SPECIAL-STATUS WILDLIFE SPECIES WITH THE POTENTIAL TO OCCUR

Common Name	Scientific Name	Listing Status[1]	Habitat and Life History	Potential to Occur in the survey area
Amphibians				
California red-legged frog	*Rana draytonii*	FT, SSC	This species has several requirements for suitable habitat, including streams or stock ponds for breeding, neighboring upland areas with insects and invertebrates as prey, and areas with relief from heat during the summer months. Tadpoles rely on algae that grow on top of rocks and vegetation for food and are active during both day and night, whereas adults are generally nocturnal (USFWS 2023b).	Suitable habitat is not present within the survey area. This species has not been recently documented within 5 miles of the survey area based on California Natural Diversity Database (CNDDB) records (CDFW 2023b). This species was not observed during the field survey. **No Potential**
California tiger salamander	*Ambystoma californiense*	FT, ST, WL	This species occupies grassland, savanna, or open woodland habitats and spends much of the year in underground refuges, especially ground squirrel burrows. Vernal pools or other seasonal water sources are required for breeding and egg-laying. Adults may travel hundreds of meters across upland habitat to reach breeding ponds following seasonal rains from November to February. The diet of this species is highly variable and may include invertebrates, amphibians, or small mammals (USFWS 2023b).	Suitable annual grassland habitat is present within the survey area and suitable refuge burrows were observed during field surveys. No suitable vernal pools were observed within the survey area. This species has not been documented within 5 miles of the survey area based on CNDDB records (CDFW 2023b) and was not observed during field surveys. **Low Potential**

[1] Explanation of federal, state, and local listing codes:

Federal listing codes:
-FE: Federally listed as endangered
-FT: Federally listed as threatened
-PT: Proposed to be federally listed as threatened
-C: Candidate for listing
-BCC: United States (U.S.) Fish and Wildlife (USFWS) Bird of Conservation Concern

State listing codes:
-SE: State-listed as endangered
-ST: State-listed as threatened
-SCE: State candidate for listing as endangered
-FP: Fully protected species
-SSC: California Department of Fish and Wildlife (CDFW) Species of Special Concern

State listing codes (cont.):
-WL: California Watch List species
-WBWG-H: Western Bat Working Group (WBWG) high designation
-WBWG-M: WBWG medium designation

Common Name	Scientific Name	Listing Status[1]	Habitat and Life History	Potential to Occur in the survey area
Foothill yellow-legged frog – Central Coast Distinct Population Segment (DPS)	*Rana boylii (population 4)*	FT, SE	This species can be found in foothills and mountain streams at elevations up to 5,000 feet. Adults occur in a variety of vegetation types, including valley-foothill hardwood, hardwood-conifer, and riparian. Ponderosa pine (*Pinus ponderosa*), mixed conifer, mixed chaparral, and wet meadows may also be habitat for this species. Diet includes aquatic and terrestrial invertebrates like snails, moths, flies, water striders, beetles, grasshoppers, hornets (*Vespa* spp.), and ants (for adults) (USFWS 2023b).	Suitable stream habitat is not present within the survey area. This species has been recently documented between 1 and 5 miles of the survey area based on CNDDB records (CDFW 2023b) but was not observed during the field survey. **No Potential**
Western spadefoot	*Spea hammondii*	SSC, PT	This species occurs predominantly in grasslands but may also occur in valley-foothill hardwood woodlands. The western spadefoot consumes worms, insects, and other invertebrates and require shallow, temporary pools of water from heavy winter rains for reproduction (USFWS 2023c).	Suitable grassland habitat is present within the survey area. This species has been recently documented between 1 and 5 miles of the survey area based on CNDDB records (CDFW 2023b). This species was not observed during the field survey. **Moderate Potential**
Birds				
Burrowing owl	*Athene cunicularia*	SSC, BCC	This species can be found in a variety of open habitat types, including grassland, savanna, desert scrub, agricultural, and urban areas. Breeding occurs from March through October, and nesting takes place within abandoned burrows dug by burrowing mammals. The young leave the nest when they are self-reliant at 12 weeks old. This species preys on large insects and small mammals (USFWS 2023b).	Grassland habitat suitable for foraging is found in the survey area; burrows suitable for species occupation and breeding were observed during the field surveys. Migrating individuals may occur in or near the survey area during winter months. This species has been recently documented between 1 and 5 miles of the survey area based on CNDDB records (CDFW 2023b). This species was not observed during the field survey. **Moderate Potential (Nesting)** **Moderate Potential (Foraging/Migration)**

Common Name	Scientific Name	Listing Status[1]	Habitat and Life History	Potential to Occur in the survey area
California condor	*Gymnogyps californianus*	FE, SE, FP	This species uses extensive territories in open grasslands, oak savannah foothills, and beaches adjacent to coastal mountains for foraging, roosting, and nesting. Nests are built in caves and ledges in steep, rocky terrain. This species may also use cavities and broken tops of conifers for nesting locations. Juveniles remain dependent on their parents for 1 to 2 years while they learn to forage on their own. The species will consume carrion and carcasses (USFWS 2023b).	Marginal foraging habitat is present, and no nesting habitat is present in the survey area. This species has not been documented within 5 miles of the survey area based on CNDDB records (CDFW 2023b) and was not observed during field surveys. **No Potential (Nesting)** **No Potential (Foraging)**
California horned lark	*Eremophila alpestris actia*	WL	This species is found in a variety of open habitats, notably where trees and large shrubs are not present. Diet consists mostly of snails, insects, and spiders in the breeding season and includes more grass and forb seeds during the rest of the year. California horned lark frequent grasslands and habitats with low, sparse vegetation to take cover and forage. Breeding season is from March to July, with peak activity in May. Young typically leave the nest within 9 to 12 days (CDFW 2023b).	Marginal foraging and breeding habitat is present in the survey area. This species has been documented between 1 and 5 miles of the survey area based on CNDDB records (CDFW 2023b); however, all occurrences are over 30 years old. This species was not observed during field surveys. **Low Potential (Nesting)** **Low Potential (Foraging)**
California thrasher	*Toxostoma redivivum*	BCC	This species occurs from sea level to the upper elevations of montane chaparral and lower elevation limits of coniferous and pine-oak woodlands (approximately 5,000 feet). California thrasher rely on dense cover and shrub habitats for breeding (CDFW 2023a).	No foraging or breeding habitat is present in the survey area. This species is not tracked by CNDDB (CDFW 2023b) and was not observed during field surveys. **No Potential (Nesting)** **No Potential (Foraging)**
Oak titmouse	*Baeolophus inornatus*	BCC	This species occurs primarily in warm, dry oak or oak-pine woodlands. The composition of the oak woodlands varies but they are generally open. Nests are primarily in natural cavities and woodpecker-excavated cavities in oak (*Quercus* spp.) (USFWS 2023a).	No foraging or breeding habitat is present in the survey area. This species is not tracked by CNDDB (CDFW 2023b) and was not observed during field surveys. **No Potential (Nesting)** **No Potential (Foraging)**

Common Name	Scientific Name	Listing Status[1]	Habitat and Life History	Potential to Occur in the survey area
Northern harrier	*Circus cyaneus*	SSC, BCC	This species is found in a variety of open grassland, wetland, and agricultural habitats. Open wetland habitats used for breeding include marshy meadows, wet and lightly grazed pastures, and freshwater and brackish marshes. Breeding habitat also includes dry upland habitats, such as grassland, cropland, drained marshland, and shrub-steppe in cold deserts. Wintering habitat includes open areas dominated by herbaceous vegetation, such as grassland, pastures, cropland, coastal sand dunes, brackish and freshwater marshes, and estuaries (U.S. Department of Agriculture [USDA] 2023).	Suitable foraging and nesting habitat are present in the survey area. This species has not been documented within 5 miles of the survey area based on CNDDB records (CDFW 2023b) and was not observed during field surveys. **Low Potential (Nesting)** **Low Potential (Foraging)**
Prairie falcon	*Falco mexicanus*	WL	This species is highly associated with perennial grasslands, savannahs, rangeland, agricultural fields, and desert scrub areas. Prairie falcon forage in the early morning and late afternoon, except while raising young or when food is scarce. Optimal nesting locations utilize open terrain near canyons, cliffs, escarpments, and rock outcrops. Small mammals make up most of this species' prey, with small birds and reptiles being the remainder. Breeding season takes place from February to September, with peak activity from April to August. The young of this species begin to disperse in June and July (Washington Department of Fish and Wildlife [WDFW] 2023).	Suitable nesting habitat is not present within the survey area; however, suitable foraging habitat is present throughout the survey area. This species has recently been documented within 0.25 mile of the survey area based on CNDDB records (CDFW 2023b) but was not observed during field surveys. **No Potential (Nesting)** **High Potential (Foraging/Migration)**
Short-eared owl	*Asio flammeus*	SSC, BCC	This species occurs in agricultural fields, grazed and ungrazed grasslands, and freshwater and saltwater marshes. Short-eared owls are crepuscular hunters and prefer to consume meadow voles (*Microtus* spp.) and mice (*Mus* spp.) among other mammals and birds. Nestlings consume insects. This species is a ground-nesting bird, sometimes roosting and foraging communally if prey is abundant. Breeding season begins in late winter with fledglings leaving within a month of hatching (USFWS 2023b).	Suitable foraging and breeding habitat are present in the survey area. This species has been documented between 1 and 5 miles of the survey area based on CNDDB records (CDFW 2023b). This species was not observed during field surveys. **Moderate Potential (Nesting)** **Moderate Potential (Foraging)**

Common Name	Scientific Name	Listing Status[1]	Habitat and Life History	Potential to Occur in the survey area
Savannah sparrow (Belding's)	*Passerculus sandwichensis beldingi*	SE, BCC	This species is wetland-dependent and can be found in open areas like grasslands, tundra, meadows, bogs, farmlands, and grassy areas with scattered bushes, but it prefers salt marshes. Nests are built in marshes with dried pickleweed (*Salicornia* spp.). Like other savannah sparrow subspecies, it eats insects and seeds (USFWS 2023b).	No foraging or breeding habitat is present in the survey area. This species is not tracked by CNDDB (CDFW 2023b) and was not observed during field surveys. **No Potential (Nesting)** **No Potential (Foraging)**
Yellow-billed magpie	*Pica nuttalli*	BCC	This species has been observed in oak savanna, in open areas with large trees, and along streams. Yellow-billed magpie forage in grasslands, pastures, fields, and orchards. In addition to ground-dwelling invertebrates, this species consumes grains, acorns, carrion, and small mammals. Nests are built in large trees and small colonies (USFWS 2023a).	Suitable foraging habitat is present within the survey area; however, trees suitable for nesting habitat are not present. This species is not tracked by CNDDB (CDFW 2023b) and was not observed during field surveys. **No Potential (Nesting)** **Moderate Potential (Foraging)**
Swainson's hawk	*Buteo swainsoni*	ST	This species occurs in open grasslands, prairies, and farmlands that have nearby trees for nesting. Swainson hawks nest in bushes and in several tree species, including oak, willow (*Salix* spp.), and eucalyptus (*Eucalyptus* spp.), and usually nest in trees in riparian areas near open fields. This species primarily hunts small rodents, rabbits, birds, and reptiles during the breeding season. This species largely lives off insects, such as grasshoppers and beetles, during the non-breeding season. Reproduction is from March through April, incubation lasts 34 to 35 days, and fledging is 6 weeks later (CDFW 2023a).	Suitable foraging habitat for the species is present in the survey area; however, oak woodland or riparian habitat suitable for nesting is not present. This species has been documented between 1 and 5 miles of the survey area based on CNDDB records (CDFW 2023b) but was not observed during the field survey. **Low Potential (Nesting)** **Moderate Potential (Foraging)**

Common Name	Scientific Name	Listing Status[1]	Habitat and Life History	Potential to Occur in the survey area
Tricolored blackbird	*Agelaius tricolor*	ST, SSC, BCC	This highly colonial species requires open water, protected nesting substrate, and foraging areas adjacent to the colony with insect prey. Breeding occurs near fresh water, often in emergent wetlands with tall, dense cattails (*Typha* spp.) or tules (*Schoenoplectus* spp.), but also in thickets of willow; blackberry (*Rubus* spp.); wild rose (*Rosa acicularis*); or tall, dense forbs. Seeds and cultivated grains, such as rice and oats, compose most of this species' fall and winter diet. It forages on the ground in croplands, grassy fields, flooded land, and along edges of ponds. Breeding season usually occurs from mid-April to late July (USFWS 2023a).	Suitable foraging habitat is present within the survey area; however, wetlands suitable for nesting are not present. This species has been documented between 1 and 5 miles of the survey area based on CNDDB records (CDFW 2023b) but was not observed during field surveys. **No Potential (Nesting)** **Moderate Potential (Foraging)**
Invertebrates				
Crotch's bumblebee	*Bombus crotchii*	SCE	This species inhabits grasslands and shrublands and requires hotter, drier environments than other bee species. Due to a short tongue, this species prefers milkweeds (*Asclepias* spp.), dusty maidens (*Chaenactis douglasii*), lupines, medics (*Medicago* spp.), phacelias (*Phacelia* spp.), sages (*Salvia* spp.), clarkias (*Clarkia* spp.), poppies (*Papaver* spp.), and wild buckwheats (*Erigonum* spp.). Nests are frequently located in abandoned rodent nests, tufts of grass, old bird nests, rock piles, or cavities in dead trees (Los Padres Forest Watch [LPFW] 2023).	Suitable habitat is present within the survey area. This species has been documented between 1 and 5 miles of the survey area based on CNDDB records (CDFW 2023a) but was not observed during the field survey. **Moderate Potential**
Longhorn fairy shrimp	*Branchinecta longiantenna*	SSC	This species lives in clear to turbid freshwater vernal pools, water-filled depressions in sandstone, grass-bottomed pools, or claypan pools. Longhorn fairy shrimp are opportunistic feeders, ingesting algae, bacteria, protozoa, rotifers, and bits of waste from other plants and animals. Eggs of this species lie at the bottom of the pool and remain viable for several years until the vernal pool refills with water (USFWS 2023b).	No suitable vernal pool habitat is present in the survey area. This species has been documented between 1 and 5 miles of the survey area based on CNDDB records (CDFW 2023b) but was not observed during the field survey. **No Potential**

Common Name	Scientific Name	Listing Status[1]	Habitat and Life History	Potential to Occur in the survey area
Monarch butterfly	*Danaus plexippus*	C, SSC	This species requires milkweed and flowering plants for suitable habitat. Although adults only need to feed on nectar from flowers, milkweed is the only place where they can lay eggs. Most individuals of this species live 2 to 5 weeks, but overwintering individuals may live 6 to 9 months (USFWS 2023b).	Marginal habitat is present within the survey area. This species has not been documented within 5 miles of the survey area based on CNDDB records (CDFW 2023b) and was not observed during the field survey. **Low Potential**
Valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	FT	This species is extremely dependent on the elderberry (*Sambucus nigra* ssp. *canadensis*), which is a shrub found in riparian areas and foothill oak woodlands. Adults and juveniles exclusively eat the stems, leaves, and flowers of the elderberry. Individuals are only found on the valley floor and low foothills. The typical lifespan of this species is 1 to 2 years (USFWS 2023b).	Suitable habitat for this species is not present within the survey area. This species has not been documented within 5 miles of the survey area based on CNDDB records (CDFW 2023b). No observations of this species or elderberry shrubs, this species' obligate host plant, were made during field surveys. **No Potential**
Vernal pool fairy shrimp	*Branchinecta lynchi*	FT	This species occurs within vernal pool habitats throughout California. Female vernal pool fairy shrimp carry fertilized eggs in a sac on the underside of their body. The eggs are either dropped to the pool bottom or remain in the brood sac until the mother dies and sinks to the bottom of the pool. This species opportunistically filter-feeds on various planktonic food sources, including algae and protozoa (USFWS 2023b).	Suitable vernal pool habitat was not observed during the field survey. This species has not been documented within 5 miles of the survey area based on CNDDB records (CDFW 2023b) and was not observed during the field survey. **No Potential**
Mammals				
American badger	*Taxidea taxus*	SSC	This solitary species can be found in grassland, shrub steppe, desert, dry forest, parkland, and agricultural areas. It forages underground by digging into burrow systems of prey species, commonly including ground squirrels (*Otospermophilus beecheyi*), prairie dogs (*Cynomys* spp.), marmots (*Marmota* spp.), and pocket gophers (*Heteromeomys* spp.). American badgers may also feed on carrion, insects, reptiles, and birds (USDA 2023).	Suitable grassland habitat is present within the survey area; however, no suitable breeding burrows/dens were encountered during the survey. This species has been documented within 5 miles of the survey area based on CNDDB records (CDFW 2023b), but occurrences are over 30 years old. **Low Potential**

Common Name	Scientific Name	Listing Status[1]	Habitat and Life History	Potential to Occur in the survey area
Big free-tailed bat	*Nyctinomops macrotis*	SSC, WBWG-M	This insectivorous species occurs in rugged, rocky canyons and roosts in buildings, caves, and occasionally holes in trees. Little is known about this species in California (Texas Parks and Wildlife Department [TPWD] 2023).	No suitable roosting habitat is present in the survey area, and suitable foraging habitat is not present. This species has not been documented within 5 miles of the survey area based on CNDDB records (CDFW 2023b) and was not observed during field surveys. **No Potential (Roosting)** **No Potential (Foraging)**
California leaf-nosed bat	*Macrotus californicus*	SSC, WBWG-H	This species is confined to lowland Sonoran Desert habitat and forages in open desert wash habitats. The California leaf-nosed bat utilizes caves and mines almost exclusively for roosting (CDFW 2023a).	No suitable roosting habitat is present in the survey area, and suitable foraging habitat is not present. This species has not been documented within 5 miles of the survey area based on CNDDB records (CDFW 2023b) and was not observed during field surveys. **No Potential (Roosting)** **No Potential (Foraging)**
Fresno kangaroo rat	*Dipodomys nitratoides exilis*	FE, SE	This species consumes primarily seeds but may also forage on green herbaceous vegetation and insects. Burrows of this species are usually found in relatively light, sandy soils in raised areas. Breeding season is assumed to be initiated in winter after the onset of the rainy season (USFWS 2023b).	No suitable habitat is present in the survey area. This species has not been documented within 5 miles of the survey area based on CNDDB records (CDFW 2023b) and was not observed during field surveys. **No Potential**
Giant kangaroo rat	*Dipodomys ingens*	FE, SE	This species eats seeds, small amounts of green foliage like clovers (*Trifolium* spp.) and filaree (*Erodium* spp.), and insects. Giant kangaroo rats often emerge from their burrow around twilight and are mainly active at night. This species mainly inhabits sandy-loam soils located on level and gently sloping ground vegetated with annual grasses and forbs and widely scattered desert shrubs (USFWS 2023b).	Marginal annual grassland habitat is present within the survey area, and small mammal burrows suitable for occupation were also observed. This species has been documented within 0.25 mile of the survey area based on CNDDB records (CDFW 2023b) but was not observed during field surveys. **High Potential**

Common Name	Scientific Name	Listing Status[1]	Habitat and Life History	Potential to Occur in the survey area
Hoary bat	*Lasiurus cinereus*	WBWG-M	This species generally roosts alone or in family groups consisting of a mother and her young. Forest habitats with a mixture of forest and small, open areas that provide edges are ideal for this species. Hoary bat can be found in a variety of places, such as Spanish moss (*Tillandsia usneoides*), squirrel nests, woodpecker holes, and tree trunks. This species forages for food in the early evening and before sunrise, preferring moths, beetles, and sometimes mosquitoes or any other large insect that can be caught in open areas (TPWD 2023).	No suitable roosting habitat is present in the survey area, and suitable foraging habitat is present. This species has been documented between 1 and 5 miles of the survey area based on CNDDB records (CDFW 2023b), but all occurrences are over 30 years old. This species was not observed during field surveys. **No Potential (Roosting)** **Low Potential (Foraging)**
Mexican long-tongued bat	*Choeronycteris mexicana*	SSC, WBWG-M	This species occurs in the southernmost part of California in desert and arid scrub habitats and feeds on nectar and pollen. Mexican long-tongued bat roost in caves, crevices, and buildings (TPWD 2023).	No suitable roosting habitat is present in the survey area, and suitable foraging habitat is not present. This species has not been documented within 5 miles of the survey area based on CNDDB records (CDFW 2023b) and was not observed during field surveys. **No Potential (Roosting)** **No Potential (Foraging)**
Long-eared myotis	*Myotis evotis*	WBWG-M	This insectivorous species occupies a wide range of rocky and forested habitats year-round and roosts in abandoned buildings, bridges, hollow trees, stumps, loose bark, and rock fissures. Long-eared myotis forage in a variety of habitats including conifer forests ranging from drier Ponderosa pine to humid coastal and montane forests. Non-forested habitats are also used, including shrub steppe, chaparral, and agricultural lands (State of Montana 2023).	No suitable roosting habitat is present in the survey area, and suitable foraging habitat is present. However, suitable roosting sites, water sources, and riparian habitats and rock outcroppings are not available nearby. This species is not tracked by CNDDB (CDFW 2023b) and was not observed during field surveys. **No Potential (Roosting)** **No Potential (Foraging)**

Common Name	Scientific Name	Listing Status[1]	Habitat and Life History	Potential to Occur in the survey area
Pallid bat	*Antrozous pallidus*	SSC, WBWG-H	This species generally roosts in colonies of 20 to several hundred individuals. Pallid bats prefer to roost in rock crevices, tree hollows, mines, caves, and a variety of anthropogenic structures like buildings. This species consumes insects it can reach on the ground or sometimes in flight. These may include large, flightless arthropods like scorpions, ground crickets, and cicadas (TPWD 2023).	No suitable roosting habitat is present in the survey area, and suitable foraging habitat is marginal. This species has been documented between 1 and 5 miles of the survey area based on CNDDB records (CDFW 2023b), but all occurrences are over 30 years old. This species was not observed during field surveys. **No Potential (Roosting)** **Low Potential (Foraging)**
Pocketed free-tailed bat	*Nyctinomops femorosaccus*	SSC, WBWG-M	This insectivorous species inhabits pinyon-juniper woodlands, desert scrub, desert succulent shrub, desert riparian, desert wash, alkali desert scrub, Joshua tree, and palm oasis habitats. It prefers rock crevices and cliffs for roosting (TPWD 2023).	No suitable roosting habitat is present in the survey area, and suitable foraging habitat is not present. This species has not been documented within 5 miles of the survey area based on CNDDB records (CDFW 2023b) and was not observed during field surveys. **No potential (Roosting)** **No Potential (Foraging)**
San Joaquin antelope squirrel	*Ammospermophilus nelsoni*	ST	This species inhabits arid grassland, shrubland, and alkali sink habitats. This species is an omnivore, ingesting mostly green vegetation, fungi, seeds, and insects. Breeding season lasts from late winter to early spring, with gestation lasting approximately 26 days. The typical lifespan of a San Joaquin Antelope Squirrel is less than one year (California State University, Stanislaus [CSUS] 2023).	Suitable grassland habitat for this species is present within the survey area. This species has been documented between 1 and 5 miles of the survey area based on CNDDB records (CDFW 2023b) but was not observed during field surveys. **Moderate Potential**
San Joaquin kit fox	*Vulpes macrotis mutica*	FE, ST	This species inhabits a variety of open habitats, including grasslands, chenopod scrublands, and semi-arid regions. Breeding occurs from January to March, with a gestation period of 49 to 55 days. The female constructs a den in the ground, often utilizing existing burrows dug by other animals. Diet primarily consists of small mammals, such as rodents, rabbits, and ground squirrels (USFWS 2023b).	Grassland habitat suitable for foraging is present within the survey area and burrows suitable for occupation were observed during the survey. This species has been documented within 0.25 mile of the survey area based on CNDDB records (CDFW 2023b) but was not observed during field surveys. **High Potential**

Common Name	Scientific Name	Listing Status[1]	Habitat and Life History	Potential to Occur in the survey area
Silver-haired bat	*Lasionycteris noctivagans*	WBWG-M	This migratory species inhabits coastal and montane coniferous forests, valley foothill woodlands, pinyon-juniper woodlands, and valley foothill and montane riparian habitats in the summer. Silver-haired bats roost in hollow trees, snags, buildings, rock crevices, and caves, as well as under bark (TPWD 2023).	No suitable roosting habitat is present in the survey area, and marginal foraging habitat is present. This species has not been documented within 5 miles of the survey area based on CNDDB records (CDFW 2023b) and was not observed during field surveys. **No Potential (Roosting)** **No Potential (Foraging)**
Spotted bat	*Euderma maculatum*	SSC, WBWG-H	This species occurs in foothills, mountains, and desert regions of southern California. Habitat includes arid deserts, grasslands, and mixed conifer forests. Spotted bat prefer to roost in rock crevices and is occasionally found in caves and buildings. Cliffs provide optimal roosting habitat (TPWD 2023).	No suitable roosting habitat is present in the survey area; however, suitable foraging habitat is present. This species has not been documented within 5 miles of the survey area based on CNDDB records (CDFW 2023b) and was not observed during field surveys. **No Potential (Roosting)** **Low Potential (Foraging)**
Tulare grasshopper mouse	*Onychomys torridus tularensis*	SSC	This nocturnal species inhabits low, open scrub and semi-scrub habitats. Diet includes primarily insects, specifically grasshoppers, crickets, caterpillars, moths, scorpions, and beetles. In general, wild individuals are expected to live less than 1 year and are capable of breeding year-round (CDFW 2023a).	No suitable scrub habitat for this species is present within the survey area. This species has been documented between 0.25 mile and 1 mile of the survey area based on CNDDB records (CDFW 2023b); however, all occurrences are over 30 years old. This species was not observed during the field survey. **No Potential**

Common Name	Scientific Name	Listing Status[1]	Habitat and Life History	Potential to Occur in the survey area
Fringed myotis	*Myotis thysanodes*	WBWG-H	This insectivorous species occurs in pinyon-juniper, valley foothill hardwood, and hardwood-conifer forests at elevations from 4,000 to 7,000 feet. Fringed myotis forage in open habitats, early successional stages, streams, lakes, and ponds. This species utilizes caves, mines, buildings, or crevices for roosting (WDFW 2023).	No suitable roosting habitat is present in the survey area; however, suitable foraging habitat is present. This species has not been documented within 5 miles of the survey area based on CNDDB records (CDFW 2023b) and was not observed during field surveys. **No Potential (Roosting)** **Low Potential (Foraging)**
Little brown bat	*Myotis lucifugus*	WBWG-M	This insectivorous species is common in mid- to high-elevation forests. The little brown bat is fairly common in sagebrush, bitterbrush, alkali desert scrub, wet meadow, and montane chaparral and is least common in valley foothill woodlands, redwood, mixed chaparral, low sagebrush, alpine dwarf-shrub, coastal scrub, and grasslands. Individuals may roost in buildings, in trees, under rocks or wood, and occasionally in caves (USFWS 2023b).	No suitable roosting habitat is present in the survey area, and suitable foraging habitat is not present. This species is not tracked by CNDDB (CDFW 2023b) and was not observed during field surveys. **No Potential (Roosting)** **No Potential (Foraging)**
Long-legged myotis	*Myotis volans*	WBWG-H	This insectivorous species occurs in woodland and forest habitats above 4,000 feet and forages in chaparral, coastal scrub, and Great Basin shrub habitats, as well as in early successional stages of woodlands and forests. This species is uncommon in desert and arid grassland habitats. Long-legged myotis utilize rock crevices, buildings, tree bark and snags, mines, and caves for roosting (WDFW 2023).	No suitable roosting habitat is present in the survey area, and marginal foraging habitat is present. This species has not been documented within 5 miles of the survey area based on CNDDB records (CDFW 2023b) and was not observed during field surveys. **No Potential (Roosting)** **No Potential (Foraging)**

Common Name	Scientific Name	Listing Status[1]	Habitat and Life History	Potential to Occur in the survey area
Western mastiff bat	*Eumops perotis californicus*	SSC, WBWG-H	This insectivorous species occurs in many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, annual and perennial grasslands, palm oases, chaparral, desert scrub, and urban settings. Western mastiff bats utilize cliff faces, high buildings, trees, and tunnels for roosting (CDFW 2023a).	No suitable roosting habitat is present in the survey area, and foraging habitat is marginal. This species has been documented between 1 and 5 miles of the survey area based on CNDDB records (CDFW 2023b), but all occurrences are over 30 years old. This species was not observed during field surveys. **No Potential (Roosting)** **No Potential (Foraging)**
Townsend's big-eared bat	*Corynorhinus townsendii*	SSC, WBWG-H	This insectivorous species occurs in subalpine and alpine habitats and is most abundant in mesic habitat. Townsend's big-eared bat utilizes caves, mines, tunnels, buildings, or other human-made structures for roosting (WDFW 2023).	No suitable roosting habitat is present in the survey area, and suitable foraging habitat is not present. This species has not been documented within 5 miles of the survey area based on CNDDB records (CDFW 2023b) and was not observed during field surveys. **No Potential (Roosting)** **No Potential (Foraging)**
Western red bat	*Lasiurus blossevillii*	SSC, WBWG-H	This insectivorous species occurs in many regions of California in edge habitats adjacent to streams and open fields. Western red bats utilize the foliage of trees and shrubs to roost (TPWD 2023).	No suitable roosting habitat Is present in the survey area, and foraging habitat is present. This species has not been documented within 5 miles of the survey area based on CNDDB records (CDFW 2023b) and was not observed during field surveys. **No Potential (Roosting)** **Low Potential (Foraging)**

Common Name	Scientific Name	Listing Status[1]	Habitat and Life History	Potential to Occur in the survey area
Western yellow bat	*Lasiurus xanthinus*	SSC, WBWG-H	This insectivorous species occurs in valley foothill riparian, desert riparian, desert wash, and palm oasis habitats. Western yellow bat utilizes trees (including palms) for roosting (CDFW 2023b).	No suitable roosting habitat is present in the survey area, and foraging habitat is marginal. This species has not been documented within 5 miles of the survey area based on CNDDB records (CDFW 2023b) and was not observed during field surveys. **No Potential (Roosting)** **Low Potential (Foraging)**
Reptiles				
Blunt-nosed leopard lizard	*Gambelia silus*	FE, SE, FP	This species lives in central California within arid, open spaces that have patchy or sparse vegetation. These habitats typically have low, drought-tolerant shrubs and elevations below 2,600 feet. Most of this species' diet is insects (USFWS 2023b).	Marginal habitat for this species is present within the survey area. This species has been documented within 0.25 mile of the survey area based on CNDDB records (CDFW 2023b) but was not observed during field surveys. **High Potential**
California glossy snake	*Arizona elegans occidentalis*	SSC	This species is typically found in desert scrub, grasslands, and rocky areas. This species is primarily nocturnal and seeks shelter in burrows, in crevices, or under rocks during the day. Breeding occurs in the spring and early summer. Females lay eggs in sandy soil or loose substrate, where they are left to incubate. The diet of this species consists mainly of small mammals, including rodents, lizards, and occasionally birds or eggs (CDFW 2023a).	Suitable grassland habitat for this species is present within the survey area. This species has been documented between 1 and 5 miles of the survey area based on CNDDB records (CDFW 2023b) but was not observed during field surveys. **Moderate Potential**
Coast horned lizard	*Phrynosoma blainvillii*	SSC	This species is found frequently near ant hills in open areas of sandy soil and low vegetation in valleys, foothills, and semiarid mountains. Although they may eat other small invertebrates such as spiders, beetles, termites, flies, bees, and grasshoppers (National Park Service [NPS] 2023).	Suitable grassland habitat is present within the survey area. The species has been documented between 1 and 5 miles of the survey area based on CNDDB records (CDFW 2023b), but all occurrences are over 30 years old. **Low Potential**

Common Name	Scientific Name	Listing Status[1]	Habitat and Life History	Potential to Occur in the survey area
Northern California legless lizard	*Anniella pulchra*	SSC	This fossorial species utilizes the base of shrubs or other vegetation to forage for prey. The diet of this species includes insect larvae, small insects, and spiders. This species is mainly found in coastal dune, valley-foothill, chaparral, and coastal scrub habitats (CDFW 2023a).	No suitable shrubland habitat for this species is present within the survey area. This species has been documented within 1 and 5 miles of the survey area based on CNDDB records (CDFW 2023b) but was not observed during field surveys. **No Potential**
Giant gartersnake	*Thamnophis gigas*	FT, ST	This semi-aquatic species inhabits marshes, wetlands, and slow-moving bodies of water. This species is often closely associated with the water sources that serve as hunting grounds. Breeding typically occurs in the spring and early summer. After mating, females give birth to live young. The diet of this species primarily consists of small fish, amphibians, and aquatic invertebrates (USFWS 2023b).	Suitable wetland habitat is not present within the survey area and suitable nesting habitat is not present. This species has not been documented within 5 miles of the survey area based on CNDDB records (CDFW 2023b) and was not observed during field surveys. **No Potential**
San Joaquin coachwhip	*Masticophis flagellum ruddocki*	SSC	This species is observed most in open terrain with abundant grass, desert, scrub, chaparral, and pasture habitats. San Joaquin Coachwhip may use rodent burrows, bushes, trees, and rock piles for cover. It feeds on rodents, other reptiles, eggs, and carrion (CDFW 2023a).	Suitable grassland habitat for this species is present within the survey area. This species has been documented within 5 miles of the survey area based on CNDDB records (CDFW 2023b) but was not observed during field surveys. **Moderate Potential**
Western pond turtle	*Actinemys marmorata*	PT, SSC	This freshwater turtle species primarily inhabits ponds, lakes, and slow-moving streams with suitable basking sites. Western pond turtle spend a significant amount of time basking on logs or rocks. Breeding typically occurs in the spring and early summer. Females dig nests in sandy or gravelly areas near water, where they lay their eggs. The hatchlings emerge several months later and make their way to the water. This species is omnivorous with a diet that consists of various aquatic plants, insects, small fish, and amphibians (USFWS 2023b).	Suitable wetland and nesting habitat is not present within the survey area. This species has been documented between 1 and 5 miles of the survey area based on CNDDB records (CDFW 2023b) but was not observed during field surveys. **No Potential**

ATTACHMENT 5.5-A: CULTURAL RESOURCES TECHNICAL REPORT

CHRONICLE™
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Cultural Resource Assessment for the Manning 500/230KV Substation Project, Fresno County, California

Final
June 27, 2024

Cultural Resource Assessment for the Manning 500/230KV Substation Project, Fresno County, California

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June 27, 2024

Abstract

Insignia Environmental retained PaleoWest, LLC dba Chronicle Heritage to complete a cultural resource assessment in support of the proposed Manning 500/230 Kilovolt (kV) Substation Project (Proposed Project). The Proposed Project proposes to construct a substation and transmission lines to address the California Independent System Operator-identified overloads on the existing Borden-Storey 230 kV transmission lines and facilitate the advancement of renewable energy generation. The Proposed Project is in western Fresno County, primarily within the San Joaquin Valley, west of Highway 33 and abutting the foothills of the Temblor Range. Specifically, the Proposed Project is in Townships 15 and 16 South, Range 12, 13 and 14 East in the Levis, California (USGS 1985), Chaney Ranch, California (USGS 1972), Tumey Hills, California (USGS 1972), and Monocline Ridge, California (USGS 1972), U.S. Geological System (USGS) 7.5-minute quadrangles (Attachment A).

The Proposed Project is subject to compliance with the California Environmental Quality Act (CEQA), with the California Public Utilities Commission acting as the lead CEQA agency.

Chronicle Heritage's efforts for the Proposed Project included completing a literature search, a review of historical maps and aerial photographs, and a cultural resources pedestrian survey.

Pedestrian survey efforts for the Proposed Project did not identify any unrecorded cultural resources. There is one previously recorded historic resource, P-10-007205 (known as Interstate 5), intersecting the Proposed Project. This resource was evaluated in 2020 and determined ineligible for inclusion in the National Register of Historic Places or California Register of Historical Resources through survey evaluation. Due to its ineligible status and the fact that it is a paved and maintained highway, this resource was not revisited during this study.

Chronicle Heritage's pedestrian survey efforts included only a portion of the total number of parcels that comprise the Proposed Project. Due to this limitation, it is recommended that an intensive pedestrian survey be completed for any unsurveyed parcels within the Proposed Project prior to implementation of Proposed Project activities. Section 5 lists all parcels discussed in this report and their survey status.

In addition, Chronicle Heritage initiated Native American coordination efforts for the Proposed Project on November 20, 2023, with the submittal of a Sacred Lands File search request to the Native American Heritage Commission. Follow up emails regarding the status of the search were sent on January 2 and 10, 2024. As of January 12, 2024, the results of the search have not been received. It is recommended Native American outreach efforts be completed prior to implementation of Proposed Project Activities. These efforts include mailing letters to the Native American representatives listed in the Sacred Lands File search results letter once it is received, and documenting responses by the recipients (if any).

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1 Introduction

Insignia Environmental retained PaleoWest, LLC dba Chronicle Heritage to complete a cultural resource assessment in support of the proposed Manning 500/230 Kilovolt (kV) Substation Project (Proposed Project). The Proposed Project would construct a substation and transmission lines to address the California Independent System Operator (CAISO)-identified overloads on the existing Borden-Storey 230 kV transmission lines and facilitate the advancement of renewable energy generation. The Proposed Project is in western Fresno County, primarily within the San Joaquin Valley, west of Highway 33 and abutting the foothills of the Temblor Range (Attachment A). Specifically, the Proposed Project is in Townships (T) 15 and 16 South (S), Range (R) 12, 13 and 14 East (E) in the Levis, California (U.S. Geological Survey [USGS] 1985), Chaney Ranch, California (USGS 1972), Tumey Hills, California (USGS 1972), and Monocline Ridge, California (USGS 1972), USGS 7.5-minute quadrangles (Attachment A).

This report presents the results of a literature search, a review of historical maps and aerial photographs, and a cultural resources pedestrian survey. The Proposed Project is subject to compliance with the California Environmental Quality Act (CEQA), with the California Public Utilities Commission acting as the lead CEQA agency.

1.1 Project Description

The Proposed Project involves four major components:

- Constructing an approximately 12-acre 500/230 kV substation (Manning Substation);
- Constructing an approximately 12-mile (mi)-long double-circuit 230 kV line from the proposed LS Power Grid California, LLC (LSPGC) Manning Substation to Pacific Gas and Electric Company's (PG&E's) existing Tranquillity Switching Station;
- Interconnecting the following PG&E lines into the proposed LSPGC Manning Substation:
  - Los Banos-Midway #2 500 kV Line (approximately 0.75 mi),
  - Los Banos-Gates #1 500 kV Line (approximately 0.75 mi), and
  - Panoche-Tranquillity switching station (Sw. Sta.) #1 and #2 230 kV Transmission Lines (approximately 4.2 mi each);
- Rebuilding approximately 7 mi of PG&E's existing Panoche-Tranquillity #1 and #2 230 kV Transmission Lines between the Manning Substation and Tranquillity Switching Station.

The proposed Manning Substation would occupy approximately 12 acres of an approximately 40-acre parcel of land to be purchased by LSPGC. Adequate space would be available on LSPGC-controlled property outside of the initial substation footprint to expand the proposed Manning Substation, if needed, to accommodate the ultimate buildout contemplated by the CAISO's functional specification. Temporary construction laydown areas would be established on the substation property. Additionally, an approximately 550-foot (ft)-long, 50-ft-wide new driveway; a small parking lot (with space for approximately five vehicles); and a detention basin would be constructed adjacent to the proposed Manning Substation. The permanent access road, parking lot, and detention basin would be located outside of the walled portion of the substation. The substation would be surrounded by a concrete masonry unit wall that would be 8 ft tall, with 1 ft of barbed wire on top. The access gate would have an opening of 16 ft wide.

Construction at the proposed Manning Substation site would begin by clearing all vegetation within the site, grading it to create a generally flat area, and constructing the permanent access road to the substation. The below-ground components (e.g., ground grid and equipment foundations) would then be installed, followed by the substation and telecommunication components. Lastly, testing and commissioning would be conducted once the transmission lines were terminated at the proposed substation prior to energization.

The Proposed Project would leverage existing roads and cleared areas around existing structures, to the extent practical. However, temporary access roads would be required to provide access to some structures and construction areas. New permanent access roads may be constructed for access to structures, where needed, based on engineering design and landowner feedback. Construction of the access roads would involve vegetation clearing and grading, as required, to create a flat area to facilitate construction. Staging areas would be utilized to help stage construction efforts and store equipment and materials. Four staging areas are anticipated—one on Dinuba Avenue, one at the Panoche Junction, one on San Diego Avenue, and one on Washoe Avenue. The staging yards would each be between 50 and 80 acres in size. In addition, the proposed Manning Substation parcel would also be used as a staging area with an approximate size of 40 acres.

The proposed LSPGC 230 kV Transmission Lines would be constructed using tubular steel poles (TSPs) and guyed six-pole TSP structures, which are anticipated to be no more than 199 ft tall and would be direct buried. Guy wires installed on concrete pier foundations may be required in some locations. The proposed PG&E 230 kV Interconnections and 230 kV Rebuild would be constructed using TSPs that are anticipated to be no more than 199 ft tall and would be on drilled pier foundations. The PG&E 500 kV Interconnections would be constructed on lattice steel towers and TSP structures at some angle points. The 500 kV structures for the Proposed Project would be no more than 160 ft tall. The 500 kV structures would be supported by drilled pier foundations. In addition, modifications to PG&E's existing Tranquillity Switching Station, as well as the Los Banos, Panoche, Gates, and Midway substations, would be completed as part of the Proposed Project.

The Proposed Project would construct new telecommunication facilities on existing structures in the Proposed Project vicinity and/or new structures installed as part of the Proposed Project. The fiber connection to the proposed communications center would originate at an existing distribution pole southeast of PG&E's existing Tranquillity Switching Station. The new cable would travel on existing distribution poles west along West Dinuba Avenue, turn north near the intersection of West Dinuba Avenue and South Ohio Avenue, then turn east again for approximately 665 ft. At that point, the cable would be installed underground for approximately 350 ft to a proposed LSPGC 230 kV Transmission Lines structure just west of the existing PG&E Tranquillity Switching Station. A fiber hut, which would be mounted on the proposed transmission structure or within the vicinity of the structure, would allow the fiber to be connected to the optical ground wire (OPGW) of the proposed LSPGC 230 kV Transmission Lines, which would continue west to the proposed LSPGC Manning Substation. The OPGW would be installed above the primary conductors along the proposed LSPGC 230 kV Transmission Lines.

1.2 Study Area Description

The Study Area for the Proposed Project includes the approximately 12-acre proposed LSPGC Manning Substation site; approximately 12-mi-long double-circuit 230 kV line from the proposed substation site to the existing PG&E Tranquillity Switching Station; rebuilding approximately 7 mi of PG&E's existing Panoche-Tranquillity Sw. Sta.#1 and #2 230 kV lines; and interconnecting the following PG&E lines into the proposed substation site:

- Los Banos-Midway #2 500 kV Line (approximately 0.75 mi),
- Los Banos-Gates #1 500 kV Line (approximately 0.75 mi), and
- Panoche-Tranquillity Sw. Sta. #1 and #2 230 kV lines (approximately 4.2 mi each);

The Proposed Project Study Area also includes two alternative substation locations, one Manning substation 500kV interconnection alternative, two substation alternative 500 kV interconnections, and two 230 kV transmission line alternatives, which are listed below and represented in Attachment A.

1.2.1 Substation Alternative 1

Substation Alternative 1 is approximately 1.5 mi west of Interstate 5 (I-5), approximately 3.0 mi southwest of PG&E's existing Panoche-Tranquillity Sw. Sta. #1 and #2 230 kV Lines, approximately 0.2 mi east of PG&E's existing Los Banos-Midway #2 and Los Banos-Gates #1 500 kV Lines, and approximately 9.6 mi west of PG&E's existing Tranquillity Switching Station. This alternative was determined to not meet the Proposed Project's objective and was dismissed.

1.2.2 Substation Alternative 2

Substation Alternative 2 is approximately 1.0 mi east of I-5, approximately 0.7 mi west of PG&E's existing Panoche-Tranquillity Sw. Sta. #1 and #2 230 kV Lines, approximately 2.5 mi northeast of PG&E's existing Los Banos-Midway #2 and Los Banos-Gates #1 500 kV Lines, and approximately 7.9 mi west of PG&E's existing Tranquillity Switching Station.

1.2.3 Manning Substation 500 kV Interconnection Alternative 1

The Manning Substation 500 kV Interconnection Alternative 1 would begin at PG&E's existing Los Banos-Midway #2 and Los Banos-Gates #1 500 kV Lines and extend northeast approximately 4,050 ft to the north and west side of the proposed Manning Substation site. These lines would be approximately 200 ft apart. This alternative route would include the same components as the Proposed Project.

1.2.4 Substation Alternative 2 500 kV Interconnection Alternative 1

Substation Alternative 2 500 kV Interconnection Alternative 1 would begin at the existing PG&E Los Banos-Midway #2 and Los Banos-Gates #1 500 kV Lines, extend approximately 8,600 ft directly east, then extend approximately 7,900 ft northeast toward the north and west sides of the Substation Alternative 2 site.

1.2.5 Substation Alternative 2 500 kV Interconnection Alternative 2

Substation Alternative 2 500 kV Interconnection Alternative 2 would begin at the existing PG&E Los Banos-Midway #2 and Los Banos-Gates #1 500 kV Lines and extend approximately 13,100 ft generally northeast toward the north and west sides of the Substation Alternative 2 site.

1.2.6 230 kV Transmission Line Alternative

The 230 kV Transmission Line Alternative would begin at the proposed Manning Substation site, extend southeast for approximately 3,520 ft, and then extend east through parcels just north of

Dinuba Avenue and south of West Manning Avenue. This alternative was determined to not meet the Proposed Project's objectives and was dismissed.

1.2.7 230 kV Transmission Line Route Variation 1

The 230 kV Transmission Line Route Variation 1 would begin at the proposed Manning Substation site, extend directly east for approximately 2,430 ft through the adjacent parcel, then extend south at the parcel boundary for approximately 2,290 ft. The route variation would then turn due east and, at this point, would follow the same route as the 230 kV Transmission Line Alternative for approximately 56,120 ft until reaching PG&E's existing 230 kV transmission lines.

1.2.8 230 kV Transmission Line Route Variation 2

The 230 kV Transmission Line Route Variation 2 would begin at the proposed Manning Substation site and turn southeast for approximately 4,130 ft before turning east through parcels just north of West Dinuba Avenue and south of West Manning Avenue. The alternative would extend directly east for approximately 6,830 ft until reaching I-5, where it would cross the highway at an approximately 90-degree angle for approximately 480 ft and, at the point, would follow the same route as the 230 kV Transmission Line Alternative for approximately 48,700 ft until reaching PG&E's existing 230 kV transmission lines.

The Proposed Project Study Area also includes a 250-ft buffer surrounding the above-described Proposed Project components.

2 Regulatory Context

2.1 State

2.1.1 California Environmental Quality Act

CEQA requires the lead agency to consider the impacts of a project on two categories of cultural resources: historical resources (Section 15064.5[b]) and unique archaeological resources (Section 15064.5[c] and Public Resources Code [PRC] Section 21083.2). CEQA also requires the lead agency to consider the impacts of a project on Tribal Cultural Resources (TCRs) (PRC Section 21074). CEQA and other California laws also set forth special rules for dealing with human remains that might be encountered during construction. Pursuant to PRC 5097.98(b)(1)(A) and 5097.98 (d)(2), this includes consultation with the Most Likely Descendant (MLD) for the nondestructive removal and analysis of any items identified to be associated with Native American human remains.

As defined in Appendix G of the 2019 CEQA Statute & Guidelines, project impacts to cultural resources would be considered significant if the project was determined to:

a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5 of the CEQA Guidelines;

b) Cause a substantial adverse change in the significance of an archaeological resource as defined in Section 15064.5 of the CEQA Guidelines;

c) Disturb any human remains, including those interred outside of formal cemeteries; or

d) Cause a substantial adverse change in the significance of a TCR as defined in Public Resources Code §21074.

Historical or archaeological resources include: (1) a resource listed in or determined to be eligible by the State Historical Resources Commission for listing in the California Register of Historical Resources (CRHR), (2) a resource included in a local register of historical resources, and (3) any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant.

The State Historical Resources Commission has also developed criteria to identify, evaluate, register, and protect California's historical resources. The CRHR is the authoritative guide to the state's significant historical and archaeological resources. The CRHR identifies historical resources (i.e., cultural resources that are listed in or eligible for listing in the CRHR for state and local planning purposes), determines eligibility for state historic preservation grant funding, and affords certain protections under CEQA. Generally, a resource is considered significant if it is 45 years old or older, possesses integrity of location, design, setting, materials, workmanship, feeling, and association. In addition, it must meet at least one of the following criteria for listing in the CRHR:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
2. Is associated with the lives of persons important in our past;
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or,
4. Has yielded, or may be likely to yield, information important in prehistory or history (PRC Section 5024.1).

Cultural resources are buildings, sites, humanly modified landscapes, traditional cultural properties, structures, or objects that may have historical, architectural, cultural, or scientific importance. CEQA states that if a project will have a significant impact on important cultural resources, deemed "historically significant," then project alternatives and mitigation measures must be considered. Substantial adverse change in the significance of a resource includes physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance would be materially impaired. The significance of a historical or archaeological resource is materially impaired if a project demolishes or materially alters in an adverse manner those physical characteristics of the resource that justify its inclusion in, or eligibility for inclusion in, the CRHR or other local register of historic resources.

2.1.2 Unique Archaeological Resources

CEQA also applies to effects on archaeological sites that do not meet the criteria for historical resources but do meet the definition of a "unique archaeological resource" (PRC 21083[g]). A unique archaeological resource is an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

1. Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information
2. Has a special and particular quality such as being the oldest of its type or the best available example of its type
3. Is directly associated with a scientifically recognized important prehistoric or historic event or person

2.1.3 Assembly Bill 52

Signed into law in September 2014, California Assembly Bill 52 (AB 52) created a new class of resources—TCRs—for consideration under CEQA. TCRs may include sites, features, places, cultural landscapes, sacred places, or objects with cultural value to a California Native American tribe that are listed or determined to be eligible for listing in the CRHR, included in a local register of historical resources, or a resource determined by the lead CEQA agency, in its discretion and supported by substantial evidence, to be significant and eligible for listing on the CRHR. AB 52 requires that the lead CEQA agency consult with California Native American tribes that have requested consultation for projects that may affect TCRs. The lead CEQA agency shall begin consultation with participating Native American tribes prior to the release of a negative declaration, mitigated negative declaration, or environmental impact report. Under AB 52, a project that has potential to cause a substantial adverse change to a TCR constitutes a significant effect on the environment unless mitigation reduces such effects to a less-than-significant level.

2.2 Local

2.2.1 Fresno County

The Fresno County General Plan (Fresno County 2000) provides an overarching goal related to the protection and preservation of cultural resources:

Goal OS-J To identify, protect, and enhance Fresno County's important historical, archeological, paleontological, geological, and cultural sites and their contributing environment.

The policies related to archaeological and cultural resources outlined by the Fresno County General Plan include the following:

Policy OS-J.1 The County shall require that discretionary development projects, as part of any required CEQA review, identify and protect important historical, archeological, paleontological, and cultural sites and their contributing environment from damage, destruction, and abuse to the maximum extent feasible. Project-level mitigation shall include accurate site surveys, consideration of project alternatives to preserve archeological and historic resources, and provision for resource recovery and preservation when displacement is unavoidable.

Policy OS-J.2 The County shall, within the limits of its authority and responsibility, maintain confidentiality regarding the locations of archeological sites in order to preserve and protect these resources from vandalism and the unauthorized removal of artifacts.

Policy OS-J.3 The County shall solicit the views of the local Native American community in cases where development may result in disturbance to sites containing evidence of Native American activity and/or sites of cultural importance.

Policy OS-J.4 The County shall maintain an inventory of all sites and structures in the County determined to be of historical significance (Index of Historic Properties in Fresno County).

Policy OS-J.5 The County shall support the registration by property owners and others of cultural resources in appropriate landmark designations (i.e., National Register of Historic Places, California Historical Landmarks, Points of Historical Interest, or Local Landmark).

Policy OS-J.6 The County shall provide for the placement of historical markers or signs on adjacent County roadways and major thoroughfares to attract and inform visitors of important historic

resource sites. If such sites are open to the public, the County shall ensure that access is controlled to prevent damage or vandalism.

Policy OS-J.7 The County shall use the State Historic Building Code and existing legislation and ordinances to encourage preservation of cultural resources and their contributing environment.

Policy OS-J.8 The County shall support efforts of other organizations and agencies to preserve and enhance historic resources for educational and cultural purposes through maintenance and development of interpretive services and facilities at County recreational areas and other sites.

In support of the above policies, Fresno County designed an implementation program for archaeological and cultural resources:

Program OS-J.A The County shall adopt and implement an ordinance to protect and preserve significant archaeological, historical, and geological resources. The ordinance shall provide for implementation of applicable development conditions, open space easements, tax incentives, related code revisions and other measures as needed. (Policy OS-J.1).

3 Natural and Cultural Setting

This section discusses the nature of the physical environment, as well as the prehistoric, ethnographic, and historic contexts for the Proposed Project. This background provides a context for understanding the nature of the cultural resources that may be identified within the boundaries of the Proposed Project.

3.1 Natural Vegetation and Climate

The Proposed Project is within the middle San Joaquin Valley at the base of the Temblor Mountain Range, which is composed of alluvial plains, river channels, dry lakebeds, marshes, sloughs, and uplands. The Proposed Project is in a relatively flat area along I-5, north of Panoche Junction. Historical land use consisted primarily of agricultural activities.

Average rainfall within this part of the San Joaquin Valley is approximately 5–7 inches per year. As with the rest of California, this rain usually falls during the winter months. Temperatures during the winter months can be as low as 40 degrees Fahrenheit, and highs in the summer months can reach into the 90s (U.S. Climate Data 2024).

3.2 Paleoenvironments

During the Early Holocene, San Joaquin Valley vegetation consisted of pine, oak, sagebrush, and greasewood in the uplands, and greasewood on salt flats near the lakes (West et al. 2007). Approximately 7,000 years ago, the greasewood died out and a more drought-tolerant shrub community spread throughout the valley. Tule marshes resulted from lowering water levels. This drier period lasted until about 4,000 years ago. Wetter conditions prevailed for the next 2,000 years. By approximately 1,000 years ago, the climate warmed and became more arid (West et al. 2007). Early Europeans described large tule swamps and prairies throughout much of the Central Valley (Moratto 2004).

Vegetation also would have included swamp-growing coarse grasses, tules, and cattails, which were useful to early valley residents. These items could provide food, house materials, and fiber. Outside of the waterways, valley vegetation was largely a Lower Sonoran grassland. Game in this grassland included tule elk, antelope, and deer (Moratto 2004).

Prior to the early 1800s, riparian forest grew along San Joaquin Valley watercourses. Riparian vegetation along rivers in the San Joaquin Valley was not as diverse, or as large, as that along the Sacramento River and its tributaries (West et al. 2007). Trees found along waterways included sycamore, cottonwood, box elder, and Oregon ash trees. Wild grasses, California blackberries, and blue elderberries also grew within the riparian corridor (Moratto 2004). Much of the water in the San Joaquin Valley is a result of Sierra snowmelt, and prior to the modern era, much of the valley contained several shallow lakes and wetlands. The largest lake was Tulare Lake, in the southern San Joaquin Valley (West et al. 2007).

Most of the riparian forests in the San Joaquin Valley are now gone or much reduced as a result of the rapid development of agriculture throughout the valley (Warner and Hendrix 1984).The tule marshes and floodplains were reclaimed for agriculture, and levees (which also impacted the forests) were built to prevent flooding (Warner and Hendrix 1984).

3.3 Geomorphology

During the Pleistocene, the larger rivers emerging from the Sierra Nevada, such as the Kings, Merced, and Tuolumne rivers, created low-gradient alluvial fans tens of kilometers in size over the San Joaquin Valley. During the Holocene, those rivers subsequently incised their way into these fans, creating distinct channels tens of meters deep. One of the processes associated with this dynamic environment is the tendency for natural levees to accumulate over time, providing topographic highs some meters above the surface of the floodplain. Deposition in the area is characterized by poorly sorted and fine-grained sediments, which are very heterogeneous and may contain gravel, sand, silt, and clay (Brown and Caldwell and Water Resources and Information Management Engineering, Inc. 2006). Focused reviews of archaeological site occurrences in the San Joaquin Valley reveal that village sites along riparian corridors were often on topographic highs, such as natural levees (e.g., Moratto 2004). Accumulation of anthropogenic debris accompanying habitation would have led to further buildup of that topographic high. Flood basins commonly would have occurred outside of these levees, and the sites themselves largely may have been isolated by waters during spring floods.

Rosenthal and colleagues (2004) examined the relationship between buried archaeological deposits and paleosols, or formerly stable land surfaces, in the Central and San Joaquin valleys of California. According to Rosenthal and colleagues, soils within the boundaries of the Proposed Project and surrounding region are the result of:

1. Partial erosion and truncation of late Pleistocene and older surfaces;
2. Subsequent burial of late Pleistocene and early Holocene surfaces on fans and floodplains during the early to middle Holocene;
3. Partial erosion and removal of early Holocene floodplains;
4. Subsequent aggradation and periodic stability of floodplains during the middle and late Holocene; and
5. Deposition of alluvium on portions of most floodplains during the latest Holocene (Rosenthal et al. 2004).

This has resulted in the majority of Early to Middle Holocene archaeological deposits being buried beneath Late Holocene sediments. The authors suggest that sites may be mixed chronologically, associated with the surface of a given stratigraphic layer, and that there may not be any surface indication of a buried deposit in a given area. Buried deposits may occur with large amounts of

sterile material between components of a site (Rosenthal et al. 2004). Rosenthal and colleagues also state that Early to Middle Holocene archaeological deposits tend to be identified near substantial water sources, where numerous resources were found in abundance, or found buried in association with paleosols formed in floodplains or alluvial fans, also near important water sources and abundant resource bases (Rosenthal et al. 2004).

3.4 Precontact Setting

The general trend throughout California prehistory has been an increase in population density over time, coupled with greater sedentism and the use of a greater diversity of food resources. There is abundant evidence that humans have been present in the Americas for at least the past 11,500 years. These earliest known remains indicate very small, mobile populations, apparently dependent on hunting of large game animals as the primary subsistence strategy.

Past attempts by archaeologists to develop a chronology for the San Joaquin valley have been confronted with numerous challenges for the past 100 years. Archaeologists have faced difficulties in documenting and analyzing the cultural resource records due to the level of destruction of surface cultural resource sites through agricultural practices, levee building, erosion, and extensive looting. In the early 1970s, Frederickson (1973) proposed three basic periods for the Central and San Joaquin valleys: Paleoindian, Archaic, and Emergent. Rosenthal and colleagues (2007) further refined these periods based on newly calibrated radiocarbon dates. Except where noted, the following framework is based on their discussion. Archaeological assemblages of many Native cultural groups occupying California's Central Valley share similar artifact types. Therefore, overarching cultural groups within the vicinity of the Proposed Project are subdivided into two types, the Foothill Tradition and the Valley Tradition. Given the Proposed Project's location in the western San Joaquin Valley, Valley Tradition site types and artifacts are the most likely type to be encountered.

3.4.1 Paleoindian (11,550-8,550 BCE)

The Paleoindian Period has a relatively faint cultural resource footprint in California. The earliest sites in the San Joaquin Valley are Fluted Point Tradition and Western Pluvial Lakes Tradition sites found at Tracy, Tulare, and Buena Vista lakes. Sites of this antiquity are few and remain mostly undated by scientific means, but artifact types indicate probable ages of 11,500–7,500 years old (Moratto 2004). Radiocarbon age determinations of human bone from the Witt site at Tulare Lake yielded dates of 11,379 and 15,802 radiocarbon years before present (Rosenthal et al. 2007).

3.4.2 Lower Archaic (8,550-5,550 BCE)

The Lower Archaic economy appears to have emphasized mobile foraging. Artifact types found in these sites include handstones, milling slabs, and various cobble tools. In Sacramento County, an isolated flake stone crescent was found near the city of Orland on an ancient alluvial fan that dates to the Lower Archaic (Rosenthal et al. 2007).

Relationships between Foothill and Valley floor archaeology have not been explored for this early period, primarily because Valley archaeology from the Lower Archaic and Early Middle Archaic periods lacks data. Thus, it is unclear to researchers whether Foothill sites and Valley sites are two different cultural traditions or seasonal expressions of a single culture.

3.4.3 Middle Archaic (5,550-550 BCE)

More distinct cultural adaptations for the valley floor and foothills are visible in sites that date to the Middle Archaic. Artifact assemblages for the Foothill Tradition are composed of flaked stone dart points and cobble tools like those of the Lower Archaic. Tabular pendants, incised slate, and perforated stone plummets are rare, but nevertheless have wide distribution. Middle Archaic Foothill sites also are characterized by rock-filled hearths and ovens, and "cairn-capped" graves (Rosenthal et al. 2007:153).

Sites of the Valley Tradition in the Later Middle Archaic are well-represented in the archaeological record. The "archetypal Middle Archaic Expression" (Rosenthal et al. 2007:154) is the Windmiller Pattern, but the genesis, spatial distribution, and variation of Windmiller Pattern sites across the regional landscape are not clearly defined at this time. Situated in riverine, marshland, or valley floor settings, as well as on small knolls above prehistoric seasonal floodplains, most Windmiller Pattern sites contain ventrally extended burials that are oriented to the west. These sites contain large amounts of mortuary artifacts with indications of social hierarchy, and often include large projectile points and a variety of fishing gear, such as net weights, bone hooks, and spear points. In addition, evidence of trade and interaction is inferred from the presence of non-local utilitarian and ceremonial items. Faunal remains imply a hunting economy that included both large and small mammals.

During the Middle Archaic, there was a substantial change in climate, and dry conditions prevailed throughout central California. As rising sea levels pushed inland, creating the Sacramento-San Joaquin Delta, the landscape of the Proposed Project and surrounding vicinity also changed dramatically. After a period of soils deposition, the landscape stabilized. According to Rosenthal and colleagues (2007:152), this stabilization is revealed by buried paleosols found throughout central California, and many Middle Archaic sites are associated with these buried paleosols.

The beginnings of other technologies, such as cordage, twined basketry, basketry awls, simple pottery and other baked clay objects, stone plummets, bird bone tubes, and shell beads, appear in the Middle Archaic. The presence of non-local lithic materials and other exotic artifact types, such as obsidian and shell ornaments, suggests an active exchange system.

3.4.4 Upper Archaic (550 BCE-1,100 CE)

The technologies that existed in the Middle Archaic became highly specialized in the Upper Archaic, as evidenced by new types of tools and widely traded goods, like saucer- and saddle-shaped *Olivella* beads, *Haliotis* ornaments, obsidian biface "roughouts," and ceremonial blades. Native economies focused on seasonally available resources that could be harvested and processed in large quantities, such as acorns. Although the Berkeley Pattern began to emerge during this time, as evidenced by large accumulations of habitation debris reflecting long-term habitation, the Windmiller Pattern continued as well. There is only one archaeological site in the region, CA-SAC-107, that provides an example of the Berkeley Pattern replacing Windmiller (Rosenthal et al. 2007:156).

Unlike the Windmiller Pattern, Berkeley Pattern burials are tightly flexed and have no consistent orientation. Cemeteries with discrete populations of either flexed (Berkeley) or extended (Windmiller) burials can be found in the western parts of the San Joaquin Valley dating to the Upper Archaic. These likely represent alternating occupations by people of both cultural traditions.

Berkeley Pattern sites are found in diverse environmental settings, with riverine settings being prevalent. Deeply stratified midden deposits characterize Berkeley Pattern sites, which contain

numerous shaped milling and grinding stone implements for food preparation. Projectile points become progressively more regularized in shape and somewhat smaller through time.

3.4.5 Emergent (1,100 CE-Historic Period)

The Augustine Pattern coincides with the Late or Emergent Period (further divided into Lower and Upper), ranging from as early as 1,100 CE to the time of European settlement of this general area in the late 1700s. Intensive fishing, hunting, and harvesting of acorns and small hard seeds typify this period (Moratto 2004:211–214). A general increase in population and settlements, a more regularized exchange system, and increased evidence of ceremonialism characterize the Augustine Pattern. Distinctive artifacts include small notched projectile points indicative of the introduction and spread of bow-and-arrow technology, bone awls used in basketry preparation, clay effigies, elaborately incised bone whistles, flanged soapstone pipes, and occasional pottery.

Cremation was also practiced, in a limited way, for individuals of high status during the Lower Emergent Period, and then more generally applied across the population during the Upper Emergent Period. An increase in ornamental artifacts occurred, with rectangular *Olivella* sequin beads and banjo-type *Haliotis* ornaments (*Kuksu* cult) a common occurrence in burials. Overall, this suggests an increase in social status and ranking. Other Upper Emergent characteristics include Stockton serrated projectile points, *Olivella* lipped and clam disc beads, bead drills, magnesite cylinders, hopper mortars, pre-interment grave pit burning with tightly flexed burials, and grave-associated ground stone artifacts that were ceremonially "killed." In the late eighteenth century, the arrival of Spanish explorers and the establishment of missions disrupted these Native lifeways (Moratto 2004:211–214).

3.5 Ethnographic Setting

The Proposed Project is within the traditional territory of the Northern Valley Yokuts (Kroeber 1925; Wallace 1978). The Yokuts language is a member of the California Penutian stock that includes four other groups found in central California: Miwok, Costanoan, Maiduan, and Wintuan. Three main groups of Yokuts-speaking people inhabited central California: the Southern Valley Yokuts, the Northern Valley Yokuts, and the Foothill Yokuts.

Large Northern Valley Yokuts occupation sites typically were on low mounds, above flood levels, and near larger bodies of water. The social structure of Southern Valley Yokuts appeared to be based on single-family units, who lived in one principal settlement and periodically left this settlement during the spring floods to move to higher ground or to harvest seasonal resources (Wallace 1978).

Resources within the Northern Valley Yokuts territory were most abundant near waterways. Fish, mussels, pond turtles, waterfowl, tule elk, pronghorn, jackrabbits, squirrels, and quail were all found in abundance in or near the water. Salmon is noted as a prime source of food in historical accounts of the Southern Valley Yokuts. Acorns from valley oaks and tule roots were ground into a meal and cooked as a thick soup or gruel.

During the Spanish and Mexican Periods (1769–1846), the Northern Valley Yokuts rapidly declined in population. Decreasing Native populations along the coast resulted in the Franciscan friars from Spanish Missions acquiring neophytes from farther and farther inland. Once removed from their villages, Native Americans pressed into the missions were taught new occupations that benefited the mission and became vaqueros, tanners, shoemakers, carpenters, blacksmiths, cooks, servants, fishermen, brick, and tile-makers, tallow-melters, and saddle- makers. Industrial-sized soap works and large spinning and weaving rooms were built at the missions. Native Americans were kept at

their assigned tasks and subdued with physical punishment (Dakin 1939; Taylor 2015). Many perished because of ill treatment and the introduction of European diseases (McCawley 1996). Many of the Southern Valley Yokuts were taken to the San Jose, Santa Clara, Soledad, San Juan Bautista, and San Antonio missions (Wallace 1978). Then in 1833, a virulent malaria epidemic swept Central California, killing an estimated 12,000 Native peoples in the San Joaquin Valley alone (Cook 1955; Eargle 2000).

During the American Period of the mid-nineteenth century, thousands of prospectors descended upon the San Joaquin Valley in search of gold, further spreading disease and inflicting violence on Native peoples (Wallace 1978). Plans for a reservation were made in 1850, but none of the proposed treaties between the United States and the Californian tribes were ever ratified. In 1853, the Fresno Indian Reservation, also called the Fresno River Farm, was set aside for Native Californian groups, including linguistic Yokuts; however, this reservation only remained open for seven years. In 1873, the Tule River Reservation was created, and thousands of Native peoples were brought there by the Army from throughout the Southern Sierra and Central Valley (Eargle 2000). Today, many Northern Yokuts people continue to live in the San Joaquin Valley and throughout California.

3.6 Historic Setting

The history of California can be divided into several periods of influence to establish a historic context to assess the potential significance of historic sites within the boundaries of the Proposed Project. Due to its location 75 mi west of the coast, the location of the Proposed Project was largely isolated during the Spanish and Mexican periods of California. Therefore, events associated with the Spanish and Mexican periods, and cultural remains from those periods, are not expected to be reflected in surface and subsurface contexts within the Proposed Project.

3.6.1 Spanish Era (1769–1821)

In 1542 Juan Rodriguez Cabrillo let the first European expedition into California. Over the following 200 years Cabrillo, other Spanish explorers, Portuguese, British, and Russian explorers sailed the California coast and made limited inland expeditions but did not establish permanent settlements (Bean 1968; Rolle 2003).

The first permanent European settlement in what is today California was established by Gaspar de Portola and Franciscan Father Junipero Serra at Mission San Diego de Alaca in 1769. This was the first of 21 missions to be established by the Spanish between 1769 and 1823. In 1772, Pedro Fages led the first European expedition into the San Joaquin Valley (Johnson et al. 1993; Wallace 1978). Numerous expeditions were made into the San Joaquin Valley in the 1800s in search of new lands for missions and to recapture runaway neophytes (Hoover et al. 2002). Although there were numerous expeditions into the San Joaquin Valley, no formal settlements were ever established.

During this period, Spain deeded tracts of land known as "ranchos" to prominent citizens and solders, none of which were located within the San Joaquin Valley. To manage these lands, herds, and crops the colonists captured numerous Native Americans as laborers (Engelhardt 1927). Due to the lack of settlements within the San Joaquin Valley, very few Central Valley tribes were directly affected, with the exception of disease that was transmitted by Europeans and greatly reduced the Native American population throughout California (McCawley 1996).

3.6.2 Mexican Era (1822-1848)

The Mexican Period started in 1822, following the successful Mexican Revolution (1810-1821). During this period, there was extensive inland exploration and development by American fur trappers. Starting in 1883, mission lands were converted into ranchos, and more than 600 ranchos were established between 1833 and 1846 (Gumprecht 2001). None of these ranchos were established in the San Joaquin Valley (Wallace 1978).

3.7 American Period (1848-Present)

The American Period began with the ending of the Mexican-American War and the signing of the Treaty of Guadalupe Hildago in 1848. The United States Government agreed to pay $15 million for territories taken during the war, which included California, Nevada, Utah and parts of Colorado, Arizona, New Mexico, and Wyoming.

Populations increased in 1849 with the discovery of gold in northern California. In 1850, California was admitted to the United States and by 1853 the population had exceeded 300,000. Populations continued to increase, especially after 1869, with the completion of the transcontinental railroad.

Fresno County was established on April 19, 1856, and generally experienced four stages of development throughout its history. The first was the mining period, which continued into the 1860s. This was followed by the sheep and cattle ranching period, which went from the 1860s to 1874. The general farming period started in the 1870s and was followed by the establishment of irrigated row crops (Winchell 1933). Today, Fresno County produces more than 350 commercial corps and has 1.88 million acres of farmland (Fresno County Farm Bureau n.d.).

The unincorporated community of Three Rocks is 4.7 mi south of the Proposed Project. This community is named after the geological feature of Three Rocks, which was purported to be a hideout and headquarters of Joaquin Murrieta, a Mexican miner and bandit who was known for terrorizing mining camps and stagecoaches (California Office of Historic Preservation 2024).

4 Records Search Results

On August 21, 2023, Chronicle Heritage staff submitted a records search request to the California Historical Resources Information System at the Southern San Joaquin Valley Information Center (SSJVIC) on the campus of California State University, Bakersfield. Due to changes in the Proposed Project footprint, a supplemental records search request was submitted to the SSJVIC on October 30, 2023 . The purpose of the records search requests was to identify the presence of previously recorded cultural resources and previously conducted cultural resource studies within and immediate vicinity of the Proposed Project Study Area.

The records searches included a 1-mi search radius around the proposed LSPGC Manning Substation site and a 0.5-mi search radius around the linear transmission line components. Because the Study Area included a 250-ft buffer around these Proposed Project components, the records search radii extended from the edge of this buffer.

The results of the records searches identified five previously recorded cultural resources within the 0.5-mi and 1-mi records search radii). Of the five previously recorded resources, one is prehistoric, and four are historical. There is one previously recorded resource within the Proposed Project Study Area (Table 4-1). This resource (P-10-007205) is the historical alignment of I-5 and is discussed in detail in Section 4.1.1 below.

The records searches identified 32 previous cultural resource studies within the records search radii. Of the 32 previous studies, 17 included portions of the Proposed Project Study Area (Table 4-2 and Table 4-3).

Table 4-1. Previously Recorded Cultural Resources within the Proposed Project Study Area

Site No.	Resource Name	Age	Description	Company/ Agency	Year
P-10-007205	Interstate-5	Historic	8-lane paved highway spanning from the Mexico border in California, to the Canadian border in Washington.	Urbana Preservation & Planning, LLC.	2019

4.1 Previously Recorded Cultural Resources

This section describes the previously recorded cultural resources within the Proposed Project Study Area:

4.1.1 P-10-007205

P-10-007205, known as Interstate 5, Montgomery Freeway, San Diego Freeway, Santa Ana Freeway, Golden State Freeway, and West Side Freeway, consists of a major north-south trending multi-lane paved freeway that spans a total of 1,380 miles from the Mexican border in San Diego, California to the Canadian border in Washington State, with 800 miles located within the State of California boundary. In 2020 this cultural resource was evaluated and found ineligible for inclusion in the NRHP (National Register of Historic Places) under Criterion A, B, C, or D or in the CRHR (California Register of Historical Resources) under Criterion 1, 2, 3, or 4 through survey evaluation (Urbana Preservation & Planning, LLC, 2020). Presently, the interstate serves as a significant byway to residents and businesses throughout California. The Proposed Project would cross P-10-007205.

Table 4-2. Previous Cultural Resource Investigations within the Proposed Project Study Area

Report No.	Authors	Year	Title	Company/Agency
FR-00320	Canady, Timothy, Ostrogorsky, Michael, and Hess, Margaret	1992	Archaeological Survey of Right-Of-Way Corridor and Extra Work Spaces Construction Spread 5B, California, PGT-PG&E Pipeline Expansion Project	INFOTEC Research, Inc.
FR-00321	Moratto, Michael J. and Jackson, Thomas L.	1990	Cultural Resources Assessment Report PGT-PG&E Pipeline Expansion Project, Idaho, Washington, Oregon, and California. Phase 1: Cultural Resources Inventory Atlas	INFOTEC Research, Inc.; BioSystems Analysis, Inc.
FR-01955	Hector, Susan M, Hale, Micah, and Wright, Catherine	2003	Cultural Resource Inventory of the Path 15 Los Banos-Gates Transmission Line Construction Project, Merced and Fresno Counties, California	ASM Affiliates, Inc.
FR-01959	Moratto, Michael J., et al.	1994	Archaeological Investigations PGT-PG&E Pipeline Expansion Project Idaho, Washington, Oregon, and California:	INFOTEC Research, Inc.; Far Western Anthropological

Report No.	Authors	Year	Title	Company/Agency
			Volume I: Project Overview, Research Design and Archaeological Inventory	Research Group, Inc.
FR-01959a	Bowyer, Gary C., Speulda, Lou Ann, Sekora, Lynda J., and Ross, Lester A.	1995	Archaeological Investigations PGT-PG&E Pipeline Expansion Project, Idaho, Washington, Oregon, and California: Volume III - Summary Reports: Historic Sites	INFOTEC Research, Inc.; Far Western Anthropological Research Group, Inc.
FR-01959b	Bowyer, Gary C., Speulda, Lou Ann, Sekora, Lynda J., and Ross, Lester A.	1995	Archaeological Investigations, PGT-PG&E Pipeline Expansion Project, Idaho, Washington, Oregon, and California: Volume IV: Synthesis of Findings	INFOTEC Research, Inc.; Far Western Anthropological Research Group, Inc.
FR-01959c	Bowyer, Gary C., Speulda, Lou Ann, Sekora, Lynda J., and Ross, Lester A.	1995	Archaeological Investigations, PGT-PG&E Pipeline Expansion Project, Idaho, Washington, Oregon, and California: Volume V: Technical Studies	INFOTEC Research, Inc.; Far Western Anthropological Research Group, Inc.
FR-02015	Unknown	2001	Los Banos-Gates 500 kV Transmission Project Draft Supplemental Environmental Impact Report - Cultural Resources Section.	Aspen Environmental
FR-02411	Hatoff, Brian, Farmer, Reid, Hacking, Christine, and Armstrong, Matthew	2006	Panoche Energy Center 06-AFC-5 Cultural Resources and Paleontological Resources	URS Corporation
FR-02416	Kaijankoski, Philip	2010	Fresno Reliability Transmission Project	Far Western Anthropological Research Group, Inc.
FR-02575	Herbert, Rand F.	2006	Historical Resources Inventory and Evaluation Report for the Panoche Energy Center	JRP Historical Consulting
FR-02581	Haas, Hannah and Ramirez, Robert	2013	Phase I Cultural Resources Survey for the RE Tranquility Solar Generation Facility Project Near Three Rocks, Fresno County, California	Rincon Consultants
FR-02912	King, Jerome	2015	Cultural Resources Study of 18 Gas Pipeline Spans on PG&E Lines 300A and 300B, Fresno County, California	Far Western Anthropological Research Group, Inc.
FR-02917	Koenig, Heidi and Alexander, Doug	2018	Hudson Solar I LLC Hudson Solar I Project Fresno County, California	ESA-Cultural Resources Group
FR-03020	Farrell, Jenna	2020	Cultural Resource Phase I Survey Report for the Luna Valley Solar Project Fresno County, California	Tetra Tech, Inc.

Report No.	Authors	Year	Title	Company/Agency
FR-03101	Sims, Ashleigh and Koenig, Heidi	2022	Heartland Hydrogen Project, Fresno County, California	Environmental Science Associates

Table 4-3. Previous Cultural Resource Investigations within the 0.5-mi and 1-mi Records Search Buffer

Report No.	Authors	Year	Title	Company/Agency
FR-00285	Bissonnette, Linda Dick	1992	Phase I Cultural Resources Assessment: The Fresno County Manning Avenue Gap Between Contra Costa and Ormsby Avenues	Cultural Resources Consulting
FR-00598	Wickstrom, Brian, Osborne, Richard, Riley, Lynn M., and Comeyne, Dominique	1996	Negative Archaeological Survey Report for Seismic Retrofit of Bridge No. 42-0247, Route 5, Fresno County, California	California Department of Transportation
FR-00599	Osborne, Richard, Comeyne, Dominique, Wickstrom, Brian, Riley, Lynn M.	1996	Negative Archaeological Survey Report for Bridge No. 42-0245	California Department of Transportation
FR-01202	Caruso, A. Glenn	1985	Negative Archaeological Survey Report Installation of Traffic Surveillance Stations along Interstate 5, State Route 41, and State Route 99 in Madera and Fresno Counties	Individual Consultant
FR-01640	Binning, Jeanne Day	1999	Supplementary Archaeological Survey of the Montezuma Wetlands Project	California Department of Transportation
FR-02148	Roark, Gabriel	2004	Cultural Resources Inventory of Two New Access Roads to Pulling Sites 1 and 2 and Pulling Site 3, Los Banos-Gates 500-kV Transmission Line Project (Path 15), Fresno and Merced Counties, California	Jones & Stokes
FR-02383	Solis, Laurie	2006	Cultural Resource Survey for the Starwood Power-Midway, LLC Peaking Project Fresno County, California	URS Corporation
FR-02384	Fink, Gary R.	2009	Starwood Power-Midway, LLC Peaking Project Cultural Resources Report, Fresno County, California	URS Corporation
FR-02404	Baloian, Mary Clark, Werner, Roger H., Baloian, Randy M., and Monastero, Andrew P.	2009	Cultural Resources Inventory and Evaluation Report for the Gill Ranch Gas Storage Project, Gill Ranch Storage, LLC., Pacific Gas and Electric Company, Madera and Fresno Counties, California	Applied EarthWorks, Inc.
FR-02576	Abdo-Hintzman, Kholood, Hamilton, M. Colleen, Price,	2009	California Register Eligibility Evaluation of Two Historic-Era Deposits Discovered During Archaeological Monitoring for the	Applied EarthWorks, Inc.

Report No.	Authors	Year	Title	Company/Agency
	David D., and Morlet, Aubrie		Starwood Power-Midway Project, Fresno County, California	
FR-02689	Sikes, Nancy E., Hanes, Phil, and Arrington, Cindy J.	2014	Cultural Resources Inventory for the Panoche Valley Solar Farm Project Telecommunications Services San Benito and Fresno Counties, California	Natural Investigations Company
FR-02805	Roper, C. Kristina	2017	Historic Resources Compliance Report Interstate 5 Vehicle Detection Systems at 18 Locations in Kern, Kings, and Fresno Counties, California	Far Western Anthropological Research Group, Inc. (for Caltrans)
FR-02805a	Young, Craig D.	2017	Geoarchaeological Investigations Interstate 5 VDS in Kern, Kings, and Fresno Counties, California	Far Western Anthropological Research Group, Inc. (for Caltrans)
FR-02805b	Roper, C. Kristina	2017	Archaeological Survey Report Interstate 5 Vehicle Detection Systems at 18 Locations in Kern, Kings, and Fresno Counties, California	Far Western Anthropological Research Group, Inc. (for Caltrans)
FR-02973	McIntosh, Douglas and Wills, Carrie D.	2018	Cultural Resources Record Search and Site Visit Results for Cellco Partnership and their Controlled Affiliates doing business as Verizon Wireless Candidate I-5 & Dinuba-H, South Hudson, Mendota, Fresno County, California (EBI Project # 6118007158)	Heliz Environmental Planning

4.2 Archival Research Results

Chronicle Heritage reviewed historical maps to assess the potential to encounter historic period (45 years and older) cultural resources during implementation of Proposed Project activities.

The earliest maps that included the area occupied by the Proposed Project come from the General Land Office (GLO) survey maps dating back to 1855 (GLO 1855). An 1855 GLO map shows the Coastal Mountain Range within the most western portion of the Proposed Project (Figure 4-1). There are no buildings, structures or features depicted on the map. GLO maps from 1881 (Figure 4-2) and 1907 (Figure 4-3) also show no evidence of historical land use (Figure 4-4 through Figure 4-6; GLO 1881 and GLO 1907).

A review of historic aerial photographs dating from 1953–1981 was also completed as part of the literature review. The aerial photographs from 1953 and 1957 show the primary land use activity within, and in the vicinity of, the Proposed Project consisted of cattle grazing. Evidence for this activity is represented by extensive networks of cattle trails (NETROnline 2024).

A review of aerial photographs from 1970 and 1971 (Figure 4-7) shows Manning Avenue, I-5, and the California Aqueduct in its current alignment (University of California–Santa Barbara [UCSB] 2019). The western portion of the Proposed Project shows evidence of cattle grazing, though the eastern portion has a sparse scattering of row crops.

An aerial photograph dating to 1981 indicates the primary land use within the Proposed Project consisted of agricultural activities. This is evidenced by the presence of row crops within almost the entirety of the Proposed Project, with just the most western portion still being used for cattle grazing (NETROnline 2024).

The study of historical maps and aerial photographs indicates land use within and in the vicinity of the Proposed Project was limited to agricultural and cattle grazing activities. In addition, the region has maintained a rural character since the earliest historic period settlement of California.

4.3 Native American Coordination

Chronicle Heritage contacted the Native American Heritage Commission (NAHC) on November 20, 2023, to request a Sacred Lands File (SLF) for the Proposed Project. Follow up emails regarding the status of the SLF search were sent to the NAHC on January 2 and January 10, 2024. As of January 12, 2023, the results of the SLF search have not been received.

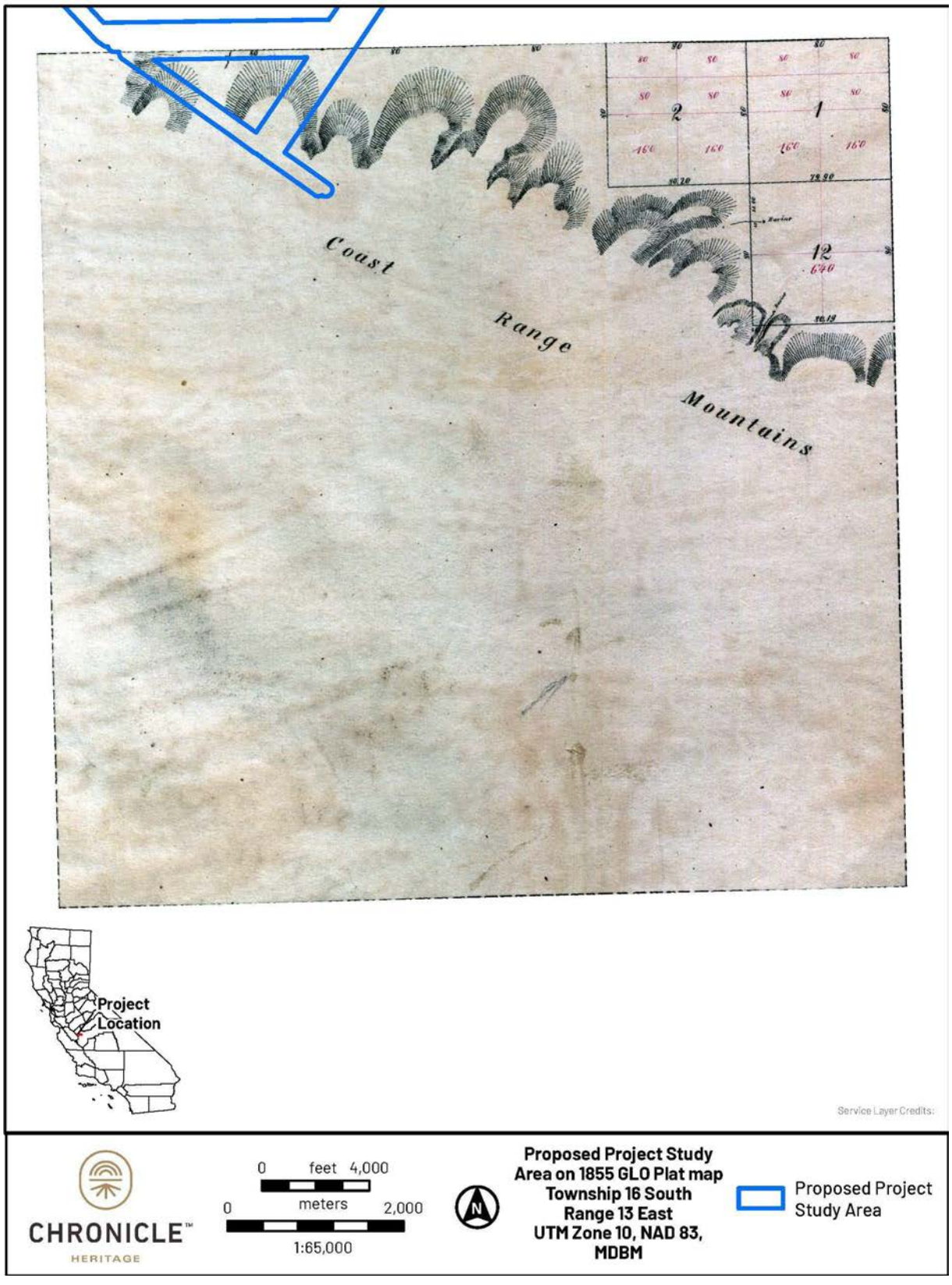

Figure 4-1. Plat map 1855 (1 of 3).

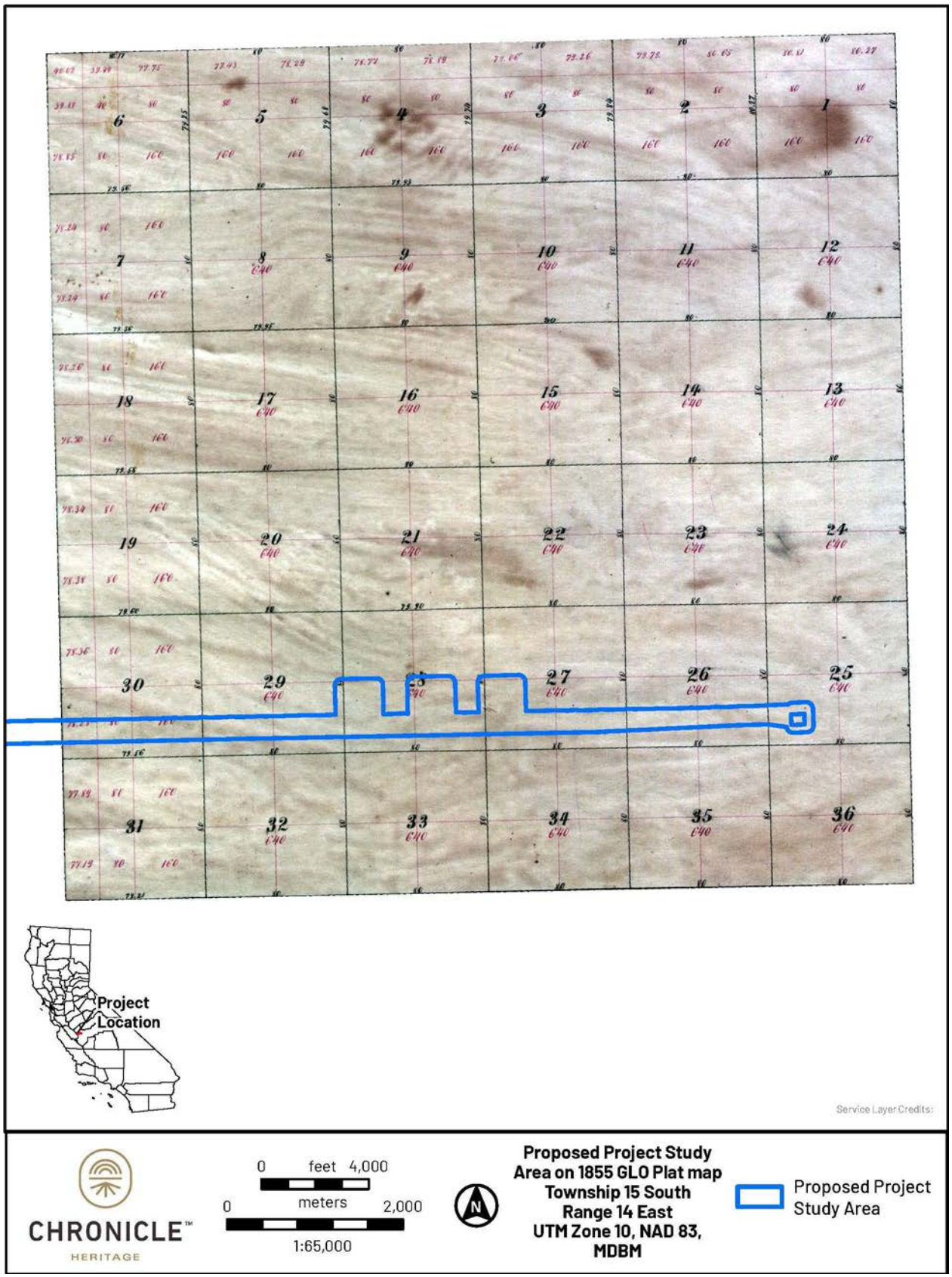

Figure 4-2. Plat map 1855 (2 of 3).

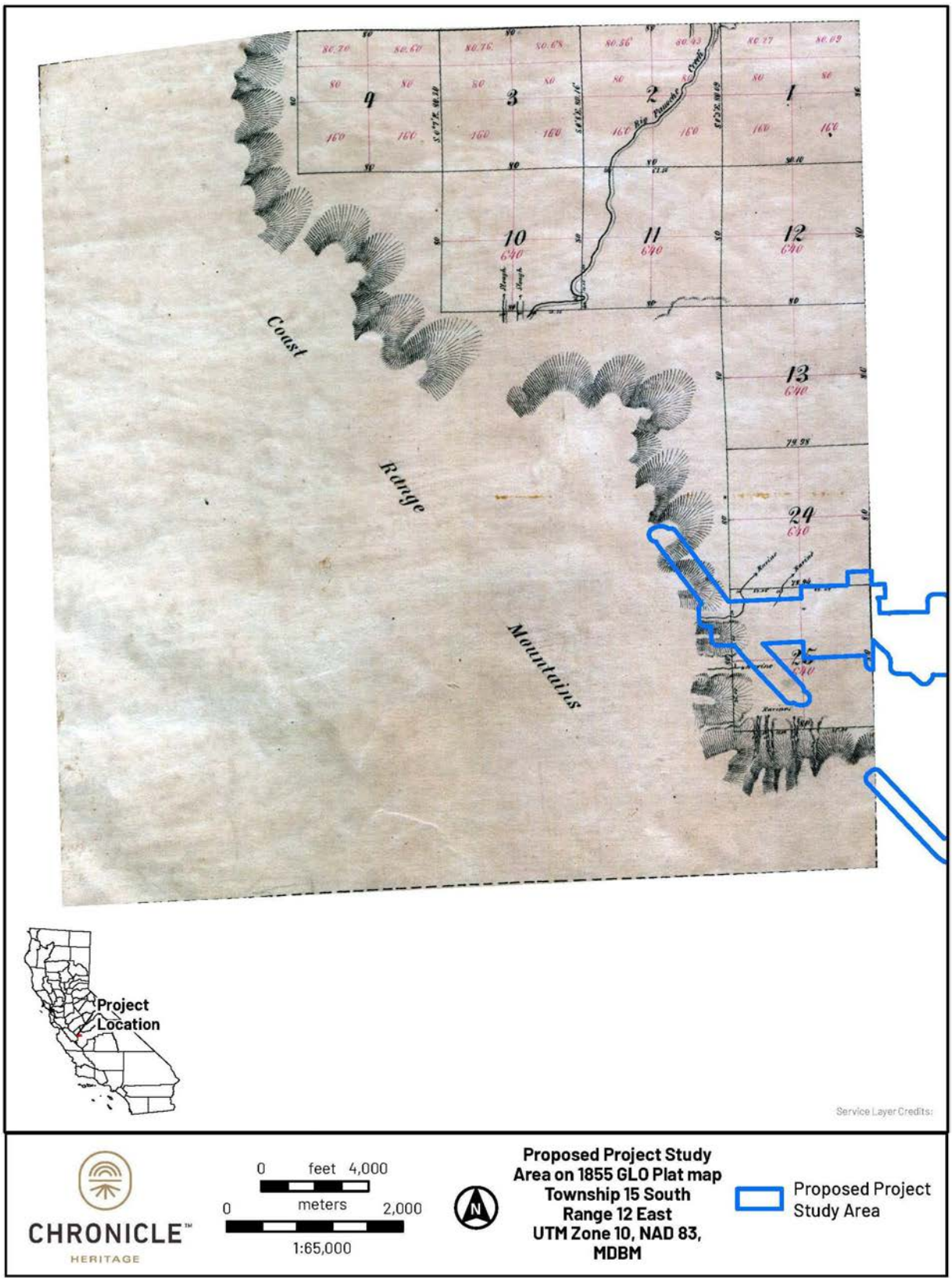

Figure 4-3. Plat map 1855 (3 of 3).

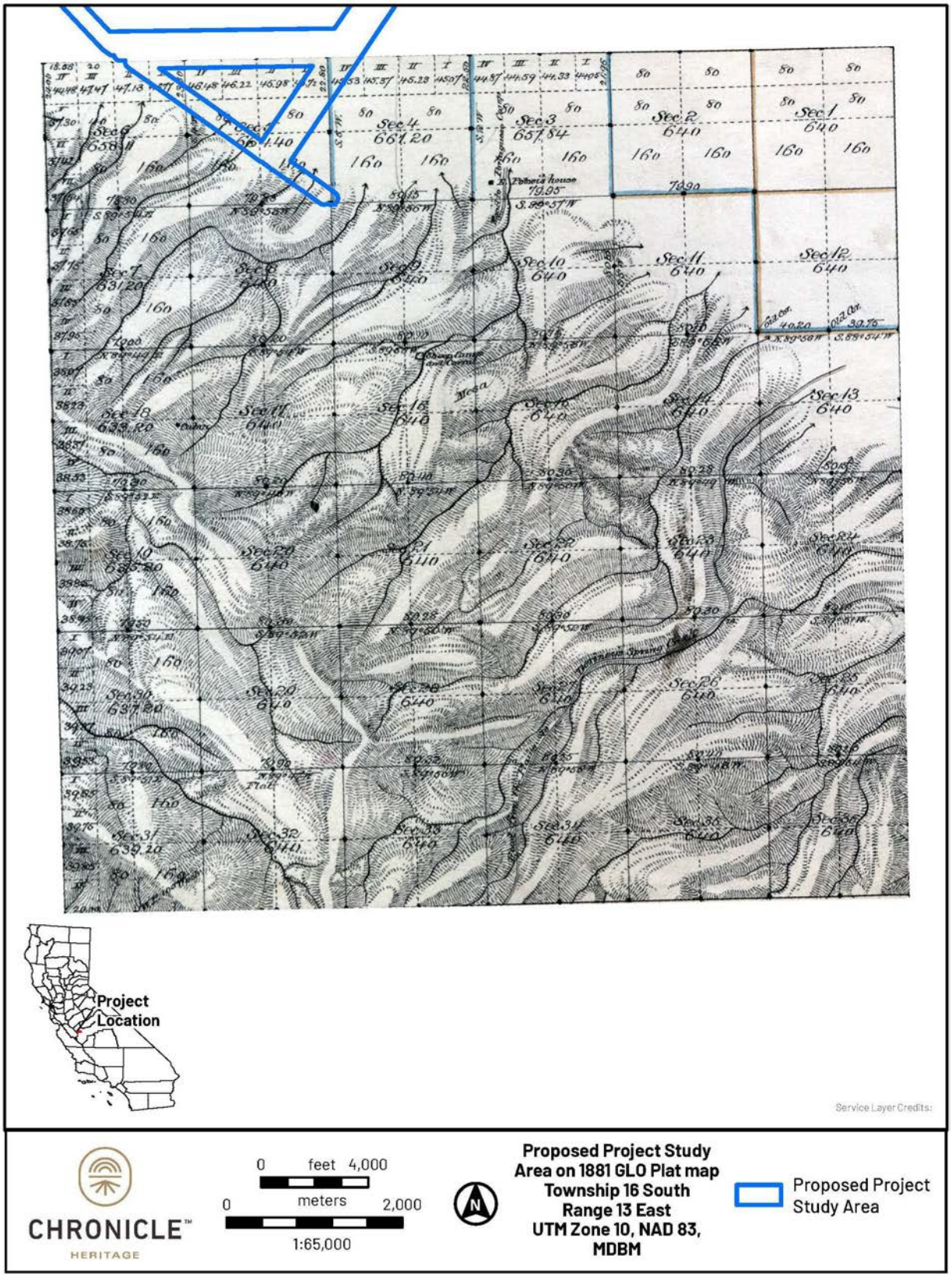

Figure 4-4. Plat map 1881 (1 of 2).

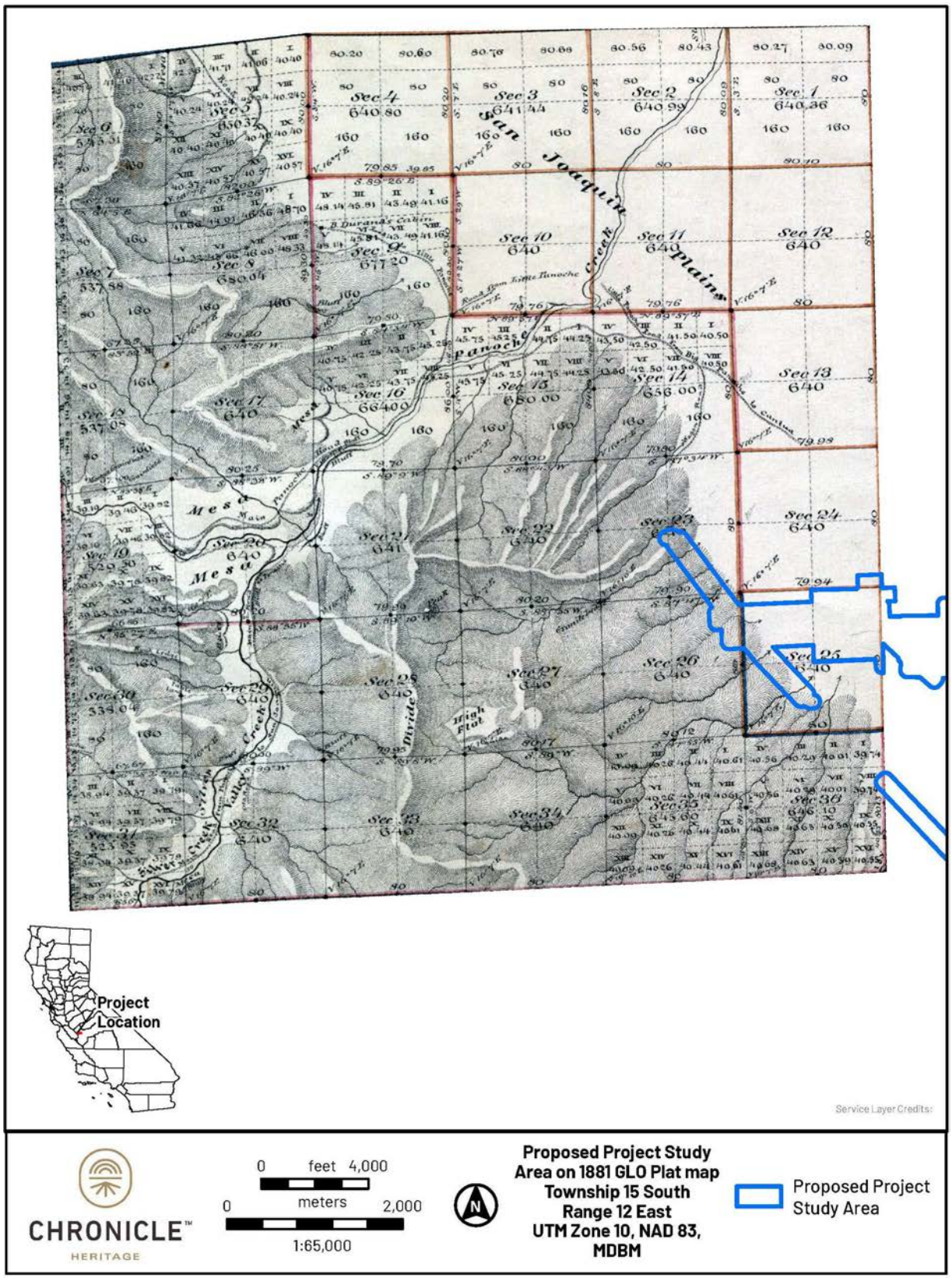

Figure 4-5. Plat map 1881 (2 of 2).

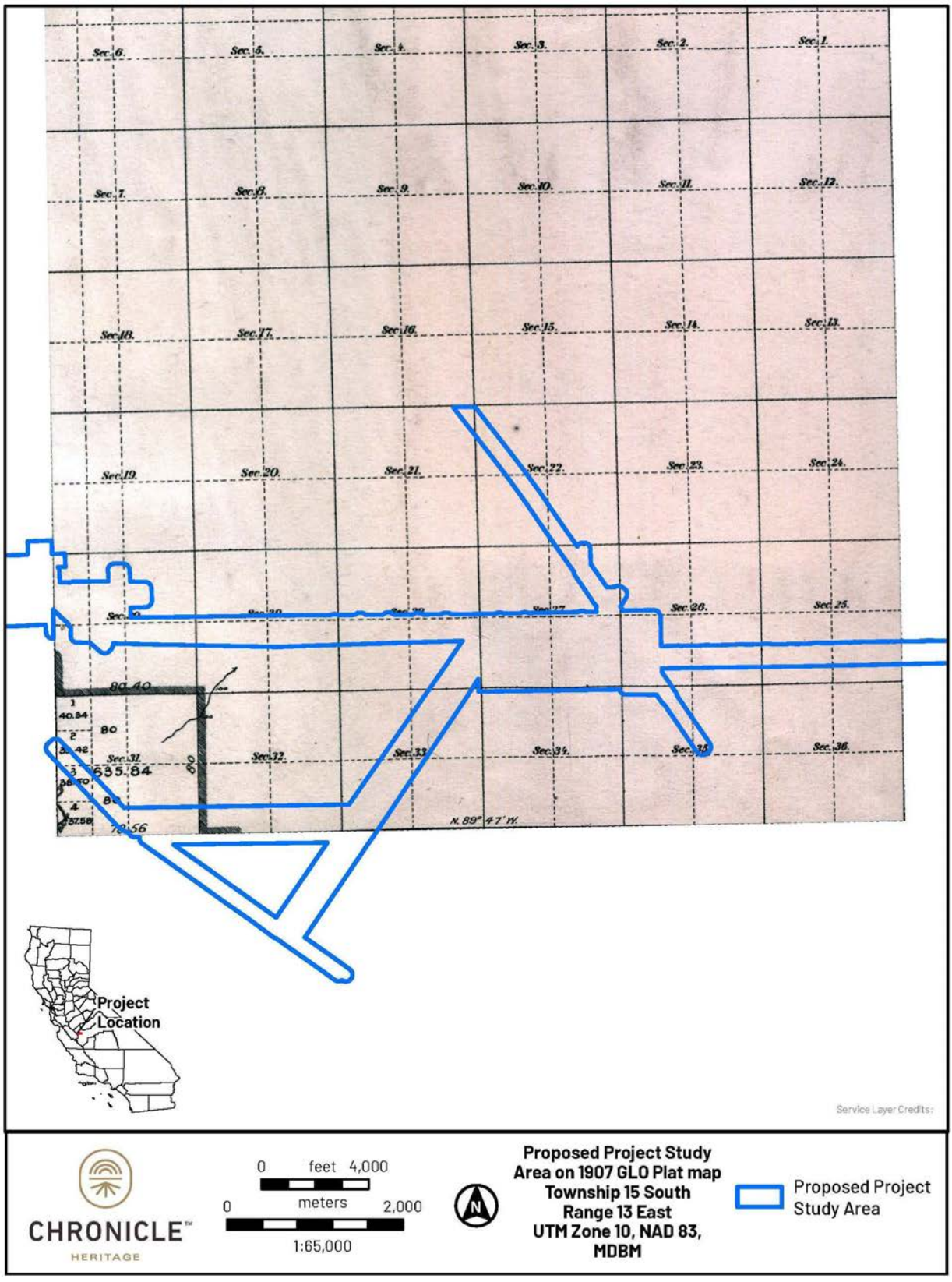

Figure 4-6. Plat map 1907.

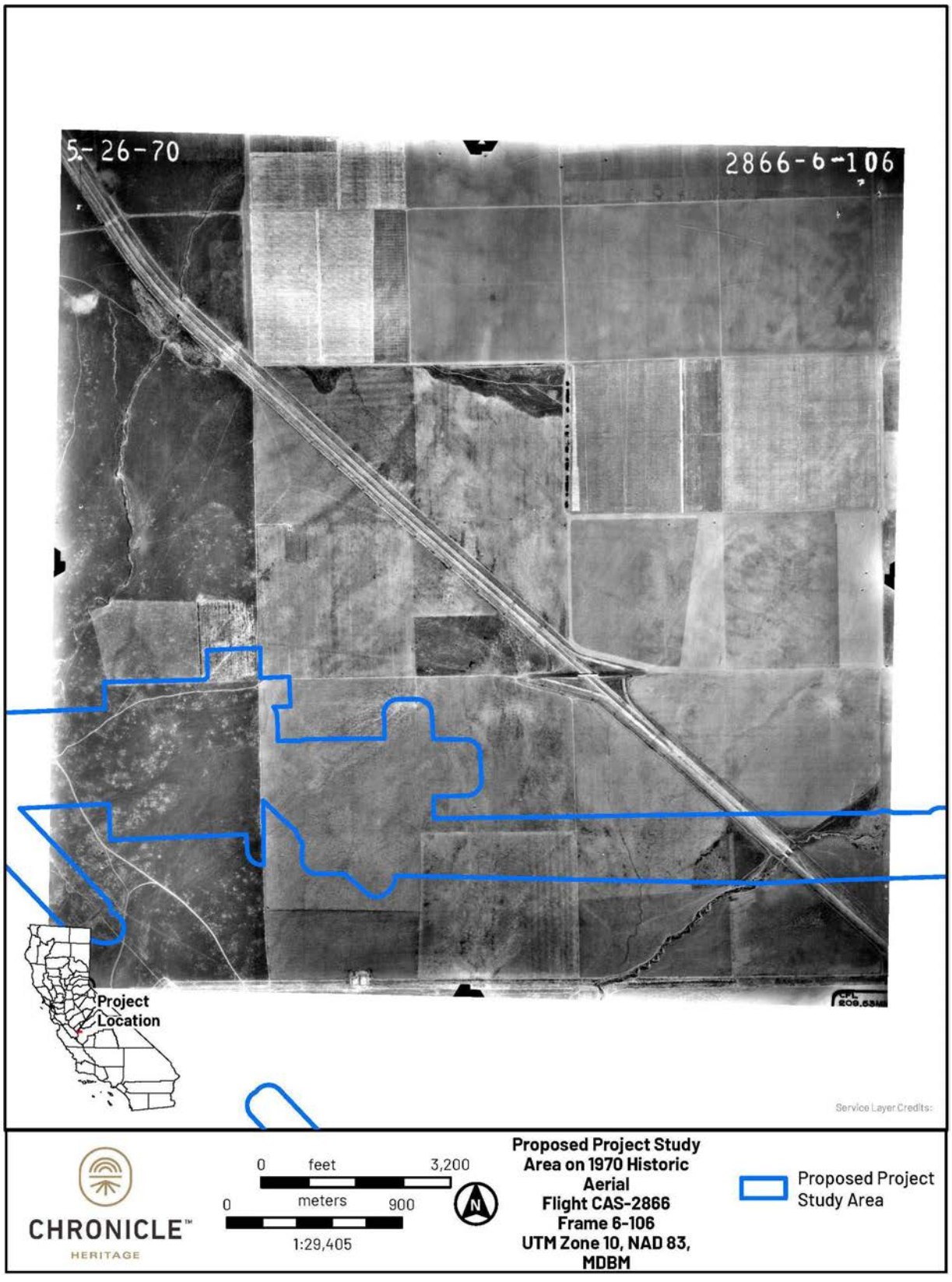

Figure 4-7. 1970 historic aerial.

5 Pedestrian Survey

5.1 Pedestrian Archaeological Survey Methods

Chronicle Heritage conducted an intensive pedestrian archaeological survey of the Proposed Project Study Area between November 6 and November 28, 2023. The survey work was conducted under the direction of Chronicle Heritage Senior Archaeologist/Principal Investigator Robert Ramirez, M.A., RPA, with assistance from Chronicle Heritage Associate Archaeologist/Project Manager Philip Clarkson. Chronicle Heritage Associate Archaeologist Gabrielle St Martin served as Field Director, with a crew that included Joshua Noyer, Kimberly Xiong, Tera Vinuela, Camille Weiskopf, Katherine Holst, and Shane Wetherbee.

The pedestrian survey was conducted using transects spaced between 10 and 15 meters apart. The area surveyed included the 12-acre Manning Substation site, the 12-mi-long double-circuit 230 kV line, the 12.7 mi of existing line, the Substation Alternative 1, Substation Alternative 2, Manning Substation 500 kV Interconnection Alternative, Substation Alternatives 500 kV Interconnection Alternative 1, Substation Alternatives 500 kV Interconnection Alternative 2, and a 250-foot buffer surrounding these Proposed Project components and alternatives.

During survey, the Proposed Project Study Area was examined for the presence of historic or precontact period cultural materials. Historic period cultural materials include foundations, fence lines, ditches, standing buildings, objects, or structures such as sheds or concentrations of materials such as domestic refuse (e.g., glass bottles, ceramics, toys, buttons, and leather shoes) or refuse from other pursuits such as agriculture (e.g., metal tanks, farm machinery parts, and horseshoes) or structural materials (e.g., nails, glass window panes, corrugated metal, wood posts or planks, metal pipes and fittings, etc.). Precontact site cultural materials include midden, ash, and charcoal deposits, as well as faunal bone (burned or unburned), shell, flaked stone, ground stone, and human remains.

Digital photographs were taken for use in documentation and reporting. Photographs include general views of the Proposed Project Study Area and topography, vegetation density, and other relevant images. An ArcGIS Collector receiver with submeter accuracy (±50 cm) was used to conduct the archaeological survey, identify the location of previously recorded cultural resources, and to document any newly identified cultural resources.

5.2 Pedestrian Survey Results

As of November 28, 2023, Chronicle Heritage pedestrian survey efforts covered approximately 1,859 acres of the total 3,229 acres that comprise the Proposed Project Study Area. The remaining 1,373 acres could not be surveyed due to right-of-entry issues that prevented access to these parcels. Table 5-1 below lists the survey status of each parcel within the Proposed Project Study Area.

Table 5-1. Parcels within the Proposed Project Study Area

Parcel Number	Acreage	Survey Status	Comments
02711014S	10.5037	Surveyed	None
02711017S	52.0578	Surveyed	None
02711018S	4.1324	Not Surveyed	None

Parcel Number	Acreage	Survey Status	Comments
02712123	9.7432	Not Surveyed	None
02713076S	22.5011	Not Surveyed	None
02713077S	66.8117	Not Surveyed	None
02716007	159.7066	Surveyed	None
02716008S	5.0339	Surveyed	None
02716020S	48.1606	Surveyed	None
02716024S	154.0373	Surveyed	None
02716025S	3.6616	Surveyed	None
02717101	32.3182	Not Surveyed	None
02717108S	23.4732	Not Surveyed	None
02717109S	24.4883	Not Surveyed	None
02718069	39.5351	Not Surveyed	None
02717118S	52.8281	Not Surveyed	None
02717121S	6.8278	Surveyed	None
02717123S	0.6638	Surveyed	None
02717124S	30.9314	Not Surveyed	None
02717125S	16.2804	Not Surveyed	None
02717140S	63.4013	Surveyed	None
02717143S	0.8994	Surveyed	None
02717149S	0.0551	Not Surveyed	None
02717151S	126.4493	Surveyed	None
02717155S	70.5692	Surveyed	None
02717156S	15.1015	Surveyed	None
02717160S	7.0338	Surveyed	None
02717162S	42.0567	Surveyed	None
02717163S	69.3069	Surveyed	None
02809065S	43.8478	Not Surveyed	None
02717181S	91.1682	Not Surveyed	None
02717182S	35.4271	Not Surveyed	None
02717184S	1.3874	Surveyed	None
02717185S	111.7340	Surveyed	None
02717186	163.4218	Not Surveyed	None
02718002S	79.9463	Surveyed	16 acres not surveyed due to flooding.

Parcel Number	Acreage	Survey Status	Comments
02718007S	1.0561	Not Surveyed	None
02718009S	37.6413	Not Surveyed	None
02718010S	0.4483	Not Surveyed	None
02718046S	15.3946	Not Surveyed	None
02718050	64.8343	Not Surveyed	None
02718061	49.6226	Surveyed	None
02718066S	40.6889	Not Surveyed	None
02718067	43.8478	Not Surveyed	None
02718070	17.7729	Not Surveyed	None
02718071S	50.7194	Not Surveyed	None
02718072S	13.5706	Not Surveyed	None
02718079S	11.7992	Not Surveyed	None
02718085S	32.0745	Not Surveyed	None
02718086S	32.3075	Not Surveyed	None
02718089S	0.1972	Not Surveyed	None
02721020S	15.5763	Not Surveyed	None
02809004S	3.8525	Surveyed	None
02809006	56.9329	Surveyed	None
02809007S	10.8996	Surveyed	None
02809036ST	18.3827	Not Surveyed	None
02809046S	17.7095	Surveyed	None
02809063S	17.7729	Surveyed	None
02809066S	7.9189	Surveyed	None
02809075S	41.6983	Surveyed	None
02809076S	1.6195	Not Surveyed	None
02809079S	98.36	Surveyed	None
02809064S	29.2784	Not Surveyed	None
02809080S	102.1807	Surveyed	None
02810103S	137.6818	Surveyed	None
02810104S	31.8815	Not Surveyed	None
02810114	14.8325	Surveyed	None
02810115ST	6.2913	Surveyed	None
02810160	8.7748	Not Surveyed	None

Parcel Number	Acreage	Survey Status	Comments
02810169ST	6.2007	Surveyed	None
02810177ST	14.0359	Surveyed	None
02810181S	3.1635	Not Surveyed	None
03804001S	38.8716	Not Surveyed	None
03804002S	135.3307	Surveyed	17 acres were not surveyed due to slopes exceeding 30 percent.
03804003	35.0156	Not Surveyed	None
03804006S	4.4382	Surveyed	None
03804007S	0.0412	Not Surveyed	None
03804008S	0.0013	Not Surveyed	None
03804012S	29.7984	Surveyed	None
03804016S	49.5138	Not Surveyed	None
02711014S	10.5037	Surveyed	None
02718068	42.0576	Not Surveyed	None
02717171S	70.3383	Surveyed	None
02717115S	14.6907	Surveyed	None
02810182S	28.8532	Not Surveyed	None
02717180S	44.5530	Not Surveyed	None

The Proposed Project Study Area consisted of cattle graze land (Figure 5-1), row crop agricultural land (Figure 5-2) and orchards (Figure 5-3). The cattle graze land is within the most western portion of the Proposed Project Study Area, in the foothills of the Temblor Mountain Range. Ground visibility ranged between 80-100 percent, and there is little to no evidence of disturbances within this portion of the Proposed Project Study Area. Soils consisted of light brown sandy clay silt. Slopes ranged between 0-40 percent. The majority of the Proposed Project Study Area consisted of row crop agricultural land and orchards. Ground visibility within these areas was 100 percent, with most parcels having been recently tilled. All of these parcels show high levels of disturbance in association with agricultural practices.

Chronicle Heritage archaeologists did not encounter any unrecorded cultural resources within the 1,859 acres surveyed within the Proposed Project Study Area. There is one previously recorded cultural resource (P-10-007205) that crosses the Proposed Project Study Area which consists of the modern alignment of I-5. This resource was not revisited for this study, as it was previously evaluated and found ineligible for inclusion in the NRHP or CRHR and is comprised of a maintained and paved roadway that would not be directly impacted by Proposed Project activities.

During the survey, approximately 17 acres of parcel 03804002S were not surveyed due to its slope exceeding 30 percent. Due to its extreme slope, this area is considered not sensitive for containing cultural resources. Approximately 16 acres of parcel 02718002S were not surveyed due to flooding.

Figure 5-1. Overview of Proposed Project Study Area with transmission line, facing northeast.

Figure 5-2. Agricultural land within Proposed Project Study Area, facing southwest.

Figure 5-3. Orchard within Proposed Project Study Area, facing north.

6 Cultural Resource Evaluations

6.1 P-10-007205

Resource P-10-007205 (known as I-5) is a major north-to-south, 8-lane paved freeway that spans a total of 1,380 mi from the Mexican border in San Diego, California to the Canadian border in Washington State, with 800 mi within the State of California boundary. It is a 4-lane freeway in each direction, and the width of the road is approximately 50-ft in each direction. I-5 was evaluated for inclusion in the NRHP under Criteria A, B, C, and D and found ineligible. In addition, it was found ineligible for inclusion in the CRHR under Criterion 1, 2, 3, or 4. Because this resource was determined ineligible for listing in the NRHP or CRHR and is a paved and maintained freeway, it was not revisited for this study. It is unlikely Proposed Project activities will directly impact this resource.

7 Summary and Recommendations

Chronicle Heritage completed a records search and literature review, initiated Native American coordination, and conducted an intensive pedestrian archaeological survey of 1,859 acres for the Proposed Project. The pedestrian survey did not encounter any unrecorded cultural resources within the surveyed area. One previously recorded resource (P-10-007205) crosses the Proposed Project, the paved and maintained right-of-way of I-5. This resource has been determined ineligible for inclusion in the NRHP or CRHR. Furthermore, this resource will not be impacted by Proposed Project activities, therefore no mitigation measures are recommended for this resource.

Chronicle Heritage recommends a cultural resource survey of any portion of the remaining unsurveyed parcels within the Proposed Project Study Area that are later determined to be part of the Proposed Project. Table 5-1 in Section 5 lists all parcels within the Proposed Project Study Area and should be used as reference to determine which parcels included in the Proposed Project will need to be surveyed prior to implementation of Proposed Project activities.

Furthermore, Chronicle Heritage initiated Native American coordination efforts for the Proposed Project on November 20, 2023, with the submittal of an SLF search request to the NAHC. Follow-up emails requesting the status of the SLF search were sent on January 2 and January 10, 2024. As of January 12, 2024, the results of the SLF search have not been received. It is recommended Native American outreach efforts be completed prior to implementation of Proposed Project Activities. These efforts include mailing letters to the Native American representatives listed in the SLF search results letter once it is received, and documenting responses by the recipients (if any).

7.1 Inadvertent Discoveries

There is potential for the discovery of unanticipated archaeological materials during Project-related ground disturbance, such as clearing, grading, excavation, and/or general construction within the Proposed Project. Work at the location of the find will halt immediately within 50 ft of the find. If an archaeologist is not present at the time of the discovery, then the applicant shall contact an archaeologist for evaluation of the find to determine whether it qualifies as significant under CEQA.

- If the find is determined not to be a unique archaeological resource (or significant under CEQA), construction can continue. The archaeologist will prepare a brief informal memorandum/letter that describes and assesses the significance of the resource, including a discussion of the methods used to determine the significance of the find.
- If the find appears to be significant and qualifies as a unique archaeological resource (or significant under CEQA), the archaeologist will determine if the resource can be avoided and will detail avoidance procedures in a formal memorandum/letter.
- If the resource cannot be avoided, the archaeologist shall develop an action plan to avoid or minimize impacts. The field crew shall not proceed until a Secretary of the Interior-qualified archaeologist approves the action plan. The action plan shall be in conformance with California PRC 21083.2.

7.2 Inadvertent Discovery of Human Remains

Although unlikely, unanticipated human remains, including those interred outside formal cemeteries, may be encountered during Proposed Project ground disturbance in many locations throughout California. Section 7050.5(b) of the California Health and Safety Code will be implemented if human remains, or possible human remains, are located during Project-related construction excavation. Section 7050.5(b) states:

> In the event of discovery or recognition of any human remains in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains until the coroner of the county in which the human remains are discovered has determined, in accordance with Chapter 10 (commencing with Section 27460) of Part 3 of Division 2 of Title 3 of the Government Code, that the remains are not subject to the provisions of Section 27492 of the Government Code or any other related provisions of law concerning investigation of the circumstances, manner and cause of death, and the

recommendations concerning treatment and disposition of the human remains have been made to the person responsible for the excavation, or to their authorized representative, in the manner provided in PRC Section 5097.98.

Upon recognizing the remains as being of Native American origin, the Fresno County Coroner will contact the NAHC within 24 hours. Once NAHC identifies the MLD, the descendants will make recommendations regarding proper burial, which will be implemented in accordance with Section 15064.5(e) of the CEQA Guidelines. All actions taken under this mitigation measure shall comply with Health and Human Safety Code § 7050.5(b).

8 Preparer Qualifications

Chronicle Heritage Senior Archaeologist Robert Ramirez is a cultural resources professional with over 25 years of experience in the environmental compliance field. Over the course of his career, he has served as a principal investigator, project manager, archaeologist, and field director, as well as lithic, marine shell, and historical artifact analyst for various projects in California, Nevada, Utah, Arizona, Washington, North Dakota, Kentucky, and Ohio. He is well versed in National Historic Preservation Act and National Environmental Policy Act regulatory requirements. Ramirez has participated in projects supporting public agencies such as the National Forest Service, Bureau of Land Management, Bureau of Reclamation and National Park Service, to name a few. He has also participated in the evaluation of historic built environment and Native American ethnographic resources, as well as the regulatory requirements for the treatment of these resources.

Chronicle Heritage Associate Archaeologist/Project Manager Philip Clarkson has 16 years of professional experience working on various archaeological investigations throughout California and Alaska. Over these 16 years, he has held multiple roles including assistant program manager, project manager, field supervisor, report author, and field lab manager.

Chronicle Heritage Associate Archaeologist Gabrielle St Martin has over 6 years of experience as a cultural resource professional. She has participated in numerous archaeological surveys and site excavation projects in California, Nevada, and Arizona. As a student, she specialized in ceramic analysis and bioarcheological studies. As part of her professional duties, she has prepared site forms for newly recorded and updated sites, drafted cultural and technical reports, assisted in coordinating various projects, and directed field surveys, monitoring, and testing projects.

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Attachment A.
Maps

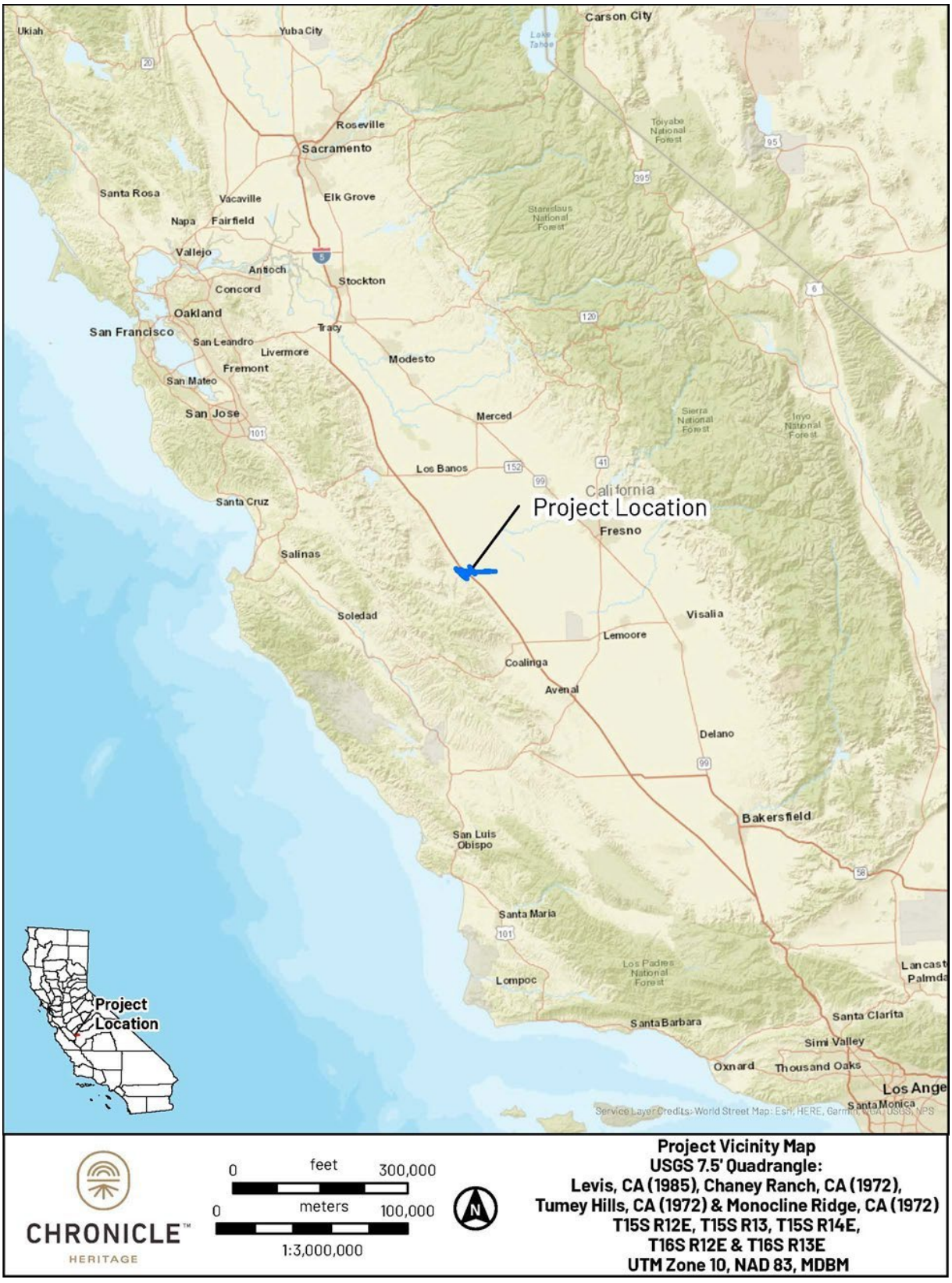

Figure A-1. Proposed Project vicinity map.

Figure A-2. Proposed Project location map.

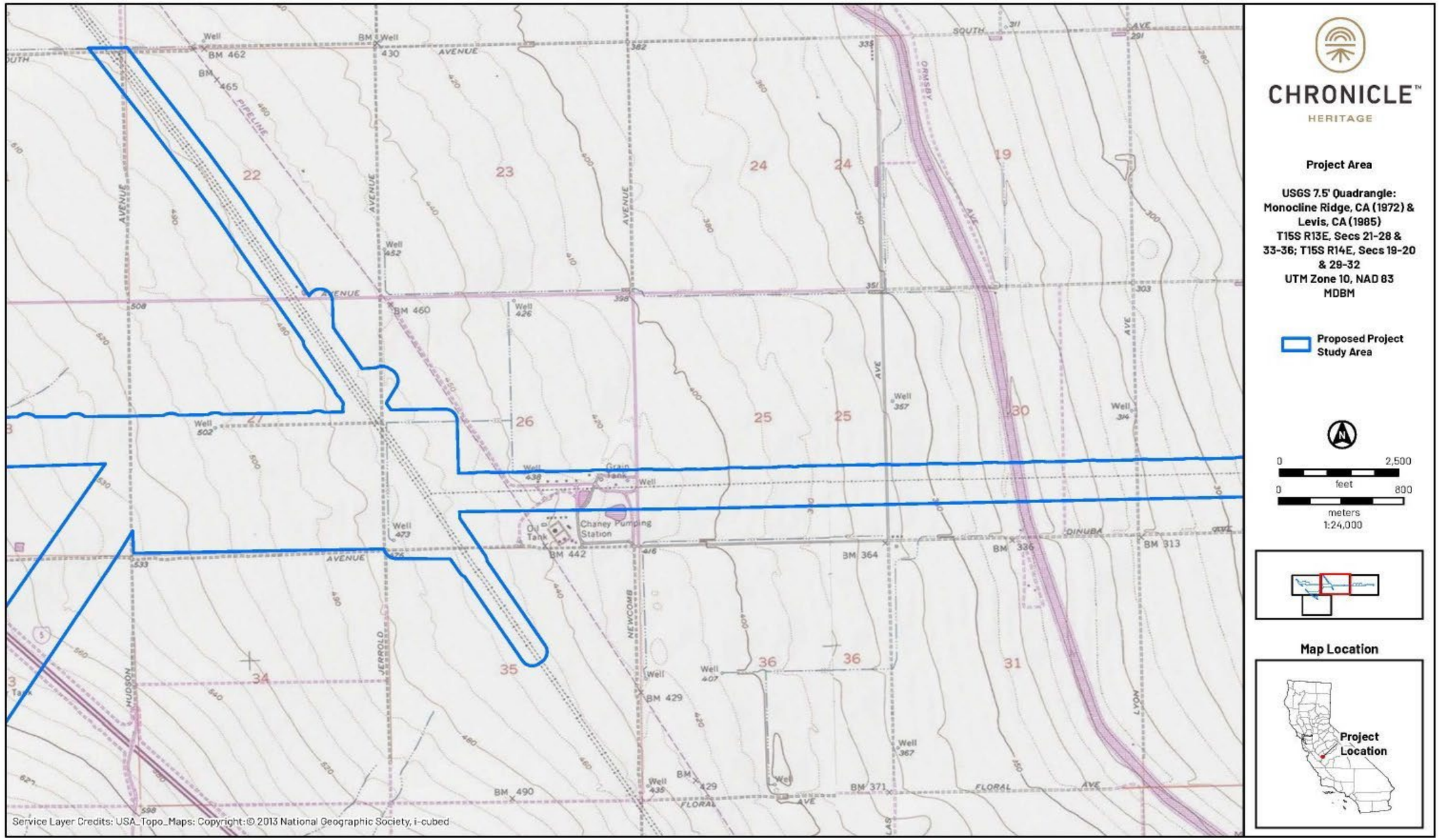

Figure A-3. Proposed Project area map (1 of 4).

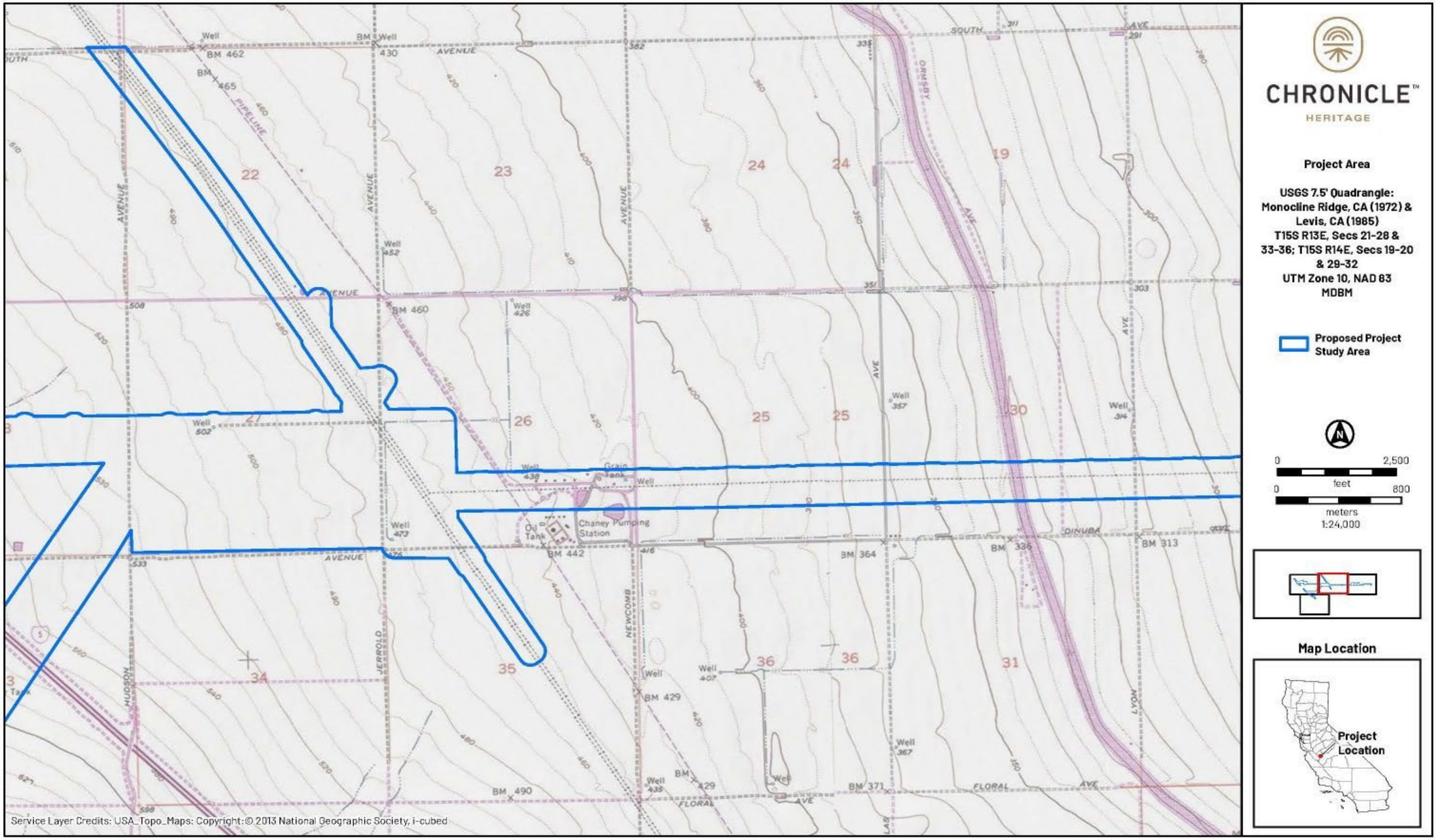

Figure A-4. Proposed Project area map (2 of 4).

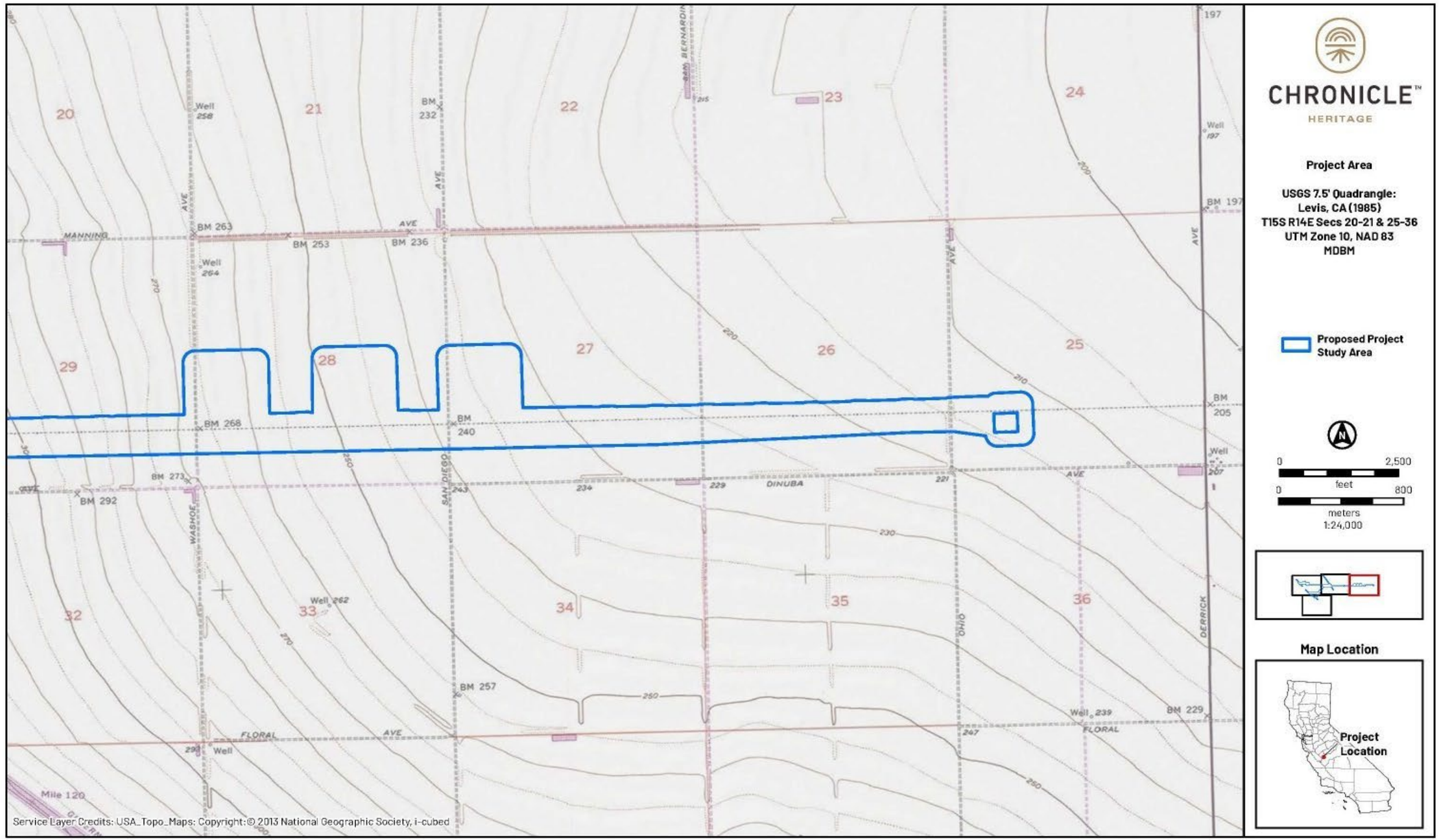

Figure A-5. Proposed Project area map (3 of 4)

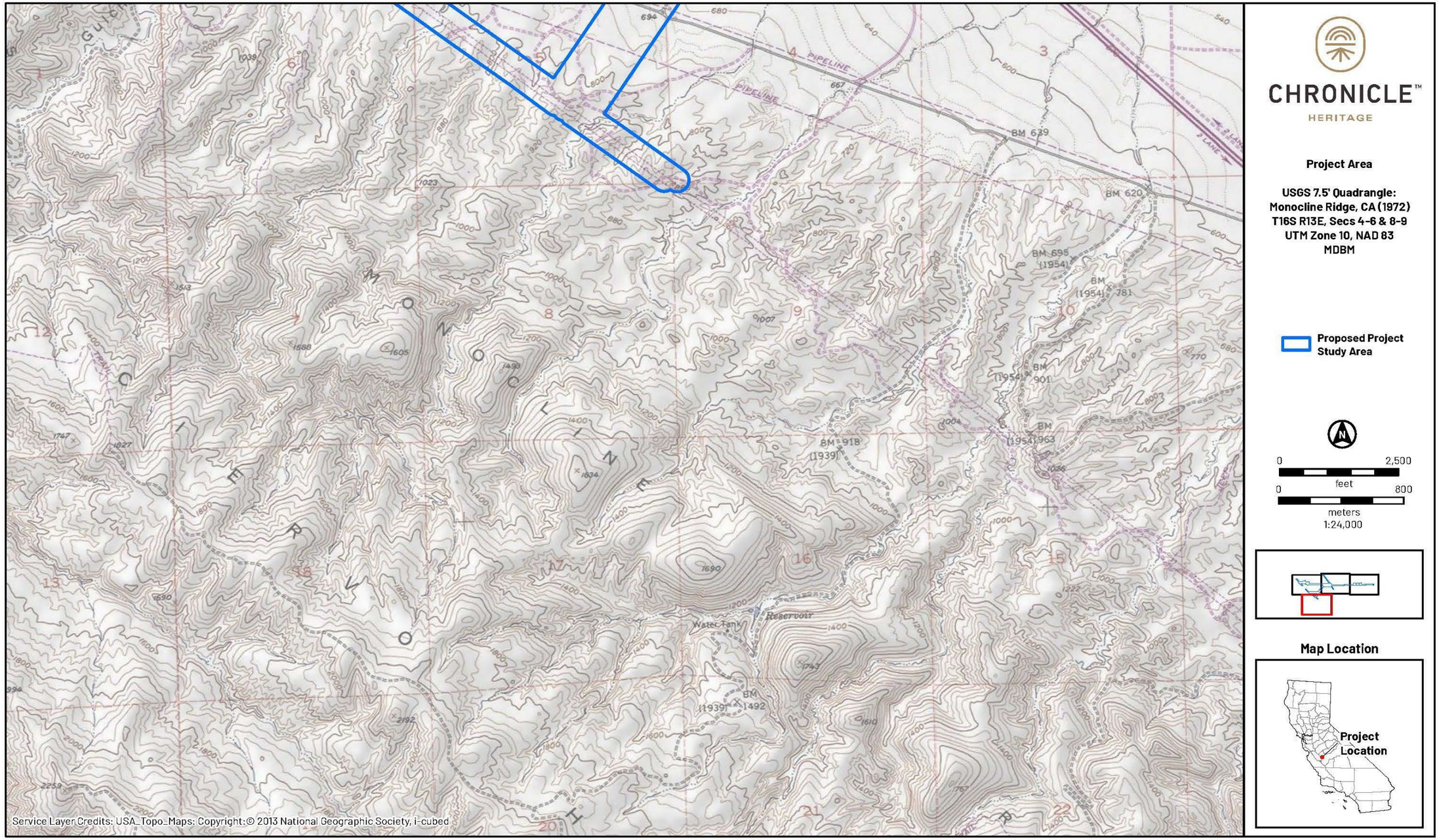

Figure A-6. Proposed Project area map (4 0f 4)

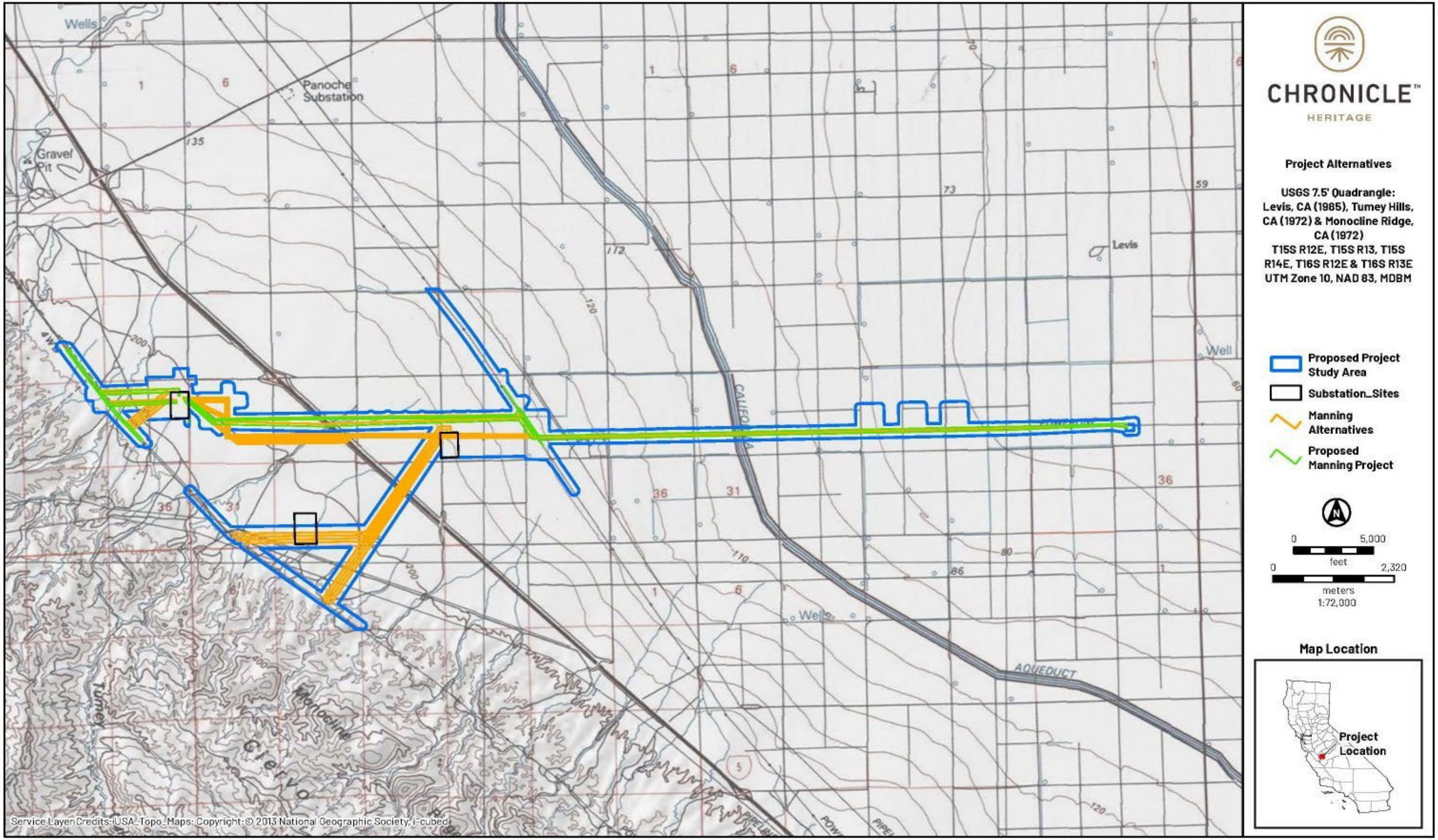

Figure A-7. Proposed Project alternatives map.

Figure A-8. Survey coverage map.

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ATTACHMENT 5.6-A: FUELS USE CALCULATIONS

Table 1: EMFAC Emissions Inventory - Fuel Consumption

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Population	Total VMT	CVMT	Trips	Fuel Consumption	Efficiency
San Joaquin Valley Unified APCD	2026	HHDT	Aggregate	Aggregate	Gasoline	6.412431143	174922.0576	174922.1	41954.0746	46.05029708	3.798500089
San Joaquin Valley Unified APCD	2026	HHDT	Aggregate	Aggregate	Diesel	80105.81713	3568034205	3.57E+09	432409164.8	571390.2772	6.244478332
San Joaquin Valley Unified APCD	2026	LDA	Aggregate	Aggregate	Gasoline	1402026.312	19408367202	1.94E+10	2249558454	628689.1533	30.87116598
San Joaquin Valley Unified APCD	2026	LDA	Aggregate	Aggregate	Diesel	3072.686012	33274491.69	33274492	4522223.912	738.0567343	45.08392125
San Joaquin Valley Unified APCD	2026	LDT1	Aggregate	Aggregate	Gasoline	125594.0689	1441811864	1.44E+09	187381178.8	56718.20202	25.42062006
San Joaquin Valley Unified APCD	2026	LDT1	Aggregate	Aggregate	Diesel	54.83764942	231619.6123	231619.6	52694.2875	9.187496301	25.21030808
San Joaquin Valley Unified APCD	2026	LDT2	Aggregate	Aggregate	Gasoline	657762.1166	9029749273	9.03E+09	1058524942	358392.7847	25.19512015
San Joaquin Valley Unified APCD	2026	LDT2	Aggregate	Aggregate	Diesel	1964.010962	28940034.35	28940034	3249367.629	819.0034601	35.33566799
San Joaquin Valley Unified APCD	2026	MHDT	Aggregate	Aggregate	Gasoline	3855.441282	73034615.21	73034615	25224671.82	15193.09233	4.80709349
San Joaquin Valley Unified APCD	2026	MHDT	Aggregate	Aggregate	Diesel	37536.35931	547651646.1	5.48E+08	140783256.5	62209.6092	8.803328829
San Joaquin Valley Unified APCD	2027	HHDT	Aggregate	Aggregate	Gasoline	5.50876722	170263.4255	170263.4	36041.74856	43.31273924	3.931024186
San Joaquin Valley Unified APCD	2027	HHDT	Aggregate	Aggregate	Diesel	82026.15764	3617891547	3.62E+09	442142855	569219.0668	6.355886087
San Joaquin Valley Unified APCD	2027	LDA	Aggregate	Aggregate	Gasoline	1406769.32	19497820101	1.95E+10	2256588807	619100.5386	31.49378637
San Joaquin Valley Unified APCD	2027	LDA	Aggregate	Aggregate	Diesel	2802.131058	30485515.45	30485515	4140125.012	666.5692674	45.73495499
San Joaquin Valley Unified APCD	2027	LDT1	Aggregate	Aggregate	Gasoline	122673.5424	1417896399	1.42E+09	183341359.8	54709.82899	25.91666662
San Joaquin Valley Unified APCD	2027	LDT1	Aggregate	Aggregate	Diesel	30.38659233	132610.9565	132611	29318.0944	5.109887717	25.95183375
San Joaquin Valley Unified APCD	2027	LDT2	Aggregate	Aggregate	Gasoline	673558.8378	9252702020	9.25E+09	1083734406	359046.9725	25.77017139
San Joaquin Valley Unified APCD	2027	LDT2	Aggregate	Aggregate	Diesel	2066.437528	30375210.47	30375210	3418609.57	842.5477318	36.05161978
San Joaquin Valley Unified APCD	2027	MHDT	Aggregate	Aggregate	Gasoline	3746.248836	71425140.31	71425140	24510267.57	14698.15528	4.859462901
San Joaquin Valley Unified APCD	2027	MHDT	Aggregate	Aggregate	Diesel	38350.11083	553285231.5	5.53E+08	143955871.5	62442.36298	8.860735007
San Joaquin Valley Unified APCD	2028	HHDT	Aggregate	Aggregate	Gasoline	4.836110681	168172.9422	168172.9	31640.81512	41.57942051	4.044619673
San Joaquin Valley Unified APCD	2028	HHDT	Aggregate	Aggregate	Diesel	83697.64325	3662894453	3.66E+09	450666985.5	565688.5733	6.475107729
San Joaquin Valley Unified APCD	2028	LDA	Aggregate	Aggregate	Gasoline	1411982.825	19586493691	1.96E+10	2264470526	610072.4033	32.10519536
San Joaquin Valley Unified APCD	2028	LDA	Aggregate	Aggregate	Diesel	2537.306368	27852459.76	27852460	3771322.873	599.5588682	46.45492083
San Joaquin Valley Unified APCD	2028	LDT1	Aggregate	Aggregate	Gasoline	120136.6958	1397308239	1.4E+09	179879721.4	52892.36884	26.41795536
San Joaquin Valley Unified APCD	2028	LDT1	Aggregate	Aggregate	Diesel	18.19655134	83963.15129	83963.15	17626.2612	3.141985914	26.72295599
San Joaquin Valley Unified APCD	2028	LDT2	Aggregate	Aggregate	Gasoline	689476.8989	9465042826	9.47E+09	1108832530	359659.8361	26.31665223
San Joaquin Valley Unified APCD	2028	LDT2	Aggregate	Aggregate	Diesel	2167.093845	31721641.14	31721641	3582007.271	864.2597432	36.70382821
San Joaquin Valley Unified APCD	2028	MHDT	Aggregate	Aggregate	Gasoline	3633.968932	69533286.24	69533286	23775663.28	14163.69936	4.909260248
San Joaquin Valley Unified APCD	2028	MHDT	Aggregate	Aggregate	Diesel	38969.23407	556087423.3	5.56E+08	146384675.5	62350.66995	8.918708071

Source: EMFAC2021 (v1.0.2) Emissions Inventory
Region Type: Air District
Region: San Joaquin Valley Unified APCD
Calendar Year: 2026, 2027, 2028
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/year for CVMT and EVMT, trips/year for Trips, kWh/year for Energy Consumption, tons/year for Emissions, 1000 gallons/year for Fuel Consumption

Table 2: On-Road Fuel Efficiency (miles/gallon)

Vehicle Category	Year	Fuel	Efficiency
passenger	2026	Gas	26.73
vendor	2026	Gas	4.81
hhdt	2026	Gas	3.80
passenger	2026	Diesel	32.71
vendor	2026	Diesel	8.80
hhdt	2026	Diesel	6.24

Table 3: Fuel Consumption Calcs

EquipIndex	Activity Index	Activity Name	Equipment Name	HP	Fuel Type	Quantity	Hours Per Day	Working Days	On-Off	Load Factor	On Distance	VMT	On Efficiency	On Fuel Use	Off BSFC	Off Use	Helo Efficiency	Helo Use	Fuel Cateogory
1	L-01	Survey	Pickup - 1/2 Ton	395	Gas	2	4	51	on		50	200	26.72688156	381.6382					Construction Vehicles
2	L-02	Site Development	Truck - Water 4 K	300	Diesel	2	8	76	on		20	80	8.803328829	690.6478					Construction Vehicles
3	L-02	Site Development	Loader - 4-5 Yd	230	Diesel	2	5	76	off	0.36					0.367	3248.639			Construction Equipment
4	L-02	Site Development	Truck - Dump 10-12 Yd	415	Diesel	2	6	76	on		50	200	6.244478332	2434.15					Construction Vehicles
5	L-02	Site Development	Motor Grader	250	Diesel	2	5	76	off	0.41					0.367	4021.564			Construction Equipment
6	L-02	Site Development	Scraper	410	Diesel	2	5	76	off	0.48					0.367	7721.403			Construction Equipment
7	L-02	Site Development	Vibratory Roller	157	Diesel	1	6	76	off	0.38					0.367	1404.448			Construction Equipment
8	L-02	Site Development	Pickup - 1/2 Ton	395	Gas	4	2	76	on		50	400	26.72688156	1137.432					Construction Vehicles
9	L-02	Site Development	Generator – 25 Kw	36	Diesel	1	8	76	off	0.74					0.408	929.5857			Construction Equipment
10	L-02	Site Development	Forklift - 15,000 lb	130	Diesel	1	6	76	off	0.2					0.367	612.0625			Construction Equipment
11	L-02	Site Development	Pickup - 1 Ton	410	Diesel	4	2	76	on		50	400	32.71005135	929.3779					Construction Vehicles
12	L-02	Site Development	Semi Truck	500	Diesel	1	3	76	on		50	100	6.244478332	1217.075					Construction Vehicles
13	L-02	Site Development	844 Loader	417	Diesel	1	6	76	off	0.36					0.367	3533.954			Construction Equipment
14	L-03	Below-Grade Construction	Truck - Water 4 K	300	Diesel	2	8	127	on		20	80	8.803328829	1154.109					Construction Vehicles
15	L-03	Below-Grade Construction	Excavator	108	Diesel	2	5	127	off	0.38					0.367	2690.721			Construction Equipment
16	L-03	Below-Grade Construction	Forklift - 15 K Reach	130	Diesel	1	6	127	off	0.2					0.367	1022.789			Construction Equipment
17	L-03	Below-Grade Construction	Backhoe - 2X4	68	Diesel	2	6	127	off	0.38					0.408	2260.108			Construction Equipment
18	L-03	Below-Grade Construction	Pickup - 1/2 Ton	395	Gas	4	2	127	on		50	400	26.72688156	1900.708					Construction Vehicles
19	L-03	Below-Grade Construction	Pickup - 1 Ton	410	Diesel	4	2	127	on		50	400	32.71005135	1553.039					Construction Vehicles
20	L-03	Below-Grade Construction	Excavator - Mini	70	Diesel	1	5	127	off	0.38					0.408	969.4089			Construction Equipment
21	L-03	Below-Grade Construction	Generator – 25 Kw	36	Diesel	1	8	127	off	0.74					0.408	1553.387			Construction Equipment
22	L-03	Below-Grade Construction	Truck - Concrete	425	Diesel	4	5	127	on		50	400	6.244478332	8135.187					Construction Vehicles
23	L-03	Below-Grade Construction	Loader - 4-5 Yd	230	Diesel	2	6	127	off	0.36					0.367	6514.376			Construction Equipment
24	L-03	Below-Grade Construction	Pressure Digger - Lo-Drill (Track	275	Diesel	1	6	127	off	0.5					0.367	5408.978			Construction Equipment
25	L-03	Below-Grade Construction	Truck - Dump 10-12 Yd	415	Diesel	3	5	127	on		50	300	6.244478332	6101.39					Construction Vehicles
26	L-03	Below-Grade Construction	Tool - Van/Conex 20'	0	NA	0	8	127	NA										Construction Vehicles
27	L-03	Below-Grade Construction	Trencher	75	Diesel	2	5	127	off	0.5					0.408	2733.296			Construction Equipment
28	L-03	Below-Grade Construction	Skid steer loader	74	Diesel	2	7	127	off	0.37					0.408	2793.939			Construction Equipment
29	L-03	Below-Grade Construction	Wire Trailer/ Tensioner	175	Diesel	1	5	127	off	0.42					0.367	2409.454			Construction Equipment
30	L-03	Below-Grade Construction	Wire Puller	175	Diesel	1	5	127	off	0.42					0.367	2409.454			Construction Equipment
31	L-04	Above-Grade Construction (Ph	Wire Trailer/ Tensioner	175	Diesel	1	5	224	off	0.42					0.367	4249.745			Construction Equipment
32	L-04	Above-Grade Construction (Ph	Wire Puller	175	Diesel	1	5	224	off	0.42					0.367	4249.745			Construction Equipment
33	L-04	Above-Grade Construction (Ph	Pickup - 1/2 Ton	395	Gas	4	2	224	on		50	400	26.72688156	3352.43					Construction Vehicles
34	L-04	Above-Grade Construction (Ph	Pickup - 1 Ton	410	Diesel	4	2	224	on		50	400	32.71005135	2739.219					Construction Vehicles
35	L-04	Above-Grade Construction (Ph	Welding Truck	395	Diesel	2	2	224	on		50	200	8.803328829	5088.984					Construction Vehicles
36	L-04	Above-Grade Construction (Ph	Generator – 25 Kw	36	Diesel	2	8	224	off	0.74					0.408	5479.663			Construction Equipment
37	L-04	Above-Grade Construction (Ph	Crane - 35 Ton (Manlift)	250	Diesel	2	5	224	off	0.29					0.367	8383.851			Construction Equipment
38	L-04	Above-Grade Construction (Ph	Forklift - 10 K Reach	130	Diesel	2	4	224	off	0.2					0.367	2405.298			Construction Equipment
39	L-04	Above-Grade Construction (Ph	Forklift -15,000 lb	130	Diesel	1	4	224	off	0.2					0.367	1202.649			Construction Equipment
40	L-04	Above-Grade Construction (Ph	Loader - 4-5 Yd	74	Diesel	2	5	224	off	0.36					0.408	3424.79			Construction Equipment
41	L-04	Above-Grade Construction (Ph	120' Manlift	74	Diesel	2	4	224	off	0.31					0.408	2359.299			Construction Equipment
42	L-04	Above-Grade Construction (Ph	Crane - 200 Ton	275	Diesel	1	4	224	off	0.29					0.367	3688.895			Construction Equipment
43	P-05	Structure Foundation Installati	Pressure Digger - Lo-Drill (Track	275	Diesel	2	8	37	off	0.5					0.367	4202.251			Construction Equipment
44	P-05	Structure Foundation Installati	Truck - Concrete	425	Diesel	4	5	37	on		50	400	6.244478332	2370.094					Construction Vehicles
45	P-05	Structure Foundation Installati	Pickup - 1 Ton	410	Diesel	4	2	37	on		50	400	32.71005135	452.4603					Construction Vehicles
46	P-05	Structure Foundation Installati	Truck - Water 4 K	300	Diesel	2	6	37	on		20	80	8.803328829	336.2364					Construction Vehicles
47	P-05	Structure Foundation Installati	Truck - Dump 10-12 Yd	415	Diesel	2	10	37	on		50	200	6.244478332	1185.047					Construction Vehicles
48	P-05	Structure Foundation Installati	Skid steer loader	74	Diesel	1	8	37	off	0.37					0.408	465.1326			Construction Equipment
49	P-05	Structure Foundation Installati	Forklift - 10 K Reach	130	Diesel	2	8	37	off	0.2					0.367	794.6074			Construction Equipment
50	P-05	Structure Foundation Installati	Crane - 35 Ton (Manlift)	250	Diesel	1	4	37	off	0.29					0.367	553.933			Construction Equipment
51	P-05	Structure Foundation Installati	Loader - 4-5 Yd	230	Diesel	1	8	37	off	0.36					0.367	1265.259			Construction Equipment
52	P-05	Structure Foundation Installati	Rough Terrain Crane	185	Diesel	1	2	37	off	0.29					0.367	204.9552			Construction Equipment
53	P-06	Structure Installation	Crane - 35 Ton (Manlift)	250	Diesel	2	8	26	off	0.29					0.367	1557.001			Construction Equipment
54	P-06	Structure Installation	Pickup - 1/2 ton	395	Gas	2	2	26	on		50	200	26.72688156	194.5607					Construction Vehicles
55	P-06	Structure Installation	Forklift - 15,000 lb	130	Diesel	1	5	26	off	0.2					0.367	174.4915			Construction Equipment
56	P-06	Structure Installation	Pickup - 1 ton	410	Diesel	2	2	26	on		50	200	32.71005135	158.9725					Construction Vehicles
57	P-06	Structure Installation	Crane - 200 Ton	275	Diesel	2	5	26	off	0.29					0.367	1070.438			Construction Equipment
58	P-06	Structure Installation	844 Loader	417	Diesel	1	8	26	off	0.36					0.367	1611.979			Construction Equipment
59	P-06	Structure Installation	Truck - Water 4 K	300	Diesel	2	6	26	on		20	80	8.803328829	236.2743					Construction Vehicles
60	P-07	Conductor Installation	Helicopter	320	Jet	1	8	20	helicopter								31.96470588	5114.352941	Helicopter and Support
61	P-07	Conductor Installation	Jet Fuel Truck	300	Diesel	1	10	20	on		50	100	8.803328829	227.1868					Construction Vehicles
62	P-07	Conductor Installation	Crane - 35 Ton (Manlift)	250	Diesel	6	4	20	off	0.29					0.367	1796.54			Construction Equipment
63	P-07	Conductor Installation	Pickup - 1/2 ton	395	Gas	4	2	20	on		50	400	26.72688156	299.3241					Construction Vehicles
64	P-07	Conductor Installation	Pickup - 1 Ton	410	Diesel	4	2	20	on		50	400	32.71005135	244.5731					Construction Vehicles

EquipIndex	Activity Index	Activity Name	Equipment Name	HP	Fuel Type	Quantity	Hours Per Day	Working Days	On-Off	Load Factor	On Distance	VMT	On Efficiency	On Fuel Use	Off BSFC	Off Use	Helo Efficiency	Helo Use	Fuel Cateogory
65	P-07	Conductor Installation	D8 Sag Dozer	200	Diesel	2	4	20	off	0.4					0.367	660.7962			Construction Equipment
66	P-07	Conductor Installation	Wire Puller	175	Diesel	1	5	20	off	0.42					0.367	379.4416			Construction Equipment
67	P-07	Conductor Installation	Truck - Water 4 K	300	Diesel	2	6	20	on		20	80	8.803328829	181.7494					Construction Vehicles
68	P-07	Conductor Installation	Wire Trailer/ Tensioner	175	Diesel	1	5	20	off	0.42					0.367	379.4416			Construction Equipment
69	P-08	Structure Foundation Installati	Pressure Digger - Lo-Drill (Track	275	Diesel	2	8	28	off	0.5					0.367	3180.082			Construction Equipment
70	P-08	Structure Foundation Installati	Truck - Concrete	425	Diesel	4	5	28	on		50	400	6.244478332	1793.585					Construction Vehicles
71	P-08	Structure Foundation Installati	Pickup - 1 Ton	410	Diesel	4	2	28	on		50	400	32.71005135	342.4024					Construction Vehicles
72	P-08	Structure Foundation Installati	Truck - Water 4 K	300	Diesel	2	6	28	on		20	80	8.803328829	254.4492					Construction Vehicles
73	P-08	Structure Foundation Installati	Truck - Dump 10-12 Yd	415	Diesel	2	10	28	on		50	200	6.244478332	896.7923					Construction Vehicles
74	P-08	Structure Foundation Installati	Skid steer loader	74	Diesel	1	8	28	off	0.37					0.408	351.9923			Construction Equipment
75	P-08	Structure Foundation Installati	Forklift - 10 K Reach	130	Diesel	2	8	28	off	0.2					0.367	601.3245			Construction Equipment
76	P-08	Structure Foundation Installati	Crane - 35 Ton (Manlift)	250	Diesel	1	4	28	off	0.29					0.367	419.1926			Construction Equipment
77	P-08	Structure Foundation Installati	844 Loader	417	Diesel	1	8	28	off	0.36					0.367	1735.978			Construction Equipment
78	P-08	Structure Foundation Installati	Rough Terrain Crane	185	Diesel	1	2	28	off	0.29					0.367	155.1013			Construction Equipment
79	P-09	Structure Installation	Crane - 35 Ton (Manlift)	250	Diesel	2	8	23	off	0.29					0.367	1377.347			Construction Equipment
80	P-09	Structure Installation	Pickup - 1/2 ton	395	Gas	2	2	23	on		50	200	26.72688156	172.1114					Construction Vehicles
81	P-09	Structure Installation	Forklift - 15,000 lb	130	Diesel	1	5	23	off	0.2					0.367	154.3579			Construction Equipment
82	P-09	Structure Installation	Pickup - 1 ton	410	Diesel	2	2	23	on		50	200	32.71005135	140.6296					Construction Vehicles
83	P-09	Structure Installation	Crane - 200 Ton	275	Diesel	1	8	23	off	0.29					0.367	757.5409			Construction Equipment
84	P-09	Structure Installation	844 Loader	417	Diesel	1	8	23	off	0.36					0.367	1425.982			Construction Equipment
85	P-09	Structure Installation	Truck - Water 4 K	300	Diesel	2	6	23	on		20	80	8.803328829	209.0118					Construction Vehicles
86	P-10	Conductor Installation	Helicopter	320	Jet	2	8	38	helicopter								31.96470588	19434.54118	Helicopter and Support
87	P-10	Conductor Installation	Jet Fuel Truck	300	Diesel	1	10	38	on		50	100	8.803328829	431.6549					Construction Vehicles
88	P-10	Conductor Installation	Crane - 35 Ton (Manlift)	250	Diesel	6	4	38	off	0.29					0.367	3413.425			Construction Equipment
89	P-10	Conductor Installation	Pickup - 1/2 ton	395	Gas	4	2	38	on		50	400	26.72688156	568.7158					Construction Vehicles
90	P-10	Conductor Installation	Pickup - 1 Ton	410	Diesel	4	2	38	on		50	400	32.71005135	464.689					Construction Vehicles
91	P-10	Conductor Installation	D8 Sag Dozer	200	Diesel	2	4	38	off	0.4					0.367	1255.513			Construction Equipment
92	P-10	Conductor Installation	Wire Puller	175	Diesel	1	5	38	off	0.42					0.367	720.939			Construction Equipment
93	P-10	Conductor Installation	Truck - Water 4 K	300	Diesel	2	6	38	on		20	80	8.803328829	345.3239					Construction Vehicles
94	P-10	Conductor Installation	Wire Trailer/ Tensioner	175	Diesel	1	5	38	off	0.42					0.367	720.939			Construction Equipment
95	P-11	Access Construction	Pickup - 1 Ton	410	Diesel	2	2	25	on		50	200	32.71005135	152.8582					Construction Vehicles
96	P-11	Access Construction	Loader - 4-5 Yd	230	Diesel	1	8	25	off	0.36					0.367	854.905			Construction Equipment
97	P-11	Access Construction	Skid steer loader	74	Diesel	1	8	25	off	0.37					0.408	314.2788			Construction Equipment
98	P-12	Structure Foundation Installati	Pressure Digger - Lo-Drill (Track	275	Diesel	1	8	51	off	0.5					0.367	2896.146			Construction Equipment
99	P-12	Structure Foundation Installati	Truck - Concrete	425	Diesel	4	5	51	on		50	400	6.244478332	3266.886					Construction Vehicles
100	P-12	Structure Foundation Installati	Pickup - 1 Ton	410	Diesel	4	2	51	on		50	400	32.71005135	623.6615					Construction Vehicles
101	P-12	Structure Foundation Installati	Truck - Water 4 K	300	Diesel	2	6	51	on		20	80	8.803328829	463.461					Construction Vehicles
102	P-12	Structure Foundation Installati	Truck - Dump 10-12 Yd	415	Diesel	2	10	51	on		50	200	6.244478332	1633.443					Construction Vehicles
103	P-12	Structure Foundation Installati	Skid steer loader	74	Diesel	1	8	51	off	0.37					0.408	641.1288			Construction Equipment
104	P-12	Structure Foundation Installati	Forklift - 10 K Reach	130	Diesel	2	8	51	off	0.2					0.367	1095.27			Construction Equipment
105	P-12	Structure Foundation Installati	Crane - 35 Ton (Manlift)	250	Diesel	1	4	51	off	0.29					0.367	763.5293			Construction Equipment
106	P-12	Structure Foundation Installati	Loader - 4-5 Yd	230	Diesel	1	8	51	off	0.36					0.367	1744.006			Construction Equipment
107	P-12	Structure Foundation Installati	Rough Terrain Crane	185	Diesel	1	2	51	off	0.29					0.367	282.5059			Construction Equipment
108	P-13	Structure Installation	Crane - 35 Ton (Manlift)	250	Diesel	2	8	26	off	0.29					0.367	1557.001			Construction Equipment
109	P-13	Structure Installation	Pickup - 1/2 ton	395	Gas	2	2	26	on		50	200	26.72688156	194.5607					Construction Vehicles
110	P-13	Structure Installation	Forklift - 15,000 lb	130	Diesel	1	5	26	off	0.2					0.367	174.4915			Construction Equipment
111	P-13	Structure Installation	Pickup - 1 ton	410	Diesel	2	2	26	on		50	200	32.71005135	158.9725					Construction Vehicles
112	P-13	Structure Installation	Crane - 200 Ton	275	Diesel	1	8	26	off	0.29					0.367	856.3505			Construction Equipment
113	P-13	Structure Installation	Loader - 4-5 Yd	230	Diesel	1	8	26	off	0.36					0.367	889.1013			Construction Equipment
114	P-13	Structure Installation	Truck - Water 4 K	300	Diesel	2	6	26	on		20	80	8.803328829	236.2743					Construction Vehicles
115	P-14	Conductor Installation	Helicopter	320	Jet	2	8	111	helicopter								31.96470588	56769.31765	Helicopter and Support
116	P-14	Conductor Installation	Jet Fuel Truck	300	Diesel	1	10	111	on		50	100	8.803328829	1260.887					Construction Vehicles
117	P-14	Conductor Installation	Crane - 35 Ton (Manlift)	250	Diesel	6	4	111	off	0.29					0.367	9970.795			Construction Equipment
118	P-14	Conductor Installation	Pickup - 1/2 ton	395	Gas	4	2	111	on		50	400	26.72688156	1661.249					Construction Vehicles
119	P-14	Conductor Installation	Pickup - 1 Ton	410	Diesel	4	2	111	on		50	400	32.71005135	1357.381					Construction Vehicles
120	P-14	Conductor Installation	D8 Sag Dozer	200	Diesel	2	4	111	off	0.4					0.367	3667.419			Construction Equipment
121	P-14	Conductor Installation	Wire Puller	175	Diesel	1	5	111	off	0.42					0.367	2105.901			Construction Equipment
122	P-14	Conductor Installation	Truck - Water 4 K	300	Diesel	2	6	111	on		20	80	8.803328829	1008.709					Construction Vehicles
123	P-14	Conductor Installation	Wire Trailer/ Tensioner	175	Diesel	1	5	111	off	0.42					0.367	2105.901			Construction Equipment
124	L-15	Access Road Construction	Pickup - 1/2 ton	395	Gas	2	4	29	on		50	200	26.72688156	217.01					Construction Vehicles
125	L-15	Access Road Construction	Pickup - 1 ton	410	Diesel	2	4	29	on		50	200	32.71005135	177.3155					Construction Vehicles
126	L-15	Access Road Construction	Motor Grader	250	Diesel	1	8	29	off	0.41					0.367	1227.635			Construction Equipment
127	L-15	Access Road Construction	Truck - Dump 10-12 Yd	415	Diesel	2	10	29	on		50	200	6.244478332	928.8206					Construction Vehicles
128	L-15	Access Road Construction	Skid steer loader	74	Diesel	1	8	29	off	0.37					0.408	364.5634			Construction Equipment
129	L-15	Access Road Construction	Truck - Water 4 K	300	Diesel	2	6	29	on		20	80	8.803328829	263.5367					Construction Vehicles

EquipIndex	Activity Index	Activity Name	Equipment Name	HP	Fuel Type	Quantity	Hours Per Day	Working Days	On-Off	Load Factor	On Distance	VMT	On Efficiency	On Fuel Use	Off BSFC	Off Use	Helo Efficiency	Helo Use	Fuel Cateogory
130	L-15	Access Road Construction	D6 Type Dozer	250	Diesel	1	8	29	off	0.4					0.367	1197.693			Construction Equipment
131	L-15	Access Road Construction	Excavator	250	Diesel	1	8	29	off	0.38					0.367	1137.808			Construction Equipment
132	L-15	Access Road Construction	Vibratory Roller	125	Diesel	1	8	29	off	0.38					0.367	568.9042			Construction Equipment
133	L-16	Structure Foundation Installati	Pressure Digger - Lo-Drill (Track	275	Diesel	1	8	47	off	0.5					0.367	2668.997			Construction Equipment
134	L-16	Structure Foundation Installati	Truck - Concrete	425	Diesel	4	5	47	on		50	400	6.244478332	3010.66					Construction Vehicles
135	L-16	Structure Foundation Installati	Pickup - 1 Ton	410	Diesel	4	2	47	on		50	400	32.71005135	574.7469					Construction Vehicles
136	L-16	Structure Foundation Installati	Truck - Water 4 K	300	Diesel	2	6	47	on		20	80	8.803328829	427.1112					Construction Vehicles
137	L-16	Structure Foundation Installati	Truck - Dump 10-12 Yd	415	Diesel	2	10	47	on		50	200	6.244478332	1505.33					Construction Vehicles
138	L-16	Structure Foundation Installati	Skid steer loader	74	Diesel	1	8	47	off	0.37					0.408	590.8441			Construction Equipment
139	L-16	Structure Foundation Installati	Forklift - 10 K Reach	130	Diesel	2	8	47	off	0.2					0.367	1009.366			Construction Equipment
140	L-16	Structure Foundation Installati	Crane - 35 Ton (Manlift)	250	Diesel	1	4	47	off	0.29					0.367	703.6447			Construction Equipment
141	L-16	Structure Foundation Installati	844 Loader	417	Diesel	1	8	47	off	0.36					0.367	2913.962			Construction Equipment
142	L-16	Structure Foundation Installati	Rough Terrain Crane	185	Diesel	1	2	47	off	0.29					0.367	260.3485			Construction Equipment
143	L-17	Structure Installation	Crane - 35 Ton (Manlift)	250	Diesel	2	8	35	off	0.29					0.367	2095.963			Construction Equipment
144	L-17	Structure Installation	Pickup - 1/2 ton	395	Gas	2	2	35	on		50	200	26.72688156	261.9086					Construction Vehicles
145	L-17	Structure Installation	Forklift - 15,000 lb	130	Diesel	1	5	35	off	0.2					0.367	234.8924			Construction Equipment
146	L-17	Structure Installation	Pickup - 1 ton	410	Diesel	2	2	35	on		50	200	32.71005135	214.0015					Construction Vehicles
147	L-17	Structure Installation	Crane - 200 Ton	275	Diesel	1	8	35	off	0.29					0.367	1152.78			Construction Equipment
148	L-17	Structure Installation	844 Loader	417	Diesel	1	8	35	off	0.36					0.367	2169.972			Construction Equipment
149	L-17	Structure Installation	Truck - Water 4 K	300	Diesel	2	6	35	on		20	80	8.803328829	318.0615					Construction Vehicles
150	L-18	Conductor Installation	Helicopter	320	Jet	1	8	60	helicopter								31.96470588	15343.05882	Helicopter and Support
151	L-18	Conductor Installation	Jet Fuel Truck	300	Diesel	1	10	60	on		50	100	8.803328829	681.5604					Construction Vehicles
152	L-18	Conductor Installation	Crane - 35 Ton (Manlift)	250	Diesel	6	4	60	off	0.29					0.367	5389.619			Construction Equipment
153	L-18	Conductor Installation	Pickup - 1/2 ton	395	Gas	4	2	60	on		50	400	26.72688156	897.9723					Construction Vehicles
154	L-18	Conductor Installation	Pickup - 1 Ton	410	Diesel	4	2	60	on		50	400	32.71005135	733.7194					Construction Vehicles
155	L-18	Conductor Installation	D8 Sag Dozer	200	Diesel	2	4	60	off	0.4					0.367	1982.389			Construction Equipment
156	L-18	Conductor Installation	Wire Puller	175	Diesel	1	5	60	off	0.42					0.367	1138.325			Construction Equipment
157	L-18	Conductor Installation	Truck - Water 4 K	300	Diesel	2	6	60	on		20	80	8.803328829	545.2483					Construction Vehicles
158	L-18	Conductor Installation	Wire Trailer/ Tensioner	175	Diesel	1	5	60	off	0.42					0.367	1138.325			Construction Equipment
159	P-19	Structure Foundation Installati	Pressure Digger - Lo-Drill (Track	275	Diesel	2	8	25	off	0.5					0.367	2839.359			Construction Equipment
160	P-19	Structure Foundation Installati	Truck - Concrete	425	Diesel	2	5	25	on		50	200	6.244478332	800.7074					Construction Vehicles
161	P-19	Structure Foundation Installati	Pickup - 1 Ton	410	Diesel	2	2	25	on		50	200	32.71005135	152.8582					Construction Vehicles
162	P-19	Structure Foundation Installati	Truck - Water 4 K	300	Diesel	1	6	25	on		20	40	8.803328829	113.5934					Construction Vehicles
163	P-19	Structure Foundation Installati	Truck - Dump 10-12 Yd	415	Diesel	1	10	25	on		50	100	6.244478332	400.3537					Construction Vehicles
164	P-19	Structure Foundation Installati	Crane - 35 Ton (Manlift)	250	Diesel	1	4	25	off	0.29					0.367	374.2791			Construction Equipment
165	P-20	Structure Installation	Crane - 35 Ton (Manlift)	250	Diesel	2	8	13	off	0.29					0.367	778.5005			Construction Equipment
166	P-20	Structure Installation	Pickup - 1/2 ton	395	Gas	2	2	13	on		50	200	26.72688156	97.28034					Construction Vehicles
167	P-20	Structure Installation	Forklift - 15,000 lb	130	Diesel	1	5	13	off	0.2					0.367	87.24574			Construction Equipment
168	P-20	Structure Installation	Pickup - 1 ton	410	Diesel	2	2	13	on		50	200	32.71005135	79.48627					Construction Vehicles
169	P-20	Structure Installation	Crane - 200 Ton	275	Diesel	2	5	13	off	0.29					0.367	535.2191			Construction Equipment
170	P-21	Conductor Installation	Helicopter	320	Jet	1	8	13	helicopter								31.96470588	3324.329412	Helicopter and Support
171	P-21	Conductor Installation	Jet Fuel Truck	300	Diesel	1	8	13	on		50	100	8.803328829	147.6714					Construction Vehicles
172	P-21	Conductor Installation	Crane - 35 Ton (Manlift)	250	Diesel	6	4	13	off	0.29					0.367	1167.751			Construction Equipment
173	P-21	Conductor Installation	Pickup - 1/2 ton	395	Gas	2	2	13	on		50	200	26.72688156	97.28034					Construction Vehicles
174	P-21	Conductor Installation	Pickup - 1 Ton	410	Diesel	2	2	13	on		50	200	32.71005135	79.48627					Construction Vehicles
175	P-21	Conductor Installation	Wire Puller	175	Diesel	1	5	13	off	0.42					0.367	246.637			Construction Equipment
176	P-21	Conductor Installation	Wire Trailer/ Tensioner	175	Diesel	1	5	13	off	0.42					0.367	246.637			Construction Equipment
177	P-22	Structure Foundation Installati	Pressure Digger - Lo-Drill (Track	275	Diesel	1	8	13	off	0.5					0.367	738.2332			Construction Equipment
178	P-22	Structure Foundation Installati	Truck - Concrete	425	Diesel	2	5	13	on		50	200	6.244478332	416.3678					Construction Vehicles
179	P-22	Structure Foundation Installati	Pickup - 1 Ton	410	Diesel	2	2	13	on		50	200	32.71005135	79.48627					Construction Vehicles
180	P-22	Structure Foundation Installati	Truck - Water 4 K	300	Diesel	1	6	13	on		20	40	8.803328829	59.06856					Construction Vehicles
181	P-22	Structure Foundation Installati	Truck - Dump 10-12 Yd	415	Diesel	1	10	13	on		50	100	6.244478332	208.1839					Construction Vehicles
182	P-22	Structure Foundation Installati	Crane - 35 Ton (Manlift)	250	Diesel	1	4	13	off	0.29					0.367	194.6251			Construction Equipment
183	P-23	Structure Installation	Crane - 35 Ton (Manlift)	250	Diesel	1	8	7	off	0.29					0.367	209.5963			Construction Equipment
184	P-23	Structure Installation	Pickup - 1/2 ton	395	Gas	2	2	7	on		50	200	26.72688156	52.38172					Construction Vehicles
185	P-23	Structure Installation	Forklift - 15,000 lb	130	Diesel	1	5	7	off	0.2					0.367	46.97848			Construction Equipment
186	P-23	Structure Installation	Pickup - 1 ton	410	Diesel	2	2	7	on		50	200	32.71005135	42.8003					Construction Vehicles
187	P-23	Structure Installation	Crane - 200 Ton	275	Diesel	2	5	7	off	0.29					0.367	288.1949			Construction Equipment
188	P-24	Conductor Installation	Pickup - 1/2 ton	395	Gas	2	2	6	on		50	200	26.72688156	44.89862					Construction Vehicles
189	P-24	Conductor Installation	Pickup - 1 Ton	410	Diesel	2	2	6	on		50	200	32.71005135	36.68597					Construction Vehicles
190	P-24	Conductor Installation	Wire Puller	175	Diesel	1	5	6	off	0.42					0.367	113.8325			Construction Equipment
191	P-24	Conductor Installation	Wire Trailer/ Tensioner	175	Diesel	1	5	6	off	0.42					0.367	113.8325			Construction Equipment
192	P-25	Structure Foundation Installati	Pressure Digger - Lo-Drill (Track	275	Diesel	1	8	12	off	0.5					0.367	681.4461			Construction Equipment
193	P-25	Structure Foundation Installati	Truck - Concrete	425	Diesel	2	5	12	on		50	200	6.244478332	384.3396					Construction Vehicles
194	P-25	Structure Foundation Installati	Pickup - 1 Ton	410	Diesel	2	2	12	on		50	200	32.71005135	73.37194					Construction Vehicles

EquipIndex	Activity Index	Activity Name	Equipment Name	HP	Fuel Type	Quantity	Hours Per Day	Working Days	On-Off	Load Factor	On Distance	VMT	On Efficiency	On Fuel Use	Off BSFC	Off Use	Helo Efficiency	Helo Use	Fuel Cateogory
195	P-25	Structure Foundation Installati	Truck - Water 4 K	300	Diesel	1	6	12	on		20	40	8.803328829	54.52483					Construction Vehicles
196	P-25	Structure Foundation Installati	Truck - Dump 10-12 Yd	415	Diesel	1	10	12	on		50	100	6.244478332	192.1698					Construction Vehicles
197	P-25	Structure Foundation Installati	Crane - 35 Ton (Manlift)	250	Diesel	1	4	12	off	0.29					0.367	179.654			Construction Equipment
198	P-26	Structure Installation	Crane - 35 Ton (Manlift)	250	Diesel	1	8	24	off	0.29					0.367	718.6158			Construction Equipment
199	P-26	Structure Installation	Pickup - 1/2 ton	395	Gas	2	2	24	on		50	200	26.72688156	179.5945					Construction Vehicles
200	P-26	Structure Installation	Forklift - 15,000 lb	130	Diesel	1	5	24	off	0.2					0.367	161.0691			Construction Equipment
201	P-26	Structure Installation	Pickup - 1 ton	410	Diesel	2	2	24	on		50	200	32.71005135	146.7439					Construction Vehicles
202	P-26	Structure Installation	Crane - 200 Ton	275	Diesel	2	5	24	off	0.29					0.367	988.0968			Construction Equipment
203	P-27	Conductor Installation	Pickup - 1/2 ton	395	Gas	2	2	23	on		50	200	26.72688156	172.1114					Construction Vehicles
204	P-27	Conductor Installation	Pickup - 1 Ton	410	Diesel	2	2	23	on		50	200	32.71005135	140.6296					Construction Vehicles
205	P-27	Conductor Installation	Wire Puller	175	Diesel	1	5	23	off	0.42					0.367	436.3578			Construction Equipment
206	P-27	Conductor Installation	Wire Trailer/ Tensioner	175	Diesel	1	5	23	off	0.42					0.367	436.3578			Construction Equipment
207	P-28	Distribution Extension to Subst	Pickup - 1/2 ton	395	Gas	2	2	26	on		50	200	26.72688156	194.5607					Construction Vehicles
208	P-28	Distribution Extension to Subst	Wire Trailer/ Tensioner	175	Diesel	1	5	26	off	0.42					0.367	493.274			Construction Equipment
209	P-28	Distribution Extension to Subst	Wire Puller	175	Diesel	1	5	26	off	0.42					0.367	493.274			Construction Equipment
210	P-28	Distribution Extension to Subst	Crane - 35 Ton (Manlift)	250	Diesel	2	8	26	off	0.29					0.367	1557.001			Construction Equipment
211	P-28	Distribution Extension to Subst	Pickup - 1 Ton	410	Diesel	2	2	26	on		50	200	32.71005135	158.9725					Construction Vehicles
212	P-28	Distribution Extension to Subst	Forklift - 15 K Reach	130	Diesel	2	6	26	off	0.2					0.367	418.7796			Construction Equipment
213	P-28	Distribution Extension to Subst	Pressure Digger - Lo-Drill (Track	275	Diesel	1	8	26	off	0.5					0.367	1476.466			Construction Equipment
214	P-28	Distribution Extension to Subst	Truck - Dump 10-12 Yd	415	Diesel	2	10	26	on		50	200	6.244478332	832.7357					Construction Vehicles
215	P-28	Distribution Extension to Subst	Skid steer loader	74	Diesel	2	8	26	off	0.37					0.408	653.6999			Construction Equipment
216	P-28	Distribution Extension to Subst	Truck - Concrete	425	Diesel	4	5	26	on		50	400	6.244478332	1665.471					Construction Vehicles
217	P-28	Distribution Extension to Subst	Backhoe - 2X4	68	Diesel	1	8	26	off	0.38					0.408	308.4661			Construction Equipment
218	L-29	Fiber Extension to Substation	Crane - 35 Ton (Manlift)	250	Diesel	2	8	51	off	0.29					0.367	3054.117			Construction Equipment
219	L-29	Fiber Extension to Substation	Forklift - 10 K Reach	130	Diesel	1	5	51	off	0.2					0.367	342.2718			Construction Equipment
220	L-29	Fiber Extension to Substation	Excavator - Mini	70	Diesel	2	5	51	off	0.38					0.408	778.5804			Construction Equipment
221	L-29	Fiber Extension to Substation	Truck - Dump 10-12 Yd	415	Diesel	3	5	51	on		50	300	6.244478332	2450.165					Construction Vehicles
222	L-29	Fiber Extension to Substation	Skid steer loader	74	Diesel	2	8	51	off	0.37					0.408	1282.258			Construction Equipment
223	L-29	Fiber Extension to Substation	Trencher	75	Diesel	1	8	51	off	0.5					0.408	878.0982			Construction Equipment
224	L-29	Fiber Extension to Substation	Pickup - 1 Ton	410	Diesel	3	2	51	on		50	300	32.71005135	467.7461					Construction Vehicles
225	L-29	Fiber Extension to Substation	Truck - Concrete	425	Diesel	2	5	51	on		50	200	6.244478332	1633.443					Construction Vehicles
226	L-29	Fiber Extension to Substation	Wire Trailer/ Tensioner	175	Diesel	1	5	51	off	0.42					0.367	967.576			Construction Equipment
227	L-29	Fiber Extension to Substation	Wire Puller	175	Diesel	1	5	51	off	0.42					0.367	967.576			Construction Equipment
228	L-29	Fiber Extension to Substation	Truck - Water 4 K	300	Diesel	2	6	51	on		20	80	8.803328829	463.461					Construction Vehicles
229	L-29	Fiber Extension to Substation	Pickup - 1/2 Ton	395	Gas	2	1	51	on		50	200	26.72688156	381.6382					Construction Vehicles
230	L-29	Fiber Extension to Substation	HDD machine	75	Diesel	1	5	51	off	0.5					0.408	548.8114			Construction Equipment
231	L-29	Fiber Extension to Substation	Manlift - 40'	49	Diesel	1	5	51	off	0.31					0.408	222.3052			Construction Equipment
232	P-30	Tranquility Outdoor	Pickup - 1/2 Ton	395	Gas	4	2	200	on		50	400	26.72688156	2993.241					Construction Vehicles
233	P-30	Tranquility Outdoor	Pickup - 1 Ton	410	Diesel	4	2	200	on		50	400	32.71005135	2445.731					Construction Vehicles
234	P-30	Tranquility Outdoor	Excavator - Mini	70	Diesel	1	5	200	off	0.38					0.408	1526.628			Construction Equipment
235	P-30	Tranquility Outdoor	Truck - Concrete	425	Diesel	2	6	200	on		50	200	6.244478332	6405.659					Construction Vehicles
236	P-30	Tranquility Outdoor	Loader - 4-5 Yd	230	Diesel	1	8	200	off	0.36					0.367	6839.24			Construction Equipment
237	P-30	Tranquility Outdoor	Pressure Digger - Lo-Drill (Track	275	Diesel	1	8	200	off	0.5					0.367	11357.43			Construction Equipment
238	P-30	Tranquility Outdoor	Welding Truck	395	Diesel	2	5	200	on		50	200	8.803328829	4543.736					Construction Vehicles
239	P-30	Tranquility Outdoor	Crane - 35 Ton (Manlift)	250	Diesel	2	8	200	off	0.29					0.367	11976.93			Construction Equipment
240	P-30	Tranquility Outdoor	Forklift -15,000 lb	130	Diesel	1	4	200	off	0.2					0.367	1073.794			Construction Equipment
241	P-30	Tranquility Outdoor	Manlift - 40'	49	Diesel	3	8	200	off	0.31					0.408	4184.568			Construction Equipment
242	P-30	Tranquility Outdoor	120' Manlift	74	Diesel	2	4	200	off	0.31					0.408	2106.517			Construction Equipment
243	P-31	Tranquility Indoor	Pickup - 1/2 Ton	395	Gas	4	2	148	on		50	400	26.72688156	2214.998					Construction Vehicles
244	P-31	Tranquility Indoor	Pickup - 1 Ton	410	Diesel	4	2	148	on		50	400	32.71005135	1809.841					Construction Vehicles
245	P-31	Tranquility Indoor	Welding Truck	395	Diesel	2	5	148	on		50	200	8.803328829	3362.364					Construction Vehicles
246	P-31	Tranquility Indoor	Crane - 35 Ton (Manlift)	250	Diesel	1	8	148	off	0.29					0.367	4431.464			Construction Equipment
247	P-31	Tranquility Indoor	Forklift -15,000 lb	130	Diesel	1	4	148	off	0.2					0.367	794.6074			Construction Equipment
248	P-31	Tranquility Indoor	Manlift - 40'	49	Diesel	3	8	148	off	0.31					0.408	3096.581			Construction Equipment
249	P-31	Tranquility Indoor	120' Manlift	74	Diesel	2	4	148	off	0.31					0.408	1558.823			Construction Equipment
250	P-32	Panoche Outdoor	Pickup - 1/2 Ton	395	Gas	4	2	200	on		50	400	26.72688156	2993.241					Construction Vehicles
251	P-32	Panoche Outdoor	Pickup - 1 Ton	410	Diesel	4	2	200	on		50	400	32.71005135	2445.731					Construction Vehicles
252	P-32	Panoche Outdoor	Excavator - Mini	70	Diesel	1	5	200	off	0.38					0.408	1526.628			Construction Equipment
253	P-32	Panoche Outdoor	Truck - Concrete	425	Diesel	2	6	200	on		50	200	6.244478332	6405.659					Construction Vehicles
254	P-32	Panoche Outdoor	Loader - 4-5 Yd	230	Diesel	1	8	200	off	0.36					0.367	6839.24			Construction Equipment
255	P-32	Panoche Outdoor	Pressure Digger - Lo-Drill (Track	275	Diesel	1	8	200	off	0.5					0.367	11357.43			Construction Equipment
256	P-32	Panoche Outdoor	Welding Truck	395	Diesel	2	5	200	on		50	200	8.803328829	4543.736					Construction Vehicles
257	P-32	Panoche Outdoor	Crane - 35 Ton (Manlift)	250	Diesel	2	8	200	off	0.29					0.367	11976.93			Construction Equipment
258	P-32	Panoche Outdoor	Forklift -15,000 lb	130	Diesel	1	4	200	off	0.2					0.367	1073.794			Construction Equipment
259	P-32	Panoche Outdoor	Manlift - 40'	49	Diesel	3	8	200	off	0.31					0.408	4184.568			Construction Equipment

EquipIndex	Activity Index	Activity Name	Equipment Name	HP	Fuel Type	Quantity	Hours Per Day	Working Days	On-Off	Load Factor	On Distance	VMT	On Efficiency	On Fuel Use	Off BSFC	Off Use	Helo Efficiency	Helo Use	Fuel Cateogory
260	P-32	Panoche Outdoor	120' Manlift	74	Diesel	2	4	200	off	0.31					0.408	2106.517			Construction Equipment
261	P-33	Panoche Indoor	Pickup - 1/2 Ton	395	Gas	4	2	150	on		50	400	26.72688156	2244.931					Construction Vehicles
262	P-33	Panoche Indoor	Pickup - 1 Ton	410	Diesel	4	2	150	on		50	400	32.71005135	1834.299					Construction Vehicles
263	P-33	Panoche Indoor	Welding Truck	395	Diesel	2	5	150	on		50	200	8.803328829	3407.802					Construction Vehicles
264	P-33	Panoche Indoor	Crane - 35 Ton (Manlift)	250	Diesel	1	8	150	off	0.29					0.367	4491.349			Construction Equipment
265	P-33	Panoche Indoor	Forklift -15,000 lb	130	Diesel	1	4	150	off	0.2					0.367	805.3453			Construction Equipment
266	P-33	Panoche Indoor	Manlift - 40'	49	Diesel	3	8	150	off	0.31					0.408	3138.426			Construction Equipment
267	P-33	Panoche Indoor	120' Manlift	74	Diesel	2	4	150	off	0.31					0.408	1579.888			Construction Equipment
268	P-36	Substation Modifications	Pickup - 1/2 Ton	395	Gas	4	2	77	on		50	400	26.72688156	1152.398					Construction Vehicles
269	P-36	Substation Modifications	Pickup - 1 Ton	410	Diesel	4	2	77	on		50	400	32.71005135	941.6066					Construction Vehicles
270	P-36	Substation Modifications	Welding Truck	395	Diesel	2	5	77	on		50	200	8.803328829	1749.338					Construction Vehicles
271	P-36	Substation Modifications	Crane - 35 Ton (Manlift)	250	Diesel	1	8	77	off	0.29					0.367	2305.559			Construction Equipment
272	P-36	Substation Modifications	Forklift -15,000 lb	130	Diesel	1	4	77	off	0.2					0.367	413.4106			Construction Equipment
273	P-36	Substation Modifications	Manlift - 40'	49	Diesel	3	8	77	off	0.31					0.408	1611.059			Construction Equipment
274	P-36	Substation Modifications	120' Manlift	74	Diesel	2	4	77	off	0.31					0.408	811.0092			Construction Equipment
275	L-37	Commissioning and Testing	Pickup - 1/2 Ton	395	Gas	4	2	198	on		50	400	26.72688156	2963.309					Construction Vehicles
276	L-37	Commissioning and Testing	Pickup - 1 Ton	410	Diesel	4	2	198	on		50	400	32.71005135	2421.274					Construction Vehicles
277	L-37	Commissioning and Testing	Crane - 35 Ton (Manlift)	250	Diesel	1	5	198	off	0.29					0.367	3705.363			Construction Equipment
278	L-37	Commissioning and Testing	Truck - Water 4 K	300	Diesel	1	10	198	on		20	40	8.803328829	899.6597					Construction Vehicles
279	L-37	Commissioning and Testing	Tool - Van/Conex 20'	0	NA	3	8	198	NA										Construction Vehicles
280	L-38	Site & ROW Restoration	Pickup - 1/2 ton	395	Gas	4	2	140	on		50	400	26.72688156	2095.269					Construction Vehicles
281	L-38	Site & ROW Restoration	Truck - Dump 10-12 Yd	415	Diesel	2	10	140	on		50	200	6.244478332	4483.961					Construction Vehicles
282	L-38	Site & ROW Restoration	Skid steer loader	74	Diesel	1	8	140	off	0.37					0.408	1759.961			Construction Equipment
283	L-38	Site & ROW Restoration	Truck - Water 4 K	300	Diesel	2	6	140	on		20	80	8.803328829	1272.246					Construction Vehicles
284	L-38	Site & ROW Restoration	Excavator	250	Diesel	1	8	140	off	0.38					0.367	5492.868			Construction Equipment
285	L-38	Site & ROW Restoration	D6 Type Dozer	250	Diesel	1	8	140	off	0.4					0.367	5781.967			Construction Equipment
286	L-38	Site & ROW Restoration	Motor Grader	250	Diesel	1	8	140	off	0.41					0.367	5926.516			Construction Equipment
287	L-39	Above-Grade Construction (Pha	Wire Trailer/ Tensioner	175	Diesel	0	5	52	off	0.42					0.367	0			Construction Equipment
288	L-39	Above-Grade Construction (Pha	Wire Puller	175	Diesel	0	5	52	off	0.42					0.367	0			Construction Equipment
289	L-39	Above-Grade Construction (Pha	Pickup - 1/2 Ton	395	Gas	4	2	52	on		50	400	26.72688156	778.2427					Construction Vehicles
290	L-39	Above-Grade Construction (Pha	Pickup - 1 Ton	410	Diesel	1	2	52	on		50	100	32.71005135	158.9725					Construction Vehicles
291	L-39	Above-Grade Construction (Pha	Welding Truck	395	Diesel	0	2	52	on		50	0	8.803328829	0					Construction Vehicles
292	L-39	Above-Grade Construction (Pha	Generator – 25 Kw	36	Diesel	2	10	52	off	0.74					0.408	1590.081			Construction Equipment
293	L-39	Above-Grade Construction (Pha	Crane - 35 Ton (Manlift)	250	Diesel	0	1	52	off	0.29					0.367	0			Construction Equipment
294	L-39	Above-Grade Construction (Pha	Forklift - 10 K Reach	130	Diesel	0	4	52	off	0.2					0.367	0			Construction Equipment
295	L-39	Above-Grade Construction (Pha	Forklift -15,000 lb	130	Diesel	0	4	52	off	0.2					0.367	0			Construction Equipment
296	L-39	Above-Grade Construction (Pha	Loader - 4-5 Yd	74	Diesel	0	5	52	off	0.36					0.408	0			Construction Equipment
297	L-39	Above-Grade Construction (Pha	120' Manlift	74	Diesel	2	1	52	off	0.31					0.408	136.9236			Construction Equipment
298	L-01	Survey	Worker Commute	NA	Gas	2	0	51	on		50	200	26.72688156	381.6382					Worker Vehicles
299	L-02	Site Development	Worker Commute	NA	Gas	12	0	76	on		50	1200	26.72688156	3412.295					Worker Vehicles
300	L-03	Below-Grade Construction	Worker Commute	NA	Gas	32	0	127	on		50	3200	26.72688156	15205.66					Worker Vehicles
301	L-04	Above-Grade Construction (Pha	Worker Commute	NA	Gas	20	0	224	on		50	2000	26.72688156	16762.15					Worker Vehicles
302	P-05	Structure Foundation Installati	Worker Commute	NA	Gas	11	0	37	on		50	1100	26.72688156	1522.811					Worker Vehicles
303	P-06	Structure Installation	Worker Commute	NA	Gas	11	0	26	on		50	1100	26.72688156	1070.084					Worker Vehicles
304	P-07	Conductor Installation	Worker Commute	NA	Gas	22	0	20	on		50	2200	26.72688156	1646.283					Worker Vehicles
305	P-08	Structure Foundation Installati	Worker Commute	NA	Gas	11	0	28	on		50	1100	26.72688156	1152.398					Worker Vehicles
306	P-09	Structure Installation	Worker Commute	NA	Gas	11	0	23	on		50	1100	26.72688156	946.6125					Worker Vehicles
307	P-10	Conductor Installation	Worker Commute	NA	Gas	22	0	38	on		50	2200	26.72688156	3127.937					Worker Vehicles
308	P-12	Structure Foundation Installati	Worker Commute	NA	Gas	11	0	51	on		50	1100	26.72688156	2099.01					Worker Vehicles
309	P-13	Structure Installation	Worker Commute	NA	Gas	11	0	26	on		50	1100	26.72688156	1070.084					Worker Vehicles
310	P-14	Conductor Installation	Worker Commute	NA	Gas	22	0	111	on		50	2200	26.72688156	9136.868					Worker Vehicles
311	L-15	Access Road Construction	Worker Commute	NA	Gas	8	0	29	on		50	800	26.72688156	868.0399					Worker Vehicles
312	L-16	Structure Foundation Installati	Worker Commute	NA	Gas	11	0	47	on		50	1100	26.72688156	1934.382					Worker Vehicles
313	L-17	Structure Installation	Worker Commute	NA	Gas	11	0	35	on		50	1100	26.72688156	1440.497					Worker Vehicles
314	L-18	Conductor Installation	Worker Commute	NA	Gas	22	0	60	on		50	2200	26.72688156	4938.848					Worker Vehicles
315	P-19	Structure Foundation Installati	Worker Commute	NA	Gas	13	0	25	on		50	1300	26.72688156	1216.004					Worker Vehicles
316	P-20	Structure Installation	Worker Commute	NA	Gas	11	0	13	on		50	1100	26.72688156	535.0418					Worker Vehicles
317	P-21	Conductor Installation	Worker Commute	NA	Gas	6	0	13	on		50	600	26.72688156	291.841					Worker Vehicles
318	P-22	Structure Foundation Installati	Worker Commute	NA	Gas	6	0	13	on		50	600	26.72688156	291.841					Worker Vehicles
319	P-23	Structure Installation	Worker Commute	NA	Gas	6	0	7	on		50	600	26.72688156	157.1452					Worker Vehicles
320	P-24	Conductor Installation	Worker Commute	NA	Gas	6	0	6	on		50	600	26.72688156	134.6958					Worker Vehicles
321	P-25	Structure Foundation Installati	Worker Commute	NA	Gas	6	0	12	on		50	600	26.72688156	269.3917					Worker Vehicles
322	P-26	Structure Installation	Worker Commute	NA	Gas	6	0	24	on		50	600	26.72688156	538.7834					Worker Vehicles
323	P-27	Conductor Installation	Worker Commute	NA	Gas	6	0	23	on		50	600	26.72688156	516.3341					Worker Vehicles
324	P-28	Distribution Extension to Subst	Worker Commute	NA	Gas	6	0	26	on		50	600	26.72688156	583.682					Worker Vehicles

EquipIndex	Activity Index	Activity Name	Equipment Name	HP	Fuel Type	Quantity	Hours Per Day	Working Days	On-Off	Load Factor	On Distance	VMT	On Efficiency	On Fuel Use	Off BSFC	Off Use	Helo Efficiency	Helo Use	Fuel Cateogory
325	L-29	Fiber Extension to Substation	Worker Commute	NA	Gas	7	0	51	on		50	700	26.72688156	1335.734					Worker Vehicles
326	P-30	Tranquility Outdoor	Worker Commute	NA	Gas	5	0	200	on		50	500	26.72688156	3741.551					Worker Vehicles
327	P-31	Tranquility Indoor	Worker Commute	NA	Gas	0	0	148	on		50	0	26.72688156	0					Worker Vehicles
328	P-32	Panoche Outdoor	Worker Commute	NA	Gas	5	0	200	on		50	500	26.72688156	3741.551					Worker Vehicles
329	P-33	Panoche Indoor	Worker Commute	NA	Gas	0	0	150	on		50	0	26.72688156	0					Worker Vehicles
330	P-36	Substation Modifications	Worker Commute	NA	Gas	0	0	77	on		50	0	26.72688156	0					Worker Vehicles
331	L-37	Commissioning and Testing	Worker Commute	NA	Gas	16	0	198	on		50	1600	26.72688156	11853.23					Worker Vehicles
332	L-38	Site & ROW Restoration	Worker Commute	NA	Gas	8	0	140	on		50	800	26.72688156	4190.538					Worker Vehicles
333	L-39	Above-Grade Construction (Ph	Worker Commute	NA	Gas	10	0	52	on		50	1000	26.72688156	1945.607					Worker Vehicles

Table 4: Fuel Consumption Summary

Vehicle Type	Gas	Diesel	Jet A
Worker Vehicles	98059	0	0
Construction Vehicles	29895	120269	0
Construction Equipment	0	330519	0
Helicopter and Support	0	0	99986
Total	**127954**	**450788**	**99986**

Note: All values in gallons