Appendix E
Amargosa River Regional History

The Amargosa River study area encompasses a variety of unique and significant cultural and paleontological resources. Human use of the Amargosa River is known to extend over the last eight thousand years (BLM 1983b:9). This river is a significant water source in the Mojave Desert. While it flows under ground most of the year, the Amargosa River flows above ground all year long between Tecopa and the northwest area of Dumont Dunes near the Salt Creek Hills. The result is an oasis in the desert utilized by prehistoric and historic people.

Rogers (1939) identified four distinct cultural complexes, which have since been renamed Paleo-Indian, Lake Mohave/Pinto, Amargosa, and Shoshonean. Remains identified by Broadbent (1972) include sleeping rings, chopping tools, worked flakes, diagnostic projectile points (Pinto, Gypsum, Elko, and Rose Springs), metates, mortars, pottery, and pendants (BLM 1983b:9). In addition to its archaeological value, historic landmarks include the Old Spanish Trail and the Tonopah and Tidewater (T&T) Railroad, which traversed the canyon. Evidence of historic mining for nitre and talc are also present.

Peripheral to the Amargosa River are the Kingston Range and Salt Creek Hills. The Kingston Range is a culturally significant location in the Mojave Desert because it contains one of the few large Piñon-Juniper woodlands in the region. Site records indicate a major concentration of habitation sites, including midden and food processing sites, with ground stone artifacts related to piñon exploitation dating to about 3,000 to 1,500 BC. The riparian vegetation along a desert stream in the Salt Creek Hills is also a rare and unique habitat in the Mojave Desert and, like the Amargosa River, an important source of water, food, and shelter for birds and other animals. The presence of standing water and game attracted aboriginal peoples to the vicinity, which resulted in a relative abundance of artifacts and sites. Historic cultural resources for both areas consist of the remains of various mining activities, such as gold in the Salt Creek Hills, beginning in the mid-nineteenth century and continuing until World War II (BLM 1982:1; BLM 1989:8, 10).

Prehistoric Archaeological Overview

Some assemblages may be cautiously considered cultural remains that date from the Pleistocene, prior to 12,000 before present (BP). Warren et al. (1980:25-27) make a reasonable argument for the tentative recognition of the Manix Lake Lithic Industry represented at the Baker Site CA-SBR-541 (Glennan 1974), the assemblages at the Calico Early Man Site (Leakey, Simpson, and Clements 1968), and the core tool tradition at China Lake (Davis 1978). The age and/or the cultural nature of the artifacts at these sites have not been demonstrated with the rigor necessary to convince the scientific community (Warren et al. (1980:27). Warren *et al*. (1980:27) suggest that the Pleistocene becomes a catchall time period for a number of different assemblages of alleged antiquity and/or artifacts.

Lake Mojave Period (12,000-7,000 BP)

The Lake Mojave complex is a Paleo-Indian assemblage that has become a comparative unit for early man in the Mojave Desert. There are some similarities to sites in the western Great Basin and to the San Dieguito complex of southern California. The assemblage consists of various projectile point types, including leaf-shaped forms, long stemmed points with narrow shoulders (Lake Mojave and Parman points), short bladed, stemmed points with pronounced shoulders (Silver Lake point), and the rarer fluted point. Other tools include crescents in simple lunate and more excentric forms, small flake graving tools, specialized scrapers, leaf-shaped knives, drilling tools, and a few heavy core tools possibly used as choppers or hammer stones. Milling stones are rare or absent (Warren et al. 1980:19-20; Warren and Crabtree 1986:184).

Pinto Period (7,000-4,000 BP)

Increasing warmth and dryness during this period, often called the "altithermal," is thought to have cause Pleistocene lakes to dry up, thus altering the distribution and nature of the vegetation. This period may be characterized by Pinto Basin type points (Wallace 1962:175), Lake Mojave and Silver Lake points (Bettinger and Taylor 1974:130), leaf-shaped points, knife blades, drills, scrapers, hammers, choppers, and a few manos and flat metates (Stickel and Weinman-Roberts 1980:68).

There are several different interpretations of cultural development in the Mojave Desert during the Pinto Period. This stems from problems of inadequate documentation as well as other factors. One major problem is the definition and identification of Pinto Points, the diagnostic artifact for this period. There has been some confusion with projectile point types since Pinto points are very similar (or identical) to Humboldt Concave Based A and Elko Eared points. Radiocarbon dates appear to support a short chronology with Pinto points beginning around 5,000 BP and continuing until about 2,700 BP; however, these dates derive from sties outside of the Mojave Desert and the identification of Pinto points my be inaccurate in some cases. The association of Pinto points with Lake Mojave points, Silver Lake points, small beaked gravers, and certain concave scrapers in a deep midden at the Stahl Site suggests a long period with relatively little change (Warren et al. 1980:44). Researchers generally hold that human populations were greatly reduced in the Mojave Desert region in response to this environmental shift (Wallace 1962; Stickel and Weinman-Roberts 1980:68). During the later part of this period when the Mojave Desert was most arid, much of the desert may have been essentially uninhabited (Warren and Crabtree 1986:187).

Gypsum Period (4,000-1,500 BP)

Around 4,000 years ago, the Little Pluvial period began and corresponding flora and fauna essentially assumed its present form and distribution. This period is initially characterized by intense occupation of the desert, broadening economic activities, and increased contact with the California coast and Southwest. Petroglyphs and split twig figurines at Etna Cave (Wheeler 1973) and Newberry Cave (Smith *et al*. 1957; Davis and Smith 1981; Davis, Taylor, and Smith 1981) suggest ritual activities were in existence, especially concerning big horn sheep hunting. It

is presumed that a flexible "band" organization was still operative as people exploited food resources across the landscape (Warren and Crabtree 1986:189; Warren *et al*. 1980:46).

Hunting technology consisted of medium to large stemmed and notched points; the most common forms include Elko Eared, Elko Corner-notched, Gypsum Cave, and Humboldt Concave Base points. Found at a number of sites, these points seem to represent Great Basin influence (Warren and Crabtree 1986:187). Other defining features of the material culture include blades, drills, flake scrapers, slate pendants, introduction of mortars and pestles, and an increase in manos and metates (Stickel and Weinman-Roberts 1980:70). Transition from atlatl to bow and arrow technology is also apparent during this time. Pottery and split twig figurines reminiscent of Southwest cultures suggest additional relations with Mojave Desert inhabitants (Warren and Crabtree 1986:189).

During the latter part of this period, cultural development of the eastern and western Mojave diverges. In the east, pit houses and some agriculture are apparent in the Moapa and Virgin Valleys. This represents the beginnings of Anasazi influence and is equated with Basketmaker II, which leads to the Basketmaker II-Pueblo sequence in the extreme eastern Mojave. The western Mojave appears to have maintained a less sedentary way of life based on a foraging economy (Warren *et al*. 1980:46-47).

Saratoga Springs Period (1,500-1,200 BP)

There does not appear to be any major climatic changes correlated to the Saratoga Spring Period. The defining feature of this period is the appearance of true arrowheads, as opposed to spear/dart points, indicating adoption of the bow and arrow (Stickel and Weinman-Roberts 1980:80). Knives, drills, scrapers, and slate pendants are still present. Manos and metates are slightly more prominent and pottery is more frequent, suggesting greater interaction with Southwest cultures. The hunting-gathering economy persisted, but settlement patterns may be characterized as having "camp sites" on sandy terrain near waterholes or on the edges of playas (Stickel and Weinman-Roberts 1980:79; Wallace 1962:176). Sites in the period include Bickel (McGuire, Garfinkel, Basgall 1981), Saratoga Springs (Wallace Taylor 1959), Oro Grande (Rector, Swenson, Wilke 1979), Rustler Rockshelter (J. T. Davis 1962), and possibly China Ranch (McKinney *et al*. 1971) (Warren and Crabtree 1986:191).

Shoshonean Period (1,200 BP to Contact)

Increased numbers of habitation sites suggest a general population increase in the Mojave Desert. Small groups of people more than likely continued to hunt and forage along a seasonal route, but village sites become more frequent (Stickel and Weinman-Roberts 1980:85-86). Numerous marine shell beads and steatite ornaments suggest continued, if not intensified, interaction with other regional populations (Stickel and Weinman-Roberts 1980:88). The diagnostic artifacts for this period are Desert Side-notched points and various poorly defined types of brown ware pottery, including Owens Valley Brown ware. This period is also characterized by a wet climatic regime between about 800 and 900 BP. This moist episode is suggested by the shell middens surrounding the Cronise Lakes (Rogers 1933). Most of the material culture at Cronise

Lakes seems best compared with prehistoric "Yuman" (Patayan) occupations (Davis 1962; Donnan 1962, 1964; True, Davis, and Sterud 1966; Kroeber 1959) (Warren *et al*. 1980:54).

Prehistoric Resources

Prehistoric cultures in the Mojave Desert have been described within a series of periods distinguished by environmental, technological, and/or ethnographic variations. There seems to be a consistent lack of agreement on taxonomic systems and terminology for Mojave Desert archaeology. Therefore, the overview presented here is derived from Warren and Crabtree (1986), who provide one of the most current syntheses for the Mojave Desert region. It is a modified version of Warren and Crabtree's (1986) chronology, organized on the basis of temporal units, or periods, that are marked by changes in distinctive artifact types, such as projectile points and pottery (Warren and Crabtree 1986:184).

Periods were originally determined by the occurrence of time sensitive artifact types and attributes (Rowe1962). Later, temporal control was maintained through radiocarbon and other dating techniques (Warren et al. 1980:16). Time sensitive artifacts are cultural items that generally create chronologies dependent on the cultural changes they reflect. However, these "period markers" are only a small part of the total assemblage and many changes (i.e. settlement patterns, social organization) will not significantly affect artifact types; therefore, period markers identify units of time, not cultural content.

The basic function of period markers is to construct a chronology by which the whole, preserved cultural assemblage of sites may be dated. "Cultural units" are independent of time in that they may not be confined within a period, but extend across two or more chronological periods (Warren et al. 1980:17). The cultural unit usually consists of taxonomic divisions and units traditionally used by archaeologists (i.e. complex, phase, stage, culture, etc). The basis for definition in this case, however, is the similarity of cultural content (Warren et al. 1980:18).

Major site concentrations can be found along valley floors in the salt bush-sand dune zone, especially near past and/or present water sources. A second area of site concentration occurs at higher elevations in the black bush, Joshua tree pinyon-juniper zone not necessarily near existing water. These two areas of concentration have different resources and differing site types. High elevation sites appear smaller, more scattered, and contain fewer artifacts than lower elevation sites. Sites on the valley bottom are concentrated along lake margins and springs and may cover several acres. A wide range of artifacts are found here, suggesting many different activities. The same or different groups of people may have used these same sites repeatedly (Warren et al. 1980:68). The site distribution suggests small bands dispersed across the countryside to exploit scattered resources. The pattern of sites suggests seasonal movement from valley bottoms to higher elevations in search of pine nuts, agave, deer, mountain sheep, etc. The pattern is one in which bands gathered in the valley bottoms and dispersed in small task groups at higher elevations (Warren et al. 1980:70).

Twelve sites and nine isolates with tools on both sides of the Amargosa River occur at Ash Meadows and Franklin Wells, possibly distributed by sheet flooding. Ash Meadows is an area of springs and sand dunes with mesquite groves and rice grass. The remains of small camps are

located in areas of sand dunes and mesquite trees (Hunt and Hunt 1964) (Warren *et al*. 1980:71-72). The Barnett site is a Gypsum period site radiocarbon dated between 2660 BP and 1790 BP. The artifact assemblage contains many knives, milling stones, and manos as well as Elko-Eared, Humboldt Basal Notched, Concave Based, and Gypsum Cave points. Saratoga Springs period sites have, among characteristics artifacts, olivine tempered Moapa Gray Ware (Hunt and Hunt 1964:10). Shoshonean Period site are found on sand dunes near springs with Paiute brown ware and small triangular & desert side-notched points among other characteristic artifacts (Warren *et al*. 1980:72).

The China Ranch area has a number of late sites clearly showing use of spring-related resources as well as mesquite and game animals. Data seem to represent migratory hunting and foraging people who utilized the spring in the China Ranch area. Sites include China Ranch (McKinney *et al*. 1971) Shoshone Cave #2 (Gearheart 1974), and Robinson Cave. Robinson Cave (Saratoga Springs and Shoshonean Period) contained Anasazi gray ware & Paiute brown ware pottery, Desert side-notched, Rose Springs series, & possible Gypsum Cave points, mesquite seeds and pods, and pieces of fur. Shoshone Cave #2 (Shoshonean & Historic Period) had a few shards of Paiute brown ware, small triangular and Desert side-notched points, egg shells, small pieces of rabbit skin blanket, and sea shell fragments (as ornaments). Both caves contained manos, metates, scrapers, and knives (Warren et al. 1980:73).

The Salt Springs area consists of approximately eighteen small, dispersed campsites dispersed over about four square miles along Salt Creek (Rogers 1939). The fossil dunes have been considerably eroded, exposing the sites (Warren et al. 1980:73-74). Most sites exhibit Pinto and/or Gypsum Period projectile points, the most characteristic of which are the Pinto series, Gypsum Cave points, Elko series, and a few Humboldt types. In addition to the projectile points, knives and scrapers are numerous. Hammer stones, cores, manos, and metates are frequent, indicating diverse activities. The fossil dunes cluster around an old water source (Salt Creek) where a number of groups returned seasonally (Warren et al. 1980:74). Salt Springs is significant because the sites concern the numerous problems related to the Pinto and Gypsum Periods and the sites located here are associated with a spring that has no potable water at present. This suggests that the sites were occupied during different climatic conditions (Warren et al. 1980:88).

Ethnographic Overview

The major groups occupying the western Mojave Desert include the Serrano, Kitanemuk, Kawaiisu, Vanyume, and possibly the Tataviam. Some Mohave, Chemehuevi, and desert Cahuilla may have traveled through the area for trade or other purposes, though whether they settled is controversial (Stickel and Weinman-Roberts 1980:93-94). Ethnographic and ethnohistoric accounts indicate that the original inhabitants had efficient foraging processes, some of which were semi-agricultural. For instance, burning was applied to enhance plant growth and animal resources (Lewis 1972; Bean and Blackburn 1976:45) and quasi-agricultural patterns are apparent for harvesting acorn, yucca, mesquite, and piñon nuts (Stickel and Weinman-Roberts 1980:94). Group settlement and exploitation patterns were within well-defined territories, though inter-group marriage and friendship no doubt existed (Heizer 1978:649; Kroeber 1925:145, 213, 395; Powers 1877:109-110; Stickel and Weinman-Roberts

1980:93-94). Ethnographically, Southern Paiute people occupied the Amargosa River region. Serrano (Vanyume), Kawaiisu, and Chemehuevi groups were immediate neighbors and probably utilized the area as well (Warren *et al*. 1980:141).

The Serrano are generally located in the San Bernardino Mountains east of Cajon Pass, at the base and north of these mountains near Victorville, east as far as Twentynine Palms, and south to and in the Yucaipa Valley. The area has considerable topographic variation and associated plant and animal communities (Bean and Smith 1978:570). Like their neighbors, a settlement location was determined by the availability and accessibility of water. Most Serrano lived in small villages situated near water sources. Family dwellings were usually circular, domed structures built of willow frames covered with tule thatching. An adjacent shade ramada was often constructed where daily household activities took place (Bean and Smith 1978:571).

Vegetable staples varied by locality. Generally, staple foods were piñon nuts (*Pinus monophylla*), Indian rice grass (*Oryzopis hymenoides*), mesquite (*Prosopis juliflora glandulosa*), and screwbean (*Prosopis pubescens*). Other food plants available included Mojave yucca (*Yucca schidigera*), Joshua trees (*Yucca brevifolia*) and agave (*Agave deserti*) (Warren *et al*. 1980:147-148). Various roots, bulbs, shoots, and seeds, particularly chia (*Salvia columbariae*) supplemented the main vegetable resources (Bean and Smith 1978:571). In riparian areas, specialized resources such as reeds (*Phragmites vulgaris*), tule (*Scirpus* sp.), and cattail (*Typha latifolia*) were also available (Warren *et al*. 1980:150).

Animals provided only a small part of the overall diet. While many groups highly valued mountain sheep (*Ovis canadensis*), deer (*Odocoileus hemionus*), and antelope (*Antilocapra americana*), such big game was rare (Laird 1976:112; Warren *et al*. 1980:153). Smaller species were more important. The most commonly used animals were cottontails (*Sylvilagus audubonii*) and jack rabbits (*Lepus californicus*), followed by chuckwalla (*Sauromalus obesus*), desert tortoise (*Gopherus agassizi*), rattle snake (*Crotalus* sp.), and birds, such as quail (*Lophortyx gambelii*) (Warren *et al*. 1980:153).

Shells, wood, bone, stone, and plant fibers were used to make a variety of implements, such as decorated baskets (Smith and Simpson 1964), pottery, awls, arrow straighteners, sinew-backed bows, arrows, fire drills, stone pipes, mats, cordage, nets, rabbit skin blankets, musical instruments (rattles of turtle, tortoise, or deer-hoof, wood rasps, bone whistles, bull-roarers, flutes), and feathered costumes. Bows and arrows, curved throwing sticks, traps, snares, and deadfalls were all employed in hunting. Manos, metates, stone knives, scrapers, pottery trays and bowls, baskets, and horn and bone spoons and stirrers were used to process animal and plant foods (Strong 1929; Bean 1962-1972; Bean and Smith 1978:571; Drucker 1937; Benedict 1924).

Other aboriginal populations living in the Mojave Desert are thought to have had similar subsistence patterns and cultural organization to the Serrano. The greatest differences are in location. Very little is known about the Vanyume, who lived along the Mojave River north and east of Victorville. It is thought that subsistence and social structure resembled that of the Serrano (Bean and Smith 1978:570).

The Kawaiisu culture overlaps between the Mojave Desert and Great Basin regions. The core area is located in the Sierra Nevada and Piute and Tehachapi mountains. Their habitat consisted of low mountainous ridges between the Mojave Desert and San Joaquin Valley (Zigmond 1986:398). Social and political organization was minimal and band territory was flexible in response to resource availability (Zigmond 1986:405).

Except for cultivating tobacco plants through pruning and burning, agriculture was not practiced. Acorns were a primary food source followed by piñon nuts, among other edible plants. Gathering and preparation involved a number of basket types, such as seed-beaters, burden baskets, winnowers, trays, hoppers, and containers of various sizes for collection acorns, seeds, nuts, berries, and roots (Zigmond 1986:399, 408). Baskets were made with two basic weaves, twined and coiled. The Kawaiisu had a unique variant of the coiled method that has no analog in the Great Basin or California areas (Zigmond 1986:401).

Other items in the Kawaiisu tool kit included bedrock and portable metates, pestles, manos, and obsidian knives were the primary stone implements for preparing food. Mammals (deer, rabbit) and birds (eagle, crow) were usually hunted with bow and arrows and sometimes hunters used decoys and blinds (Zigmond 1986:400). A three-piece composite arrow was utilized to hunt big game. Smaller game and birds were sought with one and two-piece composite arrows. Some undecorated brownware pottery is also associated with Kawaiisu sites, but it is unclear if it was made or traded in from neighboring areas (Zigmond 1986:401).

The Southern Paiute, also thought to include Chemehuevi culture, are generally located across southern Utah and Nevada and southward into California west of the Colorado River (Kelly *et al*. 1986:368). These people subsisted on a great variety of plant foods, small game, and the less common large game animals. Piñon nuts, agave, and various seeds were staple foods. Small animals included wood rats, mice, gophers, squirrels, chipmunks, birds, chuckwalla, and tortoise. Deer and antelope were usually available while bear and elk were more scarce (Kelly *et al*. 1986:370).

Historic Resources

In few other regions of the American west has the topography, climate, and geography played such a direct role in its development. Settlement in the Amargosa River region was slow to be established. Between 1776 and 1880, only precious metals or agriculture attracted Mexican, Spanish, and American settlers. The region was mainly used as a corridor for aboriginal traders and couriers, Mexican caravans, and later railroads, telegraph, telephone lines, and power lines. Ephemeral towns and mining camps were linked to these routes of travel and stimulated by their development. Railroad lines and other roads often died when the towns died (Warren *et al*. 1980:195). Historic sites associated with American settlement and commerce across the Mojave desert relate to ranches/homesteads, trails and landmarks, military presence, and mining (Stickel and Weinman-Roberts 1980:177). Other early activity in the area consisted of exploration and scientific expeditions.

Expeditions

Many early exploratory, scientific, military, and railroad expeditions passed near or through the Amargosa River region. In 1844, John C. Fremont's second and third western expeditions followed the Old Spanish Trail from the southern Mojave River to Las Vegas (Von Till Warren *et al*. 1981:II-2). In the spring of 1855, Lieutenant Sylvester Mowry and a military detachment marched from Salt Lake City to Fort Tejon by way of Resting Springs. They traveled through Cedar City, Santa Clara, Las Vegas, and the Mojave River (Von Till Warren *et al*. 1981:II-63). Coming from the east, Edward F. Beales' first trans-continental expedition explored a central route for a proposed railroad from May 10, 1853 to August 22, 1853. While passing through Utah, he intersected the Old Spanish Trail before reaching the Green River. His survey passed by Stump Spring, Resting Springs, the Amargosa Desert, and Bitter Spring to the Mojave River (Von Till Warren *et al*. 1981:II-72).

J. R. N. Owen and his Nevada-California Border Survey Party of 1861 traversed the Old Spanish Trail on their way from Mount Potosi in Nevada to the Amargosa River and finally the Owens Valley (Von Till Warren *et al*. 1981:II-25). During the summer of 1867, William M. Gabb of the California State Geologic Survey and the army-scientist Lieutenant Charles Emil Bendire left Camp Independence and rode across Death Valley to Resting Springs and Oasis Valley. Since the army was short of funds that fiscal year, it sent Bendire and an escort to accompany this California State Geologic Survey expedition (Von Till Warren *et al*. 1981:II-30).

In 1871, George M. Wheeler and Lieutenant Daniel Alfred Lyle led seventy-five men (two divisions) on an expedition to correct vague maps, provide geological data, study the flora and fauna, study potential agricultural possibilities, and record meteorological conditions. In the course of their survey, Wheeler and Lyle traveled through Ash Meadows, Cottonwood Springs, and Ivanpah, among other areas (Von Till Warren *et al*. 1981:II-40).

Mining

The earliest white European settlement was a small gold mining camp at the mouth of Salt Creek on the Amargosa River. Addison Pratt and other members of the 1849 Jefferson Hunt wagon train to California discovered gold in December 1849. A small mill was brought to the site in 1851, but after an Indian attack, the place was abandoned. The Amargosa Mining Company attempted to mine gold and silver in 1863. This operation was even shorter lived; however, the mine was operated sporadically until the 1930s (Heap 1957; Rousseau 1958; Warren *et al*. 1980:214).

The Resting Springs Mining District included the Gunsight and Noonday Mines. The earliest town established here was Tecopa in about 1875 along Willow Creek about eight miles from present day Tecopa (Warren *et al*. 1980:218). Mormons opened the Confidence Mine nearby as early as the 1860s. Ores from the mines were processed at Ivanpah in 1876. Development at Tecopa continued as three water jacket furnaces and a ten stamp mill were installed in 1880 to supplement the existing smelter. The boom subsided some time after 1882 (Myrick 1963; Warren *et al*. 1980:219).

In 1908, the camp was reactivated, but called "Tecopa Well," perhaps because the new Tecopa station on the Tonopah and Tidewater (T&T) railroad had usurped the name (Warren *et al*.

1980:219). The station along the railroad was located next to present day Tecopa Hot Springs, with the intent to use it for a water stop. Between 1913 and 1918, one or two cars of ore per day were sent to a concentration mill at the Tecopa T&T station. After 1918, production again decreased (Warren *et al*. 1980:220).

Aaron and Rose Winters made the first discovery of borax in 1880 in Death Valley. The claim was sold to William T. Coleman of San Francisco and developed into the Harmony Borax Works. Coleman later bought the claims for the Amargosa Borax works. This plant operated in the Amargosa Valley where temperatures were cool enough to operate year round. Elsewhere, summer temperatures were so high, borax would not crystallize. Finally, Coleman bought the Monte Blanco deposit, later named the Lila C. mine after his daughter (Glasscock 1940:145; Warren *et al*. 1980:222). Borax production would decline as the Calico District Borax mines would become the major supplier between 1888 and 1893 (Warren *et al*. 1980:222).

Railroads

The California gold rush, in conjunction with extensive settlement of the Oregon Territory, created more pressure to establish railroad routes across the continent. Four railroad surveys were begun in 1853, though Congress had been studying the "Railroad West Project" since 1849 (Stickel and Weinman-Roberts 1980:130). To determine a practical route to the Pacific Ocean, Secretary of War Jefferson Davis defined four routes to be examined: north between the 46th and 49th parallels, central between the 38th and 39th parallels, at the 35th parallel (Senator Gwin Route), and at the 32nd parallel (Gila route). Relevant to the Mojave Desert is the survey of the 35th parallel by Lt. Amiel Weeks Whipple. Lt. Robert Stockton Williamson conducted a second independent survey that included the western Mojave Desert (Stickel and Weinman-Roberts 1980:130).

Many other spur lines were established in the course of various mining activities in order to market the raw ore. Francis Marion "Borax" Smith instigated the Tonopah and Tidewater (T&T) Railroad in 1904 to ship ore out of Death Valley (Myrick 1991:545-546). Later, the Death Valley Railroad Company was formed by the Pacific Coast Borax Company in order to construct short rail lines between the Lila C., Biddy McCarty, and Widow Mines (Myrick 1991:608). The company acquired the Calico mines, where they also established the Borate and Daggett Railroad to haul ore to Daggett and replacing the twenty-mule teams (Myrick 1991:823). Likewise, The Tecopa Consolidated Mining Company completed the Tecopa Railroad in 1910 to connect the Noonday and Gunsight Mines to the Tonopah and Tidewater Railroad (Myrick 1991:593-594).

Although the Atlantic and Pacific Line (Santa Fe railroad) had been operational since 1883, train travel did not pass through the northeast Mojave Desert until eighteen years later. The San Pedro, Los Angeles, and Salt Lake line opened in 1905. Within two years, the T&T line bisected the region north to south, running between Ludlow on the Santa Fe railroad and extending north through the Death Valley-Amargosa regions into southern Nevada. This stimulated new mining developments and the beginning of tourist traffic (Warren *et al*. 1980:232). During its thirty-one years of use, the T&T Railroad was subject to flash floods and slides that caused tracks and stations to be relocated (Warren *et al*. 1980:236). All traffic finally ceased on June 14, 1940. Tracks were torn up by the War Department between 1942 and 1942 to be used for World War II

(Myrick 1963; Warren *et al*. 1980:236). Myrick (1963), Belden (1953b, 1960b) and Art Rader provide further detail regarding history and construction of the T&T.

Trails and Wagon Roads

At the same time the railroad surveys of the early 1850s were being carried out, traffic on the Spanish Trail (also called the Mormon Road) flourished. Sheep, pack trains, and wagons used it and in 1855, Jules Remey and Julius Brenchley led a scientific expedition for the French government across the western Mojave along that trail (Stickel and Weinman-Roberts 1980:135). One of the most important figures for trail development was Edward F. Beale. In the Navy, he fought with John Fremont and Kit Carson during the California takeover and was later appointed Superintendent of Indian Affairs for California in 1852. In 1857, he was appointed superintendent of a wagon road survey from Fort Defiance to the Colorado River along the 35th parallel. Shortly after Beales appointment, Secretary of War Jefferson Davis and Major George H. Crasman supported the idea of using camels for military service and Beale was put in charge of this experiment. Beale became well known for commanding the Camel Corps and was partially responsible for its existence (Stickle and Wienman-Roberts 1980:135).

Like other major east-west trails across the Mojave Desert, the North Fork route of the Old Spanish Trail and Salt Lake (Mormon) Road was first developed by aboriginal traders. Between 1829 and 1830, a trail was established from Santa Fe and Los Angeles following this route. This allowed New Mexicans to immigrate to California. After 1848, Mormon converts used the trail, later followed by Mormon freighting companies carrying goods between Salt Lake City and San Pedro Harbor (Von Till Warren *et al*. 1981:21). Two notable locations along the Old Spanish/Mormon Trail include Salt Creek and Resting Springs (Von Till Warren *et al*. 1981:28).

Colonel Reese discovered the Kingston Cut-Off in 1854. This shortened the Salt Lake route by about 40 miles by cutting off at Kingston Wash and traveling via Kingston Springs to Mountain Springs, Nevada (Von Till Warren *et al*. 1981:28). Ivanpah was also a stop on the Salt Lake trail by way of Coyote Holes (Springs). Two stages served Potosi in 1860-1861 (Von Till Warren *et al*. 1981:29). From the Ivanpah route, lesser wagon roads connected ranches to the north and the silver mines at Potosi, Nevada to California (Von Till Warren *et al*. 1981:40).

The Amargosa Mines route developed from the Ivanpah Road in the 1860's. The Amargosa Mines were established as early as the 1850's with the establishment of a camp and mill at Salt Creek on the Amargosa River (Von Till Warren *et al*. 1981:39). The route probably followed the Amargosa River south to Salt Creek where it connected with the Salt Lake Road. Major stops along this road include Burnt-Book Springs and Leach's Point (Von Till Warren *et al*. 1981:40).

Another cut-off from the Salt Lake trail was developed in the 1860's. Known as the Cox-Cut-Off, this route left the trail and looped through Mesquite Wells to the Potosi town site and back to the Salt Lake Trail at Cottonwood Springs. Silas C. Cox was an active freighter between San Bernardino and Salt Lake City and is the likely namesake for this road (Beattie 1925). Two stages served Potosi in 1860-1861 (Von Till Warren *et al*. 1981:29).

Amargosa Valley Ranches

The Spanish in the mid-1700s began exploration and early settlement of the Mojave Desert region. Francisco Garces, a Spanish Franciscan priest, was one of the first people to go looking for a practical route from Arizona to northern California. He was a consummate explorer and maintained good relations with the Mohave people, among other groups (Keeling 1976:2). Subsequent Spanish contact with aboriginal people became increasingly hostile, involving reciprocating massacres (Stickel and Weinman-Roberts 1980:119). Mexican control of the western Mojave Desert and the Spanish missions and ranches resulted in secularizing ownership by 1836. Settlement by white colonists, mostly trappers like Jedediah Strong Smith, soon followed (Stickel and Weinman-Roberts 1980:122).

During this period, the western Mojave Desert served first as a point of entry for westward bound American fur trappers. By the 1840s, these trappers had joined forces with aboriginal tribes to attack cattle ranches, which were the economic mainstay of California under Mexican rule. Some of the biggest and best-known raids were led by American Thomas L. "Peg-Leg" Smith (Stickel and Weinman-Roberts 1980:125, 126). Historic sites of this time mostly relate to missions, ranches, and trails.

Ash Meadows, located on the upper reaches of the Amargosa River, was the site of historic Indian rancherias. Aaron and Rose Winters were one of the earliest European residents before 1880 (Warren *et al*. 1980:225). In 1904, R. J. "Dad" Fairbanks established the first tent city at Ash Meadows, which functioned as a passenger stopover for the Las Vegas to Beatty stretch of the Las Vegas and Tonopah Railroad (Myrick 1963:588; Warren *et al*. 1980:226). Grain and provisions were obtained at the ranch, which was irrigated from springs (Warren *et al*. 1980:226).

Philander "Phi" Lee and his Paiute wife settled Resting Springs, south of Ash Meadows at the southern tip of the Resting Springs Range, in 1882 (Waring 1915:319; Warren *et al*. 1980:226). It is thought he began his ranch with the money from selling the Monte Blanco borax works to Coleman is about 1880 or 1881. Differing accounts (Mendenhall 1909; Waring 1915) place the size of the ranch between twenty-five and two hundred acres on which alfalfa, corn, and garden vegetables were raised (Warren *et al*. 1980:227). Yeoman Hot Spring and the Alec C. Yeoman ranch (Thompson 1929:574-575) are thought to have been located about five miles southeast of Shoshone. It is not certain when this ranch began (Warren *et al*. 1980:227).

China Ranch, also known as the Morrison Ranch and Willow Creek Ranch (Mendenhall 1909:40) was established just north of the Amargosa River and Willow Creek confluence. The ranch is located on an old road leading from Manse in Pahrump Valley to Death Valley (Warren *et al*. 1980:227). Early development of the site may have begun with the first activity at Tecopa in the 1870s. Mining entrepreneur J. B. Osborne was involved in Tacoma's development since 1876 and is credited with settling his personal cook on the ranch (Vincent 1973; McKinney *et al*. 1971). Quon Sing had come from China to work as a cook for the Harmony Borax works, the Gunsight mine, and later as personal cook for Osborne. He possibly ran a small farming operation and sold crops to the local mining camp (Warren *et al*. 1980:227-228). Quon Sing disappeared one day and was never seen again. Morrison took over (or chased Quon Sing away)

and his name appeared on the records during construction of the T&T Railroad. A siding to this railroad was also called Morrison and later renamed Acme (Warren *et al*. 1980:228).

Another account (Belden 1957) states that the ranch founder was Ah Foo, a Tibetan. He raised vegetables in the 1880s for the local "borax crews" and later planted fig trees. Belden (1957) says Ah Foo returned to Tibet to visit relatives and was unable to return (Warren *et al*. 1980:228). These two accounts may be versions of the same story, but more research is necessary to clarify events. China Ranch was purchased by Ben Robinson and his wife in 1955, and later by Bernice Brown-Sorrell and her brother Charles Brown in 1969 Warren *et al*. 1980:228). Brian Brown is the current owner and operator of the China Ranch date farm.

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