

APPENDIX B

B.1 Peninsular Bighorn Sheep (*Ovis Canadensis nelson*) Assessment of Sheep Use of Urban Lands And Effect of Proposed bighorn Sheep Barrier In the La Quinta Area of the Coachella Valley Riverside County, California

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B.3 Western Burrowing Owls Survey Report: La Quinta Bighorn Sheep Barrier Project, Coachella Valley Conservation Commission

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Peninsular Bighorn Sheep
(Ovis canadensis nelsoni)

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And
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Peninsular Bighorn Sheep (*Ovis canadensis nelsoni*)

Assessment of Sheep Use of Urban Lands And Effects of Proposed Bighorn Sheep Barrier

Introduction

This analysis has been prepared on behalf of the Coachella Valley Conservation Commission (CVCC) to assess the potential impacts associated with the planned development of a barrier to exclude a local population of the federal and state-listed and protected Peninsular bighorn sheep (*Ovis canadensis nelsoni*; PBS) from urban areas in the City of La Quinta, Riverside County, California. The La Quinta Peninsular Bighorn Sheep Barrier Project is also herein referred to as the PBS Barrier Project or Project.

The City of La Quinta and the Coachella Valley are located at the western edge of the Colorado Desert sub-unit of the Sonoran Desert. PBS are well adapted to harsh desert conditions and inhabit mountain slopes, canyons, washes, and alluvial fans along the lower elevations of a series of mountain ranges known as the Peninsular Ranges. Numerous perennial water sources are available in these mountains and used by PBS as sources of drinking water. The Peninsular Ranges population of bighorn sheep includes eight defined ewe groups or “subpopulations” from the San Jacinto Mountains near Palm Springs south to the Mexican border (U. S. Fish and Wildlife Service 2000).

PBS that utilize urban developments in the Project area have been exposed to a variety of associated hazards including poisoning from non-native plants, auto collisions, and drownings. Since 2012, eleven urban-related sheep mortalities have been documented in the Project area: four drownings in the Coachella Canal, one oleander poisoning, one auto collision on Jefferson Street, and five lambs found dead on golf courses and residential areas. Additionally, a sick lamb was illegally picked up from a development and as a result will be spending the rest of its life in captivity.

Project Description

The purpose of the barrier project is to prevent continuing urban-related impacts to PBS that consume artificial sources of food and water in urbanized lands, including golf course and resort residential lands in the project area. A variety of barrier materials and methods to prevent PBS access to urbanized areas have been investigated and considered. This analysis included possible alternatives to fencing to keep sheep from accessing the golf courses and associated developments, and the Coachella Branch Canal that bounds much of the eastern portion of the Project area. Alternative barrier alignments also were evaluated relative to physical constraints and opportunities, and conservation goals for the PBS and the Conservation Area established by the Coachella Valley Multiple Species Habitat Conservation Plan (CVMSHCP). The Coachella Valley Water District (CVWD) has already constructed approximately 2,976 linear feet of eight-foot chain link fence adjacent to the Coachella Branch of the All-American Canal to prevent access by PBS.

The Proposed Project involves the construction of about a 9.5 mile chain link and/or welded steel fence that extends along the mountain-urban interface along the foothills of the Santa Rosa Mountains. The Project area extends from the Quarry Golf Club on the south, north along the toe of slope west of Lake Cahuilla and the PGA West development, north along the Silver Rock Resort, and west and south along the foothills adjacent to the Tradition Golf Club.

Desert Bighorn Sheep Natural Habitat Selection and Diet Quality Patterns

Predators have greatly influenced the evolution of bighorn sheep, including two basic adaptations that largely define their habitat selection. The first is their agility on precipitous rocky slopes, which is their primary means of evading predators. The second is their keen eyesight, which is their primary sense for detecting predators (Krausman et al. 1999). Shorter legs and a stocky build provide a low center of gravity and allow agility on steep, rocky slopes, but preclude the fleetness necessary to outrun coursing predators in less rocky terrain. Consequently, bighorn sheep select mostly visually open habitats that allow detection of predators at sufficient distances to allow adequate lead time to reach the safety of precipitous slopes commonly referred to as escape terrain. Optimal bighorn sheep habitat is visually open and contains steep, generally rocky, slopes.

Desert mountain ranges satisfy these habitat requirements. Sparse, low vegetation provides visual openness and is a consequence of insufficient rainfall mediated by seasonal temperature patterns (hot summers); soil moisture is too low much of the year to permit growth in most plant species. This climatic extreme has important implications relative to nutrient availability for desert bighorn sheep. Similar to many herbivorous species, the nutrient content of the diet of a bighorn sheep depends on the amount of green, growing (and flowering) vegetation in their habitat from which they select their diet (Wehausen 2005). When soil moisture is too low for plant growth, nutrient intake drops to a low level that annually often persists for many months and even longer in drought periods. That background low diet quality is normally punctuated annually by a season of vegetation growth during the cool months (winter and spring) – a growing season that varies considerably from year to year in the amount of plant growth because of variation in timing and amount of rainfall (Wehausen 2005). The life history of desert bighorn sheep revolves around that growing season, which is when lambs are born and reared. Females and lambs both require a high nutrient intake for lamb rearing to be successful, and that success varies with the amount of rainfall in the cool season (Wehausen 2005).

Desert bighorn sheep maximize their nutrient intake by selecting the most nutritious bites from what is available around them and, to the extent possible, feed in habitat patches that have higher availability of more nutritious bites. However, the latter aspect often entails a decision relative to a tradeoff between safety (predation risk) and diet quality, because the patches with the highest availability of nutrients are often further from escape terrain. These tradeoff decisions vary between sexes and seasons, and years. Lambs are particularly vulnerable to predation during the lamb rearing season and females typically trade off diet quality for safety of lambs (Bleich et al 1997). Desert bighorn ewes also are known sometimes to leave lambs in safe habitat while they venture into more dangerous habitat to feed. As lambs grow, females are willing to venture further from safer habitats with their lambs in search of nutrients. In contrast, males live separate from females much of the year and have more freedom to feed in habitats that would be risky for lambs (Bleich et al 1997). Males are also larger than females and consequently less vulnerable to predation, but they also potentially take more risks to become more successful breeders.

Desert Bighorn Sheep Use of the Urban Interface

When golf courses and homes are built in the margins of bighorn sheep habitat, what is created are sources of highly nutritious forage unlike anything in the natural habitat of desert bighorn sheep. This occurs through manipulation of soil moisture and soil fertility leading to a year-round source of highly nutritious forage for an herbivore. Additionally, these urban interfaces offer sources of drinking water, which may contain lawn care and other chemical products.

To use such habitats, desert bighorn sheep have to greatly alter their innate behavior of keeping a safe distance from humans as potential predators. There are many examples of such habituation in bighorn sheep in the Rocky Mountains, and in the Peninsular Ranges of California; this species readily develops a tolerance for human activities that are geographically predictable and non-threatening. People walking on trails are a prime example. Such habituation is adaptive in that the sheep minimize the waste of energy that would be expended fleeing from something that is not dangerous. It also is adaptive because these sheep can utilize habitat near the human activity for feeding and thereby minimize the loss of potential feeding habitat near locations of frequent human activities. Development of tolerance of humans occurs incrementally over time and is a behavioral attribute that is learned by lambs from their mothers and by other adult sheep accompanying those that have developed more tolerant behavior. Such behavioral shifts define subcultures within larger bighorn sheep populations, just as there can be multiple distinct habitat use patterns among females and between the sexes within what is typically defined as a bighorn sheep population.

The use of golf courses and gardens in urban interfaces such as La Quinta represents an extreme expression of this habituation process. Most extreme in this regard are females that bring young lambs into the urban interface, a behavior that strongly contrasts with the innate tendency of females in the wild to trade off nutrient intake for safety of young lambs.

Respiratory Disease in Bighorn Sheep

A brief review of the subject of pneumonia in bighorn sheep is important here because of the association of that disease with bighorn sheep living in the urban interface in the Peninsular Ranges of California. Much of the history of bighorn sheep since the appearance of Europeans in western North America revolves around repeated population die-offs from diseases. Numerous diseases of bighorn sheep have been identified (Jessup 1985, Bunch et al. 1999), but pneumonia and psoroptic scabies have had the greatest population-level effects. Both diseases apparently have resulted from the transmission of causative agents to bighorn sheep from domestic livestock, primarily domestic sheep and goats – a transmission well documented for one pneumonia-associated bacterial strain (Lawrence et al. 2010). While many early bighorn sheep die-offs were attributed to scabies (Jones 1950, Buechner 1960), respiratory disease appears to have been the larger factor, and the microbes involved are pathogenic to bighorn sheep but not to domestic sheep. This apparently reflects an estimated 5.63 million years of evolution that separates domestic sheep and bighorn sheep (Hiendleder et al. 2002) and the considerable evolutionary changes over that time period in their immune systems and in the normal bacterial flora of their respiratory tracts. North of where domestic sheep have been grazed in western North America, native distribution of wild sheep remains unchanged and no respiratory disease epizootic (wildlife equivalent of human epidemic) has ever been documented (Wehausen et al. 2011).

Bighorn sheep show a high susceptibility to pneumonia in general (Post 1971), perhaps reflecting a fragile immune system. Pneumonia epizootics typically involve bacteria of the genus *Pasteurella* and its recent taxonomic derivatives (Wehausen et al. 2011). Bunch et al. (1999) considered pneumonia caused by such bacteria alone, or in combination with other pathogens, as the most significant disease threat for bighorn sheep.

It is important, however, to recognize that respiratory disease typically consists of a cascade of events in which some or all of the microbial species potentially detectable at the later stages may not be the initiators of the disease, but instead are opportunists that have taken advantage of a compromised respiratory system, even if these species are the proximate cause of death at the final stage of that disease process. Besser et al. (2008, 2012) recently have found the involvement of a different bacterial species, *Mycoplasma ovipneumoniae*, in many pneumonia epizootics of bighorn sheep as a likely initiator of the respiratory disease process, and some bacterial species and strains once thought to be causative agents perhaps should better be shifted to the category of opportunists (Besser et al. 2013). Nevertheless, multiple independent processes, including viral initiators, can lead to pneumonia in bighorn sheep, and clear assignment of the specific cause is not always possible. While respiratory disease episodes in bighorn sheep may mostly be initiated by the introduction of pathogenic microbes from livestock, pneumonia also may develop, or take a different course, if the immune system is compromised by other factors. In short, there appear to be multiple pathways to respiratory disease in bighorn sheep.

Following contact with domestic sheep or goats, pneumonia epizootics in bighorn sheep frequently begin with an all-ages die-off in the first year, in which a large proportion of adults and young sheep die. This is typically followed by numerous years in which most lambs die of respiratory disease, apparently because some of the surviving adults continue to harbor pathogenic microbial strains, and serve as a source of infection for each new lamb cohort (Cassirer et al. 2013). Just as there appear to be multiple pathways to respiratory disease in bighorn sheep, there is also considerable variation in the outcome of such epizootics on population dynamics. At one end of the spectrum, populations can flirt with extinction from high losses of adults followed by long periods of very low survivorship of lambs. At the other end are situations of short lived-epizootics that may do no more than kill some lambs in a single year. Similar to the lack of ability to assign precise causation to some outbreaks of respiratory disease in bighorn sheep, it also is not clear what the factors are that drive the variation in outcomes among different respiratory disease epizootics. There are no effective vaccines against this disease; thus, recommendations have emphasized the need for adequate buffer zones between bighorn sheep and domestic sheep or goats to minimize the risk of interspecies contact (Wehausen et al. 2011).

Introduced diseases have played a significant role in the population dynamics of bighorn sheep in the Peninsular Ranges of southern California. There have been multiple episodes of depressed lamb survival (Wehausen et al. 1987), and there is clear evidence of pneumonia as the cause where studied (DeForge and Scott 1982; J. Colby, CDFW unpubl. data). There also is evidence of exposure to multiple viruses that may have been causal agents during one episode (DeForge et al. 1982). A more recent disease episode in the northern Santa Rosa Mountains in 2005 that killed numerous adult bighorn appears to have involved bovine respiratory syncytial virus, as evidenced by particularly high antibody titers to that virus and no apparent evidence of involvement of *Mycoplasma ovipneumoniae* in retrospective PCR testing of lung tissue samples fixed for histology studies at the time of the die-off (B. Gonzales, CDFW unpubl. data). Elliott et al. (1994) found that relative to many other bighorn sheep

populations sampled across the desert region of southeastern California, those in the Peninsular Ranges stood out as exhibiting in their blood serum evidence of exposure to more potential disease organisms. This suggests a higher interface with domestic livestock, and explains the repeated disease episodes.

Effects of Urban Environment Use on Desert Bighorn Sheep

A. The Rancho Mirage History.

The Recovery Plan for bighorn sheep in the Peninsular Ranges (U.S. Fish and Wildlife Service 2000) divided the Santa Rosa Mountains bighorn sheep population into 3 demographic units: (1) the Northern Santa Rosa Mountains (NSRM) herd unit northwest of Highway 74, (2) the Central Santa Rosa Mountains (CSRM) herd unit south of Highway 74 through Martinez Canyon, and (3) the Southern Santa Rosa Mountains (SSRM) herd unit south of Martinez Canyon. These divisions followed prior geographic divisions used relative to bighorn sheep demographic data (e.g. DeForge et al. 1995).

The recent colonization of the urban interface by bighorn sheep at La Quinta has a nearby potentially parallel situation in the NSRM herd and its use of urban habitat at Rancho Mirage that began decades earlier, has been closely studied (DeForge et al. 1995, Ostermann et al. 2001), and may have some lessons useful for the current situation at La Quinta. In the absence of other influences, ready access to water and highly nutritious forage in urban habitats would be expected to lead to a population increase through greater reproductive success. This did not occur at Rancho Mirage for multiple reasons.

One of the respiratory disease epizootics in the bighorn sheep in the Santa Rosa Mountains began in 1977 and led to a prolonged period of depressed lamb survival (Wehausen et al. 1987). The measured population effect correlated with this disease epizootic was a mostly declining trend during 1984-90, with an average annual decline of 17.8% in the number of ewes counted during helicopter surveys (DeForge et al. 1995). This was followed by a period (1990-1994) when the population showed no change (DeForge et al. 1995). Compared with the SSRM and CSRM herd units, the NSRM herd showed less population decline because its losses were in part compensated for by releases of captive-reared sheep (DeForge et al. 1995). However, the population leveling seen in the SSRM and CSRM herds after 1990 would not have occurred for the NSRM herd in the absence of augmentations; the population trajectory for the NSRM herd was instead headed toward extinction as evidenced by numbers of wild-reared sheep. By 1997 the NSRM herd would have been essentially extinct with only 2 wild-reared adult ewes remaining (Ostermann et al. 2001). Use of urban habitat clearly did not benefit the NSRM herd. Multiple factors were involved in the inability of this population to increase or even maintain its numbers while utilizing the urban interface.

Four parameters determine the dynamics of populations: losses due to adult mortality and emigration, and gains due to successful reproduction (known as recruitment), and immigration (Krebs 1972). The infrequency of emigration and immigration in bighorn sheep allows those two parameters to be ignored in most situations, allowing focus on losses due to adult mortality and gains from reproduction. The balance between those two variables determines whether a population grows, declines, or remains unchanged from year to year. For desert bighorn sheep survivorship of ewes has a particularly strong influence on population dynamics (Rubin et al. 2002).

For the NSRM herd utilizing urban habitat there was an elevated mortality rate of adult bighorn sheep. Adult bighorn sheep died from a variety of causes in the urban environment that would not affect them in the wild, including collisions with cars and consumption of poisonous ornamental plants. For an

investigation of 32 adult deaths, one third could be attributed to urban factors, while another third was undetermined; thus, of the deaths with assigned causes, half were due to urban factors (Bighorn Institute, unpublished data).

The NSRM herd also saw a very high mortality of lambs while utilizing urban habitats; few lambs survived in contrast to a nearby wild population (Rubin et al. 2002). Use of the urban interface by the NSRM herd unit began at Thunderbird Ranch Estates in the 1950s (U.S. Fish and Wildlife Service 2000), where in 1965 residents built a watering station for bighorn sheep a short distance from homes (DeForge and Scott 1982). Following construction of a housing development in adjacent Thunderbird Cove in the 1980s, the geographically limited use of urban habitat by these sheep expanded greatly (J. DeForge, pers comm.). This urban habitat use apparently exacerbated the effects of the ongoing disease epizootic and perhaps its interaction with increasing mountain lion predation (Hayes et al. 2000), as evidenced by a notably lower survivorship of lambs in the NSRM herd compared with the CSRM and SSRM herd units. During 1985-1993, fall ratios of mostly 5-8-month old lambs per 100 ewes in the NSRM herd were consistently lower than the 2 herd units to the south, averaging 22 lambs fewer per 100 ewes (range: 9.9 – 43.4) than the adjacent CSRM herd (Figure 7 in DeForge et al. 1995). A similar comparison (NSRM vs Deep Canyon) in Table 1 of the Recovery Plan for bighorn sheep in the Peninsular Ranges (U.S. Fish and Wildlife Service 2000) for 1994-1996 also shows this consistent difference, but of much higher magnitude (average difference of 48 lambs per 100 ewes). The magnitude of this latter difference suggests that use of this urban habitat did not only exacerbate the effects of this disease on lamb survivorship, but may have extended the duration of this epizootic compared with the closest neighboring population. This might be explained by a higher longevity due to excellent nutrition of ewes using urban habitat where those surviving ewes were individuals that harbored pathogenic bacteria.

In addition to respiratory disease, predation also played a role. Wild desert bighorn sheep are frequently difficult to find, in part because there is a lack of geographic predictability in where they will be on any day. The opposite is true of sheep making extensive use of the urban environment. This allowed multiple predator species to key on and prey on bighorn sheep near the urban interface and may have interacted with disease, given that sick lambs will be more easily caught. For a sample of 14 mortalities of collared lambs, 13 occurred within 300 m of the urban interface, of which 7 were due to predation and 6 due to urban causes (Bighorn Institute, unpublished data).

In 1998 an unknown factor changed for the NSRM herd leading to a sudden increase in lamb survival. During 1998-2002, the fall lamb:ewe ratio for this herd, while initially highly variable, averaged 5 times the average for 1985-1997 (Bighorn Institute, unpublished data). This change occurred while the population continued to exploit the urban environment and reversed the previous long declining trend for this herd. However, in the absence of prior augmentations, it is unlikely that there would have been a population in 1998 to respond to this changed condition. The death of the last native ewe that carried pathogenic bacteria may have been the source of the change in 1998.

B. La Quinta

While the recovery plan for bighorn sheep in the Peninsular Ranges defined the CSRM as a herd unit relative to recovery goals, it also recognized 2 separate female subpopulations within that unit, referred to as Deep Canyon and Martinez Canyon ewe groups (Figure 3 in U.S. Fish and Wildlife Service 2000). The recent deployment of GPS collars in the CSRM unit has verified these distinct, but overlapping,

home range patterns among wild-living ewes; but, emerging data also suggest that the northern home range pattern of ewes in the SSRM herd unit has considerable geographic overlap with the Martinez Canyon ewe group (Figure 1).

The sheep living in and near the urban habitat represent an additional habitat use pattern clearly distinct from the wild-living ewes (Figure 1). The use of urban habitat at La Quinta began with males in 2007, and females apparently began to enter that habitat in 2012 (J. DeForge, pers. comm.; U.S. Fish and Wildlife Service and California Department of Fish and Wildlife 2014). This habituation by females has occurred rapidly since 2012, as evidenced by the finding that females with small lambs were already documented in that urban habitat in 2015. A notable feature for the ewes utilizing this urban habitat and fitted with GPS collars is their small annual home range size compared with wild-living ewes (Figure 1). This small annual home range size is another indicator of a very major behavioral change.

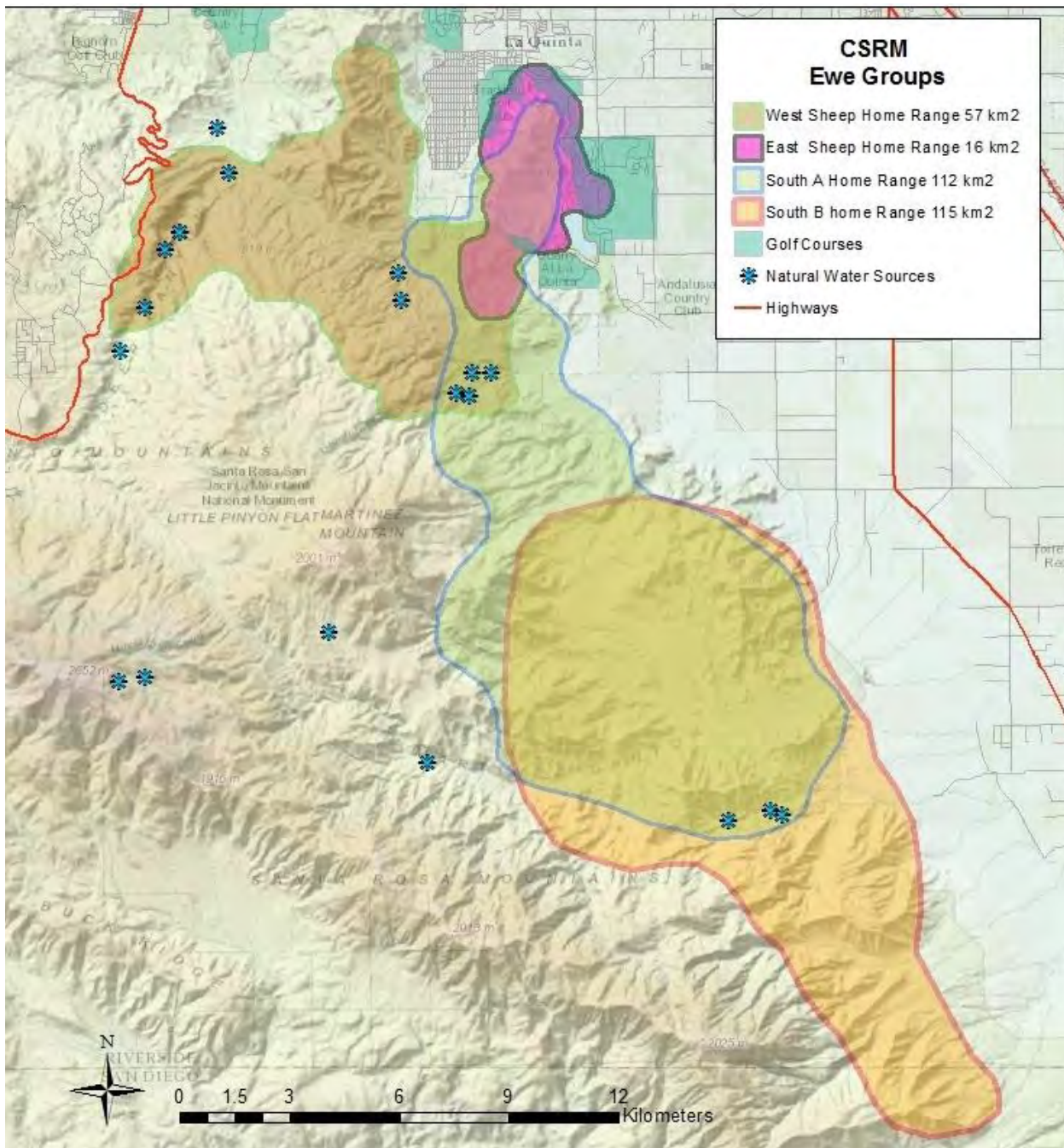


Figure 1. Home range patterns of bighorn sheep ewes in the CSR M herd unit based on location points from GPS telemetry collars. Map courtesy of the California Department of Fish and Wildlife.

Among the ewes that received GPS collars are two that have exhibited habitat use patterns that suggest that they are in different stages of shifting from a wild pattern to an urban pattern. One has shown increasing use of the urban interface over time, while the other has been spending considerable time close to the urban interface, apparently watching sheep that are using that urban habitat and probably interacting with them when they are outside of the urban interface; but she has yet to venture into the urban habitat (Janene Colby, CDFW, unpubl. data). In 2016 a yearling ram that was not a known

surviving lamb from 2015 joined the sheep group utilizing the urban habitat at La Quinta. His more skittish behavior compared with the two surviving lambs from 2015 (both female) helped to identify him as a likely immigrant (Aimee Byard, pers. comm.).

Population composition data collected during 2015 and 2016 for the sheep utilizing golf course habitat at La Quinta show a change in yearling recruitment that is consistent with the respiratory disease observed in lambs beginning in 2015. Recruitment of the 2014 lamb cohort as yearlings in 2015 for the golf course sheep was statistically equivalent to non-urban sheep in its ratio to ewes sampled (Table 1). A year later this had changed, with low yearling recruitment for the golf course sampling at one third that of the wild-living sheep (Table 1); most of the lambs born to golf course ewes had died. A similar pattern appears to be emerging for the 2016 lamb cohort using golf courses. Most lambs have exhibited clinical signs of severe respiratory disease and the deaths of five of these lambs have been documented on the golf courses. Postmortem analyses of those lambs have found (1) major pneumonia lesions in lungs, (2) presence of *Mycoplasma ovipneumoniae* in the respiratory tract, and (3) severe copper deficiency (Ben Gonzales, CDFW, unpubl. data). Copper deficiency is known to suppress the immune system and lead to poor performance in young.

Table 1. Recent yearling recruitment rates in the Central Santa Rosa Mountains bighorn sheep herd measured for wild sheep living away from the urban interface and the subpopulation living on and near golf courses. The samples from 2015 are not statistically different ($P = 0.833$), whereas the samples from 2016 are statistically different ($P = 0.00832$). Data courtesy of Janene Colby, California Department of Fish and Wildlife.

Location	Year	Sampling Period	Ewes Sampled	Yearling:Ewe Ratio
Wild	2015	12/19/14 – 4/8/15	16	0.38
Urban	2015	12/19/14 – 5/6/15	72	0.35
Wild	2016	2/5/16 – 3/23/16	43	0.33
Urban	2016	1/26/16 – 3/4/16	55	0.11

The data developed to date for the subpopulation of ewes utilizing the urban habitat at La Quinta suggest a situation parallel to that of the NSRM herd in the Rancho Mirage area during 1985-1997 relative to depressed lamb survival. In both situations, use of the urban habitat appears to have exacerbated a respiratory disease process that may have been ongoing. For the CSRM this disease episode may stem from a domestic sheep that was found with these bighorn sheep in 2005. A recent retrospective PCR analysis of lung tissues from that domestic sheep fixed for histological studies identified the presence of *Mycoplasma ovipneumoniae* but was unable to determine the strain (Ben Gonzales, CDFW unpublished data).

The factors causing notably higher lamb mortality in the urban interface are not known. One possibility is increased social interactions that lead to higher rates of transmission of pathogenic bacteria. Severe copper deficiencies also may be involved in these lamb mortalities. Such deficiencies have not been found for wild-living lambs much further south in the Peninsular Ranges of California (J. Colby, pers. comm.); however, it is not known if the levels recorded for lambs dying in the urban habitat of La Quinta are different from CSRM herd lambs living in the wild. Other unknown factors in the urban

environment of La Quinta may also play a role. That the NSRM herd experienced a major spike in lamb survival during 1998-2002 while utilizing the urban habitat suggests that this problem may be limited to the situation of an ongoing respiratory disease epizootic, which for the La Quinta subpopulation has been documented to involve *Mycoplasma ovipneumoniae*.

The low level of lamb recruitment recently recorded for the urban habitat ewes at La Quinta can be expected to lead to a declining population trend if it were to continue in the future. However, an increasing population trend may occur instead, despite high lamb mortality, if increasing numbers of wild sheep shift to this urban habitat use pattern. If allowed to continue, the use of this urban habitat may replicate the demographic history of the NSRM herd at Rancho Mirage. This situation can be viewed as a potential extinction vortex that will likely pull in increasing numbers of ewes from the wild and transform them to a subpopulation with reduced reproductive success that is inadequate for long term persistence.

Terminating Use of the Urban Environment.

A. The Rancho Mirage History.

In 2002 a fence was completed at Rancho Mirage to prevent the NSRM herd from continuing to use the urban habitat. While some sheep initially attempted to broach that fence, the population quickly shifted to use of the water sources and forage in the wild. This shift did not protect them from livestock diseases. Three years following the completion of the fence a new disease episode began, initially killing numerous adult sheep. Since 2005 lamb survivorship has been depressed relative to the 1998-2004 period, despite rare evidence of diseased lambs (Bighorn Institute, unpubl. data); however, since 2005 fall lamb:ewe ratios have averaged twice what they were during 1985-97 when this population made extensive use of the urban habitat. Despite the sheep losses in 2005, since being fenced out of the urban habitat this population has shown an overall increasing population trend with an average annual gain in the number of ewes of 4.8% at the end of 2014 and a cumulative gain of 77% (Bighorn Institute, unpubl. data). The re-wilding of this population has clearly been beneficial to the population.

B. La Quinta

In 2010 the total number of bighorn sheep in the CSRM herd unit was estimated at 133 (Colby and Botta 2014), of which 71 were ewes (Colby and Botta 2012). Existing data suggested a stable ewe population between 2006 and 2010, with fall lamb:ewe ratios varying between 0.35 and 0.51 (Colby and Botta 2012). No additional population estimates have been obtained since 2010.

The numbers of ewes observed using the urban habitat in La Quinta in 2015 and 2016 has been as high as 20 (Janene Colby, CDFW, unpubl. data). Relative to the 2010 population estimate, this suggests that about a quarter of the ewes in the CSRM herd unit are using this urban habitat. This relatively low percentage speaks to the recent shift to this habitat selection pattern. The home range pattern of the ewes using this urban habitat overlaps both of the home range patterns of wild-living ewes in the CSRM herd unit (Figure 1). This suggests the potential for large numbers of ewes to be drawn into this urban habitat use pattern. The data reviewed here point to the importance of ending the use of the urban habitat at La Quinta before that behavioral pattern draws in more sheep from the CSRM herd and expands to penetrate further into the urban habitat. While the use of this urban habitat appears detrimental to the sheep, these sheep are themselves detrimental to golf course management and to

gardens; thus, there are multiple reasons to end this pattern. Wild habitat in this region has multiple natural water sources and forage resources available for these sheep to use when they are forced to shift back to living in the wild. Most of these urban sheep lived as wild sheep relatively few years ago, making this an opportune time to transition them back to living in the wild.

It should be recognized that the altered behavior involved in repeated use of this urban habitat by bighorn sheep has parallels in a variety of unhealthy human addictions. Similar to such human addictions, reversing this behavior pattern will not be easy; these sheep can be expected to make every effort to keep the current habitat use pattern going. Secure fencing has been demonstrated to work at Rancho Mirage. Any alternative to secure fencing will effectively be an experiment. Such experiments have a high probability of failing to keep bighorn sheep from using the urban habitat, and will thereby likely delay correcting this problem. Any such experiment should include an unambiguous adaptive management trigger that reverts to the secure fencing alternative if bighorn sheep continue using urban habitat.

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Literature Cited

- Besser, T. E., E. F. Cassirer, K. A. Potter, J. VanderShalie, A. Fischer, D. P. Knowles, D. R. Herndon, F. R. Rurangira, G. C. Weiser, and S. Srikumaran. 2008. Association of *Mycoplasma ovipneumoniae* with population-limiting respiratory disease in free-ranging Rocky Mountain bighorn sheep (*Ovis canadensis canadensis*). *Journal of Clinical Microbiology* 46:423-430.
- Besser, T. E., M. A. Highland, K. Baker, E. F. Cassirer, N. J. Anderson, J. M. Ramsey, K. Mansfield, D. L. Bruning, P. Wolff, J. B. Smith, and J. A. Jenks. 2012. Causes of pneumonia epizootics among bighorn sheep, western United States, 2008-2010. *Emerging Infectious Diseases* 18:406-414.
- Besser, T. E., E. F. Cassirer, M. A. Highland, P. Wolff, A. Justice-Allen, K. Mansfield, M. A. Davis, and W. Foreyt. 2013. Bighorn sheep pneumonia: Sorting out the cause of a polymicrobial disease. *Preventative Veterinary Medicine* 108:85-93.
- Bleich, V. C., R. T. Bowyer, and J. D. Wehausen. 1997. Sexual segregation in mountain sheep: resources or predation? *Wildl. Monogr. No. 134*. 50pp.
- Buechner, H. K. 1960. The bighorn sheep in the United States, its past, present, and future. *Wildl. Monogr. No. 4*. 174pp.
- Bunch, T. D., W. M. Boyce, C. P. Hibler, W. R. Lance, T. R. Spraker, and E. S. Williams. 1999. Diseases of North American Wild Sheep. Pages 209-237 in R. Valdez and P. R. Krausman, eds. *Mountain sheep of North America*. Univ. of Ariz. Press., Tucson.

- Cassirer, E. F., R. K. Plowright, K. R. Manlove, P. C. Cross, A. P. Dobson, K. A. Potter, and P. J. Hudson. 2013. Spatio-temporal dynamics of pneumonia in bighorn sheep. *Journal of Animal Ecology* 82:518-528.
- Colby, J., and R. Botta. 2012. California Department of Fish and Wildlife Peninsular bighorn sheep 2012 annual report and recovery program review 1993-2012. California Department of Fish and Wildlife, South Coast Region.
- Colby, J., and R. Botta. 2014. Peninsular bighorn sheep annual report 2014. California Department of Fish and Wildlife, South Coast Region.
- DeForge, J. R., and J. E. Scott. 1982. Ecological investigations into high lamb mortality. *Desert Bighorn Council Transactions* 26:65-76.
- DeForge, J. R., D. A. Jessup, and C. W. Jenner. 1982. Disease investigations into high lamb mortality of desert bighorn in the Santa Rosa Mountains. *Desert Bighorn Council Transactions* 26:76-81.
- DeForge, J. R., E. M. Barrett, S. D. Ostermann, M. C. Jorgensen, and S. G. Torres. 1995. Population dynamics of peninsular bighorn sheep in the Santa Rosa Mountains, California, 1983-1994. *Desert Bighorn Council Trans.* 39:50-67.
- Elliott, L. F., W. M. Boyce, R. K. Clark, and D. A. Jessup. 1994. Geographic analysis of pathogen exposure in bighorn sheep (*Ovis canadensis*). *Journal of Wildlife Diseases* 30:315-318.
- Hiendleder, S., B. Kaupe, R. Wassuth, and A. Janke. 2002. Molecular analyses of wild and domestic sheep questions current nomenclature and provides evidence for domestication from two different subspecies. *Proc. Royal Society London* 269:893-904.
- Jones, F. L. 1950. A survey of the Sierra Nevada bighorn. *Sierra Club Bulletin* 35(6):29-76.
- Krausman, P. R., A. V. Sandoval, and R. C. Etchberger. 1999. Natural history of desert bighorn sheep. Pages 139-191 in R. Valdez and P. R. Krausman, eds. *Mountain sheep of North America*. Univ. of Ariz. Press., Tucson.
- Krebs, C. J. 1972. *Ecology, the experimental analysis of distribution and abundance*. Harper & Row, New York, NY.
- Lawrence, P. K., S. Shanthalingam, R. P. Dassanayake, R. Subramaniam, C. N. Herndon, D. P. Knowles, F. R. Rurangirwa, W. J. Foreyt, G. Wayman, A. M. Marciel, S. K. Highlander, and S. Srikumaran. 2010. Transmission of *Mannheimia haemolytica* from domestic sheep (*Ovis aries*) to bighorn sheep (*Ovis canadensis*): unequivocal demonstration with green fluorescent protein-tagged organisms. *Journal of Wildlife Diseases* 46:706-717.
- Ostermann, S. D., J. R. DeForge, and W. D. Edge. 2001. Captive breeding and reintroduction evaluation criteria: a case study of peninsular bighorn sheep. *Conservation Biology* 15:749-760.

Post, G. 1971. The pneumonia complex in bighorn sheep. *Trans. N. Amer. Wild Sheep Conf.* 1:98-102.

Rubin, E. S., W. M. Boyce, and E. P. Caswell-Chen. 2002. Modeling demographic processes in an endangered population of bighorn sheep. *Journal of Wildlife Management* 66:796-810.

U. S. Fish and Wildlife Service. 2000. Recovery plan for bighorn sheep in the Peninsular Ranges, California. U.S. Fish and Wildlife Service, Portland, OR.

U. S. Fish and Wildlife Service and California Department of Fish and Wildlife. 2014. 28 February 2014 letter from Kennon A. Corey and David Elms to Tom Kirk and Frank J. Spevacek.

Wehausen, J. D. 2005. Nutrient predictability, birthing season, and lamb recruitment for desert bighorn sheep. Pages 37-50 *in* J. Goerrissen and J. M. André, eds. Sweeney Granite Mountains Desert Research Center 1978-2003: A Quarter Century of Research and Teaching. University of California Natural Reserve Program, Riverside, CA 2005.

Wehausen, J. D., V. C. Bleich, B. Blong, and T. L. Russi. 1987. Recruitment dynamics in a southern California mountain sheep population. *Journal of Wildlife Management* 51:86-98.

Wehausen, J. D., S. T. Kelley, and R. R. Ramey II. 2011. Domestic sheep, bighorn sheep, and respiratory disease: a review of the experimental evidence. *California Fish and Game* 97:7-24.



BIOLOGICAL RESOURCES ASSESSMENT

Peninsular Bighorn Sheep Barrier Project

La Quinta
Riverside County
California

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19 August 2016

BIOLOGICAL RESOURCES ASSESSMENT

La Quinta Peninsular Bighorn Sheep Barrier Project

TABLE OF CONTENTS

	PAGE
1.0 INTRODUCTION	1
2.0 PROJECT LOCATION	1
3.0 PROJECT DESCRIPTION & BACKGROUND	4
3.1 Toe of Slope Alternative	5
3.2 Upslope Alternative	5
3.1 Ridgeline Alternative	10
3.2 Lake Cahuilla to Cove Alternative	10
4.0 REGULATORY FRAMEWORK	11
4.1.1 Recovery Plan for Bighorn Sheep in the Peninsular Ranges, California (USFWS, 2000).	11
4.1.2 Coachella Valley Multiple Species Habitat Conservation Plan	11
4.1.3 City of La Quinta General Plan	12
5.0 METHODS	13
5.1 Literature Review	13
5.2 Field Assessment	13
6.0 RESULTS	14
6.1 Weather Conditions	14
6.2 Topography and Soils	14
6.2.1 Toe of Slope Alternative	14
6.2.1 Upslope Alternative	18
6.2.2 Ridgeline Alternative	18
6.2.3 Lake Cahuilla to Cove Alternative	20
6.3 Vegetation	20
6.4 Wildlife	23
6.5 Special Status Species	24
DISCUSSION	36
7.0 36	
7.1 Discussion of the Special-status Species Tables	36

7.1.1	Potentially Occurring Plant Species	38
7.2	Project Alternatives	47
7.2.1	Toe of Slope Alternative.....	47
7.2.2	Upslope Alternative.....	48
7.2.3	Ridgeline Alternative.....	49
7.2.4	Lake Cahuilla to Cove Alternative	49
7.3	Coachella Valley Multiple Species Habitat Conservation Plan.....	49
7.4	Recommended Impact Avoidance and Minimization Measures.....	50
7.5	Land Use Adjacency Guidelines	51
8.0	CONCLUSION	52
9.0	LITERATURE CITED AND REFERENCES	55

LIST OF FIGURES

Figure 1.	Vicinity & Location.....	2
Figure 2.	Site Topography & Relationship to Conservation Areas	3
Figure 3a.	Toe of Slope Alternative	6
Figure 3b.	Upslope Alternative.....	7
Figure 3c.	Ridgeline Alternative.....	8
Figure 3d.	Lake Cahuilla to Cove Alternative.....	9
Figure 4.	Soils	17
Figure 5.	NWI Drainages and Bodies of Water.....	20
Figure 6.	Vegetation Communities	21
Figure 7.	Designated Critical Habitat for Peninsular Bighorn Sheep.....	23
Figure 8.	CVMSHCP Modeled Habitat for Special Status Species.....	25
Figure 9.	Special-Status Species Observed	34
Figure 10.	CNDDDB Special Status Species Occurrence Records.....	36

LIST OF TABLES

Table 1.	Special Status Plants.....	28
Table 2.	Special Status Vegetation Communities	30
Table 3.	Special Status Invertebrates	30
Table 4.	Special Status Amphibians & Reptiles	30
Table 5.	Special Status Birds.....	31
Table 6.	Special Status Mammals	33

LIST OF APPENDICES

Appendix 1.	Species List: Vascular Plants
Appendix 2.	Species List: Vertebrate Animals
Appendix 3.	Photographic Exhibits
Appendix 4.	Coachella Valley Native Plants Recommended for Landscaping
Appendix 5.	Prohibited Invasive Ornamental Plants

Appendix 6. Western Burrowing Owls (*Athene cunicularia*) Survey Report

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BIOLOGICAL RESOURCES ASSESSMENT

Peninsular Bighorn Sheep Barrier Project

1.0 INTRODUCTION

This biological resources assessment was prepared by Amec Foster Wheeler Environment & Infrastructure, Americas (Amec Foster Wheeler) for the proposed Peninsular Bighorn Sheep Barrier Fence Project (Project) located in the City of La Quinta (City), Riverside County, California (Figure 1). The proposed Project is a covered project under the Coachella Valley Multiple Species Habitat Conservation Plan (CVMSHCP). Information contained herein is intended to be used for compliance with the CVMSHCP, California Environmental Quality Act (CEQA), as well as federal and California Endangered Species Acts.

2.0 PROJECT LOCATION

The proposed Project area is generally located in and adjacent to the Santa Rosa Mountains in the City of La Quinta, Riverside County, CA. The site is within Sections 6, 7, 8, 13, 18, 19, 20 Township 6 South, Range 7 East, United States Geological Survey (USGS) 7.5' *La Quinta, Calif.* Quadrangle (Figure 1).


The proposed Project area generally occurs along the mountain-urban interface toe of the Santa Rosa Mountains, at the interface between the undeveloped natural open space (foothills of the mountains) and the developed areas of the City of La Quinta. It is bordered by private golf resorts which include single-family residential development, a City golf course, and the Lake Cahuilla County Park. The Project area includes, from south to north, the mountainous lands and adjacent developed areas from approximately the southeastern corner of The Quarry at La Quinta Golf Club along the southern and western boundaries of The Quarry, north along the western boundary of the Lake Cahuilla County Park to the southwestern boundary of the PGA West Golf Resort, then along the western boundary of PGA West Golf Resort to the southwestern boundary of the SilverRock Resort Golf Club, northwest, along the western boundary of the SilverRock Resort Golf Club, then along the eastern edge of the Tradition Golf Club to its terminus at the southwestern corner of the Tradition Golf Club, near Avenida Bermudas (Figure 1).

The Project also occurs, in part, within the CVMSHCP Santa Rosa and San Jacinto Mountains Conservation Area (Section 4.1.2 & Figure 2).



Prepared by: Mindy Boehm, Amec Foster Wheeler
 Date prepared: 8/25/2016
 Source: ESRI world imagery

Legend	
—	Lake Cahulla to Cove Alternative
—	Upslope Alternative
—	Ridgeline Alternative
—	Toe of Slope Alternative
- - - -	Potential Small Route Deviations
—	Existing CVWD Fence



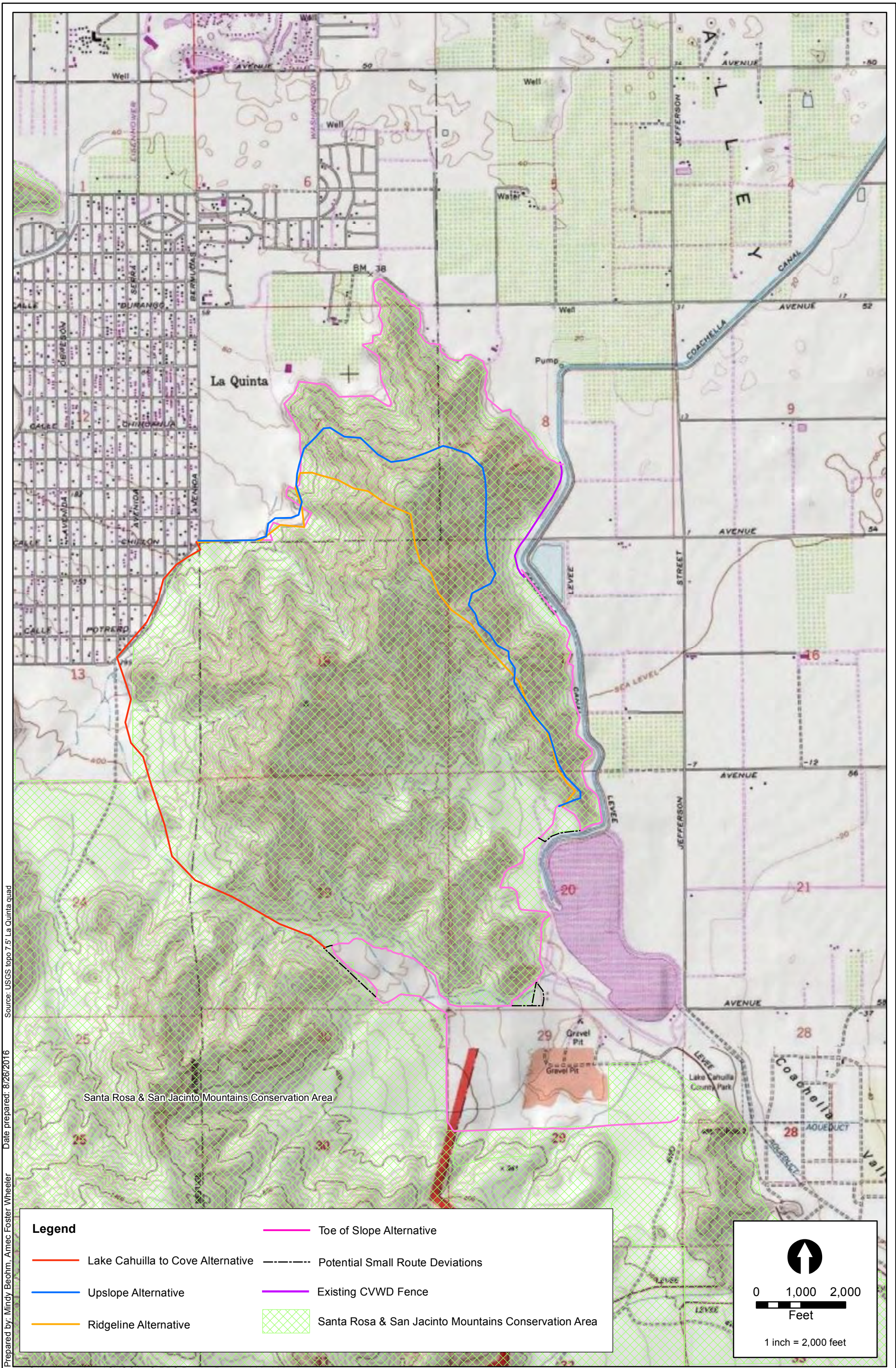
 0 1,000 2,000
 Feet
 1 inch = 2,000 feet

Vicinity & Location

Peninsular Bighorn Sheep Barrier Project

FIGURE
1





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Site Topography & Relationship to Conservation Area

Peninsular Bighorn Sheep Barrier Project

FIGURE

2

3.0 PROJECT DESCRIPTION & BACKGROUND

On 28 February of 2014, the U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW) issued a formal written notice to the Coachella Valley Conservation Commission (CVCC) and the City of La Quinta regarding the agencies' concerns about urban-related impacts to Peninsular bighorn sheep (PBS), *Ovis canadensis nelsoni*. These agencies described reports of PBS grazing on several golf resorts in La Quinta. The agencies expressed concern that PBS could be vulnerable to injury and death as a result of drowning in canals and swimming pools, poisoning by toxic plants, vehicle collisions, and the ingestion of internal parasites that may occur in landscaped lawns and grasses. The USFWS cited at least six PBS deaths in La Quinta since 2012.

Section 8.2.4.1, Item 14 of the CVMSHCP states:

"If the USFWS or CDFG provides written notice to the CVCC or Local Permittee that Peninsular bighorn sheep are using artificial sources of food or water in unfenced areas of existing urban Development within or near a Conservation Area, the CVCC (unless otherwise agreed to by the applicable Local Permittee) shall cause to be constructed a barrier to sheep access to cure the problem within 2 years of such notice. The location of this barrier (i.e., an 8-foot fence or functional equivalent) shall be determined by CVCC based on its ability to obtain permission/access to the necessary lands. If placement of a barrier must occur on other public lands (e.g., BLM, CDFG), CVCC will coordinate with these other agencies as appropriate."

The notice stated that the 2-year clock for completion of barrier installation by the CVCC and the City of La Quinta started on 28 February 2014). The notice also requested that the CVCC and the City provide a letter report summarizing actions taken to notify and work with golf resort owners/managers to plan fence construction, a preliminary map of the proposed fence locations, provisions for providing a CEQA analysis and a timeline for construction.

On 28 August 2014, the CVCC submitted the requested 6-month status report to the USFWS and CDFW which included: 1) a map of the proposed fence and ownership boundaries in the vicinity; 2) a summary of the sections of the fence relating to the various golf resorts and other development in the vicinity; 3) a preliminary estimate for the cost of the fence; 4) provisions for the CEQA analysis; 4) a draft plan and preliminary timeline for the fence Project; including coordination with the various golf resort owners/managers and other property owners

The focus of the Project is to address potential impacts to PBS resulting from their use of urban areas, such as golf courses and residential areas with landscaping and water that attract sheep. In these areas, bighorn sheep are at risk of collisions with vehicles, poisoning from consuming toxic ornamental plants, entanglement in wire fences, harassment by dogs, and exposure to pathogens, herbicides and insecticides (CVMSHCP page 9-258).

The proposed Project consists of the installation of a barrier, fence, or functional equivalent to prevent PBS from entering developed areas where they are vulnerable to urban hazards that may result in injury, disease, or death.

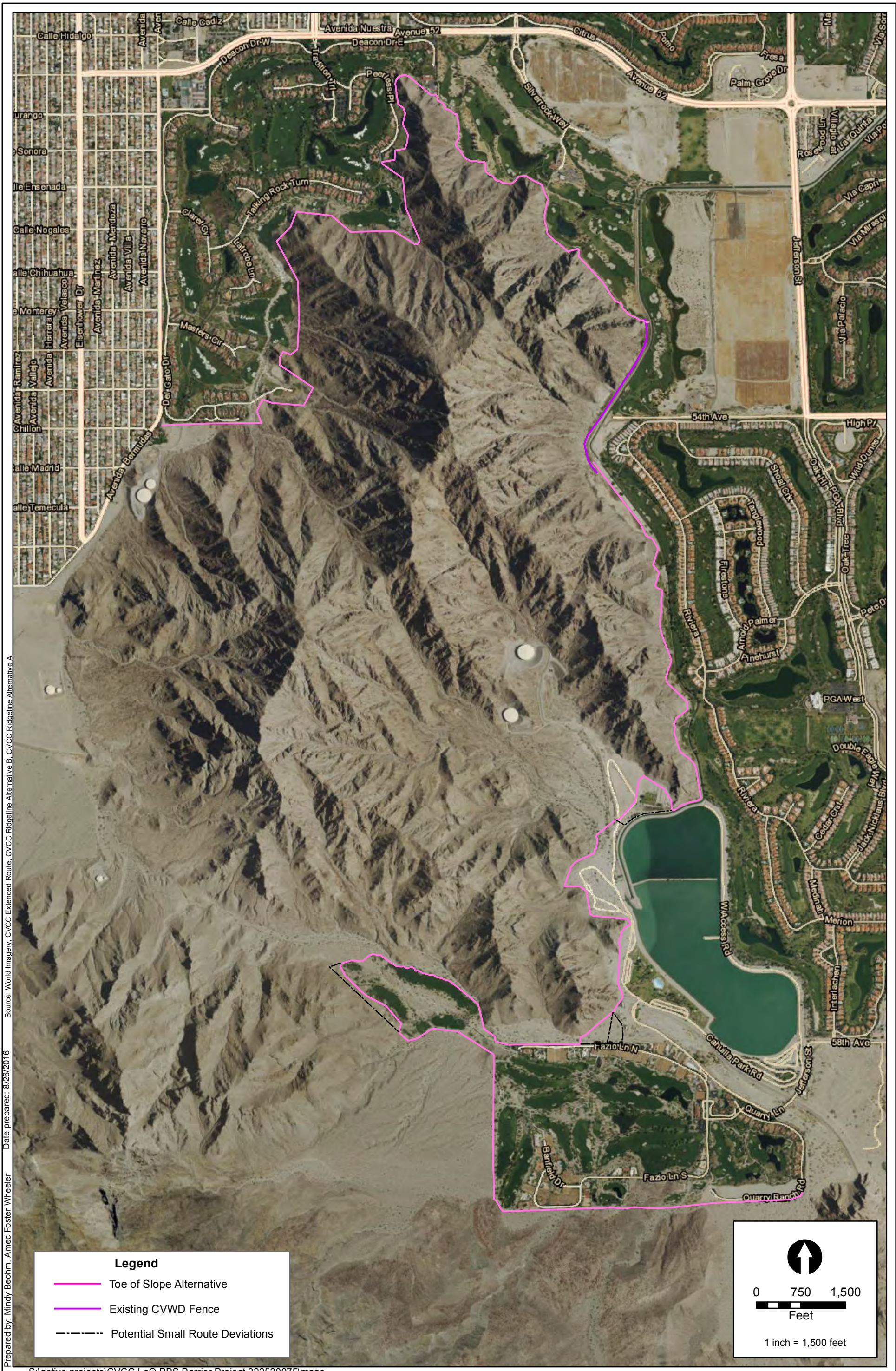
This report and the associated surveys were completed to assess the biological resources and potential impacts associated with each of the various alternatives for the barrier alignments (Figures 3a-3d). These alignments include: 1) the Toe of Slope Alternative (illustrated in pink), 2) Upslope Alternative (illustrated in blue), 3) Ridgeline Alternative (illustrated in orange), and 4) the “Lake Cahuilla to Cove Alternative” (illustrated in red). The Proposed Alignment and each of the alternatives are described separately below. It should be noted that the alternative alignments, including the preferred alternative, may not follow the exact route as depicted in the figures. Depending on topography, slope stability, impacts to views, land ownership, and other factors, the alignment may have to be moved up or downslope. This report was prepared while the alignment alternatives were being refined so descriptions here are general. More specific descriptions of the alternative alignments are included in the Draft EIR.

3.1 Toe of Slope Alternative

The Toe of Slope Alternative, which is the preferred alternative, is anticipated to be a maximum of approximately 9.5 miles in length, and is generally located along the base of the steep foothills of the Santa Rosa Mountains, between the undeveloped, steep mountain slopes and the various existing golf course and residential developments in the City of La Quinta (Figure 3). Installation of the barrier along the Toe of Slope Alignment would result in the permanent loss of up to 1.14 acres (i.e., barrier footprint) of habitat currently occupied by PBS and other wildlife. Additionally, implementation of this alternative is expected to result in the exclusion (fencing out) of up to approximately 43 acres of natural habitat that is currently occupied/used by PBS and other terrestrial wildlife (primarily larger mammals that can't traverse the barrier). In addition to natural habitats, this alternative would also result in impacts to landscaped, disturbed and currently developed areas along the margins of the golf courses and residential developments. When compared to the other alternatives, implementation of the Toe of Slope Alternative, would result in the largest amount of natural habitats and resources conserved, remaining available for use by PBS and other terrestrial wildlife. Very little natural habitat would be lost or excluded from use by PBS with the implementation of this alternative. The areas excluded from PBS would primarily be the landscaped, developed and/or barren areas present along the various golf courses and existing developments adjacent to the Santa Rosa Mountain foothills.

3.2 Upslope Alternative

The total length of the Upslope Alternative is anticipated be up to 8.55 miles in length. This includes approximately 5.16 miles of the Toe of Slope Alternative. A total of 3.39 miles of the Upslope Alternative would be located midway up the mountain slopes in this portion the Santa Rosa Mountains (Figure 3). Implementation of this alternative would also result in the permanent loss of a total of approximately 1.04 acres of habitat (i.e., barrier footprint). This includes 0.63 acres of the Toe of Slope Alternative. A total of 0.41 acres of habitat would be lost along the undisturbed hillside where the Upslope Alternative would be located. In addition to excluding PBS from the developed golf courses and residential areas adjacent to the Santa Rosa Mountains, implementation of this alternative would result in the exclusion (fencing out) of 462 acres of undisturbed, natural habitat that is currently occupied by PBS and other terrestrial wildlife within the conservation area.



Prepared by: Mindy Boehm, Amec Foster Wheeler Date prepared: 8/26/2016 Source: World Imagery, CVCC Extended Route, CVCC Ridgeline Alternative B, CVCC Ridgeline Alternative A

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Toe of Slope Alternative
Peninsular Bighorn Sheep Barrier Project

FIGURE
3a



Prepared by: Mindy Boehm, Amec Foster Wheeler Date prepared: 8/26/2016 Source: World Imagery, CVCC Extended Route, CVCC Ridgeline Alternative B, CVCC Ridgeline Alternative A

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Upslope Alternative
Peninsular Bighorn Sheep Barrier Project

FIGURE
3b



Prepared by: Mindy Boehm, Amec Foster Wheeler | Date prepared: 8/26/2016 | Source: World Imagery, CVCC Extended Route, CVCC Ridgeline Alternative B, CVCC Ridgeline Alternative A

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Ridgeline Alternative
Peninsular Bighorn Sheep Barrier Project

FIGURE
3c



Prepared by: Mindy Boehm, Amec Foster Wheeler Date prepared: 8/26/2016 Source: World Imagery, CVCC Extended Route, CVCC Ridgeline Alternative B, CVCC Ridgeline Alternative A

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Lake Cauilla to Cove Alternative
Peninsular Bighorn Sheep Barrier Project

FIGURE
3d

3.1 Ridgeline Alternative

The total length of the Ridgeline Alternative would be 7.88 miles in length. This includes approximately 5.16 miles of the Toe of Slope Alternative. A total of 2.72 miles of the Ridgeline Alternative would be located along a ridgeline at the top of the slopes in this portion the Santa Rosa Mountains (Figure 3). Implementation of this alternative would result in the permanent loss of a total of approximately 0.96 acre of habitat (i.e., barrier footprint). This includes 0.63 acres of the Toe of Slope Alternative and a total of 0.33 acres along the ridgeline where this alternative would be located. In addition to excluding PBS from the developed areas adjacent to the Santa Rosa Mountains, implementation of the Ridgeline Alternative would result in the exclusion of 579 acres of natural habitat that is currently occupied by PBS and other terrestrial wildlife within the conservation area.

3.2 Lake Cahuilla to Cove Alternative

The total length of the Lake Cahuilla to Cove Alternative would be 4.86 miles in length. This includes approximately 2.56 miles of the Toe of Slope Alternative. A total of 2.30 miles of the Lake Cahuilla to Cove Alternative would be located along the bottom of a small canyon in this portion of the Santa Rosa Mountains, between the Cove residential area to the west and the Quarry Golf Resort to the east. Implementation of this alternative would result in the permanent loss of a total of approximately 0.59 acre of habitat (i.e., barrier footprint). This includes 0.31 acre of the Toe of Slope Alternative and a total of 0.28 acre along the canyon bottom where this alternative is proposed to be located. Implementation of this alternative would result in the exclusion (fencing out) of approximately 2,378 acres of natural habitat within the conservation area that is currently occupied and used by PBS and other terrestrial wildlife.

All of the proposed alternatives eventually tie into the alignment of the Toe of Slope Alternative at one point or another. The length of each alternative takes this into account and includes the shared portion of the Toe of Slope Alternative in their respective impact analyses as implementation of any one of these would also result in Toe of Slope impacts (Figure 3).

Other small alternate routes/deviations to the Proposed Alignment (illustrated in black) have also been considered, however, these are relatively small optional routes which result in little change to the proposed alignment (Figure 3).

The Upslope, Ridgeline and Lake Cahuilla to Cove alternatives are generally considered to be less desirable due to the greater amount of undisturbed, natural habitat and the associated vegetation communities that PBS and other native, mostly large terrestrial species, would be excluded from and no longer able to utilize.

The barrier is proposed to be constructed of several fence materials depending on the location and concerns about impacts to property owners. The barrier, or functional equivalent, will be installed at a height of eight (8) feet or more, depending on topography. Other alternative barriers (i.e., primarily landscaped densely-planted vegetation) have also been considered. Methods of installation have been designed and are proposed to be implemented to minimize impacts to natural resources to the greatest extent possible. The barrier would be installed by

hand and on foot by a small work crew where possible. Limited motorized equipment may be used only when necessary. Due to the rugged terrain, access by vehicles may not be possible. Post-holes will be hand-dug and a dry post-hole mix is anticipated to be used allowing individual bags to be carried to each hole.

For the Upslope and Ridgeline alternatives, the use of helicopters to deliver materials to key locations along the respective alignments is anticipated. Construction crews would walk into these some of these areas, and/or fly in via helicopter each day to install the barrier by hand.

4.0 REGULATORY FRAMEWORK

4.1.1 Recovery Plan for Bighorn Sheep in the Peninsular Ranges, California (USFWS, 2000).

Developed by the USFWS in cooperation with the CDFW, Bureau of Land Management (BLM), U.S. Forest Service and the California Department of National Parks and Recreation, and with assistance from the Peninsular Bighorn Sheep Recovery Team, the Recovery Plan for Bighorn Sheep in the Peninsular Ranges, California (Recovery Plan) was enacted “to secure and manage habitat in order to alleviate threats so that population levels will increase to the point that this species may be reclassified to threatened status, and ultimately delisted” (USFWS 2000).

According to the Recovery Plan, PBS would be considered recovered and no longer require Endangered Species Act (ESA) protection and ultimately removed from the Endangered Species List after established delisting criterion have been met. In general, the delisting criterion include specific population stabilization goals, conservation milestones and regulatory mechanisms and land management commitments that provide for the long-term protection of PBS and all essential habitat to ensure continued population viability.

4.1.2 Coachella Valley Multiple Species Habitat Conservation Plan

The CVMSHCP is a comprehensive, regional plan that addresses the conservation needs of 27 species of native flora and fauna and 27 natural communities occurring throughout the Coachella Valley region of western Riverside County, California. Permits for the CVMSHCP were issued by the CDFW on September 9, 2008 and by the USFWS on October 1, 2008 (TE104604-0). The CVMSHCP balances environmental protection and economic development objectives in the CVMSHCP area, simplifying compliance with endangered species and related laws. The CVMSHCP accomplishes this by conserving unfragmented habitat to permanently protect and secure viable populations of the covered species. The covered species include plants and animals that are either currently listed as threatened or endangered, are proposed for listing, or have a high probability of being proposed for listing in the future if not provided protection by the CVMSHCP. The goal of the CVMSHCP is to meet the requirements of the state and federal endangered species acts, while at the same time allowing for the economic growth within the plan area without significant delay or hidden costs. Under the CVMSHCP, land development/mitigation fees are collected from all new development projects occurring in the plan area. The purpose of this fee is to support the acquisition, monitoring and management of

a preserve system for the covered species and natural communities within areas identified as having high conservation value.

The Project site is at the northeastern edge of the Santa Rosa and San Jacinto Mountains Conservation Area (Figure 2). La Quinta is within the boundaries of the CVMSHCP and the City is a local permittee. The proposed PBS barrier or functional equivalent is a CVMSHCP-required mitigation project.

The Santa Rosa and San Jacinto Mountains Conservation Area provides essential habitat for the PBS (Figure 2). This conservation area also contains other conserved habitat and known locations for burrowing owl, gray vireo, and desert tortoise. There are known records of or habitat for triple-ribbed milkvetch, Coachella Valley milkvetch, Coachella Valley giant sand-treader cricket, Coachella Valley Jerusalem cricket, Coachella Valley fringe-toed lizard, flat-tailed horned lizard, Le Conte's thrasher, Coachella Valley round-tailed ground squirrel, Palm Springs pocket mouse and large predators such as American badger, coyote, gray fox, bobcat and mountain lion. Although no biological corridors have been identified, this conservation area is known to be important for connectivity for PBS and other species (CVAG 2008).

Some of the conserved natural communities occurring in the conservation area include Sonoran creosote bush scrub, Sonoran mixed woody and succulent scrub and desert dry wash woodland. Very limited areas of active desert dunes, ephemeral desert sand fields, stabilized and partially stabilized desert sand fields, and stabilized shielded desert sand fields also occur in this conservation area (CVAG 2008).

Conservation objectives for the Santa Rosa and San Jacinto Mountains Conservation Area include, but are not limited to the following: conservation of a total of at least 55,890 acres of natural habitat, at least 19,205 acres of essential habitat for PBS and at least 2,545 acres in the City of La Quinta, ensuring that development allowed does not fragment core habitat, and that edge effects are minimized.

4.1.3 City of La Quinta General Plan

The La Quinta General Plan was designed as the policy document to guide the City's vision as expressed by its citizens, its leaders and as established by City Council. Although the general plan was designed to be compliant with applicable state and federal legislation, the City's goals, policies and programs are those of the citizens of La Quinta and are not intended to facilitate the agenda of any outside group or foreign entity (City of La Quinta 2015).

General Plan goals are broad statements reflecting the City's values, goals and aspirations. These goals address the physical development of the City, the protection of people and property from environmental and manmade hazards, as well as the preservation of the City's assets. Policies have been developed to accomplish the goals of the General Plan. They present specific performance requirements for each goal. Programs provide quantitative and qualitative targets to implement the policies in the General Plan.

La Quinta's General Plan outlines policy, goals, standards and guidelines for the physical development of the lands; residential, commercial and industrial structures; circulation; recreation; open space and conservation; safety; air quality; noise; and community design which

are set forth in the City's General Plan and Zoning Ordinance. More specifically, the City's Planning Division is responsible for the physical planning which includes: development review, analysis and compliance, environmental review, long-range planning and development policies.

5.0 METHODS

5.1 Literature Review

In preparation for the field assessment, a literature search was conducted to identify special status biological resources known from the vicinity of the Project alignment. In the context of this report, and for the purpose of this assessment, vicinity is defined as areas within a 1-mile radius of the Project alignment.

The literature search included a review of the following documents:

- Recovery Plan for Bighorn Sheep in the Peninsular Ranges, California (USFWS, 2000).
- California Natural Diversity Data Base (CNDDDB) RareFind 5 (CDFW 2015a)
- Special Animals List (CDFW 2015b)
- California Native Plant Society's (CNPS) Inventory of Rare, Threatened, and Endangered Plants of California (CNPS 2015a)
- Coachella Valley Multiple Species Habitat Conservation Plan (CVAG 2008)
- United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS). 2015a. Web Soil Survey
- Coachella Valley Water District Biological Survey Report for the Coachella Canal Relocation Project (CVWD 2013).
- USGS 7.5' *La Quinta, Calif.* quadrangle (USGS 2015)
- City of La Quinta General Plan (City of La Quinta 2015)
- National Wetlands Inventory (NWI)
- Assessing Climate-Related Changes in Water Resources in the Santa Rosa and San Jacinto Mountains National Monument. Technical report dated July 2014 and prepared for the Bureau of Land Management and the Coachella Valley Conservation Commission (University of California Riverside's Center for Conservation Biology 2014)
- Peninsular Bighorn Sheep Impact Assessment (Wehausen 2016)
- Western Burrowing Owls (*Athene cunicularia*) Survey Report, La Quinta Bighorn Sheep Barrier Project (CVCC 2016)

Scientific nomenclature for this document follows standard reference sources: For plant communities, CVMSHCP (CVAG 2008), CDFW (2015a); and Holland (1986) for flora, Jepson eFlora (2015) and the USDA NRCS PLANTS Database (2015b); for amphibians, reptiles, and mammals, CDFW (2014); and for birds, American Ornithologists Union (2015).

5.2 Field Assessment

The field assessment of the eastern portions of the Toe of Slope Alignment and portions of the Lake Cahuilla to Cove Alternative was conducted on 16 and 17 December 2015 by Amec Foster Wheeler Senior Biologists John F. Green and Michael D. Wilcox and the southern-most portions of the Proposed Alignment on 19 February 2016 by Wilcox. Others in attendance during the

December field assessment were Coachella Valley Association of Governments (CVAG)/ Coachella Valley Conservation Commission (CVCC) biologists Katie Barrows and Kathleen Brundige, Terra Nova principal John Criste and Terra Nova Assistant Environmental Planner Khadija Nadimi and bighorn sheep biologist John Wehausen. Staff from The Quarry Golf Club, PGA West, SilverRock Golf Resort, County Parks and the Coachella Valley Water District provided access to their respective facilities during the field assessment of the proposed alignment. Access to the westernmost portions of the Proposed Alignment (i.e., the areas that traverse the Traditions Golf Club) was not surveyed. It should be noted, however, that the portions of the Upslope Alternative, Ridgeline Alternative and Lake Cahuilla to Cove Alternative that are not shared with the Toe of Slope Alternative were not surveyed.

Onsite suitable habitat along the surveyed alignments was assessed based on the presence or absence of habitat components (e.g., soils, vegetation and topography) characteristic of the potentially occurring special-status biological resources determined by the literature review. The proposed alignments were walked to record pertinent field data and current site conditions. All flora and fauna observed or otherwise detected (e.g., vocalizations, presence of scat, tracks, and/or bones) during the course of this assessment were recorded in field notes and are included in Appendices 1 and 2. Plant species of uncertain identity were collected, pressed and identified by Andrew C. Sanders, Herbarium Collections Manager, University of California, Riverside. General weather and site conditions were also recorded at the beginning and end of each survey. Temperatures and wind speeds were recorded with a handheld Kestrel 2000 anemometer. Percent cloud cover was estimated.

6.0 RESULTS

6.1 Weather Conditions

Weather conditions during the assessments conducted for this Project were mild for this area at this time of year. Skies were clear with 0% cloud cover. Temperatures ranged from 45 to 82 degrees Fahrenheit. Winds were calm with estimated wind speeds of mostly 0-3 mph.

6.2 Topography and Soils

6.2.1 Toe of Slope Alternative

The elevation along the Toe of Slope Alternative ranges from approximately 7 meters (m) to 99 m (22 feet [ft.] to 325 ft.) above mean sea level (ASML).

The review of the onsite soils (based on the Riverside County, Coachella Valley Area, California Soil Survey [Soil Survey Staff 2013]) resulted in the following soil types mapped along this alignment (Figure 4):

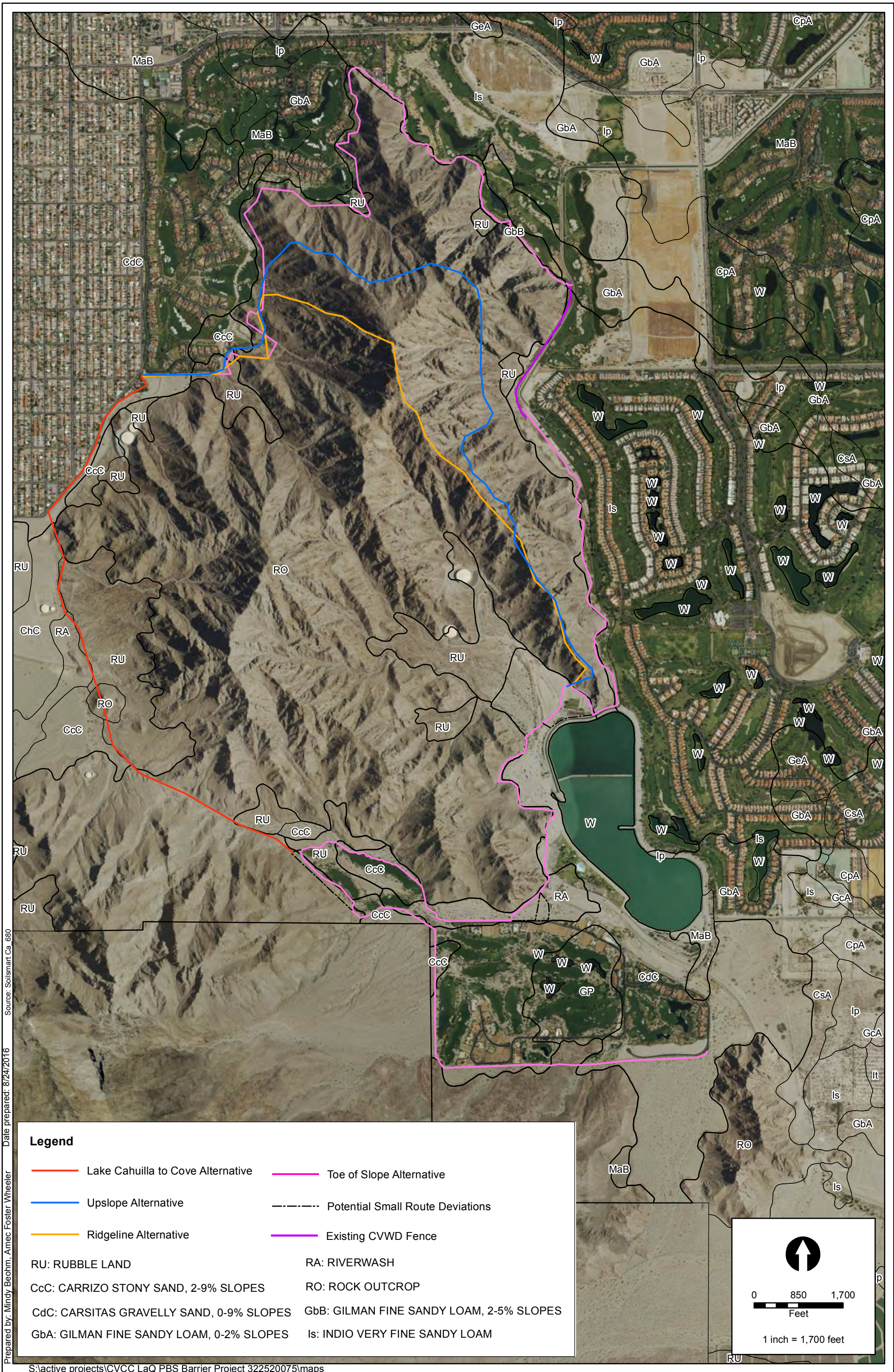
- **Carrizo Stony Sand (CcC), 2 to 9 percent slopes.** A gently to moderately sloping soil that occurs on alluvial cones where drainage from the mountains enters the Coachella Valley. These soils are often used for watershed and wildlife habitat (Knecht 1980).

- **Carsitas Gravelly Sand (CdC), 0 to 9 percent slopes.** A gently to moderately sloping soil on alluvial fans along the east, north and west edges of the Coachella Valley. These soils are often used for agriculture, residential development, wildlife habitat, recreation and watershed (Knecht 1980).
- **Gilman Fine Sandy Loam (GbA), 0 to 2 percent slopes.** A well-drained soil formed in alluvium where the water table is at a depth of more than 6 feet. These soils are often used for agriculture (Knecht 1980).
- **Gilman Fine Sandy Loam (GbB), 2 to 5 percent slopes.** A gently sloping soil that occurs at the edges of alluvial fans and valley fill. This soil is often used for agriculture (Knecht 1980).
- **Indio Very Fine Sandy Loam (Is).** A nearly level soil with a water table that is below 6 feet (Knecht 1980).
- **Riverwash (Ra).** Located in and adjacent to channels of perennial and intermittent stream courses. This soil consists of stratified, water-deposited stony, cobbly and gravelly coarse sand with only small amounts of fine sand. These soils are often used for watershed, wildlife habitat and recreation (Knecht 1980).
- **Rock Outcrop (RO).** Occurs on rolling to very steep mountainous areas. 75 to 100 percent of the surface is rock. Between rock outcrops is a 1 to 6 inch layer of sand, gravelly or loamy sand. These soils are often used for watershed, recreation and occasionally residential development (Knecht 1980).
- **Rubble Land (RU).** This soil type is located on gentle to steep slopes of very old alluvial fans and is 90 percent or more cobble, stone and boulders. Rocks on the surface often have desert varnish on the exposed surface. These soils are often used for watershed, wildlife habitat and recreation (Knecht 1980).

Soils and substrates in the Project area varied from small undisturbed, natural sandy/loamy areas, undisturbed rocky mountain slopes, disturbed surfaces and developed areas (the edges of grassy fairways, greens and landscaping). The developed areas consisted of landscaped golf courses, Lake Cahuilla County Park facilities, single-family dwellings, maintenance yards and facilities, paved and unimproved roads, paved and unpaved trails, golf cart and bike paths (Appendix 3, Photographic Exhibits). No sand dunes, hummocks, clay lenses, springs, seeps, or natural bodies of water were evident on the Project site. The Coachella Branch of the All American Canal, the man-made recreational lake at the Lake Cahuilla County Park and various water hazards within the onsite golf courses are present throughout, mostly adjacent to various areas along the Toe of Slope Alignment.

Review of the National Wetlands Inventory (NWI) indicated that five (5) unnamed blue line streams, which are dry washes that drain the steep slopes of the Santa Rosa Mountains, and one (1) area of freshwater emergent wetland occur along the Toe of Slope Alternative. It

appears that implementation of this alternative would traverse these five drainages at twelve (12) different




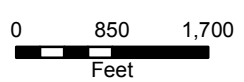
Prepared by: Mindy Boehm, Amec Foster Wheeler
 Date prepared: 8/24/2016
 Source: Solismart Ca 680

Legend

— Lake Cahuilla to Cove Alternative	— Toe of Slope Alternative
— Upslope Alternative	- - - - Potential Small Route Deviations
— Ridgeline Alternative	— Existing CVWD Fence

RU: RUBBLE LAND	RA: RIVERWASH
CcC: CARRIZO STONY SAND, 2-9% SLOPES	RO: ROCK OUTCROP
CdC: CARSITAS GRAVELLY SAND, 0-9% SLOPES	GbB: GILMAN FINE SANDY LOAM, 2-5% SLOPES
GbA: GILMAN FINE SANDY LOAM, 0-2% SLOPES	Is: INDIO VERY FINE SANDY LOAM





 1 inch = 1,700 feet

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Soils Map
Peninsular Bighorn Sheep Barrier Project

FIGURE
4

locations (Figure 5). It appears that the alignment of this alternative does not cross, but skirts the edge of the area of freshwater emergent wetland. These drainages and the area of freshwater emergent wetland may fall under the jurisdiction of the USACE or CDFW. A formal jurisdictional delineation to determine which, if any, of these drainages fall under the jurisdiction of these regulatory agencies, however, has not been performed for this Project, however, may be required should Project implementation result in impacts to any of these potentially jurisdictional areas.

6.2.1 Upslope Alternative

The elevation along the portions of the Upslope Alternative that are not shared with the Toe of Slope Alternative ranges from approximately 8 m to 279 m (26 ft. to 915 ft.) above sea level.

The onsite soils for this alternative are almost entirely Rock Outcrop (Ro) (Figure 4). Small areas of CcC and RU also appear to be present at the location where this alternative meets the Toe of Slope Alternative (Soil Survey Staff 2013).

The substrates along the Upslope Alternative are almost entirely undisturbed steep, jagged mountainous rock. No sand dunes, hummocks, clay lenses, springs, seeps, natural bodies of water, development, roads or infrastructure of any kind are evident along the alignment of this alternative.

Review of the NWI indicated that one (1) unnamed blue line stream is present and would be traversed by the Upslope Alternative (Figure 5). It appears that implementation of this alternative would ultimately require at least ten (10) crossings of at least five (5) different unnamed drainages as this alternative joins the Toe of Slope Alternative which crosses four (4) additional drainages at nine (9) different locations. These drainages may fall under the jurisdiction of the USACE or CDFW.

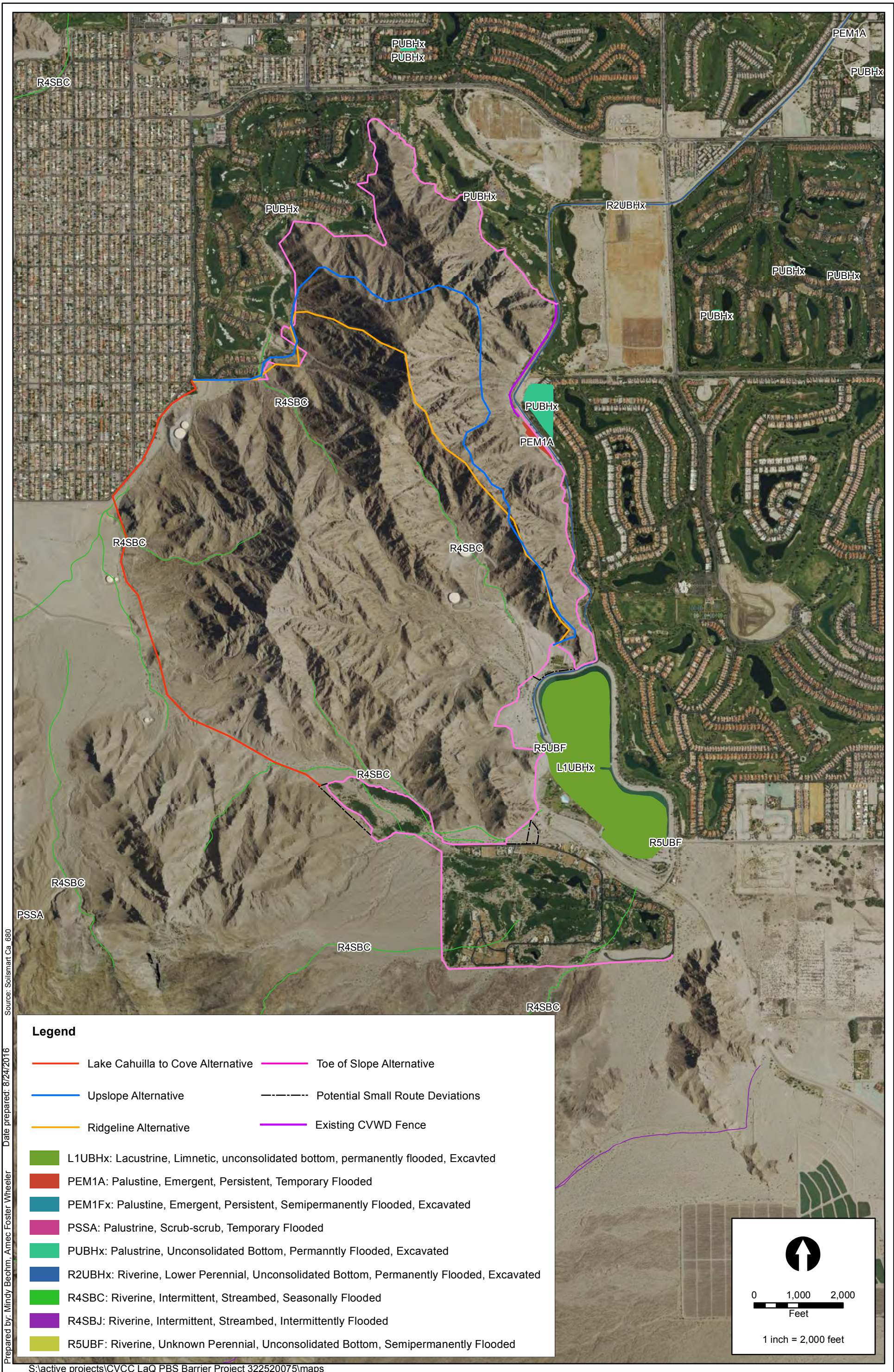
6.2.2 Ridgeline Alternative

The elevation along the portions of the Ridgeline Alternative that are not shared with the Toe of Slope Alternative ranges from approximately 9 m to 442 m (31 ft. to 1,450 ft.) above sea level.

The onsite soils for this alternative are almost entirely Rock Outcrop (Ro) (Figure 4). Small areas of Carrizo Stony Sand (CcC) and Rubble Land (RU) also appear to be present at the locations where this alternative joins the Toe of Slope Alternative (Soil Survey Staff 2013).

The substrates along the Ridgeline Alternative are almost entirely undisturbed steep, jagged mountainous rock. No sand dunes, hummocks, clay lenses, springs, seeps, natural bodies of water, development, roads or infrastructure of any kind are evident along the alignment of this alternative.


Review of the NWI indicated that one (1) unnamed blue line stream is present and would be traversed by the Ridgeline Alternative (Figure 5). It appears that implementation of this alternative would ultimately require at least ten (10) crossings of at least five (5) different unnamed drainages as this alternative joins the Toe of Slope Alternative which crosses four (4) additional drainages at nine different locations. These drainages may fall under the jurisdiction of the USACE or CDFW.

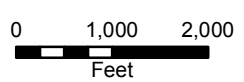


Prepared by: Mindy Beohm, Amec Foster Wheeler
 Date prepared: 8/24/2016
 Source: Solismart Ca 680

Legend

- Lake Cahuilla to Cove Alternative
- Upslope Alternative
- Ridgeline Alternative
- Toe of Slope Alternative
- Potential Small Route Deviations
- Existing CVWD Fence
- L1UBHx: Lacustrine, Limnetic, unconsolidated bottom, permanently flooded, Excavated
- PEM1A: Palustrine, Emergent, Persistent, Temporary Flooded
- PEM1Fx: Palustrine, Emergent, Persistent, Semipermanently Flooded, Excavated
- PSSA: Palustrine, Scrub-scrub, Temporary Flooded
- PUBHx: Palustrine, Unconsolidated Bottom, Permanently Flooded, Excavated
- R2UBHx: Riverine, Lower Perennial, Unconsolidated Bottom, Permanently Flooded, Excavated
- R4SBC: Riverine, Intermittent, Streambed, Seasonally Flooded
- R4SBJ: Riverine, Intermittent, Streambed, Intermittently Flooded
- R5UBF: Riverine, Unknown Perennial, Unconsolidated Bottom, Semipermanently Flooded





 1 inch = 2,000 feet

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NWI Drainages & Bodies of Water Map
 Peninsular Bighorn Sheep Barrier Project

FIGURE
5

6.2.3 Lake Cahuilla to Cove Alternative

The elevation along the portions of the Lake Cahuilla to Cove Alternative that are not shared with the Toe of Slope Alternative ranges from approximately 55 m to 170 m (180 ft. to 558 ft.) above sea level.

The onsite soils for this alternative include a mixture of CcC, CdC, RO and RU (Soil Survey Staff 2013) (Figure 4).

The substrates along the Lake Cahuilla to Cove Alternative are a mixture of relatively undisturbed sandy, gravelly and rocky alluvium as well as areas of undisturbed steep, rocky, mountainous slopes. No sand dunes, hummocks, clay lenses, springs, seeps, natural bodies of water, development, roads or infrastructure of any kind are evident along the alignment of this alternative.

Review of the two (2) unnamed blue line streams are present and would be traversed by the Lake Cahuilla to Cove Alternative (Figure 5). It appears that implementation of this alternative would ultimately require at least six (6) crossings of at least four (4) different unnamed drainages as this alternative joins the Toe of Slope Alternative which crosses two (2) additional drainages at four (4) different locations. These drainages may fall under the jurisdiction of the USACE or CDFW.

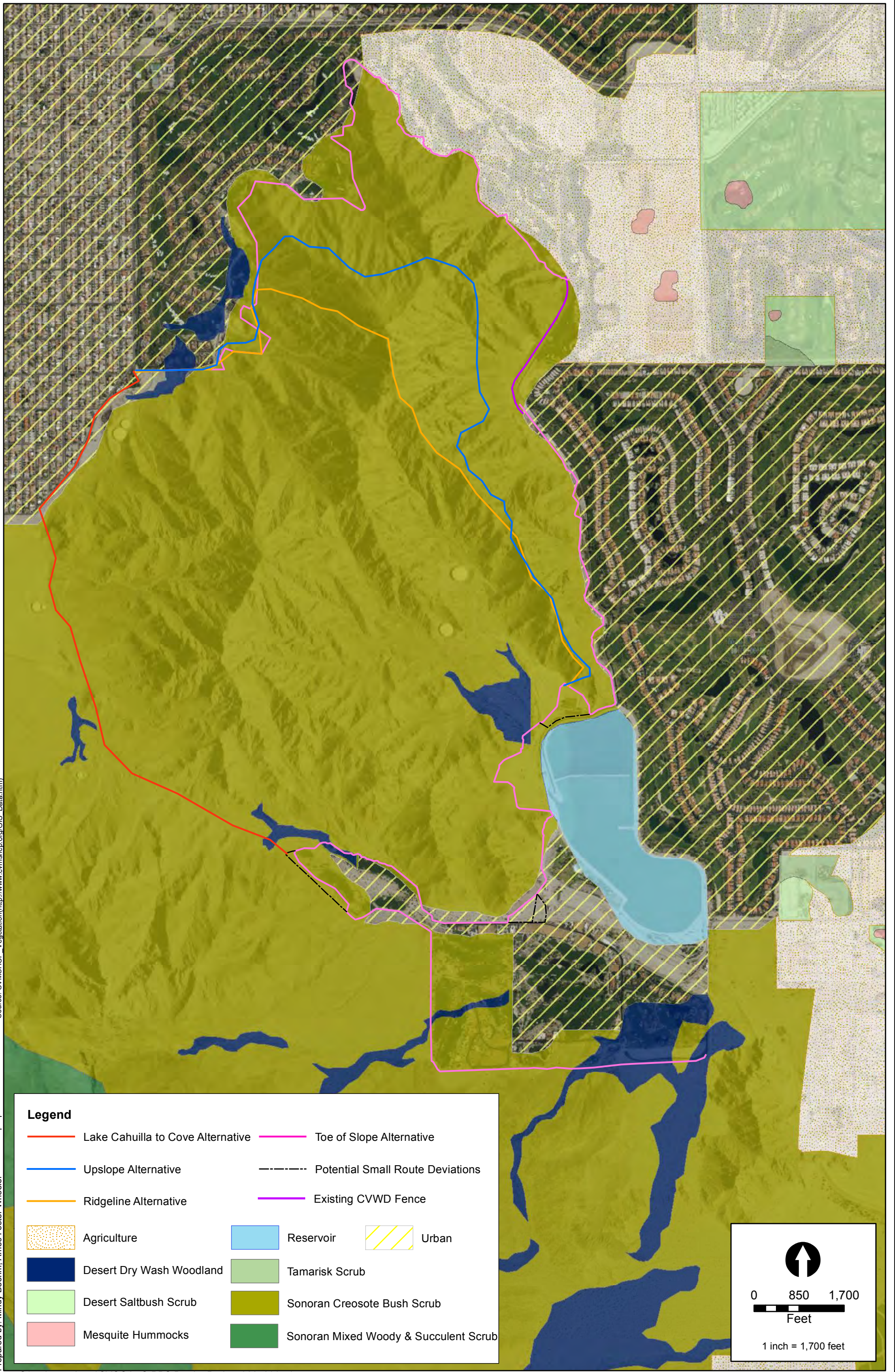
6.3 Vegetation

The dominant vegetation community for all of the alternatives is Sonoran creosote bush scrub (CVAG 2009). Sawyer et. al. (2009) refers to this community as “*Larrea tridentata*-*Ambrosia dumosa* shrubland alliance (creosote bush-white burr sage scrub)” (Figure 6). Representative dominant perennial plant species observed included: creosote bush (*Larrea tridentata*), burrowbush (*Ambrosia dumosa*), brittlebush (*Encelia farinosa*), allscale (*Atriplex polycarpa*), quailbush (*Atriplex lentiformis*), sweetbush (*Bebbia juncea* var. *aspera*), desert lavender (*Condea emoryi*) and scale broom (*Lepidospartum squamatum*). Other representative, but less abundant perennials observed included: California indigo bush (*Psoralea arborescens* var. *simplicifolius*), catclaw acacia (*Acacia* sp.), smoke tree (*Psoralea spinosus*), honey mesquite (*Prosopis glandulosa*), blue palo verde (*Parkinsonia florida*), desert willow (*Chilopsis linearis*), golden cholla (*Cylindropuntia echinocarpa*), pencil cholla (*Cylindropuntia ramosissima*) and barrel cactus (*Ferocactus cylindraceus*). Representative annuals observed during the surveys were mostly dead or dormant and included desert trumpet (*Eriogonum inflatum*), brown-eyed primrose (*Chylismia claviformis*), desert dicoria (*Dicoria canescens*), and apricot mallow (*Sphaeralcea ambigua*). Non-native species included Bermuda grass (*Cynodon dactylon*), Mediterranean schismus (*Schismus barbatus*), and tall tumbled mustard (*Sisymbrium cf. altissimum*). Sonoran creosote bush scrub is the predominant vegetation community occurring below 2,500 feet in the Colorado Desert from the Little San Bernardino Mountains south and eastward into Arizona and Mexico (Holland 1986).




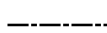



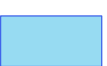



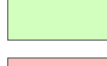



Smaller areas of desert dry wash woodland are intermittently present at various locations throughout the alignments of the Toe of Slope and Lake Cahuilla to Cove Alternatives. The

Upslope Alternative and Ridgeline Alternative would also traverse this community after they join the Toe of Slope Alternative. Representative dominant perennial plant species observed

Prepared by: Mindy Boehm, Amec Foster Wheeler Date prepared: 8/25/2016 Source: CVMSHCP_Vegetation(http://www.cvmshcp.org/GIS_Data.htm)



Legend

- | | | |
|---|---|---|
|  Lake Cahuilla to Cove Alternative |  Toe of Slope Alternative | |
|  Upslope Alternative |  Potential Small Route Deviations | |
|  Ridgeline Alternative |  Existing CVWD Fence | |
|  Agriculture |  Reservoir |  Urban |
|  Desert Dry Wash Woodland |  Tamarisk Scrub | |
|  Desert Saltbush Scrub |  Sonoran Creosote Bush Scrub | |
|  Mesquite Hummocks |  Sonoran Mixed Woody & Succulent Scrub | |

0 850 1,700
Feet
1 inch = 1,700 feet



Vegetation Map
Peninsular Bighorn Sheep Barrier Project

FIGURE
6

included: creosote bush, burrobush (*Ambrosia dumosa*), catclaw acacia (*Senegalia greggii*), smoke tree, honey mesquite, blue palo verde and desert willow.

Landscaped golf courses and heavily disturbed areas (weedy and/or largely barren) are intermittently present along the Toe of Slope Alternative. The other alternatives also traverse or skirt the edges of the landscaped and disturbed areas after joining the Toe of Slope Alternative. The landscaped areas included the neatly manicured greens and fairways of the various golf courses that the alignment traverses or skirts as well as the ornamental trees, shrubs, cacti and succulents (natives and exotics) that are intermittently present along the alignment within these areas. Some of the vegetation commonly used in desert landscaping are species that are known to be poisonous to herbivorous wildlife such as PBS and can cause severe illness and/or death when ingested (e.g., oleander [*Nerium oleander*], gum tree [*Eucalyptus spp.*], lantana [*Lantana camara*], Sago palm and other cycads [*Cycas spp.*], lavender [*Lavendula angustifolia*], yucca [*Yucca spp.*]). The disturbed areas included various graded, weedy and/or largely barren lots, fill slopes surrounding development such as the Coachella Branch of the All American Canal

No special-status vegetation communities were observed along the alignments of any of the alternatives surveyed and none are expected along the Upslope Alternative, Ridgeline Alternative or unsurveyed portions of the Lake Cahuilla to Cove Alternative. A list of the plant species observed during the surveys, including common and scientific names, is appended to this report (Appendix 1).

6.4 Wildlife

Vertebrate wildlife directly observed and/or detected otherwise (e.g., scat, bones, prints, feathers, burrows, etc.) during the surveys included a total of at least 57 species. This number includes animals directly observed and detected through the presence of sign (i.e., tracks, scat, feathers, bones and/or burrows). Most were identified to species; however, some could only be identified to class as in the case of rodent burrows. The total detected fauna included: two (2) fish, three (3) reptiles, at least forty-three (43) birds, and at least nine (9) mammals. No amphibians were detected. See Appendix 2 for a complete list of all wildlife species detected.

Three (3) reptile species were observed onsite. These included side-blotched lizard (*Uta stansburiana*), western whiptail (*Aspidoscelis tigris*) and common chuckwalla (*Sauromalus ater*). A variety of other common species are also expected to occur during more favorable time of the year and during favorable weather. These include, but are not limited to: desert iguana (*Dipsosaurus dorsalis*), zebra-tailed lizard (*Callisaurus draconoides*), desert horned lizard (*Phrynosoma platyrhinos*), desert banded gecko (*Coelonyx variegatus variegatus*), red coachwhip (*Coluber flagellum*), glossy snake (*Arizona elegans*), Colorado Desert shovel-nosed snake (*Chionactis occipitalis annulata*), southwestern speckled rattlesnake (*Crotalus mitchellii pyrrhus*). The site supports no suitable habitat for any native amphibians.

The forty-three (43) species of birds observed onsite included, but were not limited to: great blue heron (*Ardea herodias*), red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), Gambel's quail (*Callipepla gambelii*), mourning dove (*Zenaidura macroura*), greater

roadrunner (*Geococcyx californianus*), Anna's hummingbird (*Calypte anna*), Say's phoebe (*Sayornis saya*), loggerhead shrike (*Lanius ludovicianus*), common raven (*Corvus corax*), verdin (*Auriparus flaviceps*), rock wren (*Salpinctes obsoletus*), black-tailed gnatcatcher (*Polioptila melanura*), Abert's towhee (*Pipilo aberti*) and white-crowned sparrow (*Zonotrichia leucophrys*).

The nine (9) mammals detected onsite included, but were not limited to: PBS (*Ovis canadensis nelsoni*), black-tailed jackrabbit (*Lepus californicus*), coyote (*Canis latrans*), Botta's pocket gopher (*Thomomys bottae*) and white-tailed antelope squirrel (*Ammospermophilus leucurus*). Other small mammals, particularly rodents, occur on the site as small mammal burrows were observed; however the species that are present cannot be conclusively determined without a more intensive trapping effort. Larger carnivores such as the gray fox (*Urocyon cinereoargenteus*), bobcat (*Lynx rufus*) and mountain lion (*Puma concolor*) were not detected by this study but have the potential to occur onsite as well.

It should be noted that relatively short-term biological studies of this nature are often limited by the seasonality of annual plants, the migratory habits of many birds, the fossorial and nocturnal habits of many mammals and reptiles, and the timing of field surveys. A complete inventory of the wildlife on the site would require extensive year-round surveys for birds, amphibians, and reptiles. Additional surveys, such as live trapping for small mammals, placement of scent stations and tracking stations for the detection of larger nocturnal mammals would also be required for a complete inventory. Knowledge of habitat associations, natural history, seasonality, and distribution is essential in the assessment of the potential for occurrence of the various sensitive plants and animals known to occur throughout the various areas of Riverside County. For these reasons, other common and special status species that were not observed onsite may also have the potential to occur based on their geographic distribution, habitat preferences, and the regional location of the site. Tables 1 through 6 below summarize information on sensitive species known to occur in the vicinity of the Project site, including the status of each species on the Project site based on the best available information and the collective expertise of Amec Foster Wheeler biologists.

6.5 Special Status Species

Plant or animal taxa may be considered "sensitive" or as having "special status" due to declining populations, vulnerability to habitat change, or because they have restricted ranges. Some are listed as threatened or endangered by the USFWS or by the CDFW and are protected by the federal and state Endangered Species acts and the NPPA. Others have been identified as sensitive or as special-status species by the USFWS, the BLM, the CDFW, or by private conservation organizations, including the CNPS. Unlisted sensitive species do not have formal state or federal status, but may nevertheless be considered significant under CEQA.

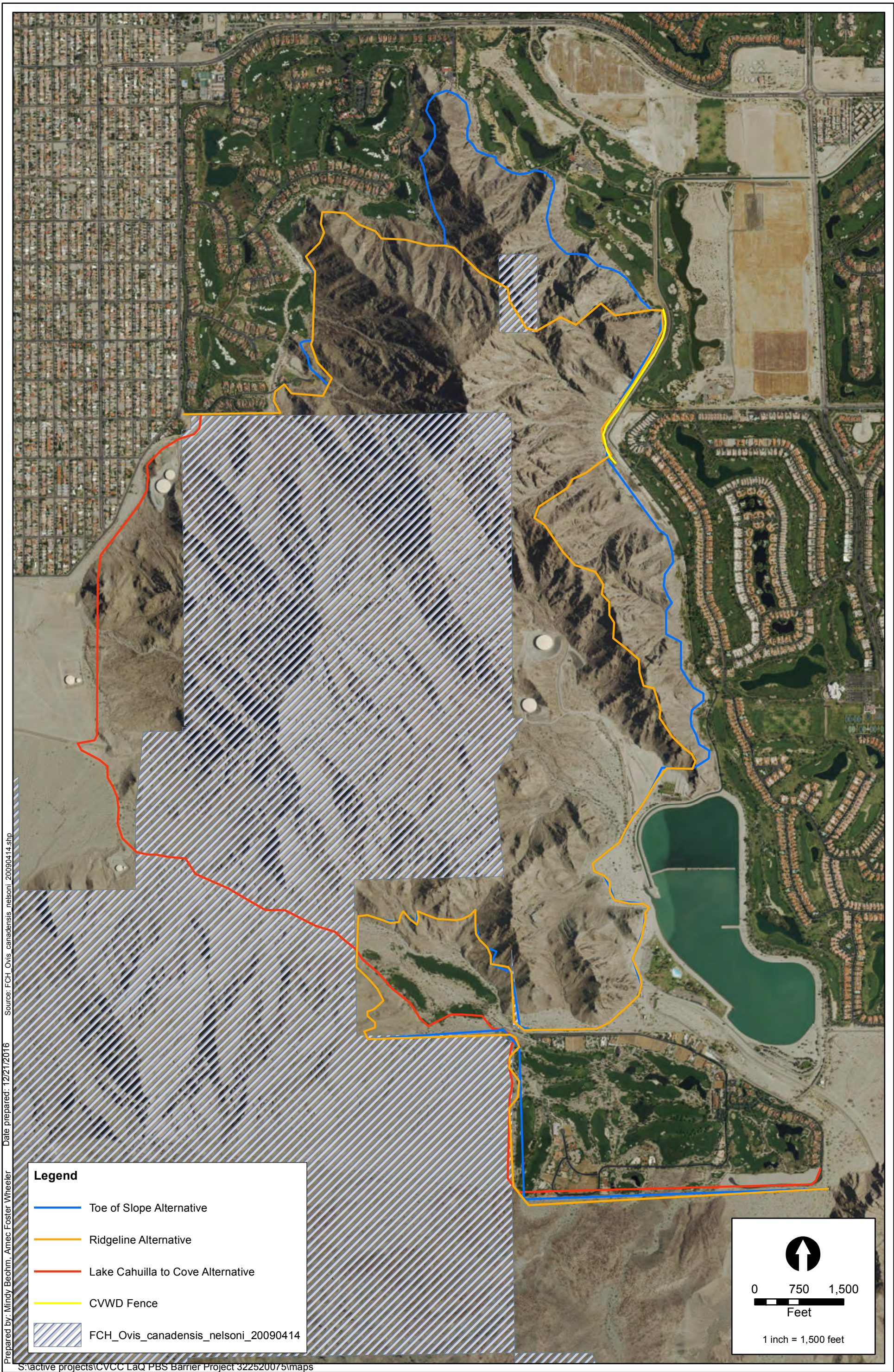
The review of the CNDDDB, CNPS Online Inventory of Rare Plants, other biological reports from the vicinity, and consultation with other experienced biologists/naturalists resulted in the identification of 42 special-status biological resources known to occur in the vicinity (within an approximate 1-mile radius) of the Project alignment. These included 18 plants, one vegetation communities, two invertebrates, four reptiles, 11 birds, and five mammals. Tables 1 through 6 provide a complete list of the special-status biological resources, their associated legal status, and their respective on-site occurrence potentials.

The CVMSHCP provides conservation for twenty-seven (27) imperiled plant and animal species (5 plants, 2 insects, 1 amphibian, 3 reptiles, 11 birds, and 5 mammals). These include federal and state-listed species, federal and California Species of Concern (CSC), and species on the CNPS sensitive species lists. Also included are species that are designated as sensitive by the BLM regardless of their other federal, state, or regional conservation status.

Designated critical habitat for PBS is located along and immediately adjacent to portions of the Toe of Slope Alternative (Figure 7). Portions of the Upslope Alternative, Ridgeline Alternative and Lak Cahuilla to Cove Alternative are within designated critical habitat for PBS and immediately adjacent to it after they join the Toe of Slope Alignment. Modeled habitat for triple-ribbed milkvetch (*Astragalus tricarinatus*), Coachella Valley fringe-toed lizard (*Uma inornata*), flat-tailed horned lizard (*Phrynosoma mcallii*), prairie falcon (*Falco mexicanus*), Le Conte's thrasher (*Toxostoma lecontei*), black-tailed gnatcatcher (*Polioptila melanura*), pocketed free-tailed bat (*Nyctinomops femorosaccus*), western yellow bat (*Lasiurus xanthinus*), Palm Springs pocket mouse (*Parognathus longimembris bangsi*) and Coachella Valley round-tailed ground squirrel (*Spermophilus tereticaudus chlorus*) is also intermittently present at various locations along the alignments of the proposed alternatives (Figure 8).

Three special-status species were observed during the course of the three-day survey. These included the black-tailed gnatcatcher, vermilion flycatcher and PBS. Several black-tailed gnatcatchers and several vermilion flycatchers were observed at various locations along and/or adjacent to the Toe of Slope Alternative. The black-tailed gnatcatchers were observed foraging within the native Sonoran creosote bush scrub and desert drywash woodland present along the alignment adjacent to PGA West and The Quarry golf clubs. The vermilion flycatchers were observed foraging and perching in trees and structures at locations within the adjacent landscaped golf course on PGA West. Several herds of PBS were observed at various locations along and adjacent to the Toe of Slope Alignment on and immediately adjacent to The Quarry, PGA West and SilverRock golf resorts. At least two groups of PBS were also observed along or adjacent to the alignments for the Upslope and Ridgeline Alternatives. It is likely, however, that these groups were some of the same individuals that were later observed on and adjacent to the Toe of Slope Alignment.

Tables 1 through 6 summarize information on all special-status species that have been reported within the vicinity (1-mile radius) or are considered to have some potential to occur onsite based on geographic distribution and presence of potentially suitable habitat. These tables provide the names, legal or conservation status, general habitat associations, and the probability of occurrence for each of these species.



Prepared by: Mindy Boehm, Amec Foster Wheeler Date prepared: 12/21/2016 Source: FCH_Ovis canadensis_nelsoni_20090414.shp

Legend

- Toe of Slope Alternative
- Ridgeline Alternative
- Lake Cahuilla to Cove Alternative
- CVWD Fence
- FCH_Ovis_canadensis_nelsoni_20090414

0 750 1,500

 Feet

 1 inch = 1,500 feet

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Designated Critical Habitat for Peninsular Bighorn Sheep
Peninsular Bighorn Sheep Barrier Project

FIGURE
7



Prepared by: Mindy Boehm, Amec Foster Wheeler
 Date prepared: 8/26/2016
 Source: CVMSHCP_Vegetation(http://www.cvmshcp.org/GIS_Data.htm)

S:\active projects\CVCC LaQ PBS Barrier Project 322520075\maps

CVMSHCP Modeled Habitat for Special Status Species

Peninsular Bighorn Sheep Barrier Project

FIGURE

8



Table 1. Special Status Plants

Species	Status	Habitat	Probability
<i>Abronia villosa</i> var. <i>aurita</i> chaparral sand-verbena	F: None C: None CNPS: List 1B.1 Global Rank: G5T2T3 State Rank: S2 CVMSHCP: No	Sandy areas in chaparral and coastal sage scrub; 75-1600 m. B: Jan-Sept.	Very Low (habitat marginally suitable. <i>Abronia villosa</i> occurs in the La Quinta Cove but presence of this var. has not been documented)
<i>Astragalus lentiginosus</i> var. <i>borreganus</i> Borrego milkvetch	F: None C: None CNPS: List 4.3 Global Rank: G5T5? State Rank: S4 CVMSHCP: No	Mojave desert scrub, Sonoran desert scrub; 30 - 320 m. B: Feb–May.	Very Low-Low (older record, not within 1 mile radius)
<i>Astragalus lentiginosus</i> var. <i>coachellae</i> Coachella Valley milkvetch	F = END C = None CNPS: List 1B.2 Global Rank: G2 State Rank: S2 CVMSHCP: Yes	Sonoran desert scrub; sandy flats, washes, outwash fans, sometimes on dunes. 40 - 665 m. B: Jan –Sept.	Very low (Prefers sandy substrates; limited and marginally suitable)
<i>Astragalus preussii</i> var. <i>laxiflorus</i> Lancaster milkvetch	F: None C: None CNPS: List 1B.1 Global Rank: G4T2 State Rank: S1 CVMSHCP: No	Chenopod scrub; B: Mar-May	Absent (non-georeferenced records are from 1928 in area; known range outside this area)
<i>Astragalus tricarinatus</i> triple-ribbed milkvetch	F: END C: None CNPS: List 1B.2 Global Rank: G2 State Rank: S2 CVMSHCP: Yes	Joshua tree woodland & Sonoran desert scrub on hot, rocky slopes in canyons and along edge of boulder-strewn desert washes, with <i>Larrea</i> and <i>Encelia</i> . 455-1525 m. B: February – May.	Low (CVMSHCP has modeled habitat. Found recently in just outside of vicinity in Martinez and Agua Alta Canyons; will disperse from higher elevations in washes)
<i>Chorizanthe xanti</i> var. <i>leucotheca</i> white-bracted spineflower	F: None C: None CNPS: List 1B.2 Global Rank: G3T3 State Rank: S3 CVMSCHP: No	Mojavean desert scrub, pinyon and juniper woodland, sandy or gravelly. 300-1200 m. B: April – June.	Very Low (Alignment at edge of species known geographic and elevational range)
<i>Cryptantha costata</i> ribbed cryptantha	F: None C: None CNPS List: List 4.3 Global Rank: G4G5 State Rank: S4 CVMSCHP: No	Sandy Mojave desert scrub, sandy Sonoran desert scrub, dunes; -60-500 m. B: Feb–May	Low (Onsite sandy substrates extremely limited, dunes not present. Reported from vicinity of La Quinta Cove in 1962)
<i>Cryptantha holoptera</i> winged cryptantha	F: None C: None CNPS: List 4.3 Global Rank: G4G5 State Rank: S4 CVMSCHP: No	Mojave desert scrub, Sonoran desert scrub; 100-1690 m. B: Mar–Apr.	Low (Found in vicinity of Lake Cahuilla in 1983)

Table 1. Special Status Plants

Species	Status	Habitat	Probability
<i>Ditaxis clariana</i> glandular ditaxis	F: None C: None CNPS: List 2B.2 Global Rank: G3G4 State Rank: S2 CVMSHCP: No	Sandy Sonoran Desert scrub and Mojavean desert scrub; 0-465 m. B: Oct-Mar.	Moderate-High (Known from immediate vicinity, however sandy substrates limited along alignment)
<i>Ditaxis serrata</i> var. <i>californica</i> California ditaxis	F: None C: None CNPS: List 3.2 Global Rank: G5T3T4 State Rank: S2? CVMSHCP: No	Sonoran Desert scrub; 30-1000 m. B: Mar-Dec.	Moderate (Species is common on alluvial fans, mountain slopes around La Quinta Cove)
<i>Linanthus [Gilia] maculatus</i> Little San Bernardino Mountains linanthus (gilia)	F: None C: None CNPS: List 1B.3 Global Rank: G2G3T1T2 State Rank: S2? CVMSHCP: Yes	Desert dunes, Sonoran & Mojavean desert scrub, Joshua tree woodland; most often on low benches along washes or bajadas where substrate shows evidence of water flow. From 195 - 2075 m. B: March – May.	Absent (Outside of known range)
<i>Marina orcuttii</i> var. <i>orcuttii</i> California marina	F: None C: None CNPS List 1B.3 Global Rank: G2G3T1T2 State Rank: S2? CVMSHCP: No	Rocky chaparral, pinyon and juniper woodland, Sonoran desert scrub; 1050-1160 m; May-Oct.	Absent (Alignment below elevational range of species)
<i>Nemacaulis denudata</i> var. <i>gracilis</i> slender cottonheads	F: None C: None CNPS: List 2B.2 Global Rank: G3G4T3? State Rank: S2 CVMSHCP: No	Sandy places in coastal dunes, desert dunes, & Sonoran desert scrub. -50 to 400 m. B: Mar – May.	Absent (Alignment below elevational range of species. Dunes absent, onsite sandy substrates limited and marginal)
<i>Pseudorontium cyathiferum</i> Deep Canyon snapdragon	F: None C: None CNPS: List 2B.3 Global Rank: G4? State Rank: S1 CVMSHCP: No	Sonoran desert scrub in rocky washes and on rocky slopes. Restricted to the immediate vicinity of Deep Canyon; 0-800 m. B: Feb-Apr.	Very Low (Alignment just outside the eastern edge of this species very limited known distribution)
<i>Salvia greatae</i> Orocopia sage	F: None C: None CNPS: List 1B.3 Global Rank: G2G3 State Rank: S2S3 CVMSHCP: Yes	Mojave desert scrub, Sonoran desert scrub; -40-825 m. B: Mar-Apr.	Very low (Perennial shrub not detected. Alignment is outside species known distribution)
<i>Selaginella eremophila</i> desert spike-moss	F: None C: None CNPS: List 2B.2 Global Rank: G4 State Rank: S2S3 CVMSHCP: No	Chaparral, Sonoran desert scrub; shaded sites, gravelly soils, crevices or among rocks. 200-900 m. B: May – July.	Absent (Alignment below elevational range of species)

Table 1. Special Status Plants

Species	Status	Habitat	Probability
<i>Stemodia durantifolia</i> purple stemodia	F: None C: None CNPS: List 2B.1 Global Rank: G5 State Rank: S2 CVMSHCP: No	Mesic sites on sandy soils in Sonoran Desert scrub; 180-299 m; Jan-Dec.	Absent (Requisite mesic habitat absent. Alignment below elevational range of species)
<i>Xylorhiza cognata</i> Mecca-aster	F: None C: None CNPS: List 1B.2 Global Rank: G2 State Rank: S2 CVMSHCP: Yes	Grows on steep canyon slopes on sandstone and clay substrates; 20-305 m; B: Jan-Jun	Absent (Requisite sandstone and clay substrates absent)

Table 2. Special Status Vegetation Communities

Community	Status	Habitat	Probability
desert fan palm oasis woodland	F: None C: None Global Rank: G3 State Rank: S3.2 CVMSHCP: Yes	Natural <i>Washingtonia filifera</i> groves	Absent (Although palms intermittently present [most likely planted], oases and/or woodlands are absent)

Table 3. Special Status Invertebrates

Species	Status	Habitat	Probability
<i>Macrobaenetes valgum</i> Coachella giant sand treader cricket	F: None C: None Global Rank: G1G2 State Rank: S1S2 CVMSHCP: Yes	Active sand dune hummocks and ridges, sites favorable to permanent habitation include spring-moistened sand.	Absent (Dune, hummocks and moist sands absent)
<i>Stenopelmatus cahuiensis</i> Coachella Valley Jerusalem cricket	F: None C: None Global Rank: G1G2 State Rank: S1S2 CVMSHCP: Yes	Wind-deposited (aeolian) sand dunes, drift sands and water deposited (alluvial) gravelly/sandy soils	Absent (Extensive sandy substrates lacking. Alignment is outside known distribution)

Table 4. Special Status Amphibians & Reptiles

Species	Status	Habitat	Probability
<i>Crotalus ruber ruber</i> northern red-diamond rattlesnake	F: None C: SSC Global Rank: G4 State Rank: S3 CVMSHCP: No	Chaparral, woodland, grassland, desert in rocky areas & dense vegetation, Needs burrows, rock cracks, or surface cover objects.	Moderate (Although habitat suitable, alignment is at eastern edge of species distribution. Known from vicinity)

Table 4. Special Status Amphibians & Reptiles

Species	Status	Habitat	Probability
<i>Gopherus agassizi</i> desert tortoise	F: THR C: THR Global Rank: G3 State Rank: S2 CVMSHCP: Yes	Creosote bush scrub, Joshua tree woodland, saltbush scrub); washes, arroyos, bajadas, rocky hillsides, open flat desert.	Low-Moderate (Habitat intermittently suitable, however very low tortoise densities in vicinity)
<i>Phrynosoma mcallii</i> flat-tailed horned lizard	F: None C: CAN, SSC Global Rank: G3 State Rank: S2 CVMSHCP: Yes	Restricted to desert washes and desert flats; requires vegetative cover, ants, and fine sand.	Low (Suitable habitat along alignment intermittent and limited)
<i>Uma inornata</i> Coachella Valley fringe-toed lizard	F: THR C: END Global Rank: G1Q State Rank: S1 CVMSHCP: Yes	Requires fine, loose, windblown sand interspersed with hardpan and widely spaced desert shrubs.	Absent (Aeolian sands lacking)

Table 5. Special Status Birds

Species	Status	Habitat	Probability
<i>Athene cunicularia</i> burrowing owl	F: MBTA, BCC C: SSC (burrows) Global Rank: G4 State Rank: S3 CVMSHCP: Yes*	Open, dry annual or perennial grassland, deserts & scrublands characterized by low-growing vegetation. Burrow sites essential.	Nesting: Low-Moderate (Suitable habitat limited. Modeled habitat for nesting and migration, Very few potential shelter opportunities observed. No sign detected) Foraging: Low (Same as above)
<i>Dendroica petechia</i> yellow warbler	F: MBTA C: SSC (nesting) Global Rank: G5 State Rank: S3S4 CVMSHCP: Yes	riparian forest and woodland; nests along Mojave River, Santa Ana River, Kern River, and many others in s. Calif.	Nesting: Absent (requisite riparian habitat lacking) Foraging: Very Low (Migration only)
<i>Empidonax traillii extimus</i> southwestern willow flycatcher	F: END C: END Global Rank: G5T2 State Rank: S1 CVMSHCP: Yes	Nests in large areas of riparian forests and woodlands	Nesting: Absent (Riparian habitat lacking) Foraging: Low-Moderate (Migration only)
<i>Falco mexicanus</i> prairie falcon	F = MBTA, BCC Global = G5 State = S3 C = SSC (nesting) CVMSHCP = No	Breeding sites located on cliffs, but forages far afield.	Nesting: Moderate (Steep cliffs immediately adjacent to site provide suitable nesting habitat) Foraging: High (Even if the species does not nest on the steep cliffs immediately adjacent to the site, this species nests in the vicinity and is known to forage widely over the Coachella Valley)

Table 5. Special Status Birds

Species	Status	Habitat	Probability
<i>Icteria virens</i> yellow-breasted chat	F: MBTA C: SSC (nesting) Global Rank: G5 State Rank: S3 CVMSHCP = Yes	Riparian forest and woodland; nests along many river systems in southern CA	Nesting: Absent (Requisite riparian habitat lacking) Foraging: Very Low (Migration only)
<i>Lanius ludovicianus</i> loggerhead shrike	F: MBTA , BCC C: SSC (nesting) Global Rank: G4 State Rank: S4 CVMSHCP: No	Breeds mainly in shrublands or open woodlands with some grass cover & areas of bare ground. Requires tall plants or structures for hunting & vocalization perches and open areas of short grasses, forbs, or bare ground for hunting.	Nesting: High (Suitable habitat present) Foraging: Occurs (Observed)
<i>Piranga rubra</i> summer tanager	F: MBTA C: SSC (nesting) Global Rank: G5 State Rank: S1 CVMSHCP: Yes	Mature riparian forest and woodland; in s. Calif. known to nest at Morongo Valley, Victorville, Kern River, Colorado River.	Nesting: Absent (Requisite riparian habitat lacking. Alignment within CVMSHCP Modeled Habitat however). Foraging: Very low (Same as above)
<i>Polioptila melanura</i> black-tailed gnatcatcher	F: MBTA C: None Global Rank: G5 State Rank: S3S4 CVMSHCP: No	Primarily inhabits wooded desert wash habitats, desert scrub habitat, esp. in winter; nests in desert washes containing mesquite, palo verde, ironwood, acacia, absent from areas where salt cedar introduced	Nesting: High (Suitable habitat present) Foraging: Occurs (Observed)
<i>Pyrocephalus rubinus</i> vermillion flycatcher	F: MBTA C: SSC (nesting) Global Rank: G5 State Rank: S2S3 MSHCP: No	Usually associated with desert riparian habitats, sometimes in landscaped vegetation.	Nesting: Low-Moderate (Suitable habitat present in golf course landscaping) Foraging: Occurs (Observed)
<i>Toxostoma crissale</i> crissal thrasher	F: MBTA , BCC C: SSC Global Rank: G5 State Rank: S3 CVMSHCP: Yes	Resident of southeastern deserts in desert riparian and desert wash habitats; nests in dense vegetation along streams/washes; honey mesquite, screwbean mesquite, ironwood, catclaw, acacia, arrowweed	Nesting: Low (Suitable habitat present in golf course; known from vicinity (2016 Tradition) Foraging: Low (Suitable nesting habitat may occur nearby)
<i>Toxostoma lecontei</i> Le Conte's thrasher	F: MBTA , BLM Sensitive, BCC C: SSC (San Joaquin population only) Global Rank: G4 State Rank: S3 CVMSHCP: Yes	Desert resident, primarily of open desert wash, desert scrub, alkali desert scrub, and desert succulent scrub habitats; commonly nests in a dense, spiny shrub or densely branched cactus in desert wash habitat, usually 2-8 feet above ground	Nesting: Moderate (Suitable habitat intermittently present. Alignment is within CVMSHCP Modeled Habitat). Foraging: Moderate-High (Same as above)

Table 5. Special Status Birds

Species	Status	Habitat	Probability
<i>Vireo bellii pusillus</i> least Bell's vireo	F: END C: END Global Rank: G5T2 State Rank: S2 CVMSHCP: Yes	Riparian vegetation in the vicinity of water or in dry river bottoms; below 2000 feet elevation. Nests usually in willow, <i>Baccharis</i> , or mesquite.	Nesting: Absent (Requisite riparian habitat lacking) Foraging: Low (Migration only)

Table 6. Special Status Mammals

Species	Status	Habitat	Probability
<i>Lasiurus (ega) xanthinus</i> western (southern) yellow bat	F: None C: SSC Global: Rank: G5 State Rank: S3 WBWG: H CVMSHCP : Yes	Valley foothill riparian, desert riparian, desert wash and palm oasis habitats; roosts in trees, particularly palms, forages over water and among trees.	Roosting: High (Palms with dense aprons and other trees present) Foraging: High (Open waters present at Lake Cahuilla, water hazards and canal)
<i>Nyctinomops femorosaccus</i> pocketed free-tailed bat	F: None C: SSC Global Rank: G4 State Rank: S3 WBWG: M CVMSHCP: No	Roosts in crevices on rugged cliffs, on high rocky outcrops and slopes. May also roost in buildings, caves, and under roof tiles.	Roosting: High (Suitable habitat within steep, rocky slopes of Santa Rosa Mtns.) Foraging: High (Same as above)
<i>Perognathus longimembris bangsi</i> Palm Springs pocket mouse	F: None C: SSC Global Rank: G5T2T3 State Rank: S2S3 CVMSHCP: Yes	Desert riparian, desert scrub, desert wash & sagebrush habitats. Most common in creosote dominated desert scrub. Occurs in all canopy coverage classes. Rarely found on rocky sites.	Low-Moderate (Habitat suitable, CVMSHCP Modeled habitat present along portions of alignment)
<i>Xerospermophilus tereticaudus chlorus</i> Coachella Valley (Palm Springs) round-tailed ground squirrel	F: None C: SSC Global Rank: G5T2Q State Rank: S1S2 CVMSHCP: Yes	Prefers open, flat, grassy areas in fine-textured, sandy soil in desert succulent scrub, desert wash, desert scrub, alkali scrub, & levees.	Low-Moderate (Suitable habitat intermittent. CVMSHCP Modeled habitat present along alignment)
<i>Ovis canadensis nelsoni pop. 2</i> Peninsular bighorn sheep DPS	F: END C: THR Global Rank: G4T3Q State Rank: S1 CVMSHCP: Yes	Desert rocky slopes of the Peninsular Ranges in San Diego, Riverside, and Imperial Counties	Occurs (Observed. Designated critical habitat present along alignment)

* Species is to be conserved under the CVMSHCP, but is still protected by the MBTA

Definitions of status designations and occurrence probabilities for Tables 2-5

Definitions of occurrence probability:

Occurs: Observed in the PPA/APE by Amec Foster Wheeler personnel or recently reported in the PPA/APE by another reliable source.

High: Observed in similar habitat in region by qualified biologists, or habitat on the PPA/APE is a type often utilized by the species and the PPA/APE is within the known range of the species.

Moderate: Reported sightings in surrounding region, or PPA/APE is within the known range of the species and habitat on the PPA/APE is a type occasionally used by the species.

Low: PPA/APE is within the known range of the species but habitat on the PPA/APE is rarely used by the species

Very Low: Habitat is of marginal suitability and/or PPA/APE is at the edge of species known range or distribution.

Absent: A focused study failed to detect the species, suitable habitat not present, or PPA/APE is outside the geographic distribution of the species.

Unknown: No focused surveys have been performed in the region, and the species' distribution and habitat are poorly known.

CVMSHCP designations

Yes: Conserved by the plan

No: Not Specifically Conserved by the plan

C: Considered, but not included in the plan

Federal designations: (F = federal Endangered Species Act or USFWS designations)

END: Federally listed, Endangered

THR: Federally listed, Threatened

CAN: Candidate for Federal listing

MBTA: Migratory Bird Treaty Act

BEPA: Bald Eagle Protection Act (also protects Golden Eagles)

BCC: Birds of Conservation Concern

None: No designation

State designations: (C = California Endangered Species Act or CDFG designations)

END: State listed, Endangered

THR: State listed, Threatened

CAN: Candidate for State listing

RARE: State listed, Rare

FP: Fully Protected Species

SC: Special Concern Species

WL: Watch List Species

CDFW state rankings are a reflection of the overall condition of an element throughout its California range. The number after the decimal point represents a threat designation attached to the rank:

S1 = Critically Imperiled. Less than (<) 6 Element Occurrences (EOs) OR < 1,000 individuals OR < 2,000 acres

S1.1 = very threatened

S1.2 = threatened

S1.3 = no current threats known

S2 = Imperiled. 6-20 EOs OR 1,000-3,000 individuals OR 2,000-10,000 acres

S2.1 = very threatened

S2.2 = threatened

S2.3 = no current threats known

S3 = Vulnerable. 21-80 EOs OR 3,000-10,000 individuals OR 10,000-50,000 acres

S3.1 = very threatened

S3.2 = threatened

S3.3 = no current threats known

S4 = Apparently Secure. Uncommon but not rare in the state; some cause for long-term concern.

S5 = Secure. Common, widespread, and abundant in the state.

SH = All known California sites are historical, not extant

California Native Plant Society (CNPS) designations:

Primary Categories

LIST 1A: Plants Presumed Extirpated in California and Either Rare or Extinct Elsewhere

LIST 1B: Plants Rare, Threatened, or Endangered in California and Elsewhere

LIST 2A: Plants Presumed Extirpated in California, But Common Elsewhere

LIST 2B: Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere

LIST 3: Plants About Which More Information is Needed - A Review List

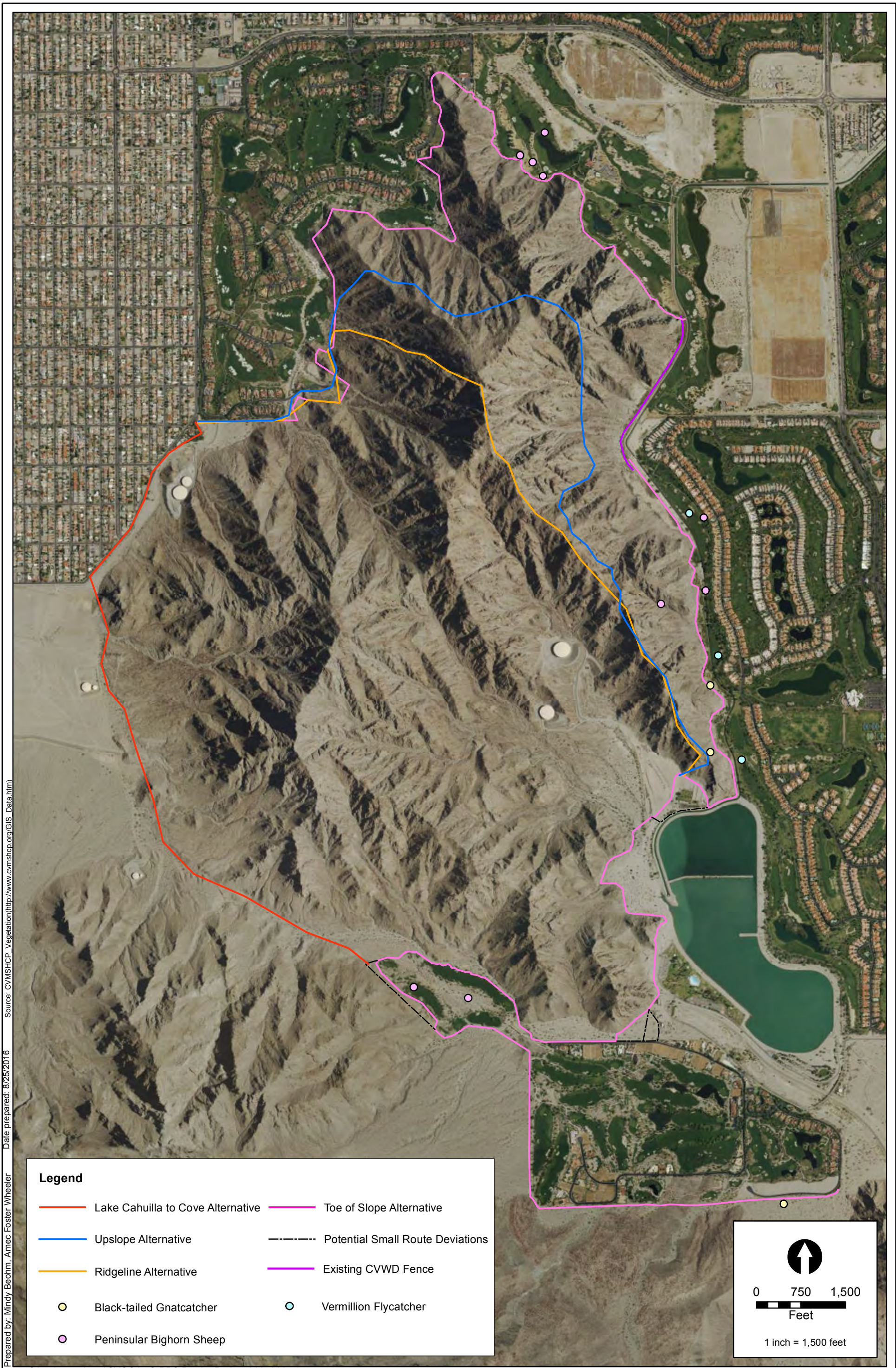
LIST 4: Plants of Limited Distribution - A Watch List

Subdivisions within Categories

0.1: Seriously threatened in California


0.2: Moderately threatened in California

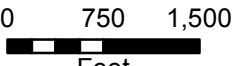
0.3: Not very threatened in California



Prepared by: Mindy Boehm, Amec Foster Wheeler
 Date prepared: 8/25/2016
 Source: CVMSHCP_Vegetation(http://www.cvmshcp.org/GIS_Data.htm)

Legend	
—	Lake Cahuilla to Cove Alternative
—	Upslope Alternative
—	Ridgeline Alternative
—	Toe of Slope Alternative
- - - -	Potential Small Route Deviations
- - - -	Existing CVWD Fence
○	Black-tailed Gnatcatcher
○	Vermillion Flycatcher
○	Peninsular Bighorn Sheep





 1 inch = 1,500 feet

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Special Status Species Observations Map
 Peninsular Bighorn Sheep Barrier Project

FIGURE
9

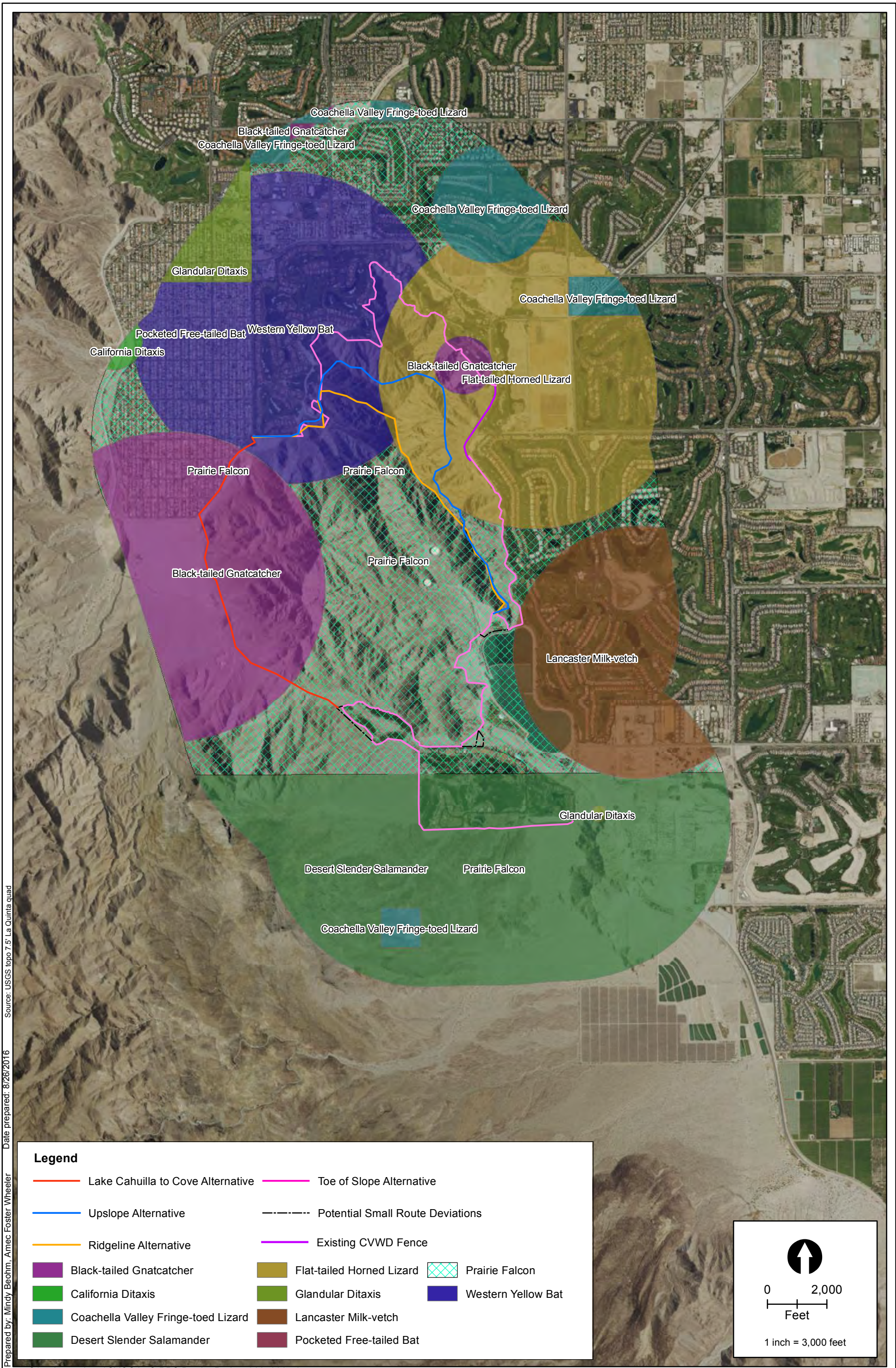
7.0 DISCUSSION

7.1 Discussion of the Special-status Species Tables

Of the forty-two (42) special-status biological resources known to occur in the vicinity of the Project site (Tables 1 through 6), ten (10) are considered to be absent from the site due to a lack of suitable habitat and/or elevational range. These include: Little San Bernardino Mountains linanthus, California marina, slender cottonheads, desert spike moss, purple stemodia, Mecca aster, desert fan palm oasis, Coachella giant sand treader cricket, Coachella Valley Jerusalem cricket and Coachella Valley fringe-toed lizard. These ten (10) species will not be discussed further.


Seventeen (17) of the remaining thirty-two (32) species are covered and conserved by the CVMSHCP. These include: Coachella Valley milkvetch, triple-ribbed milkvetch, Orocopia sage, desert tortoise, flat-tailed horned lizard, burrowing owl, southwestern willow flycatcher, crissal thrasher, Le Conte's thrasher, least Bell's vireo, summer tanager, yellow-breasted chat, yellow warbler, western (southern) yellow bat, Palm Springs pocket mouse, Coachella Valley (Palm Springs) round-tailed ground squirrel and PBS. Participation in, and compliance with the CVMSHCP would generally mitigate potential Project-related impacts to these species (if any). Some of these (i.e., southwestern willow flycatcher, least Bell's vireo, summer tanager, yellow-breasted chat and yellow warbler) are only considered to have occurrence potential during the winter or during migration and have no potential to nest onsite and therefore will not be discussed further in that regard. Some of these (i.e., desert tortoise, flat-tailed horned lizard, bird nests during the nesting season, PBS, etc.) would require biological monitoring and daily preconstruction clearance surveys (to be conducted by the biological monitor immediately prior to and/or concurrently with routine monitoring). These seventeen (17) species will not be discussed further in regards to the CVMSHCP, with the exception of PBS, which is the subject of the proposed Project, desert tortoise and flat-tailed horned lizard, which may require special consideration due to the location of the Project alignments within and/or immediately adjacent to the Santa Rosa and San Jacinto Mountains Conservation Area.

Figure 10 illustrates special status species occurrence records provided by the CNDDDB.



Prepared by: Mindy Boehm, Amec Foster Wheeler
 Date prepared: 8/26/2016
 Source: USGS topo 7.5' La Quinta quad

Legend			
—	Lake Cahuilla to Cove Alternative	—	Toe of Slope Alternative
—	Upslope Alternative	 	Potential Small Route Deviations
—	Ridgeline Alternative	—	Existing CVWD Fence
	Black-tailed Gnatcatcher		Flat-tailed Horned Lizard
	California Ditaxis		Glandular Ditaxis
	Coachella Valley Fringe-toed Lizard		Western Yellow Bat
	Desert Slender Salamander		Lancaster Milk-vetch
	Pocketed Free-tailed Bat		Prairie Falcon



 0 2,000
 Feet
 1 inch = 3,000 feet

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CNDDDB Map

Peninsular Bighorn Sheep Barrier Project

FIGURE
10



7.1.1 Potentially Occurring Plant Species

There is a very low to high potential for nine (9) unlisted and two (2) listed plant species to occur onsite based on the presence of at least marginally suitable habitat and the location of the Project alignment within the geographic and elevational range of these species. Most of these are not covered by the CVMSHCP; three (3), however, are. These include: chaparral sand-verbena, Borrego milkvetch, Coachella Valley milkvetch, triple-ribbed milkvetch, white-bracted spineflower, ribbed cryptantha, winged cryptantha, glandular ditaxis, California ditaxis, Deep Canyon snapdragon and Orocopia sage. Each of these are discussed separately below.

There is a very low potential for chaparral sand-verbena to occur onsite as the habitat is relatively limited, marginal, and the location of the site is at the edge of this species geographic range. This species is known to occur in the area, however, the var. *aurita* has not been documented. The general biological assessment conducted in the area exhibiting the best available habitat for this species (primarily the southern-most portions of the Toe of Slope Alternative and the portions of the Lake Cahuilla to Cove Alternative that are located within the bottom of the canyon) during this species blooming period ended with negative results. Nevertheless, there remains a low potential for it to occur as the species has been reported from the immediate vicinity and a focused botanical survey targeting this, or any other special status plant species', was not conducted. This species is state ranked S2 meaning that it is considered to be "imperiled" and designated as a 1B.1 species by the CNPS meaning that it is considered to be "rare, threatened, or endangered in California, and elsewhere" and considered to be "seriously threatened in California". Chaparral sand-verbena is not a covered species under the CVMSHCP; therefore, CVMSHCP participation does not mitigate impacts to this species. Impacts to chaparral sand-verbena would be considered significant under CEQA if a significant population were to be present. It is unlikely; however, that a significant population is present as it would likely have been detected during the assessment. For these reasons, it is Amec Foster Wheeler's recommendation that the biological monitor (who would otherwise be present for PBS, desert tortoise and other special-status species potentially occurring in the conservation area) be familiar in the identification of this, and the other potentially-occurring special-status species. The biological monitor would identify potential impacts and implement avoidance and/or minimization measures as necessary. Impact avoidance and minimization measures may include slight deviations from the proposed alignment to physically avoid the resource and or temporary Project delay to avoid immediate impacts (primarily to PBS, desert tortoise, nesting birds, etc) and would be at the discretion of the monitor.

There is a very low to low potential for Borrego milkvetch to occur along the Project alignment as there is at least one old record of this species from the area. This species is state ranked S4 "apparently secure" and is a CNPS List 4.3 "watch list" and "not very threatened" in California. There is little chance of significant impacts to this low sensitivity species along the Project alignment, even if a few individuals were to occur. Although Project-related impacts (if any) would not likely be considered significant under CEQA due to its "apparently secure" status, biological monitoring, which includes daily preconstruction clearance surveys and slight deviations from the proposed alignment to physically avoid the resource (if necessary) to minimize and mitigate any Project-related impacts to this species.

There is a very low potential for Coachella Valley milkvetch to occur in the Project area as the habitat is marginal and very limited. This species is federally listed as endangered and a CNPS List 1B.2 which means that it is considered “rare, threatened, or endangered in California and elsewhere”. Coachella Valley milkvetch is a CVMSHCP-covered species, therefore Project-related impacts (if any) would be mitigated through participation in the plan. Although a covered species under the CVMSHCP, biological monitoring, daily preconstruction clearance surveys and slight deviations from the proposed alignment to physically avoid the resource (if necessary) would also minimize and mitigate any Project-related impacts to this species.

There is a low potential for triple-ribbed milkvetch to occur in the Project area. The species has recently been observed in Martinez and Agua Alta Canyons south of La Quinta and is known to disperse in washes from higher elevations above. This species is state ranked S1 meaning that it is considered “critically imperiled” and is a CNPS List 1B.1 (rare, threatened, or endangered in California, and elsewhere and considered seriously threatened in California). Impacts to Lancaster milkvetch would be considered significant under CEQA if a significant population were present. The blooming period for this species is generally March through May. Biological monitoring, daily preconstruction clearance surveys and slight deviations from the proposed alignment to physically avoid the resource (if necessary) would minimize and mitigate any Project-related impacts to this species.

There is a very low potential for white-bracted spineflower to occur onsite. This species is state ranked S3 “vulnerable” and designated as a List 1B.2 species by the CNPS, meaning it is considered “rare, threatened, or endangered in California and elsewhere”. Impacts to white-bracted spineflower may be considered significant under CEQA if a significant population were present. The blooming period for this species is April through June. Biological monitoring, daily preconstruction clearance surveys and slight deviations from the proposed alignment to physically avoid the resource (if necessary) would minimize and mitigate any Project-related impacts to this species.

There is a low potential for ribbed cryptantha to occur in the Project area as it has been reported from the immediate vicinity in La Quinta. Onsite sandy soils are, however, very limited and active sand dunes are not present. This species is state ranked S4 “apparently secure” and is a CNPS List 4.3 “watch list” and “not very threatened” in California. For these reasons, there is little chance of significant impacts to this low sensitivity species along the Project alignment, even if a few individuals were to occur. Although Project-related impacts (if any) would not likely be considered significant under CEQA due to its “apparently secure” status, biological monitoring, daily preconstruction clearance surveys and slight deviations from the proposed alignment to physically avoid the resource (if necessary) would minimize and mitigate any Project-related impacts to this species.

There is a low potential for winged cryptantha to occur along the Project alignment. This species is state ranked S4 “apparently secure” and is a CNPS List 4.3 “watch list” and “not very threatened” in California. There is little chance of significant impacts to this low sensitivity species along the Project alignment, even if a few individuals were to occur. Although Project-related impacts (if any) would not likely be considered significant under CEQA due to its “apparently secure” status, biological monitoring, daily preconstruction clearance surveys and

slight deviations from the proposed alignment to physically avoid the resource (if necessary) would minimize and mitigate any Project-related impacts to this species.

Although glandular ditaxis was not detected during the biological assessment conducted along the alignment during the blooming season (October – March) for this species, there nevertheless remains a moderate to high potential for glandular ditaxis to occur onsite as this species has been reported from the immediate vicinity and the assessment conducted was not a focused botanical survey for this or any other species. This species is state ranked S2 meaning that it is considered “imperiled” and designated as a List 2B.2 by the CNPS meaning that it is “Rare, Threatened, or Endangered in California, but more common elsewhere” and it is “moderately threatened in California”. Impacts to glandular ditaxis may be considered significant under CEQA if a significant population were present. Biological monitoring, daily preconstruction clearance surveys and slight deviations from the proposed alignment to physically avoid the resource (if necessary) would minimize and mitigate any Project-related impacts to this species.

Although California ditaxis was not detected during the biological assessment conducted along the alignment during the blooming season (March - December), there nevertheless remains a moderate potential for this species to occur onsite as it is common on the alluvial fans and mountain slopes around La Quinta. This species is state ranked S2?, which means that it is considered “imperiled”, and designated by the CNPS as a List 3.2 meaning that “more information is needed” but is considered “moderately threatened in California.” The CNPS is currently considering redesignating this species as a List 1B? (higher sensitivity) species. Impacts to California ditaxis may be considered significant under CEQA if a significant population were present. Biological monitoring, daily preconstruction clearance surveys and slight deviations from the proposed alignment to physically avoid the resource (if necessary) would minimize and mitigate any Project-related impacts to this species.

There is a very low potential for Deep Canyon snapdragon to occur along the Project alignment. This species is state ranked S1 and a CNPS List 2B.3 species meaning that it is “Rare, Threatened, or Endangered in California, but more common elsewhere” but is “not very threatened in California.” Impacts to Deep Canyon snapdragon may be considered significant under CEQA if a significant population were present. The blooming period for this species is generally February through April. Biological monitoring, daily preconstruction clearance surveys and slight deviations from the proposed alignment to physically avoid the resource (if necessary) would minimize and mitigate any Project-related impacts to this species.

There is a very low potential for Orocopia sage to occur in the Project area as the habitat appears to be suitable however it is outside of the species known distribution and this perennial shrub would likely have been detected during the field assessment despite the fact that a botanical survey was not conducted. This species is a CNPS List 1B.3 which means that it is considered “rare, threatened, or endangered in California and elsewhere” but is “not very threatened in California”. Orocopia sage is a CVMSHCP-covered species, therefore Project-related impacts (if any) would be mitigated through participation in the plan. Although a covered species under the CVMSHCP, biological monitoring, daily preconstruction clearance surveys and slight deviations from the proposed alignment to physically avoid the resource (if necessary) would also add to minimize and mitigate any Project-related impacts to this species.

All of the plant species designated by the CNPS as List 1B, 2B, & 3 species “meet the definitions of CESA of the California Department of Fish and Game Code, and are eligible for state listing. Impacts to these species or their habitat must be analyzed during preparation of environmental documents relating to CEQA, or those considered to be functionally equivalent to CEQA, as they meet the definition of Rare or Endangered under CEQA Guidelines §15125 (c) and/or §15380” (CNPS 2015b). Some plants constituting California Rare Plant Rank 4 may also be eligible. Biological monitoring, daily preconstruction clearance surveys and slight deviations from the proposed alignment to physically avoid the resource (if necessary) would minimize and mitigate any Project-related impacts to any of the special-status plant species occurring along the alignment and potentially affected by Project implementation.

7.1.2 Potentially Occurring Reptile Species

There is a low to moderate potential for three (3) special-status reptile species to occur along the proposed alignment. These include the northern red-diamond rattlesnake, desert tortoise and flat-tailed horned lizard. Two (2) of these, the federally and state-listed as threatened desert tortoise and the flat-tailed horned lizard, a candidate for state-listing, are CVMSHCP-covered species. There is a low to moderate potential for both of these species to occur along the Project alignment based on the presence of suitable habitat and in consideration of the relative low numbers of these species known from the vicinity. Because of the low numbers of these species in the vicinity of the Project alignment, significant impacts are not expected. Although the desert tortoise and flat-tailed horned lizard are covered by the CVMSHCP, biological monitoring, which includes daily preconstruction clearance surveys, trash control and abatement to avoid attracting and supplementing potential predators, would help avoid and minimize Project-related impacts (i.e., direct mortality or injury). If found along the alignment during barrier installation, the biological monitor would have the authority to temporarily halt Project-related activities in the immediate vicinity, allowing these species to vacate the area and thereby avoiding Project affects. If these species do not vacate the immediate vicinity on their own accord, the biological monitor would have the authority to physically capture, temporarily handle and relocate them to nearby areas outside of the Project footprint (with regulatory agency concurrence). The northern red-diamond rattlesnake is not covered by the CVMSHCP. For this reason, it is discussed in more detail below.

The northern red-diamond rattlesnake is not state or federally-listed as threatened or endangered, however is designated as a “Species of Special Concern (SSC)” by the CDFW. Project-related impacts to this species (if any) would not likely be considered significant under CEQA due to the likelihood of very few individuals potentially affected in this very small portion (extreme edge) of this species relatively extensive range throughout southern California. Nevertheless, biological monitoring, daily preconstruction clearance surveys, trash control and abatement to avoid attracting and supplementing potential predators would help avoid and minimize Project-related impacts (i.e., direct mortality or injury). If found along the alignment, the biological monitor would have the authority to temporarily halt Project-related activities in the immediate vicinity, allowing these species to vacate the area and avoid Project impacts. If this species does not vacate the immediate vicinity on its own accord, the biological monitor would have the authority to physically capture, temporarily handle and relocate it to nearby areas outside of the Project footprint (with regulatory agency concurrence). The biological monitor should be trained and qualified in the handling and transport of venomous snakes.

7.1.3 Potentially Occurring Bird Species

A total of twelve (12) special-status bird species have been reported to occur in the vicinity of the Project alignment. These include: burrowing owl, southwestern willow flycatcher, prairie falcon, loggerhead shrike, black-tailed gnatcatcher, vermilion flycatcher, crissal thrasher, Le Conte's thrasher, least Bell's vireo, summer tanager, yellow-breasted chat and yellow warbler. Three of these species, loggerhead shrike, black-tailed gnatcatcher and vermilion flycatcher were observed during the field surveys. Five (5) of these species, the southwestern willow flycatcher, least Bell's vireo, summer tanager, yellow-breasted chat and yellow warbler, are species that require very specific habitats for nesting (i.e., dense riparian) and thus are not considered to have onsite nesting potential onsite due to a lack of these specific habitats. These species have the potential to occur onsite only during migration or wintering and/or for foraging purposes only and thus will not be discussed further.

Seven (7) of these species have the potential to nest onsite, or in the immediate vicinity. These include: burrowing owl, prairie falcon, loggerhead shrike, black-tailed gnatcatcher, vermilion flycatcher, crissal thrasher and Le Conte's thrasher. Three (3) of these, burrowing owl, Le Conte's thrasher and crissal thrasher are covered under the CVMSHCP and thus Project-related impacts for covered species are generally mitigated through participation in the plan. The CVMSHCP and its federal permit, however, does not allow for take of any birds while nesting and there is a low to moderate potential for these species to nest onsite. For this reason, if Project-related development occurs during the nesting season (generally January – July), preconstruction clearance surveys conducted by the onsite biological monitor immediately prior to daily Project operations would identify if nesting burrowing owl, Le Conte's thrasher or crissal thrasher (and other bird species protected under the MBTA) and measures to avoid impacts to these and other nesting bird species would be implemented. Measures to avoid impacts to these species and other birds while nesting include avoidance of direct and indirect impacts within an established buffer zone of the active nest(s). Standard avoidance buffer zones have been established by the CDFW and are generally 300 feet for songbirds and up to 500 feet for raptors. Reductions or modifications in the avoidance buffer zone can be requested and obtained from CDFW on a case-by-case basis and/or species-by-species basis depending on a variety of environmental and Project-specific factors. Additional conservation measures are required for burrowing owl (see below).

Although no sign (i.e., burrows with whitewash, pellets, feathers, adornments, etc.) of burrowing owl was observed during the biological assessment, a few mammal burrows, manmade drainpipes or piles of debris suitable for burrowing owl use as shelter were observed along the alignment, and habitats present are nevertheless suitable for this species and thus there remains a low to moderate potential for the burrowing owl to occur along the Project alignment. A focused survey for burrowing owl, which identified several small mammal burrows and locations that could be used by burrowing owls, was conducted by Coachella Valley Conservation Commission biologist Kathleen Brundige in December 2015, ended with negative results (i.e., no burrowing owls or sign thereof detected) and concluded that no significant impacts are expected (CVCC 2016). Burrowing owls are not state or federally-listed as threatened or endangered, however are designated as a SSC by the CDFW. This species is also covered under the CVMSHCP, which generally means impacts can be mitigated through participation in and compliance with the plan, with some exceptions. Although burrowing owl is

a CVMSHCP-covered species, the federal permit that allows take of special-status species under the plan does not allow take of burrowing owl under the MBTA; therefore, surveys are required when habitat is present and the site is within and/or immediately adjacent to a CVMSHCP conservation area. Since portions of the Project alignment are within/immediately adjacent to a CVMSHCP conservation area (Santa Rosa/San Jacinto Mountains), and despite the negative results of the CVCC burrowing owl survey, daily preconstruction clearance surveys for burrowing owls in the limited areas containing potentially suitable burrows would determine if this species has colonized areas within the immediate vicinity of the alignment since the time of the focused survey. Burrowing owls are sensitive to excessive noise and activities such as grading and operation of heavy equipment up to 500 feet away and may abandon nests or burrows if/when such activities occur. Therefore, offsite impacts to burrowing owls must also be considered. For this reason, daily preconstruction clearance surveys and monitoring to determine the current status of burrowing owls in the immediate vicinity of current Project operations will be conducted.

Although occurrence of and impacts to burrowing owl are not expected based on the results of the CVCC's focused burrowing owl survey and the limited sheltering opportunities available for burrowing owls, if found on or adjacent to the Project alignment during daily preconstruction clearance surveys and monitoring, the CDFW will need to be contacted for further guidance. Daily pre-construction clearance surveys would continue to be conducted immediately prior to Project-related ground disturbance in order to ensure that burrowing owls do not currently occur in the area. If burrowing owls are not detected, Project operations would continue without further consideration of, or impact avoidance and/or minimization measures implemented for the burrowing owl.

There is a moderate potential for prairie falcons to nest in the steep cliff faces and rock outcrops present in the Santa Rosa Mountains immediately adjacent to the Project alignment and a high potential for this species to forage over the site as this species is known to forage for considerable distances. Prairie falcons are not state or federally-listed as threatened or endangered; nor are they a species covered by the CVMSHCP. They are, however, designated as a SSC by the CDFW and protected by the MBTA. Although the Proposed Alignment is largely located at the toe of the slope of the steep Santa Rosa Mountains and direct disturbance to nesting prairie falcons are not anticipated, indirect disturbances (i.e., loud noises, vibrations and the presence of work crews nearby) must also be considered as these disturbances have been known to cause nest abandonment and failure in many birds, including raptors and any activities that could potentially cause disruption of natural nesting behavior or directly disturb an active nest or nesting prairie falcons must be minimized or avoided. Project related impacts to prairie falcons that may be nesting in the immediately adjacent steep cliffs and outcrops can be avoided entirely through avoidance of Project-related activities during the nesting season, which is generally 15 Feb through 25 June in southern California with some variation depending on location, elevation and other environmental factors. If avoidance of the nesting season is not feasible, then focused surveys for nesting prairie falcon are recommended to determine if this species is present in the immediate Project vicinity. If prairie falcons are found to be nesting in the Project vicinity and avoidance of Project-related activities during the nesting season is not feasible, additional impact avoidance and/or minimization actions may be required. One common method for avoidance and/or minimization of indirect offsite impacts is the establishment and observance of an avoidance buffer zone around the nest site(s). Regulatory

agencies generally recommend avoidance buffers of about 500 feet for birds-of-prey such as the prairie falcon, however this is often determined on a case by case and/or project by project basis. Daily preconstruction surveys and biological monitoring is designed to detect special-status species (including the prairie falcon and their nests) and will be conducted onsite before and during daily Project operations. If prairie falcon nests are found to occur in the vicinity of the Project Alignment during Project operations, avoidance buffers would be implemented to minimize indirect Project-related impacts. Standard avoidance buffer zones have been established by the CDFW and are generally 300 feet for songbirds and up to 500 feet for raptors. Reductions or modifications in the avoidance buffer zone can be requested and obtained from CDFW on a case-by-case basis and/or species-by-species basis depending on a variety of environmental and Project-specific factors.

Loggerhead shrikes were observed at various locations throughout the alignment during the biological assessment. For this reason, this species occurs onsite for foraging purposes at least. There is also a high potential for loggerhead shrike to nest (February – July) in the onsite shrubs and trees. Loggerhead shrike is not state or federally-listed as threatened or endangered, however is designated as a SSC by the CDFW and protected under the MBTA while nesting. Biological monitoring, daily preconstruction clearance surveys and establishment of avoidance buffer zones (where necessary) around active nests when would minimize and mitigate any Project-related impacts to nests occurring along the alignment and potentially affected by Project implementation. Avoidance buffer zones are generally 300 feet for songbirds such as the loggerhead shrike but can be reduced on a case-by-case (often at the discretion of the biological monitor and with CDFG concurrence) basis depending on a variety of factors (i.e., topography, vegetation, existing structures, Project-specific activities, etc.).

Black-tailed gnatcatchers were also observed foraging onsite at various locations throughout the alignment during the field study and there is a high potential for this species to nest (March – July) in onsite shrubs. Black-tailed gnatcatcher is not state or federally-listed as threatened or endangered or designated as a SSC by the CDFW. It is, however, protected while nesting by the MBTA. Daily preconstruction clearance surveys and monitoring and the establishment and observance of avoidance buffer zones (if/where necessary) around active nests when would minimize and mitigate any Project-related impacts to nests occurring along the alignment and potentially affected by Project implementation.

Several vermilion flycatchers were observed at two locations on one of the active golf courses immediately adjacent to the alignment during the field study. For this reason, this species occurs onsite for foraging purposes at least. There is a low to moderate potential for vermilion flycatcher to nest (April – August) in the landscaped trees present along the golf courses. Vermilion flycatcher is not state or federally-listed as threatened or endangered, however is designated as a SSC by the CDFW and protected under the MBTA while nesting. Significant impacts to vermilion flycatchers are not expected despite the potential for this species to nest in adjacent landscaped trees due to the location of suitable trees away from the Proposed Alignment and the species apparent tolerance of ongoing human activities (i.e., routine maintenance on the golf courses and presence of golfers and resort personnel). Nevertheless, daily preconstruction clearance surveys and biological monitoring would ensure that impacts (if any) to vermilion flycatchers are avoided and/or minimized should nests be found with the immediate vicinity of Project operations along the Proposed Alignment.

7.1.4 Potentially Occurring Mammal Species

Five (5) special-status mammals have been reported to occur in the vicinity of the Project alignment. These include western (southern) yellow bat, pocketed free-tailed bat, Palm Springs pocket mouse, Coachella Valley (Palm Springs) round-tailed ground squirrel and PBS (DPS 2) (PBS). Of these, only the PBS was observed along the Proposed Alignment during the field study. The remaining species have a low to high potential for occurrence onsite. These species are discussed separately below.

There is a high potential for western (southern) yellow bat to roost in the many landscaped California fan palms and Mexican fan palms that occur intermittently along and immediately adjacent to the Proposed Alignment and to forage over the Project alignment and immediate vicinity. This species is not state or federally-listed as threatened or endangered; however, is designated as a SSC by the CDFW and is a CVMSHCP-covered species. Significant impacts to western yellow bats are not expected despite the potential for this species to roost in adjacent landscaped palm trees due to the Project's proposed avoidance of mature palm tree removal and avoidance of night work which would require the use of artificial lighting which is known to attract and congregate nocturnal flying insects which in turn may attract foraging bats to the Project alignment. Daily preconstruction clearance surveys and biological monitoring would help ensure that impacts (if any) to yellow bats are avoided and/or minimized should this species be found with the immediate vicinity of Project operations along the Proposed Alignment.

There is a high potential for pocketed free-tailed bat to roost in the abundant rock crevices present within the steep, rugged cliffs and rock outcrops present within the onsite and adjacent Santa Rosa Mountains. This species is not state or federally-listed as threatened or endangered, not is it a CVMSHCP-covered species. Pocketed free-tailed bat has, however, is designated as a SSC by the CDFW or been assigned a "medium" designation by the Western Bat Working Group meaning that more information/research is needed for this species. Significant impacts to pocketed free-tailed bats are not expected, despite the potential for this species to roost in the adjacent steep cliffs and foothills of the Santa Rosa Mountains, due to the Project's proposed method of PBS barrier installation by hand and on foot, using hand tools, avoidance of the Project activities in the areas most likely to harbor pocketed free-tailed bats (i.e., steepest cliffs & largest rock outcroppings) and the Project's proposed avoidance of night work which would require the use of artificial lighting which is known to attract and congregate nocturnal flying insects which in turn may attract foraging bats to the Project site. Daily preconstruction clearance surveys and biological monitoring would help ensure that impacts (if any) to yellow bats are avoided and/or minimized should this species be found with the immediate vicinity of Project operations along the Proposed Alignment.

There is a moderate to high potential for pallid Palm Springs pocket mouse and a low to moderate potential for Coachella Valley (Palm Springs) round-tailed ground squirrel to occur along the Proposed Alignment. Rodent and squirrel burrows were observed onsite; however,

the species that constructed the burrows remains unknown as a number of rodent species are expected to occur and California ground squirrels were also observed onsite. Both of these mammals are designated as SSCs by the CDFW and are CVMSHCP-covered species and would be adequately conserved through participation in the CVMSHCP. For this reason, focused surveys for Palm Springs pocket mouse and Coachella Valley (Palm Springs) round-tailed ground squirrel are not considered to be warranted or recommended for this Project. In addition to CVMSHCP participation, Project-specific impact avoidance and minimization measures that will further ensure impacts to these species are avoided and/or minimized would also be incorporated. These include: 1) attendance and compliance with the Project WEAP, 2) daily preconstruction clearance surveys, 3) biological monitoring, 4) avoidance of night work (for Palm Springs pocket mouse) and 5) trash containment and disposal (to avoid attracting predators).

PBS were observed onsite, on the adjacent steep slopes of the Santa Rosa Mountains within Santa Rosa/San Jacinto Mountains Conservation Area, as well as on and immediately adjacent to the developed urban areas within The Quarry, PGA West and SilverRock Golf Resorts (Figure 9). There is also a high potential for this species to occur anywhere and everywhere else along and immediately adjacent to the Proposed Alignment. PBS are state-listed as threatened and federally-listed as endangered by the CDFW and USFWS respectively. The Project Alignment is also within or immediately adjacent to designated critical habitat for this species and within the CVMSHCP Santa Rosa/San Jacinto Mountains Conservation Area (Figures 2 & 7). Although the PBS is a covered species under the CVMSHCP, additional management and conservation measures will likely apply. A report by John Wehausen (2016) on the Project impacts to PBS was prepared for this Project. This report describes bighorn sheep ecology, behavior, population dynamics, ongoing threats, the need for effective buffer zones (or a barrier in this case) between PBS habitat and urban artificial environments as well specific conservation recommendations for this Project. This report emphasizes the importance of the proposed barrier and the need to end the unhealthy use of the urban environment by PBS as soon as possible.

Potential impacts during barrier installation would primarily include interaction between Project personnel and PBS. Recommended and proposed measures to avoid and minimize effects on PBS during the construction phase of the Project include: 1) attendance of and compliance with the Project WEAP, 2) daily preconstruction clearance surveys, 3) biological monitoring, 4) temporary work stop orders (if needed) to allow any PBS to voluntarily vacate the work zone, 5) trash containment and disposal to avoid attracting potential predators, 6) use of barrier materials (i.e., galvanized chain link or welded steel) appropriate for 100% exclusion of PBS without posing potential hazards to PBS (i.e., becoming stuck on, or trapped within the barrier), 7) avoidance of Project operations in or in close proximity to lambing areas during the PBS lambing season (January 15 – June 30), and 8) revegetation of temporarily disturbed areas (i.e., areas used staging, storage, trampled or removed) with native nontoxic plant species.

7.1.5 Migratory Bird Treaty Act

Excluded from coverage under the CVMSHCP are a variety of common bird species that are protected by the MBTA. This includes virtually all native migratory and resident bird species, including birds already known to occur in the vicinity. Avoidance of impacts to these nesting

migratory and resident birds is a requirement of the federal permit issued for the CVMSHCP. In order to avoid impacting nesting birds, avoidance of Project-related disturbance during the nesting season (generally from approximately January 15 through July 31 for the Coachella Valley) is recommended. If avoidance of the nesting season is not feasible, the following impact avoidance and minimization measures will be implemented: 1) attendance of and compliance with the Project WEAP, 2) daily preconstruction clearance surveys, 3) biological monitoring, 4) establishment and observance of no disturbance buffer zone around active bird nests found during the daily preconstruction surveys until the young birds have fledged, 5) trash containment and disposal to avoid attracting potential predators.

If nesting birds are found along the Proposed Alignment, no work would be permitted near the nest site until young have fledged. There is no established protocol for nest avoidance, however, when consulted the CDFW generally recommends avoidance buffers of about 500 feet for birds-of-prey, and 100–300 feet for songbirds.

7.1.6 Barrier to Other Wildlife's Former Foraging Habitat and Movement Corridors

Implementation of the proposed alignment will also serve as a barrier to other wildlife that have become accustomed to foraging for prey and water sources within the natural undisturbed, disturbed and developed areas. Medium-sized herbivorous mammals such as rabbits and larger predators such as coyote, kit fox, gray fox, bobcat and possibly mountain lion are expected to be effectively removed from portions of their former grazing and/or hunting grounds through the placement of the barrier. The erection of an effective barrier also has the potential to disrupt the movement of wildlife traversing the area from one area of habitat to another (wildlife movement corridors).

7.1.7 Changes to Water Resources in the Santa Rosa and San Jacinto Mountains National Monument

The University of California Riverside's Center for Conservation Biology (UCRCCB) conducted an assessment of climate-related changes in water resources in the Santa Rosa and San Jacinto Mountains National Monument (Monument) in 2014. The UCRCCB visited 216 sites that were currently and/or historically water resources for wildlife. The data collected at these sites is anticipated to be the start of a long-term, focused monitoring effort. The purpose of this effort is to determine if changes to water sources available for wildlife have occurred and if so, what the causes may be. The results of the assessment indicated that water sources within the Monument are drying, with greater levels of drying unexpectedly occurring in the Santa Rosa Mountains compared to those in the San Jacinto Mountains. The data collected supports the hypothesis that available water for wildlife and vegetation within the Monument has decreased over the last several decades (UCRCCB 2014).

7.2 Project Alternatives

7.2.1 Toe of Slope Alternative

The proposed Toe of Slope Alignment, which at this time is the preferred alternative, would be 9.5 miles in length and generally located at the edge of the interface between the undeveloped, natural open space and toe of slope of the northeastern Santa Rosa Mountains and the

developed urban areas (i.e., various golf resorts, Lake Cahuilla Recreation Area and a section of the Coachella Branch of the All American Canal). The alignment would skirt the edge of the Santa Rosa and San Jacinto Mountains Conservation Area with some areas technically inside the conservation area and some areas outside but immediately adjacent to it. The alignment would also skirt the edge of designated critical habitat for the PBS with some areas inside the boundaries of the designated critical habitat and some areas outside, immediately adjacent to it.

Implementation of this alternative would result in the permanent loss of 1.14 acres (footprint) of natural, disturbed and already developed (mostly landscaping) habitat. Although small areas of mostly wind-carried trash occur intermittently throughout the alignment, the alignment traverses a mixture of relatively undisturbed natural open space, disturbed open space (i.e., barren fill slopes of the adjacent canal infrastructure, graded vacant lots), and landscaped development (i.e., golf courses and recreational development). Undeveloped natural open space occurs adjacent to the site to the south and west while developed areas primarily occur to the east and north). Representative site photos are included in Appendix 3.

Implementation of the Toe of Slope Alternative would likely have the least amount of direct impact on the PBS, primarily because it would be located at the very edge of the conservation area and designated critical habitat and thus retain nearly all of the natural habitat within the conservation area and critical habitat to remain available for use by PBS. A total of approximately 43 acres of natural habitat that is mostly located outside of and adjacent to the conservation area and critical habitat would be permanently lost to PBS and the other terrestrial wildlife unable to traverse the barrier through implementation of the Toe of Slope Alternative. Additionally, this alternative would not require the use of helicopters for barrier installation, which can result in undue stress and be otherwise detrimental to PBS. Installation of the barrier along the Toe of Slope Alternative would be accomplished largely by hand and on foot.

7.2.2 Upslope Alternative

The 8.55-mile Upslope Alternative would result in 3.39 miles of barrier located on the rocky foothills of the Santa Rosa Mountains within the Santa Rosa and San Jacinto Mountains Conservation Area and 5.16 miles of barrier along the alignment of the Toe of Slope Alternative, which is located along the edge of the conservation area. The 3.39 miles located within the rocky foothills is located within designated critical habitat for PBS while the 5.16 miles along the shared portion of the Toe of Slope Alternative skirts the edge of the critical habitat.

Implementation of this alternative would result in the permanent loss of 1.04 acres (footprint) of natural, disturbed and already developed (mostly landscaping) habitat. A total of 0.41 acre of the Upslope Alternative footprint would be entirely within the undisturbed conservation area and designated critical PBS habitat while 0.63 acre of the footprint would be along the shared alignment of the Toe of Slope Alternative, which skirts the edge of the conservation area and critical habitat. Installation of the barrier for the Upslope Alternative would result in the permanent exclusion from/loss of 462 acres of natural, undisturbed PBS habitat that is entirely within the conservation area and designated critical habitat. This alternative would also require the use of helicopters which can result in undue stress and impacts to PBS.

7.2.3 Ridgeline Alternative

The 7.88-mile Ridgeline Alternative would result in 2.72 miles of barrier located along a rocky ridgeline towards, or at the top of the Santa Rosa Mountains in this area which is entirely within the conservation area and 5.16 miles of barrier along the shared alignment of the Toe of Slope Alternative, which is located along the edge of the conservation area. The 2.72 miles along the ridgeline is located within designated critical habitat for PBS while the 5.16 miles along the shared alignment of the Toe of Slope Alternative skirts the edge of the critical habitat.

Implementation of this alternative would result in the permanent loss of 0.96 acres (footprint) of natural, disturbed and already developed (landscaping mostly) habitat. A total of 0.33 acre of the Ridgeline Alternative footprint would be entirely within the undisturbed conservation area and designated critical PBS habitat while 0.63 acre of the footprint would be along the shared alignment of the Toe of Slope Alternative, skirting the edge of the conservation area and critical habitat. Installation of the barrier for this alternative would result in the permanent exclusion from/loss of 579 acres of natural, undisturbed habitat within the conservation area and critical PBS habitat. This alternative would also require the use of helicopters which can result in undue stress and impacts to PBS.

7.2.4 Lake Cahuilla to Cove Alternative

The 4.86-mile Lake Cahuilla to Cove Alternative would result in 2.30 miles of barrier located within a narrow gap, or canyon, between two disjunct mountains or foothills of the Santa Rosa Mountains and, within the conservation area. A total of 2.56 miles of the barrier would be located along the Toe of Slope alignment, which skirts the edge of the conservation area.

Implementation of this alternative would result in the permanent loss of 0.59 acre (footprint) of natural, disturbed and already developed (landscaping mostly) habitat. A total of 0.28 acre of the Lake Cahuilla to Cove Alternative would be entirely within the undisturbed conservation area while 0.31 acre of the footprint would be along the Toe of Slope alignment which skirts the edge of the conservation area. Installation of the barrier for the Lake Cahuilla to Cove Alternative would result in the permanent exclusion from/loss of 2.378 acres of natural, undisturbed habitat that is entirely within the conservation area and critical PBS habitat.

7.3 Coachella Valley Multiple Species Habitat Conservation Plan

Implementation of the Upslope Alternative, Ridgeline Alternative or the Lake Cahuilla to Cove Alternative would effectively fence out/exclude large portions of the existing conservation area from access to and use by PBS and the other terrestrial wildlife (primarily large mammals) that occur in the area. Implementation of the Toe of Slope Alignment would result in the exclusion of very little of the existing conservation area, generally only fencing PBS out of the landscaped and developed areas of La Quinta (Figure 3). For these reasons, the Toe of Slope Alternative is considered to be the alternative that would ultimately result the least amount of impact to PBS.

In consideration of Project impacts and the its location within and/or immediately adjacent to the Santa Rosa/San Jacinto Mountains Conservation Area and designated critical habitat for PBS, Project planning and engineering will be designed to minimize any and all impacts to PBS, special-status species and the natural resources present along the selected alignment.

Permanent and temporary impacts to natural resources resulting from installation of the PBS barrier associated with any/all of the alternatives are anticipated to be relatively limited, as the physical barrier would be approximately 1 ft. [12 inches] in width, installed mostly by hand and on foot, and located at least partially in areas that have either been previously disturbed by adjacent developments and or landscaped. Use of helicopters would be required for barrier installation for the Upslope Alternative and Ridgeline Alternative. Each of the alternatives are discussed separately below. Since the City of La Quinta is a signatory to the CVMSHCP, most of the Project-related impacts would be mitigated through participation in, and compliance with the plan. Impacts to potentially-occurring special-status species that are not covered by the CVMSHCP and/or are not yet adequately conserved by the CVMSHCP (e.g., burrowing owl) may require additional actions, which are summarized below.

7.4 Recommended Impact Avoidance and Minimization Measures

In addition to participation in the CVMSCHP, which is designed to mitigate potential Project impacts to covered special-status biological resources, Project-specific measures designed and developed to avoid and minimize impacts to special-status biological resources potentially occurring along the proposed Project alignments within, adjacent to and outside of the conservation area include:

- 1) Biological monitoring of all Project-related disturbances that have the potential to affect special-status biological resources. The biological monitor would be qualified in the identification of the special-status biological resources potentially occurring along the selected alignment and would have the authority to contact the resource agencies (i.e., USFWS, CDFW, CVAG, etc.) should special-status biological resources be encountered during barrier installation and to temporarily halt any and all Project-related activities that threaten special-status resources in order to avoid and/or minimize impacts. Examples include: desert tortoises, flat-tailed horned lizard, burrowing owl, active prairie falcon nests (or any other bird nests) observed in the immediate vicinity of the alignment and that might be affected.
- 2) Impact avoidance and/or minimization measures implemented by the biological monitor would include:
 - a. Daily preconstruction clearance surveys of the portions of the alignment proposed for immediate installation. The biological monitor would conduct preconstruction clearance surveys immediately prior (i.e., the morning of and/or the day prior) to commencement of daily operations to detect special-status biological resources present within the current work zone. Any/all special-status biological resources found in the immediate vicinity would be marked/mapped with a handheld GPS, flagged in the field for avoidance and monitored during construction to ensure that impacts to these resources are avoided and/or minimized to the greatest extent possible.
 - b. Issue a temporary stop work order to allow special-status fauna (i.e., desert tortoise, flat-tailed horned lizard, Palm Springs round-tailed ground squirrel, PBS,

- etc.) to move away from the active work zone on their own accord without interference from Project personnel.
- c. Physical capture, temporary handling and immediate relocation of special-status fauna if appropriate (i.e., desert tortoise, flat-tailed horned lizard, red-diamond rattlesnake, etc.) after receipt of verbal authorization from respective resource agencies.
 - d. Implementation of a Worker Environmental Awareness Program (WEAP) to inform Project personnel working in the field of the potential presence of special-status biological resources along the alignment. The WEAP would include photographs, descriptions, conservation status, impact avoidance and minimization measures proposed and penalties associated with unauthorized impacts to the special-status species potentially occurring along the alignment. Project personnel would be required to attend the WEAP and sign an acknowledgment of attendance and agreement to comply with the measures outlined in the WEAP, CVMSHCP and Project permit requirements.
 - e. A trash containment and proper disposal to avoid attracting scavengers and predators.

The Coachella Valley Conservation Commission (CVCC) will work with state and federal wildlife agencies to implement measures to help offset impacts to CVMSHCP-covered species, primarily within conservation areas. Some of the actions that may be implemented in this regard can include, but not limited to: 1) the identification of activities, and any restrictions on those activities, allowed within conservation areas compatible with the conservation of species, habitats, natural communities, and their associated ecological functions, 2) the control of threats, including habitat fragmentation, control of invasive plant and animal species and edge effects, and 3) restoration and enhancement of degraded habitats, using native vegetation. These actions may or may not be required for the proposed Project.

7.5 Land Use Adjacency Guidelines

Land Use Adjacency Guidelines are required to be considered by the City during Project review and implemented where applicable for public and private development projects that are adjacent to or within the Conservation Areas to avoid or minimize the potential for Project-related edge effects. These guidelines are as follows:

Drainage

Development projects adjacent to or within a Conservation Area shall incorporate plans to ensure that the quantity and quality of runoff discharged to the adjacent Conservation Area is not altered in an adverse way when compared with existing conditions. Stormwater systems shall be designed to prevent the release of pollutants (e.g., toxins, chemicals, petroleum products, exotic plant materials) or other elements that might degrade or harm biological resources or ecosystem processes within the adjacent Conservation Area.

Toxics

Land use including development adjacent to or within a Conservation Area that use chemicals or generate toxic or potentially toxic bioproducts (e.g., manure) or may adversely impact native wildlife and plant species, their habitat, or water quality are required to incorporate measures to ensure that application of such chemicals does not result in any discharge to the adjacent Conservation Area.

Lighting

Lighting in areas proposed for development that are adjacent to or located within Conservation Areas, shall be shielded and directed away from the Conservation Area, toward the developed areas. Landscape shielding or other appropriate methods shall be incorporated in Project designs to minimize the effects of lighting adjacent to or within the adjacent Conservation Area in accordance with the guidelines included in the Implementation Manual.

Noise

Noise generated from development projects adjacent to or within a Conservation Area in excess of 75 dBA shall incorporate setbacks, berms, or walls, as appropriate, to minimize the effects of noise on the adjacent Conservation Area according to Implementation Manual guidelines.

Invasives

Landscape plans for development projects and land uses that are located adjacent to or within a conservation area are required to not use invasive, non-native plant species in their design. Prohibited invasive ornamental plant species are listed in Table 4-113 of the CVMSHCP (see Appendix 4). To the maximum extent feasible, Coachella Valley native plant species listed in Table 4-112 of the CVMSHCP will be incorporated into landscape design within or adjacent to Conservation Areas (See Appendix 5).

Participation in the CVMSHCP and implementation of adaptive management measures identified by the biological monitor (if required) are expected to mitigate any impacts to the any of the special-status biological resources potentially occurring onsite.

With the implementation of the recommendations above and participation in the CVMSHCP, impacts to the special-status species potentially occurring onsite are expected to be mitigated to a less than significant level.

8.0 CONCLUSION

CVMSHCP covered species with potential to be impacted include PBS, and other species if present, including desert tortoise, flat-tailed horned lizard, Coachella Valley milkvetch, triple-ribbed milkvetch, Orocopia sage, burrowing owl, crissal thrasher, Le Conte's thrasher, western (southern) yellow bat, Palm Springs pocket mouse, and Coachella Valley (Palm Springs) round-

tailed ground squirrel. Project-related impacts to these species will be mitigated through participation in the CVMSHCP.

The following special-status species are not covered under the CVMSHCP and have at least some potential to occur and be impacted: chaparral sand-verbena, Borrego milkvetch, white-bracted spineflower, ribbed cryptantha, winged cryptantha, glandular ditaxis, California ditaxis, Deep Canyon snapdragon, northern red-diamond rattlesnake, prairie falcon, loggerhead shrike, black-tailed gnatcatcher, vermilion flycatcher and pocketed free-tailed bat. Three of these species, loggerhead shrike, black-tailed gnatcatcher and vermilion flycatcher were observed during the assessment conducted for the Project. The CVCC will work closely with the CDFG and USFWS, where applicable, to determine the best approach for avoiding and minimizing impacts to these species and determine appropriate measures to implement in that regard. Recommendations to avoid and minimize impacts to special-status biological resources potentially occurring along the Project alignment include:

- 1) Because a jurisdictional determination has not been conducted for this Project to date, determine the jurisdictional status of the onsite drainages (if they are to be impacted). If impacts are unavoidable, quantify the impact.
- 2) Attendance and observation of a Project-specific WEAP for all Project personnel.
- 3) Preconstruction clearance surveys conducted daily immediately prior to Project operations along the alignment, immediately ahead of barrier installation to detect and address potentially-occurring special-status species.
- 4) Daily biological monitoring of all ground disturbance, vegetation trimming and removal and barrier installation.
- 5) Avoidance of disturbance/impacts to special-status biological resources (if present) through temporary halting of Project operations (stop work order) and allowing special status species to voluntarily vacate on their own accord when found.
- 6) Authorized capture, temporary handling and relocation outside of the Project work area (with concurrence of the regulatory agencies) for special-status species that do not voluntarily vacate the Project work area and are in imminent danger of injury or mortality.
- 7) Avoidance of Project activities during the bird nesting season, generally February - July (if possible).
- 8) If avoidance of the nesting season is not possible, daily preconstruction clearance surveys to detect and avoid disturbance to active bird nests through the establishment and avoidance of a no disturbance buffer zone around active nest sites.
- 9) Avoidance of Project activities and no use of artificial lighting that would otherwise attract flying insects which would in turn attract bats to the Project alignment.
- 10) Avoidance of Project operations in or in close proximity to lambing areas during the PBS lambing season (January 15 – June 30).

11) Implementation of the Land Use Adjacency Guidelines as required by the CVMSCHP for projects that are immediately adjacent to conservation areas.

12) Revegetation (within native, nontoxic plant species) of areas temporarily disturbed by Project activities, if appropriate (Appendix 4).

13) Avoid use of prohibited invasive plant species in revegetation (Appendix 5).

With the implementation of the recommendations above, impacts to special-status species and their habitats would be in compliance with the CVMSHCP and/or mitigated to a less than significant level.

9.0 LITERATURE CITED AND REFERENCES

- Allen, N. et. al. Riverside and San Bernardino Counties Breeding Bird Atlas. Unpub. list.
- Amec Earth & Environmental, Inc. 2010. City of La Quinta General Plan Update: Biological Resources. Unpub. report contracted by Terra Nova Planning & Research, Inc.
- Amec Earth & Environmental, Inc. 2003. Biological Resources Assessment of the Coachella Valley Water District Dike 4 Proposed Recharge Basin Sites, Riverside County, California. Unpub. report contracted by Terra Nova Planning & Research, Inc.
- Amec Earth & Environmental, Inc. 2002. Biological Survey of the Crest Development Site, Riverside County, California. Unpub. report contracted by Terra Nova Planning & Research, Inc.
- Amec Earth & Environmental, Inc. 2001. Coachella Valley Water District Water Tank Sites: Biological Survey. Unpub. report contracted by Terra Nova Planning & Research, Inc.
- American Ornithologists' Union. 2015. Check-list of North American Birds, 7th edition + supplements. Accessed online at: <http://americanornithology.org/content/aou-checklist-north-and-middle-american-birds-7th-edition-and-supplements>
- CDFW. 2015a. California Natural Diversity Data Base, Rarefind 5. Report for the *La Quinta, Calif.* quadrangles. Accessed online at: dfg.ca.gov/biogeodata/cnddb/mapsanddata.asp
- CDFW. 2015b. Special Animals List. October. Periodic publication. Sacramento, CA. Accessed online at: <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109406&inline=1>
- CDFW. 2015c. Fish and Game Code of California. <http://www.leginfo.ca.gov/calaw.html>
- CDFW. 2015d. California Wildlife Habitat Relationships, Life History Accounts and Range Maps. Accessed online at: <http://www.dfg.ca.gov/biogeodata/cwhr/cawildlife.aspx>
- CDFW. 2015e. Threatened and Endangered Species, Species Lists and Accounts, Species Accounts-Fish. Accessed online at: https://www.dfg.ca.gov/wildlife/nongame/t_e_spp/
- CDFW. 2014. Complete List of Amphibian, Reptile, Bird and Mammal Species in California. Accessed online at: nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=87155&inline=1
- CDFG. 2012. Staff Report on Burrowing Owl Mitigation. March 7.
- California Natural Resources Agency. 2014. CEQA Guidelines. Accessed online at: <http://resources.ca.gov/ceqa/guidelines/>
- CNPS. 2015a. Inventory of Rare, Threatened, and Endangered Plants of California. Report for the *La Quinta, Calif.* quadrangles. Accessed online at: <http://www.rareplants.cnps.org>
- CNPS. 2015b. The California Rare Plant Ranking System. Accessed online at: <https://www.cnps.org/cnps/rareplants/ranking.php>

- City of La Quinta. 2015. Planning Documents. Accessed online at: <http://www.la-quinta.org/your-government/community-development/planning-division/2035-la-quinta-general-plan>
- CVAG. 2014. Proposed Major Amendment to the Coachella Valley Multiple Species Habitat Conservation Plan/Natural Community Conservation Plan. Accessed online at: http://www.cvmshcp.org/Plan_Documents.htm
- CVAG. 2008. Coachella Valley Multiple Species Habitat Conservation Plan. Accessed online at: [cvmshcp.org](http://www.cvmshcp.org)
- Coachella Valley Conservation Commission. 2016. Western Burrowing Owls (*Athene cunicularia*) Survey Report, La Quinta Bighorn Sheep Barrier Project. Unpublished report prepared by Kathleen Brundige with the CVCC dated 20 June 2016.
- Coachella Valley Water District. 2013. Biological Survey Report: Coachella Canal Relocation, SilverRock Country Club, La Quinta, Riverside County, California. Unpub. report prepared by the CVWD Environmental Services Division.
- Holland, R.F. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. Prepared for the California Department of Fish and Game.
- Jepson Flora Project. 2015. Jepson eFlora. Accessed online at: <http://ucjeps.berkeley.edu/IJM.html>
- Kiff, L. and D. Irwin. 1987. The Breeding Season of Los Angeles County Birds. *Western Tanager* 53 (7): 4-5.
- Kite, R. & L. Evans. 2016. Working to Protect Bighorn Sheep in La Quinta Mountains. Newspaper article published in *The Desert Sun* on 8 June 2016.
- Knect, A. A. 1980. Soil Survey of Riverside County, California: Coachella Valley Area. Publication of the USDA Soil Conservation Service in cooperation with University of California Agricultural Experiment Station.
- Riverside County Information Technology. 2015. Map My County. Accessed online at: http://mmc.rivcoit.org/MMC_Public/Custom/disclaimer/Default.htm
- Sawyer, J.O., T. Keeler-Wolf, and J.M. Evens. 2009. A manual of California vegetation (2nd ed.). California Native Plant Society, Sacramento, CA.
- University of California Riverside's Center for Conservation Biology. 2014. Assessing Climate-Related Changes in Water Resources in the Santa Rosa and San Jacinto Mountains National Monument. Technical report dated July 2014 and prepared for the Bureau of Land Management and the Coachella Valley Conservation Commission.
- USDA, NRCS. 2015a. Web Soil Survey. Accessed online at: <http://websoilsurvey.nrcs.usda.gov/app/>

USDA, NRCS. 2015b. The PLANTS Database. National Plant Data Team. Accessed online at: plants.usda.gov

USFWS. 2015. Bird Laws and Treaties. Accessed online at: <http://www.fws.gov/migratorybirds/RegulationsandPolicies.html>

USFWS. 2000. Recovery Plan for Bighorn Sheep in the Peninsular Ranges, California.

USGS. 2015. US Topo and Historical Topographic Map Collection. Accessed online at: <http://geonames.usgs.gov/apex/f?p=262:1:0::NO:RP:>

Wehausen, J. 2016. Draft Peninsular Bighorn Sheep Barrier Impact Assessment. Unpub. report submitted to Terra Nova.

APPENDIX 1

SPECIES LIST: VASCULAR PLANTS

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APPENDIX 1

SPECIES LIST: VASCULAR PLANTS

(this list should be carefully reviewed for accurate taxonomy, current nomenclature, and correct spelling)

This list reports only plants observed on the site by this study. Other species may have been overlooked or undetectable due to their growing season. Unless noted otherwise, nomenclature and systematics follows Jepson Flora Project (2014) = non-native species, sp. = identified only to genus, *cf*= compares favorably with]. Common names not provided by Jepson Flora Project follows those provided by USDA, NRCS (2015b). [*t*= special status species, * = non-native species, sp. = identified only to genus, *cf*= compares favorably with]

DICOTYLEDONEAE

Acanthaceae

Justicia cf. californica

Anacardiaceae

**Schinus molle*

Apocynaceae

Asclepias albicans

Asclepias subulata

**Narium oleander*

Asteraceae

Ambrosia dumosa

Ambrosia salsola

Baccharis sarothoides

Baccharis salicifolia

Bebbia juncea var. *aspera*

Dicoria canescens

Encelia farinosa

Lepidospartum squamatum

Palafoxia arida

Perityle emoryi

Peucephyllum schottii

Pluchea sericea

**Sonchus asper*

Bignoniaceae

Chilopsis linearis

DICOT FLOWERING PLANTS

Acanthus Family

beloperone, chuparosa

Sumac Family

pepper tree

Dogbane Family

white-stemmed milkweed

rush milkweed

oleander

Sunflower Family

white bur-sage

common burrowbrush, cheesebush

broom baccharis

mule fat

sweetbush

desert twinbugs

brittlebush

California broomsage

desert palafox

Emory's rock daisy

Schott's pygmy-cedar

arrow-weed

prickly sow thistle

Trumpet-Creeper Family

desert willow

Brassicaceae

- **Sisymbrium cf. altissimum*
- **Sisymbrium cf. irio*

Cactaceae

- Cylindropuntia bigelovii*
- Cylindropuntia echinocarpa*
- Cylindropuntia ramosissima*
- Ferocactus cylindraceus*
- Opuntia basilaris*
- Opuntia littoralis*
- Opuntia cf. phaeacantha*

Chenopodiaceae

- Atriplex canescens*
- Atriplex lentiformis*
- Atriplex polycarpa*
- **Salsola tragus*

Curbitaceae

- Brandegia biglovii*
- Cucurbita palmata*

Euphorbiaceae

- Ditaxis lanceolata*
- Euphorbia albomarginata*
- Euphorbia polycarpa* var. *hirtella*
- Euphorbia setiloba*
- **Ricinus communis*

Fabaceae

- Senegalia greggii*
- **Acacia* sp.
- **Dalbergia sissoo*
- Hoffmannseggia microphylla*
- **Melilotus albus*
- **Parkinsonia aculeata*
- Parkinsonia florida*
- Prosopis glandulosa*
- Psoralethamnus arborescens* var. *simplicifolius*
- Psoralethamnus emoryi*
- Psoralethamnus schottii*
- Psoralethamnus spinosus*

Mustard Family

- tumble mustard
- London rocket

Cactus Family

- teddy-bear cholla
- silver or golden cholla
- diamond cholla, pencil cactus
- California barrel cactus
- beavertail pricklypear
- coastal pricklypear
- brown-spined prickly-pear

Goosefoot Family

- four-wing saltbush
- big saltbush
- allscale saltbush
- Russian thistle, tumbleweed

Cucumber Family

- desert star-vine
- coyote melon

Spurge Family

- narrowleaf silverbush
- rattlesnake sandmat
- smallseed sandmat
- Yuma sandmat
- castor bean

Pea Family

- catclaw, Devil's claw
- Acacia sp.
- Indian rosewood
- wand holdback
- White sweetclover
- Mexican palo verde
- blue palo verde
- honey mesquite
- California indigobush
- dyebush
- indigo-bush
- smoke tree

Fouquieriaceae

Fouquieria splendens

Geraniaceae

**Erodium cicutarium*

Krameriaceae

Krameria sp.

Lamiaceae

Condea emoryi

Malvaceae

Sphaeralcea ambigua

Myrtaceae

**Eucalypus* sp.

Onagraceae

Chylismia claviformis

Nyctaginiaceae

Allionia incarnata

**Bougainvillea glabra*

Mirabilis cf. *laevis*

Plantaginaceae

Penstemon sp.

Polegonaceae

Eriogonum inflatum

Salicaceae

Populus fremontii

Solanaceae

Datura discolor

Physalis crassifolia

Tamaricaceae

**Tamarix aphylla*

**Tamarix ramosissima*

Zygophyllaceae

Fagonia cf. *laevis*

Larrea tridentata

Ocotillo Family

ocotillo

Geranium Family

redstem filaree

Rhatany Family

Krameria sp.

Mint Family

desert lavender

Mallow Family

apricot mallow

Myrtle Family

gum tree

Evening Primrose Family

browneyes

Bougainvillea Family

trailing windmills

bougainvillea

wishbone bush

Plantain Family

penstemon

Buckwheat Family

desert trumpet

Willow Family

Freemont cottonwood

Nightshade Family

desert thornapple

yellow nightshade ground cherry

Tamarisk Family

athel

salt cedar

Caltrop Family

California fagonbush

creosote bush

MONOCOTYLEDONEAE

Arecaceae

Washingtonia filifera

**Washingtonia robusta*

Poaceae

Aristida purpurea

**Cynodon dactylon*

**Pennisetum setaceum*

**Schismus* cf. *arabicus*

**Schismus barbatus*

MONOCOT FLOWERING PLANTS

Palm Family

California fan palm

Mexican fan palm

Grass Family

purple threeawn

Bermuda grass

crimson fountain grass

Arabian schismus

common Mediterranean grass

APPENDIX 2

SPECIES LIST: VERTEBRATE ANIMALS

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APPENDIX 2

SPECIES LIST: VERTEBRATE ANIMALS

This list reports only the vertebrate animals observed during Amec Foster Wheeler's field survey. Other species may have been overlooked or undetectable due to their activity patterns or weather conditions. [*f* = special status species, * = non-native species, sp. = identified only to genus, *cf* = compares favorably with]

VERTEBRATES

ACTINOPTERYGII

Cyprinidae
Unknown

Siluriformes (Order)
Unknown

REPTILIA

Iguanidae
Sauromalus ater

Phrynosomatidae
Uta stansburiana

Teiidae
Aspidozelis tigris

AVES

Pelecanidae
Pelecanus erythrorhynchos

Phalacrocoracidae
Phalacrocorax auritus

Ardeidae
Ardea herodias
Ardea alba
Egretta thula

Anatidae
Anas americana

BONY FISHES

Carp and Minnows
Unknown species of carp (canal)

Catfish (Order)
Unknown species of catfish (canal)

REPTILES

Iguanid Lizards
common chuckwalla

Horned Lizards, Spiny Lizards & Relatives
side-blotched lizard

Whiptails & Racerunners
western whiptail

BIRDS

Pelicans
American white pelican

Cormorants
double-crested cormorant

Bitterns and Herons
great blue heron
great egret
snowy egret

Swans, Geese, and Ducks
American wigeon

Anas platyrhynchos
Anas strepera
Aythya affinis
Aythya collaris
Bucephala albeola
Oxyura jamaicensis

mallard
gadwall
lesser scaup
ring-necked duck
bufflehead
ruddy duck

Accipitridae
Buteo jamaicensis

Kites, Eagles, Hawks, and Allies
red-tailed hawk

Falconidae
Falco sparverius

Caracaras and Falcons
American kestrel

Odontophoridae
Callipepla gambelii

New World Quail
Gambel's quail

Rallidae
Fulica americana

Rails, Gallinules, and Coots
American coot

Laridae
Larus sp.
Sterna sp.

Skuas, Gulls, Terns, and Skimmers
gull sp.
tern sp.

Columbidae
Zenaida macroura

Pigeons and Doves
mourning dove

Cuculidae
Geococcyx californianus

Cuckoos, Roadrunners, and Anis
greater roadrunner

Apodidae
Aeronautes saxatalis

Swifts
white-throated swift

Trochilidae
Calypte anna
Calypte costae

Hummingbirds
Anna's hummingbird
Costa's hummingbird

Picidae
Picoides scalaris

Woodpeckers and Allies
ladder-backed woodpecker

Tyrannidae
Sayornis nigricans
Sayornis saya

Tyrant Flycatchers
black phoebe
Say's phoebe

Laniidae
†*Lanius ludovicianus*

Shrikes
loggerhead shrike

Corvidae

Crows, Ravens & Jays

Corvus corax

common raven

Remizidae

Auriparus flaviceps

Penduline Tits

verdin

Troglodytidae

Salpinctes obsoletus

Thryomanes bewickii

Wrens

rock wren

Bewick's wren

Regulidae

Regulus calendula

Kinglets

ruby-crowned kinglet

Sylviidae

Polioptila caerulea

Polioptila melanura

Old World Warblers and Gnatcatchers

blue-gray gnatcatcher

black-tailed gnatcatcher

Mimidae

Mimus polyglottos

Mockingbirds, Thrashers, and Allies

northern mockingbird

Sturnidae

**Sturnus vulgaris*

Starlings and Allies

European starling

Motacillidae

Anthus rubescens

Wagtails and Pipits

American pipit

Parulidae

Dendroica coronate

Wood-Warblers

Yellow-rumped Warbler

Emberizidae

Amphispiza bilineata

Pipilo aberti

Zonotrichia leucophrys

New World Sparrows

black-throated sparrow

Abert's towhee

white-crowned sparrow

Icteridae

Euphagus cyanocephalus

Blackbirds and Allies

Brewer's blackbird

Fringillidae

Carpodacus mexicanus

Cardueline Finches & Allies

house finch

MAMMALIA

MAMMALS

Bovidae

†*Ovis canadensis nelson pop. 2*

Sheep and Relatives

Peninsular bighorn sheep

Canidae

**Canis domesticus*

Canis latrans

Dogs, Foxes, Coyotes and Wolves

domestic dog (scat)

coyote

Equidae

**Equus ferus caballus*

Geomyidae

Thomomys bottae

Leporidae

Lepus californicus

Rodentia

Unknown (burrows)

Squiridae

Ammospermophilus leucurus

Otospermophilus beecheyi

Horses

Domestic horse (scat)

Pocket Gophers

Botta's pocket gopher

Rabbits and Hares

black-tailed jackrabbit

Rodents

unknown (burrows)

Squirrels and Relatives

white-tailed antelope squirrel

California ground squirrel

APPENDIX 3

PHOTOGRAPHIC EXHIBITS

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**Peninsular Bighorn Sheep Barrier Project
La Quinta, Riverside County, California**



Photo 1. Proposed alignment of PBS barrier at the approximate northern-most area (junction of SilverRock Resort Golf Club and Tradition Golf Club). View facing southeast.



Photo 2. Proposed alignment of PBS barrier along the east-central portion of alignment (adjacent to PGA West Golf Club). View facing northwest.

**Peninsular Bighorn Sheep Barrier Project
La Quinta, Riverside County, California**



Photo 3. Proposed alignment of PBS barrier along the northern portion of alignment (adjacent to SilverRock Resort Golf Club). View facing northwest.



Photo 4. Proposed alignment of PBS barrier along the east-central portion of alignment (adjacent to PGA West Golf Club). View facing northwest.

**Peninsular Bighorn Sheep Barrier Project
La Quinta, Riverside County, California**



Photo 5. Proposed alignment of PBS barrier along the east-central portion of alignment (adjacent to PGA West Golf Club). View facing southeast.



Photo 6. Proposed alignment of PBS barrier along the east-central portion of alignment (adjacent to PGA West Golf Club). View facing southeast.

**Peninsular Bighorn Sheep Barrier Project
La Quinta, Riverside County, California**



Photo 7. Proposed alignment of PBS barrier along the northeastern portion of alignment (adjacent to SilverRock Resort Golf Club). View facing southeast.



Photo 8. Proposed alignment of PBS barrier along the southeastern portion of alignment (adjacent to The Quarry at La Quinta Golf Club). View facing east-southeast.

**Peninsular Bighorn Sheep Barrier Project
La Quinta, Riverside County, California**



Photo 9. Proposed alignment of PBS barrier along the east-central portion of alignment (adjacent to Lake Cahuilla County Park). View facing west.



Photo 10. Proposed alignment of PBS barrier along the east-central portion of alignment (adjacent to the existing Coachella Branch of the All American Canal fence). View facing SE.

**Peninsular Bighorn Sheep Barrier Project
La Quinta, Riverside County, California**



Photo 11. Proposed alignment of PBS barrier along the east-central portion of alignment (adjacent to the existing Coachella Branch of the All American Canal fence). View facing south.



Photo 12. Proposed alignment of PBS barrier along the east-central portion of alignment (adjacent to PGA West Golf Club). View facing northwest.

**Peninsular Bighorn Sheep Barrier Project
La Quinta, Riverside County, California**



Photo 13. Proposed alignment of PBS barrier along the east-central portion of alignment (adjacent to PGA West Golf Club). View facing southeast.



Photo 14. View upslope of the steep foothills of the Santa Rosa Mountains from the proposed alignment of the PRBS barrier. View facing west.

**Peninsular Bighorn Sheep Barrier Project
La Quinta, Riverside County, California**



Photo 15. Proposed alignment of PBS barrier along the southern portion of alignment (adjacent to The Quarry at La Quinta Golf Club). View facing east.



Photo 16. Proposed alignment of PBS barrier along the southeastern-most portion of alignment (adjacent to The Quarry at La Quinta Golf Club). View facing east.

**Peninsular Bighorn Sheep Barrier Project
La Quinta, Riverside County, California**



Photo 17. Proposed alignment of PBS barrier along the southeastern-most portion of alignment (adjacent to The Quarry at La Quinta Golf Club). View facing west.



Photo 18. Proposed alignment of PBS barrier along the southeastern-most portion of alignment (adjacent to The Quarry at La Quinta Golf Club). View facing south.

**Peninsular Bighorn Sheep Barrier Project
La Quinta, Riverside County, California**



Photo 19. Proposed alignment of PBS barrier along the southern portion of alignment (adjacent to The Quarry at La Quinta Golf Club). View facing west.



Photo 20. Proposed alignment of PBS barrier along the southern portion of alignment (adjacent to The Quarry at La Quinta Golf Club). View facing west.

**Peninsular Bighorn Sheep Barrier Project
La Quinta, Riverside County, California**



Photo 21. Proposed alignment of PBS barrier along the southern portion of alignment (adjacent to The Quarry at La Quinta Golf Club). View facing east.



Photo 22. Proposed alignment of PBS barrier along the southern portion of alignment (adjacent to The Quarry at La Quinta Golf Club). View facing north.

**Peninsular Bighorn Sheep Barrier Project
La Quinta, Riverside County, California**



Photo 23. Representative example of one of the many bird nests observed in vegetation along the alignment.



Photo 24. Representative example of one of the several larger bird nest (cavity with sticks below perch with whitewash) observed on a steep slope, adjacent to/slope the Proposed Alignment.

**Peninsular Bighorn Sheep Barrier Project
La Quinta, Riverside County, California**



Photo 25. Representative example of one of the few caves potentially suitable for bat roosting and nesting birds (phoebes, etc.) observed along the Proposed Alignment.



Photo 26. One of the vermilion flycatchers observed on an adjacent golf course during the biological assessment field work.

**Peninsular Bighorn Sheep Barrier Project
La Quinta, Riverside County, California**



Photo 27. Group of PBS observed along a ridgeline above the alignment during the biological assessment field work.



Photo 28. Group of PBS observed foraging on SilverRock Resort Golf Course along a portion of the alignment during the biological assessment field work.

**Peninsular Bighorn Sheep Barrier Project
La Quinta, Riverside County, California**



Photo 27. Group of PBS observed foraging on SilverRock Resort Golf Course during the biological assessment field work.



Photo 28. PBS ram observed on the foothills of the Santa Rosa Mountains adjacent to the SilverRock Resort Golf Course during the biological assessment field work.

APPENDIX 4

COACHELLA VALLEY NATIVE PLANTS RECOMMENDED FOR LANDSCAPING

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APPENDIX 4

COACHELLA VALLEY NATIVE PLANTS RECOMMENDED FOR LANDSCAPING

BOTANICAL NAME	COMMON NAME
Trees	
<i>Washingtonia filifera</i>	California fan palm
<i>Cercidium floridum</i>	blue palo verde
<i>Chilopsis linearis</i>	desert willow
<i>Olneya tesota</i>	ironwood tree
<i>Prosopis glandulosa var. torreyana</i>	honey mesquite
Shrubs	
<i>Acacia greggii</i>	cat's claw acacia
<i>Ambrosia dumosa</i>	burro bush
<i>Atriplex canescens</i>	four wing saltbush
<i>Atriplex lentiformis</i>	quailbush
<i>Atriplex polycarpa</i>	cattle spinach
<i>Baccharis sergiloides</i>	squaw water-weed
<i>Bebia juncea</i>	sweet bush
<i>Cassia (Senna) covesii</i>	desert senna
<i>Condalia parryi</i>	crucillo
<i>Crossosoma bigelovii</i>	crossosoma
<i>Dalea emoryi</i>	dye weed
<i>Dalea (Psorothamnus) schottii</i>	indigo bush
<i>Datura meteloides</i>	jimson weed
<i>Encelia farinosa</i>	brittle bush
<i>Ephedra aspera</i>	Mormon tea
<i>Eriogonum fasciculatum</i>	California buckwheat
<i>Eriogonum wrightii membranaceum</i>	Wright's buckwheat
<i>Fagonia laevis</i>	no common name
<i>Gutierrezia sarothrae</i>	matchweed
<i>Haplopappus acradenius</i>	goldenbush
<i>Hibiscus denudatus</i>	desert hibiscus
<i>Hoffmannseggia microphylla</i>	rush pea
<i>Hymenoclea salsola</i>	cheesebush
<i>Hyptis emoryi</i>	desert lavender
<i>Isomeris arborea</i>	bladder pod
<i>Juniperus californica</i>	California juniper
<i>Krameria grayi</i>	ratany
<i>Krameria parvifolia</i>	little-leaved ratany
<i>Larrea tridentata</i>	creosote bush
<i>Lotus rigidus</i>	desert rock pea

BOTANICAL NAME
COMMON NAME

<i>Lycium andersonii</i>	box thorn
<i>Petalonyx linearis</i>	long-leaved sandpaper plant
<i>Petalonyx thurberi</i>	sandpaper plant
<i>Peucephyllum schottii</i>	pygmy cedar
<i>Prunus fremontii</i>	desert apricot
<i>Rhus ovata</i>	sugar-bush
<i>Salazaria mexicana</i>	paper-bag bush
<i>Salvia apiana</i>	white sage
<i>Salvia eremostachya</i>	Santa Rosa sage
<i>Salvia vaseyi</i>	wand sage
<i>Simmondsia chinensis</i>	jojoba
<i>Sphaeralcia ambigua</i>	desert mallow
<i>Sphaeralcia ambigua rosacea</i>	apricot mallow
<i>Trixis californica</i>	trixis
<i>Zauschneria californica</i>	California fuchsia

Groundcovers

<i>Mirabilis bigelovii</i>	wishbone bush
<i>Mirabilis tenuiloba</i>	white four o'clock

Vines

<i>Vitis girdiana</i>	desert grape
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Accent

<i>Muhlenbergia rigens</i>	deer grass
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Herbaceous Perennials2

<i>Adiantum capillus-veneris</i>	maiden-hair fern (w)
<i>Carex alma</i>	sedge (w)
<i>Dalea parryi</i>	Parry dalea (w)
<i>Eleocharis montevidensis</i>	spike rush (w)
<i>Equisetum laevigatum</i>	horsetail (w)
<i>Juncus bufonis</i>	toad rush (w)
<i>Juncus effuses</i>	juncus (w)
<i>Juncus macrophyllus</i>	juncus (w)
<i>Juncus mexicanus</i>	Mexican rush (w)
<i>Juncus xiphioides</i>	juncus (w)
<i>Notholaena parryi</i>	Parry cloak fern
<i>Pallaea mucronata</i>	bird-foot fern

BOTANICAL NAME
COMMON NAME
Cacti and Succulents

<i>Agave deserti</i>	desert agave
<i>Asclepias albicans</i>	desert milkweed
<i>Asclepias subulata</i>	ajamete
<i>Dudleya arizonica</i>	live-forever
<i>Dudleya saxosa</i>	rock dudleya
<i>Echinocereus engelmannii</i>	calico hedgehog cactus
<i>Ferocactus acanthodes</i>	barrel cactus
<i>Fouquieria splendens</i>	ocotillo
<i>Mamillaria dioica</i>	nipple cactus
<i>Mamillaria tetrancistra</i>	corkseed cactus
<i>Nolina parryi</i>	Parry nolina
<i>Opuntia acanthocarpa</i>	stag-horn cholla
<i>Opuntia bigelovii</i>	teddy bear or jumping cholla
<i>Opuntia basilaris</i>	beavertail cactus
<i>Opuntia echinocarpa</i>	silver or golden cholla
<i>Opuntia ramosissima</i>	pencil cholla
<i>Yucca schidigera</i>	Mojave yucca, Spanish dagger
<i>Yucca whipplei</i>	our Lord's candle

1 Source: "Coachella Valley Native Plants, Excluding Annuals (0 ft. to approximately 3,000 ft. elevation)." Compiled by Dave Heveron, Garden Collections Manager, and Kirk Anderson, Horticulturist, The Living Desert, May, 2000, for the Coachella Valley Mountains Conservancy.

2 Common names for herbaceous perennials that are followed by "(w)" indicate a water or riparian species.

APPENDIX 5

PROHIBITED INVASIVE ORNAMENTAL PLANTS

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APPENDIX 5

PROHIBITED INVASIVE ORNAMENTAL PLANTS

BOTANICAL NAME	COMMON NAME
<i>Acacia</i> spp. (all species except <i>A. greggii</i>)	acacia (all species except native catclaw acacia)
<i>Arundo donax</i> ¹	giant reed
<i>Atriplex semibaccata</i> ¹	Australian saltbush
<i>Avena barbata</i>	slender wild oat
<i>Avena fatua</i>	wild oat
<i>Brassica tournefortii</i> ²	African or Saharan mustard
<i>Bromus madritensis</i> ssp. <i>rubens</i> ¹	red brome
<i>Bromus tectorum</i> ²	cheat grass
<i>Cortaderia jubata</i> [syn. <i>C. atacamensis</i>]	Jubata crass or Andean pampas grass
<i>Cortaderia dioica</i> [syn. <i>C. selloana</i>]	pampas grass
<i>Descurainia sophia</i>	tansy mustard
<i>Eichhornia crassipes</i>	water hyacinth
<i>Elaeagnus angustifolia</i>	Russian olive
<i>Foeniculum vulgare</i>	sweet fennel
<i>Hirschfeldia incana</i>	short-pod mustard
<i>Lepidium latifolium</i>	perennial pepperweed
<i>Lolium multiflorum</i>	Italian ryegrass
<i>Nerium oleander</i>	oleander
<i>Nicotiana glauca</i> ¹	tree tobacco
<i>Oenothera berlandieri</i> ³	Mexican evening primrose
<i>Olea europea</i>	European olive tree
<i>Parkinsonia aculeata</i> ¹	Mexican palo verde
<i>Pennisetum clandestinum</i>	Kikuyu grass
<i>Pennisetum setaceum</i> ²	fountain grass
<i>Phoenix canariensis</i> ³	Canary Island date palm
<i>Phoenix dactylifera</i> ³	date palm
<i>Ricinus communis</i> ¹	castorbean
<i>Salsola tragus</i> ¹	Russian thistle
<i>Schinus molle</i>	Peruvian pepper tree
<i>Schinus terebinthifolius</i>	Brazilian pepper tree
<i>Schismus arabicus</i>	Mediterranean grass
<i>Schismus barbatus</i> ²	Saharan grass
<i>Stipa capensis</i> ²	no common name
<i>Tamarix</i> spp. (all species) ²	tamarisk or salt cedar
<i>Taeniatherum caput-medusae</i>	Medusa-head
<i>Tribulus terrestris</i>	puncturevine
<i>Vinca major</i>	periwinkle
<i>Washingtonia robusta</i>	Mexican fan palm
<i>Yucca gloriosa</i> ³	Spanish dagger

Sources: California Exotic Pest Plant Council, United States Department of Agriculture-Division of Plant Health and Pest Prevention Services, California Native Plant Society, Fremontia Vol. 26 No. 4, October 1998, The Jepson Manual; Higher Plants of California, and County of San Diego Department of Agriculture. in California” list

¹indicates species known to be invasive in the Plan Area

² indicates particularly troublesome invasive species

³ indicates species not on CalEPPC October 1999 “Exotic Pest Plants of Greatest Ecological Concern

APPENDIX 6

FOCUSED BURROWING OWL SURVEY REPORT

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Western burrowing owls (*Athene cunicularia hypugaea*)

Survey Report: La Quinta Bighorn Sheep Barrier Project

Prepared by: Kathleen Brundige, Coachella Valley Conservation Commission
June 30, 2016

Introduction

Western burrowing owls (*Athene cunicularia hypugaea*) are a ground dwelling owl species classified as a “species of special concern” by the State of California, and are in decline across the western United States due to anthropogenic threats and decreasing suitable habitat (Shuford & Gardali 2008; Poulin *et al.* 2011). They occur throughout much of North America in a variety of vegetation types and climates, and are one of 27 species covered by the Coachella Valley Multiple Species Habitat Conservation Plan (CVMSHCP). Burrowing owls are also protected by the Migratory Bird Treaty Act. The objectives for burrowing owls within the CVMSHCP are to maintain and ensure conservation of occupied burrows on current conserved lands, minimize harmful effects to the species, and to identify and implement monitoring and management to sustain the population within the plan area (Dudek, 2007). Because populations fluctuate naturally between pre, post and breeding season, protecting potential habitat and suitable burrows throughout the year is important for population sustainability in the region. Likewise, protecting connectivity between habitat patches is also important. Under the Migratory Bird Treaty Act, individual movement in and out of conserved lands may strongly influence local abundance and overall population dynamics in the regions. Given such movement, population drivers or stressors in areas other than the study region may influence local abundance either by affecting the number of owls available for immigration or by inducing emigration during any season.

Burrowing owls are dietary generalists and occur in a variety of flatland habitat with burrowing mammals capable of excavating burrows large enough to accommodate a nest (Poulin *et al.*, 2011). As opportunistic burrow dwellers, burrowing owls do not excavate their own burrows, but instead typically nest in burrows excavated initially by burrowing mammals. Burrowing owls in the Coachella Valley occupy burrows of various mammals in wildland habitats, and erosion cavities created by extreme water flow events along levees and riverbanks. Within suburban and urban areas, they also tend to favor burrows created and abandoned by California ground squirrels (*Otospermophilus beecheyi*). Acceptable burrows are often found adjacent to suburban and urban development, washes, fallow fields, sand dunes, agricultural drains, and along burrows and erosional crags dug out of the banks of ephemeral arroyos. The species can tolerate and even thrive in areas moderately developed by humans, although intense development can be detrimental to fitness (Millsap & Bear 2000). Because they are habitat generalists within the Coachella Valley, they are not associated with specific vegetation types which are used to classify suitable habitat; but other habitat features such as topography, soil types, and the presence of occupiable burrows seem to better characterize suitable habitat (Latif *et.al*, 2012; Rotenberry *et. al*, 2010).

Methods

Site Description

The survey site was along a route being evaluated for a barrier or reasonable alternative along the toe of the slope in La Quinta (Figure 1), in the Coachella Valley, Riverside County, California. The proposed barrier and the survey route are at the edge of the Santa Rosa and San Jacinto Mountains Conservation Area. The alluvial fans and bajadas in this area are covered with Sonoran creosote bush (*Larrea tridentata*) scrub and Sonoran mixed woody and succulent scrub communities. The area just outside the conservation area is largely urbanized with golf courses and residences, with the southern end of the route occurring along the edge of Lake Cahuilla County Park. Average yearly rainfall ranges from 80 to over 300 mm at this location; rainfall can also vary widely among years (3.6 to 70 mm in 2002 versus 200 to 500 mm in 2005). Temperatures range from lows approaching 0° C in the winter to highs exceeding 45° C commonly recorded during July and August.

A burrowing owl population survey was conducted for the CVMSHCP in 2009 and 2011. The majority of owls were found between April and December indicating a preferable survey time during breeding and post-breeding seasons where detectability is highest (Latif et.al, 2012; Rotenberry et. al, 2010). Owls are often observed occupying available burrows during the breeding season, from late April through late July or early August and to a lesser, more dispersed degree through the winter (Coulombe, 1971). Western burrowing owls are assumed to be mostly non-migratory in the Colorado desert (Korfanta et. al, 2005), allowing for year-round monitoring efforts of resident birds in the Coachella Valley. In 2012, an analyses of local isotopic compositions of burrowing owl feathers also revealed a small proportion of the population to be migratory, originating in Mexico and Western Riverside County (UCR CCB, 2013).

Data Collection

The route was surveyed on December 16 - 17, 2015 between 7 am and 5 pm for the presence of burrowing owls. Because burrowing owls are semi-colonial and will often inhabit one main burrow and several peripheral burrows, biologists noted any suitable occupiable burrows for sign of previous use and/or potential future occupancy. Burrows that could be suitable throughout the year, even in the absence of owls, were noted for the presence of whitewash, feathers and/or regurgitated owl pellets to determine if they had been used in recent years (Rosenberg and Haley, 2004; Conway et. al, 2008; Manning, 2011; CDFG, 2012).

Results

The route transverses many different soil and habitat types, from the edge of golf courses, to dry wash woodlands and alluvial fans, to rocky crags and canyons, and the shoreline of a reservoir (Lake Cahuilla). No burrowing owls were observed along the survey route; therefore, no significant impacts could be found to this species. Three areas on the identified route had burrows that could be considered occupiable (identified as habitat sites in Figures 1-4); however, none of them had been previously occupied by burrowing owls in recent years and none of the habitat sites had any evidence of whitewash or regurgitated owl pellets present. Habitat site 1 is

an erosional crag along the west side of the canal adjacent to PGA West. It is marked by a stake for CVWD biologists to check as part of the monitoring of the lands along the canal. Habitat site 2 is a remnant of the old shoreline along historic Lake Cahuilla, and is very porous soil type with many burrows, adjacent to the PGA West golf course. Habitat site 3 is along a dry wash tributary, with smaller burrows just under the eroded bank in the center, adjacent to the Quarry golf course. These three sites, and the presence of these burrows and the many rocky crags under and around stones in the rocky crags do offer opportunities for burrowing owl occupancy between the time this survey was completed and the time construction of the barrier or functional alternative may begin. Therefore, a preconstruction survey would be recommended along the route to ensure none of the burrows recorded in this report are occupied by the species, and to record the presence of any other burrows, erosional cracks, or rocky crags that may become appealing during the course of construction.

References

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- Poulin, R.G., Todd, L.D., Haug, E.A., Millsap, B.A. & Martell, M.S. 2011. Burrowing Owl (*Athene cunicularia*). *Birds of North America Online* (ed. A. Poole). Cornell Lab of Ornithology. Accessed 9/29/2011: <http://bna.birds.cornell.edu/bna/species/061>
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Presented to the Coachella Valley Conservation Commission. Accessed 6/20/2016:
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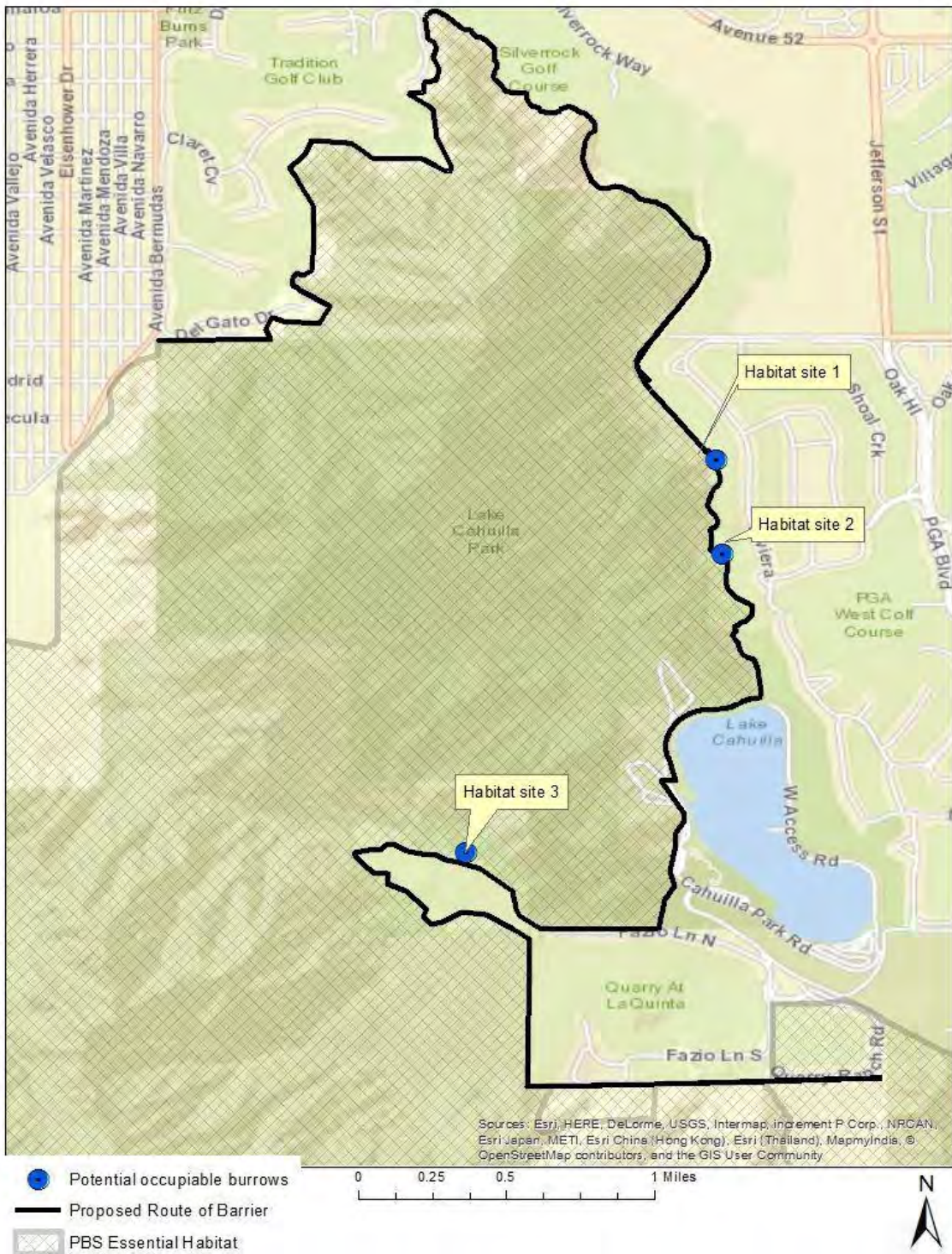


Figure 1. Route along toe of slope and potential occupiable habitat sites identified during survey.



Figure 2 and 3. Habitat site 1 along canal adjacent to PGA west.



Figure 4. Habitat site 2 – shoreline soil along PGA west at toe of slope.

Western burrowing owls (*Athene cunicularia hypugaea*)

Survey Report: La Quinta Bighorn Sheep Barrier Project

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of the old shoreline along historic Lake Cahuilla, and is very porous soil type with many burrows, adjacent to the PGA West golf course. Habitat site 3 is along a dry wash tributary, with smaller burrows just under the eroded bank in the center, adjacent to the Quarry golf course. These three sites, and the presence of these burrows and the many rocky crags under and around stones in the rocky crags do offer opportunities for burrowing owl occupancy between the time this survey was completed and the time construction of the barrier or functional alternative may begin. Therefore, a preconstruction survey would be recommended along the route to ensure none of the burrows recorded in this report are occupied by the species, and to record the presence of any other burrows, erosional cracks, or rocky crags that may become appealing during the course of construction.

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- Conway, C.J., Garcia, V., Smith, M.D. & Hughes, K. 2008. Factors affecting detection of Burrowing Owl nests during standardized surveys. *Journal of Wildlife Management*, 72, 688-696.
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- Dudek. 2007. *Final Recirculated Coachella Valley Multiple Species Habitat Conservation Plan/Natural Community Conservation Plan and associated Santa Rosa and San Jacinto Mountains Trails Plan*. Coachella Valley Association of Governments, Palm Desert, CA.
- Korfanta, N. M., MacDonald, D. B., Glenn, T. C. 2005. Burrowing Owl (*Athene cunicularia*) population genetics: A comparison of North American forms and migratory habits. *The Auk*, 122: 464-478.
- Latif, Q.S., Fleming, K.D., Barrows, C. & Rotenberry, J.T. 2012. Modeling seasonal detection patterns for burrowing owl surveys. *Wildlife Society Bulletin*, 36, 155-160.
- Manning, J.A. 2011. Factors affecting detection probability of burrowing owls in southwest agroecosystem environments. *The Journal of Wildlife Management*, 75, 1558-1567.
- Poulin, R.G., Todd, L.D., Haug, E.A., Millsap, B.A. & Martell, M.S. 2011. Burrowing Owl (*Athene cunicularia*). *Birds of North America Online* (ed. A. Poole). Cornell Lab of Ornithology. Accessed 9/29/2011: <http://bna.birds.cornell.edu/bna/species/061>
- Rosenberg, D.K. & Haley, K.L. 2004. The ecology of burrowing owls in the agroecosystem of the Imperial Valley, California. *Studies in Avian Biology*, 27, 120-135.
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- University of California Riverside Center for Conservation Biology (UCR CCB). 2013. Isotopic analyses and spatial ecology of Riverside County burrowing owls (*Athene cunicularia*). *Biological Monitoring Program 2012-2013 Year-End Report*, Appendix 3, 47-54. Presented to the Coachella Valley Conservation Commission. Accessed 6/20/2016: <http://www.cvmshcp.org/pdf%20files/CVCC%20Monitoring%20Year-End%20Report%2007.16.2013.pdf>

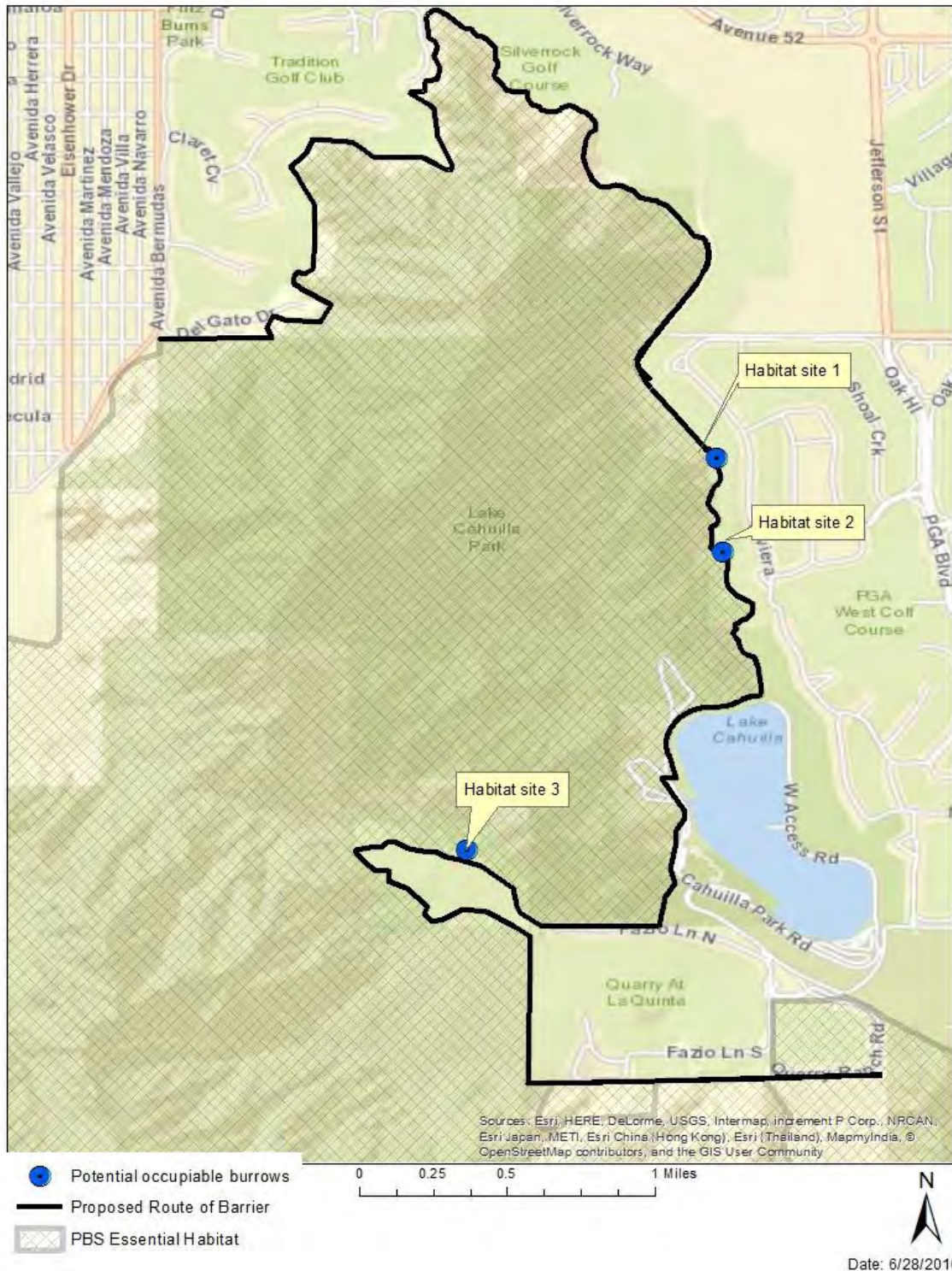


Figure 1. Route along toe of slope and potential occupiable habitat sites identified during survey.



Figure 2 and 3. Habitat site 1 along canal adjacent to PGA west.



Figure 4. Habitat site 2 – shoreline soil along PGA west at toe of slope.