



United States Department of the Interior

Fish and Wildlife Service Arizona Ecological Services Office

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In Reply Refer To:

AESO/SE

02EAAZ00-2016-F-0336

November 22, 2016

Ms. Sallie Diebolt
Los Angeles District Corps of Engineers
Arizona-Nevada Office
3636 North Central Avenue, Suite 900
Phoenix, Arizona 85012-1939

Dear Ms. Diebolt:

This biological opinion (BO) responds to your July 12, 2016 request for formal consultation with the U.S. Fish and Wildlife Service (Service) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (Act). Your request was received on August 1, 2016. At issue are impacts resulting from Freeport McMoRan Sierrita Inc.'s (FMSI; Applicant) proposed extension of development rock stockpiles and related actions at the existing Sierrita open pit copper mine located near the community of Green Valley, Pima County, Arizona, on the endangered Pima pineapple cactus (*Coryphantha scheeri* var. *robustispina*) and the threatened Chiricahua leopard frog (*Lithobates chiricahuensis*). No critical habitat for either species is located within the project area.

In your correspondence, you also requested our concurrence that the proposed action may affect, but is not likely to adversely affect the endangered lesser long-nosed bat (*Leptonycteris curasoae yerbabuena*). Our concurrence is provided in Appendix A of this BO.

This BO is based on information provided in your July 12, 2016 correspondence, including Westland Resources' June 13, 2016 Biological Assessment (BA) of the proposed action. Literature cited in this BO is not a complete bibliography of all literature available on the species of concern, the proposed action (development rock stockpiles associated with open pit mining), or on other subjects considered in this opinion. A complete administrative record of this consultation is on file at Service's Arizona Ecological Services Office in Phoenix, Arizona.

Consultation history

- July 12, 2016 – The U.S. Army Corps of Engineers (Corps) requested formal consultation with the Service on the effects of the proposed extension of FMSI's development rock stockpiles at their existing Sierrita mine complex, and provides a BA and background

information related to the proposed action.

- October 18, 2016 – The Service provided the Draft BO to the Corps for their review.
- November 9, 2016 – The Corps provided comments on the Draft BO, including clarifying information from the Applicant.
- November 22, 2016 – The Service issued the Final BO for the proposed action.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The proposed project consists of three components: extension of existing development rock stockpiles, construction of a stormwater management channel, and relocation of a Trico utility line (see Figure 2 of the BA). A brief summary of each of these components follows:

Stockpile Extension – FMSI is proposing a northern extension of the existing RS-2 and RS-3 development rock stockpiles which lie at the northern edge of the Sierrita Mine open pit. The proposed stockpile extension will have a footprint of approximately 1,380 acres, a portion of which has been previously disturbed. The stockpiles will rise approximately 600 to 1,000 feet in elevation. Long-term activities at the stockpile extension will primarily include operation of heavy equipment for haulage and dumping of development rock, development rock contouring, and other maintenance activities.

Stormwater Management Channel – The extension of the stockpiles will require the construction of a stormwater management channel to convey off-site, run-on stormwater around the stockpile extension. The stormwater channel will be approximately five miles in length and be constructed to support flows of 5,400 to 7,800 cubic feet per second, depending on the reach of the channel. An area generally 300 feet wide from the toe of the west, north, and east perimeter of the stockpile extension area has been designated for the channel and other features, including access roads, utilities, berms, and on-site stormwater runoff containment.

Trico Utility Line Relocation – The proposed action will require the relocation of an existing Trico utility line with approximately 20,000 linear feet of new line. The current line is an overhead utility line that traverses the area of the proposed stockpile extension. The relocation will move the utility line to the north, along the proposed stormwater management channel.

The proposed project will require the discharge of fill to approximately 18.2 acres of surface water features that have been identified as Waters of the United States (WUS) by the Corps. Additionally, 0.3 acre of temporary impacts and 0.2 acre of indirect impacts to WUS are anticipated. Surface water features to be impacted are all ephemeral washes, with the exception of a 0.44 acre pond (Pond 3) that supports perennial, or near perennial, surface water.

Conservation Measures

Pima Pineapple Cactus – The Applicant will establish a 215-acre conservation area for Pima pineapple cacti. This conservation area will be established within the boundaries of the lands

associated with the Sierrita Mine that are owned by FMSI (see Figure 3 of the BA). These conservation lands will be protected in perpetuity by a restrictive covenant or similar legal instrument. Any existing Pima pineapple cactus within the construction footprint will be transplanted to the Applicant's Pima pineapple cactus conservation area. These conservation actions will occur in early to mid-2017.

Following the translocation of any Pima pineapple cacti to the conservation area, annual monitoring will occur to monitor survival and health of the transplanted individual. The Applicant will submit an annual report to the Service by then end of the first quarter of each year following transplanting for three years.

Chiricahua Leopard Frog – To mitigate for the effects to the Chiricahua leopard frog, the Applicant will set up a fund with a one-time deposit of \$20,000 to be used by the Service and the Chiricahua Leopard Frog Recovery Team (it is likely that such activities will actually be implemented by the Recovery Unit 1 local recovery group) to support Chiricahua leopard frog recovery in Recovery Unit 1. The Applicant will work with the Service and Arizona Game and Fish Department to determine the appropriate entity for receiving the conservation funding.

In addition, immediately prior to any direct effects to the stock pond occupied by Chiricahua leopard frogs (Pond 3; see Figure 11 of the BA), the Applicant will work with the Service and the Arizona Game and Fish Department to translocate any Chiricahua leopard frogs or egg masses found in the pond to an appropriate alternative site. The Applicant will provide funding for the translocation, limited to labor and equipment necessary to move the Chiricahua leopard frogs and treatment of those frogs for the chytridiomycosis fungus. The proposed action is scheduled to begin in mid-2018, with the Chiricahua leopard frog mitigation activities scheduled to begin in early to mid-2017. Pond 3 will be closed after the translocation activities are complete to prevent recolonization prior to any construction activities.

If Chiricahua leopard frogs are relocated to a currently unoccupied pond, the Applicant will conduct annual monitoring and submit an annual report to the Service by the end of the first quarter of each year following the relocation event for two years.

For a complete description of the proposed action, including Conservation Measures, see Westland Resource's June 13, 2016 BA. That BA is incorporated herein by reference.

STATUS OF THE SPECIES

Pima Pineapple Cactus – As indicated in Westland Resources' BA, recent investigations of taxonomy and geographical distribution focused in part on assessing the validity of the taxon (see Baker 2004, Baker 2005, and Schmalzel *et al.* 2004). Although there is evidence for a general pattern of clinal variation across the range of the species (Schmalzel *et al.* 2004), this does not preclude the recognition of taxonomic varieties within *C. sheeri* (= *C. robustispina*). Baker (2005) found that there are distinct geographical gaps between the distribution of this subspecies and the other subspecies, which occur in eastern Arizona, New Mexico, and Texas, and that the subspecies are morphologically coherent within their respective taxa (Baker 2004). His geographical and morphological work supports the idea that the sub-specific groups within

C. robustispina are indeed discrete, and merit separate taxonomic status as subspecies (U.S. Fish and Wildlife Service 2007).

We have determined that Pima pineapple cacti that are too isolated from each other may not be effectively pollinated. For example, the major pollinator of Pima pineapple cacti is thought to be *Diadasia rinconis*, a ground-nesting, solitary, native bee. McDonald (2005) determined that the maximum distance the cactus bees travelled between Pima pineapple cactus individuals was 900 m (2,953 ft). Based on this information, we have determined that Pima pineapple cactus plants that are located at distances greater than 900 meters from one another become isolated with regard to meeting their life history requirements. The species is an obligate outcrosser (not self-pollinating), so it is important for plants to be within a certain distance to exchange pollen with each other. Also, the study found that pollination was more effective when other species of native cacti are near areas that support Pima pineapple cacti. The native bees pollinate a variety of cacti species and the sole presence of Pima pineapple cacti may not be enough to attract pollinators.

The Pima pineapple cactus occurs south of Tucson, in Pima and Santa Cruz counties, Arizona, as well as in adjacent northern Sonora, Mexico. In Arizona, it is distributed at very low densities throughout both the Altar and Santa Cruz valleys, and in low-lying areas connecting the two valleys. This cactus generally grows on slopes of less than 10 percent and along the tops (upland areas) of alluvial bajadas. The plant is found at elevations between 2,360 feet (ft) and 4,700 ft (Phillips *et al.* 1981, Benson 1982, Ecosphere Environmental Services Inc. 1992a), in vegetation characterized as either or a combination of Arizona upland of the Sonoran desertscrub community and semi-desert grasslands (Brown 1982, Johnson 2004). Paredes-Aguilar *et al.* (2000) reports the subspecies from oak woodlands in Sonora. Several attempts have been made to delineate habitat within the range of the Pima pineapple cactus (Ecosphere 1992b, McPherson 2002, RECON Environmental Inc. 2006, U.S. Fish and Wildlife Service unpublished analysis) with limited success. As such, we are still unable to determine exact ecological characters to help us predict locations of Pima pineapple cacti or precisely delineate Pima pineapple cactus habitat (U.S. Fish and Wildlife Service 2007), except perhaps in localized areas (U.S. Fish and Wildlife Service 2005). We appreciate the discussion in the BA regarding the extent of potential habitat within the range of the Pima pineapple cactus and acknowledge the logic and rationale behind the discussion. However, the existing uncertainty regarding habitat characteristics and the lack of a range-wide scientific Pima pineapple cactus habitat evaluation results in our only being able to discuss these attributes in a general manner.

As a consequence of its general habitat requirements, considerable habitat for this species appears to exist in Pima and Santa Cruz counties, much of which is unoccupied. Pima pineapple cacti occur at low densities, widely scattered, sometimes in clumps, across the valley bottoms and bajadas. The species can be difficult to detect, especially in dense grass cover. For this reason, systematic surveys are expensive and have not been conducted extensively throughout the range of the Pima pineapple cactus. As a result, location information has been gathered opportunistically, either through small systematic surveys, usually associated with specific development projects, or larger surveys that are typically only conducted in areas that seem highly suited for the species. Furthermore, our knowledge of the distribution and status of this species is gathered primarily through the section 7 process; and we only see projects that require

a Federal permit or have Federal funding. There are a number of projects that occur within the range of Pima pineapple cactus that do not undergo section 7 consultation, and we have no information regarding the status or loss of plants or habitat associated with those projects. For these reasons, it is difficult to address abundance and population trends for this species. We find that the best available information does not allow for very specific Pima pineapple cactus population estimates such as was presented in the BA. The approach and methodology used to make the Pima pineapple cactus population estimates in the BA limit their reliability and utility as we analyze the effects of the proposed action on the conservation and recovery of this species.

The Arizona Game and Fish Department maintains the Heritage Data Management System (HDMS), a database identifying elements of concern in Arizona and consolidating information about their distribution and status throughout the state. As of the summer of 2015, this database consisted of 7,558 locations for this taxon, of which 1,837 were known to no longer exist, primarily due to development of various types and not from natural causes (Tonn pers. comm., November 4, 2015). As an example of how the information continually changes, but may not be up-to-date in the database, the recent construction of the Sierrita natural gas pipeline in the Altar Valley, located west of the proposed action, resulted in effects to approximately 140 Pima pineapple cactus plants and approximately 460 acres of Pima pineapple cactus habitat. While nearly 100 of the affected Pima pineapple cactus plants were transplanted and the affected habitat was offset through the purchase of credits in an approved Pima pineapple cactus mitigation bank, this project illustrates the ongoing effects to the conservation and recovery of the Pima pineapple cactus and the ever changing baseline of information available on this species. The HDMS database is dynamic, based on periodic entry of new information, as time and staffing allows. As such, the numbers used from one BO to the next may vary and should be viewed as a snapshot in time at any given moment. We have not tracked loss of habitat because a limited number of biological assessments actually quantify habitat for PPC.

Some additional information related to the survival of PPC comes from six demographic plots that were established in 2002 in the Altar Valley. In 1997, Robert Schmalzel established a permanent plot to study *C. scheeri* var. *robustispina* growth and age structure on the King Anvil Ranch in the Altar Valley; this plot was revisited in 1998, 1999, and 2000 (Schmalzel 2000b, p. 6). In this study, 139 individuals were followed, of which 15 died between 1997 and 2000 (Schmalzel 2000b, p. 7). During a follow-up study by Marc Baker and Rafael Rouston initiated in 2002, it was reported that “many” of the 139 plants measured by Schmalzel were dead, with no apparent cause of death discovered (Dimmit and Brusca 2004, p. 5). In this follow-up study, long-term plots were established at six locations within the Altar Valley, including the area previously studied by Schmalzel (Dimmit and Brusca 2004, p. 2). In 2003, a total of 260 individuals were located on the six plots; these plants were evaluated on six additional occasions through 2012, when 93 plants remained (Baker 2013, p. 4). Rodent and insect predation, drought, and poor habitat condition are commonly associated with *C. scheeri* var. *robustispina* death (Phillips et al. 1981, p. 10; Mills 1991, p. 5; Schmalzal & McGibbon 2010, pp. 3, 10-11; Baker 2011, pp. 6; Baker 2013, p. 4; Service 2015a, p.1; Service 2015b, p. 2).”

Between 1995 and 2007, 45 individual *C. scheeri* var. *robustispina* were monitored in an enclosure on Coronado National Forest land in the Santa Cruz Valley. By the last check of these individuals in 2010, no living plants were found (Coronado National Forest 2010, entire). It

should be noted, however, that in a partial survey of this area in 2015, some *C. scheeri* var. *robustispina* were found both within and outside of this enclosure (Service 2015b, entire). Similarly, plants are monitored regularly on the Pima County and Palo Alto Pima pineapple cactus Conservation Banks. On one portion of the County-owned bank in 2006, 67 plants were mapped; when last counted in 2014, 13 of the original 67 plants remained alive and 11 new plants had been found (Pima County 2015, p. 1). Within or adjacent to the Palo Alto Conservation Bank, 49 plants were found in 2001; as of September, 2015, 9 of the original individuals remained alive and 11 new plants were discovered (Westland 2015, p. 2).

Threats to PPC continue to include habitat loss and fragmentation, competition with non-native species, and inadequate regulatory mechanisms to protect this species. We believe residential and commercial development, and its infrastructure, is by far the greatest threat to the Pima pineapple cactus and its habitat. However, we have only a limited ability to track the cumulative amount of development within the range of the Pima pineapple cactus. What is known with certainty is that development pressure continues in Pima and Santa Cruz counties.

Invasive grass species may be a threat to the habitat of Pima pineapple cactus. Habitat in the southern portion of the Altar Valley is now dominated by Lehmann lovegrass (*Eragrostis lehmanniana*). According to Gori and Enquist (2003), Boer lovegrass (*Eragrostis chloromelas*) and Lehmann lovegrass are now common and dominant on 1,470,000 acres in southeastern Arizona. They believe that these two grass species will continue to invade native grasslands to the north and east, as well as south into Mexico. These grasses have a completely different fire regime than the native grasses, tending to form dense stands that promote higher intensity fires more frequently. Disturbance (like fire) tends to promote the spread of these non-natives (Ruyle *et al.* 1988, Anable *et al.* 1992). Roller and Halvorson (1997) hypothesized that fire-induced mortality of PPC increases with Lehmann lovegrass density. Buffelgrass (*Pennisetum ciliare*) has become locally dominant in vacant areas in the City of Tucson and along roadsides, notably in the rights-of-way along Interstate 10 and State Route 86. Some portions of PPC habitat along these major roadways are already being converted to dense stands of buffelgrass, which can lead to recurring grassland fires and the destruction of native desert vegetation (Buffelgrass Working Group 2007).

The effects of climate change (i.e., decreased precipitation and water resources) are a threat to the long-term survival and distribution of native plant species, including the Pima pineapple cactus. For example, temperatures rose in the twentieth century and warming is predicted to continue over the twenty-first century. Although climate models are less certain about predicted trends in precipitation, the southwestern United States is expected to become warmer and drier. In addition, precipitation is expected to decrease in the southwestern United States, and many semi-arid regions will suffer a decrease in water resources from climate change as a result of less annual mean precipitation and reduced length of snow season and snow depth. Approximately half of the precipitation within the range of the Pima pineapple cactus typically falls in the summer months; however, the impacts of climate change on summer precipitation are not well understood. Drought conditions in the southwestern United States have increased over time and have contributed to loss of Pima pineapple cactus populations through heat stress, drought stress, and related insect attack, as well as a reduction in germination and seedling success since the species was originally listed in 1993, and possibly historically. Climate change trends are likely

to continue, and the impacts on species will likely be complicated by interactions with other factors (e.g., interactions with non-native species and other habitat-disturbing activities).

The Arizona Native Plant Law can delay vegetation clearing on private property for the salvage of specific plant species within a 30-day period. Although the Arizona Native Plant Law prohibits the taking of this species on State and private lands without a permit for educational or research purposes, it does not provide for protection of plants *in situ* through restrictions on development activities. Even if Pima pineapple cacti are salvaged from a site, transplanted individuals only contribute to a population if they survive and are close enough (within 900 m [(2,970 ft)] to other Pima pineapple cacti to be part of a breeding population from the perspective of pollinator travel distances and the likelihood of effective pollination. Transplanted Pima pineapple cacti have variable survival rates, with moderate to low levels of survival documented. Past efforts to transplant individual Pima pineapple cacti to other locations have had limited success. For example, on two separate projects in Green Valley, the mortality rate for transplanted Pima pineapple cacti after two years was 24 percent and 66 percent, respectively (SWCA, Inc. 2001, WestLand Resources, Inc. 2004). One project southwest of Corona de Tucson involved transplanting Pima pineapple cacti into areas containing *in situ* plants. Over the course of three years, 48 percent of the transplanted individuals and 24 percent of the *in situ* individuals died (WestLand Resources, Inc. 2008). There is also the unquantifiable loss of the existing Pima pineapple cactus seed bank associated with the loss of suitable habitat. Furthermore, once individuals are transplanted from a site, the Pima pineapple cactus is considered to be extirpated from that site, as those individuals functioning in that habitat are moved elsewhere.

Other specific threats that have been previously documented (U.S. Fish and Wildlife Service 1993), such as overgrazing, illegal collection, prescribed fire, and mining, have not yet been analyzed to determine the extent of effects to this species. However, partial information exists. Overgrazing by livestock, illegal collection, and fire-related interactions involving exotic Lehmann lovegrass and buffelgrass may negatively affect Pima pineapple cactus populations. Mining has resulted in the loss of hundreds, if not thousands, of acres of potential habitat throughout the range of the plant, particularly in the vicinity of Green Valley.

There have been some notable conservation developments for this species. As of 2016, there are two conservation banks for the Pima pineapple cactus, one on a private ranch in the Altar Valley (Palo Alto Ranch Conservation Bank) and another owned by Pima County that includes areas in both the Altar Valley and south of Green Valley. In the Palo Alto Ranch Conservation Bank to date, a total of 700 acres have been conserved through the execution of conservation easements. In Pima County's Bank, a total of 530 acres are under a conservation easement at this time (the County offsets its own projects within this bank). Additionally, three large blocks of land totaling another 1,078 acres have been set aside or are under conservation easements through previous section 7 consultations (see consultations 02-21-99-F-273, 02-21-01-F-101, and 02-21-03-F-0406). While not formal conservation banks, these areas are set aside and managed specifically for Pima pineapple cacti as large blocks of land, and likely contribute to recovery of the taxon for this reason; therefore, we consider these acres conserved. Another 647 acres of land have been set aside as natural open space within the developments reviewed through section 7 consultation between 1995 and 2010. However, these are often small areas within residential backyards (not in a common area) that are difficult to manage and usually isolated within the

larger development, and often include areas that do not provide Pima pineapple cactus habitat (e.g., washes). Some conservation may occur onsite because of these open space designations, but long-term data on conservation within developed areas are lacking; the value of these areas to Pima pineapple cactus recovery over the long-term is unknown.

In summary, Pima pineapple cactus conservation efforts are currently hampered by a lack of information on the species. Specifically, we have not been able to determine exact ecological characters to help us predict locations of Pima pineapple cacti or precisely delineate its habitat, and considerable area within the range of the Pima pineapple cactus has not been surveyed. Further, there are still significant gaps in our knowledge of the life history of the Pima pineapple cactus; for instance, we have yet to observe a good year for seed germination. From researcher observations and motion sensing cameras, we have learned that ants, Harris' antelope squirrels, and jackrabbits act as seed dispersal agents. Demographic plots have been only recently established, and information is just now beginning to be reported with regard to describing population dynamics for Pima pineapple cacti in the Altar Valley. A couple of larger projects are looking at the methods and results of transplanting Pima pineapple cacti. This should result in a better understanding of the use of transplanting as a tool for conservation and recovery.

Chiricahua Leopard Frog – The Chiricahua leopard frog was listed as threatened on June 13, 2002 (67 FR 40789). The range of the Chiricahua leopard frog extends through the southeastern sections of Arizona and adjacent Sonora, Mexico, at elevations ranging from 1219-4023 ft. (Santa Cruz and Cochise Counties, AZ), and from montane central Arizona east and south along the Mogollon Rim to montane parts of west-southwestern New Mexico, at elevations ranging from 3500-8040 ft. (Apache, Coconino, Gila, Graham, Greenlee, Navajo, and Yavapai Counties, AZ). This species inhabits land owned by the U.S. Forest Service - Apache-Sitgreaves, Coconino, Coronado, and Tonto National Forests, Bureau of Indian Affairs - White Mountain Apache and San Carlos Apache Reservations, U.S. Fish and Wildlife Service - San Bernardino National Wildlife Refuge, Bureau of Land Management, and private citizens. Threats to this species include introduced bullfrogs, crayfish, and predatory fish, chytrid fungus (*Batrachochytridium dendrobatidis*), habitat fragmentation, major wetland manipulations, water pollution, and over-grazing.

Because of a taxonomic revision of the Chiricahua leopard frog, the Service reassessed the status of and threats to the currently described species (*Lithobates chiricahuensis*), and listed the currently described species as threatened rangewide (77 FR 16324-16424) and critical habitat was designated at the same time. As the BA discusses, Twin Tanks and Ox Frame Tank occur in the vicinity of the Sierrita Mine and are designated critical habitat (see 77 FR 16348, with excerpt below). However, no critical habitat for the Chiricahua leopard frog occurs within the project area.

The primary habitat type for the Chiricahua leopard frog includes oak, mixed oak, and pine woodlands, although its habitat ranges into areas of chaparral, grassland, and desert, particularly for the southern populations. This species requires permanent water sources, including streams, rivers, backwaters, ponds, and stock tanks that are mostly free from introduced fish, crayfish, and bullfrogs. Natural aquatic systems include rocky streams with deep rock-bound pools, river overflow pools, oxbows, permanent springs, permanent pools in intermittent streams, and beaver

dams. Human-influenced aquatic systems include earthen stock tanks, livestock drinkers, irrigation sloughs, mine adits, abandoned swimming pools, and ornamental backyard pools (AGFD 2003).

The Chiricahua Leopard Frog Recovery Plan identifies eight recovery units in portions of Arizona, New Mexico, and Mexico. The Sierrita Mountains, including the project area, are in Recovery Unit 1 (Tumacacori-Atascosa-Pajarito Recovery Unit – also referred to as the Tumacacori Highlands (USFWS 2007). Recovery Unit 1 has three watershed-based management areas. These management areas have been assessed to have the greatest potential for successful recovery within the recovery unit. These management areas are the Buenos Aires Central Tanks Management Area, the Pajarita Wilderness Management Area, and the Alamo-Peña Blanca-Peck Canyon Management Area. The Sierrita Mountains, including the project area, are not included in a management area.

Range-wide, the most serious threats to the Chiricahua leopard frog include predation by nonnative organisms, especially American bullfrogs (*Lithobates catesbeianis*), spiny-rayed fishes, and crayfish (*Oronectes virilis*); and a fungal skin disease (chytridomycosis or “Bd”) that is killing frogs and toads around the globe. Today, invasive species such as introduced fishes, crayfish, and bullfrogs are one of the most important threats to the Chiricahua leopard frog on the local scale (FWS 2007b). The introduced crayfish is having major negative effects on native populations of frogs in North America (Kats and Ferrer 2003), probably contributing to the statewide decline of Chiricahua leopard frogs in Arizona (FWS 2007b). Bullfrogs are also important predators of native frogs and recent eradication efforts in southern Arizona (Atascosa Mountains and Cienega Valley) appear to have established conditions that are favorable to the reestablishment of the Chiricahua leopard frog.

Chytridiomycosis and nonnative organisms, coupled with habitat fragmentation and loss resulting from water diversion, groundwater pumping, and pollution have meant that recovery criteria outlined in the recovery plan have not been met for this species. Climate change and increases in UV radiation will likely impact this species in the future. Other threats include drought, floods, wildfires, degradation and destruction of habitat, water diversions and groundwater pumping, disruption of metapopulation dynamics (relationships among populations of frogs), increased chance of extirpation or extinction resulting from small numbers of populations and individuals, and environmental contamination.

Recovery Criteria to delist the Chiricahua leopard frog include:

1. At least two metapopulations located in different drainages, plus at least one isolated and robust population in each recovery unit;
2. Protection of these populations and metapopulations;
3. Connectivity and dispersal habitat protection; and
4. Reduction or elimination of threats and long-term protection.

In Recovery Unit 1, Criterion 1 has been accomplished and there has been substantial progress in reaching Criterion 4 through landscape-level removal of non-native species in conjunction with captive propagation-headstarting-release of Chiricahua leopard frogs.

The total number of known sites occupied by Chiricahua leopard frogs in Arizona increased from 49 in 2002 to 90 in 2009 (USFWS 2011), although later reported as 84 occupied sites in 2009 (USFWS 2013). The Service has assessed Chiricahua leopard frog populations in Arizona as trending between “roughly stable” and “experiencing substantial increases” (USFWS 2011).

ENVIRONMENTAL BASELINE

The environmental baseline includes past and present impacts of all Federal, State, or private actions in the action area, the anticipated impacts of all Federal actions in the action area that have undergone formal or early section 7 consultation, and impact of State and private actions which are contemporaneous with the consultation process. The environmental baseline defines the current status of the species and its habitat in the action area to provide a platform to assess the effects of the action now under consultation.

Description of the Action Area

The action area for this project is defined as those areas directly affected by the proposed action, as well as any indirect effects that may occur as a result of runoff or changes in drainage patterns that are the result of the proposed action. The action area for the proposed project includes the following: the footprints of the proposed stockpile extension and the stormwater management channel, the relocation of the Trico utility line, projected temporary and indirect impacts to WUS immediately downstream from the disturbance footprint, and a 250 meter buffer around the stormwater channel and stockpile extension (see Figure 4 of the BA).

The 250 meter buffer was determined by considering the effects of the proposed action that could potentially directly or indirectly affect listed species outside of the immediate area involved in the proposed action. The potential effects considered include noise, fugitive dust, and lighting from construction of the stockpiles. Also considered were the noise and vibrations from blasting associated with activities required for the construction of the stormwater management channel.

The project area and most of the action area are relatively undeveloped lands owned and managed by the Sierrita Mine. Only a small portion of the lands within the action area are owned by someone other than the Sierrita Mine, or are managed by the Bureau of Land Management or the Arizona State Land Department (see Figure 4 of the BA). Activities or disturbance that occurs within the action area include roadways, mine earthwork, a few rural homes, ranching, hunting, and recreation.

The action area is comprised of topography that ranges from rolling to hilly with moderate slopes and occasional boulder outcrops. Elevations range from approximately 3,750 feet to 4,500 feet, with the higher elevations occurring in the western portions of the action area. A number of ephemeral washes and stock tanks occur within the action area. The BA includes an excellent discussion related to the various soil types, geology, and biotic communities that exist within the action area and are incorporated herein by reference (see Sections 3.3 and 3.4 of the BA).

Status of the Species within the Action Area

Pima Pineapple Cactus – A number of survey efforts have been completed within the action area. Westland Resources completed Pima pineapple cactus surveys using a number of approaches resulting in various sizes and configurations of acreages covered under these surveys (see Figure 8 of the BA; Westland 2008, Westland 2010, Westland 2012). As a result, eight extant Pima pineapple cacti have been documented within the project area. All of the extant Pima pineapple cacti occur within the approximately eastern half of the project area (see Figure 8 of the BA). Surveys conducted in the western portion of the project area did not locate any Pima pineapple cacti.

The BA gives a detailed description of the process used to identify suitable Pima pineapple cactus habitat in the project area. This process is similar to one used in a previous section 7 consultation in an adjacent area (USFWS 2009). Following the criteria outlined, the BA has identified 215 acres of Pima pineapple cactus habitat that will be affected by the proposed action (see Section 4.4 of the BA). Other areas of predicted Pima pineapple cactus habitat were identified using the established criteria, but these areas of habitat occur in the western portions of the project area and sample surveys in these areas did not locate any extant Pima pineapple cacti (see Figure 9 of the BA).

Chiricahua Leopard Frog – In 2012, Westland Resources conducted pre- and post-monsoon site visits to evaluate aquatic features throughout the Sierrita Mine properties. Based on that evaluation, they conducted additional pre- and post-monsoon surveys for Chiricahua leopard frogs at selected features in 2013, 2014, and 2015. During the four years of survey, Chiricahua leopard frogs were only detected in a single feature, Pond 3 (see Figure 11 of the BA). Chiricahua leopard frogs were detected during all four survey years in Pond 3. Only adults were found in 2012 and 2013. In 2014, in addition to adults, one Chiricahua leopard frog egg mass was found during the post-monsoon survey. In 2015, 54 Chiricahua leopard frogs were counted during the pre-monsoon survey, with an estimated 48 juvenile and six adult frogs. During the post-monsoon survey, 13 adult Chiricahua leopard frogs were observed and one juvenile was captured.

Factors Affecting Species Environment within the Action Area

Pima Pineapple Cactus - Pima pineapple cacti within the action area are protected from most of the threats faced by this species throughout its range. Threats such as urban development and recreational off-road vehicle use are limited because the action area is primarily lands owned by the Sierrita Mine and these types of activities are limited because of the mining actions and access control on these lands. The primary threats to Pima pineapple cactus in the action area are related to ongoing mining activities and are the subject of this BO.

There is some potential for actions related to roadway infrastructure and utility construction that is not part of the mining operations to occur within the action area. Local municipalities and the Arizona Department of Transportation may establish rights-of-way across the action area. These actions would contribute to the loss of individual Pima pineapple cacti, as well Pima pineapple cactus habitat loss and fragmentation.

Ongoing urbanization and residential development adjacent to the Sierrita Complex is likely to continue at some level. Such activities can affect the conservation and recovery of the Pima pineapple cactus within the action area if such actions increase Pima pineapple cactus habitat loss and fragmentation. The conservation and recovery of this species are dependent on maintaining large blocks of unfragmented habitat that are supported by appropriate habitat connectivity. These habitat configurations are necessary for this species to provide for seed dispersal, the maintenance of a seed bank, and the ongoing occurrence of pollinators and other plant species that support the pollinators of the Pima pineapple cactus.

Over the past 10 years in Pima County, we have conducted approximately 31 formal section 7 consultations where actions were anticipated to adversely affect the Pima pineapple cactus. Activities evaluated under these consultations included mining activities (2), power lines and associated facilities (4), flood control/water projects (2), roadways (3), fire plans (7), pipelines (3), border infrastructure (2), grazing (2), management planning (4), and residential development (2).

Chiricahua Leopard Frog - Chiricahua leopard frogs are dependent on perennial aquatic habitats. Ongoing drought is the primary factor affecting the persistence of water in Tank 3. Direct effects to Chiricahua leopard frogs resulting from livestock grazing, OHV use, recreation, illegal collection, and shooting are probably reduced in the action area due to private ownership and access control. Effects from Chytrid fungus are a significant threat to Chiricahua leopard frogs and this is probably an issue in Pond 3. The spread of Chytrid fungus from adjacent aquatic habitats to aquatic habitats in the action area is possible through animal and human carriers. The effect of non-native predators and competitors on Chiricahua leopard frogs in Pond 3 is unknown.

Over the past 10 years in Pima County, we have conducted approximately 22 formal section 7 consultations where actions were anticipated to adversely affect the Chiricahua leopard frog. Activities evaluated under these consultations included mining activities (1), flood control/water projects (1), fire plans (5), border infrastructure (4), grazing (3), and management planning (8).

EFFECTS OF THE ACTION

Effects of the action refer to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated and interdependent with that action, that will be added to the environmental baseline. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. Indirect effects are those that are caused by the proposed action and are later in time, but are still reasonably certain to occur.

Pima Pineapple Cactus – The proposed action will directly affect the eight known extant Pima pineapple cactus individuals that have been documented during survey activities. In addition, approximately 215 acres of suitable Pima pineapple cactus habitat will be eliminated. Conservation measures have been included in the proposed action to reduce or offset the effects

of this action on the Pima pineapple cactus. These measures include the establishment of a 215-acre Pima pineapple cactus conservation area that will be protected in perpetuity through a restrictive covenant or some other appropriate legal instrument. Additionally, the eight extant Pima pineapple cactus individuals will be translocated to the Pima pineapple cactus conservation area.

Indirect effects such as dust, vibration, noise, and lighting associated with the operation of the stockpile extension are not expected to result in any effects to Pima pineapple cactus outside of the area identified as being affected by the proposed action. These same factors have the potential to indirectly affect Pima pineapple cacti through effects to potential pollinators and seed dispersers. However, we do not anticipate that the effects will extend outside of the area of effects identified in the BA and we do not find that access to or connectivity among adjacent Pima pineapple cactus individuals will be affected by the operation of the stockpiles.

Chiricahua Leopard Frog – The proposed action will eliminate a site that is currently occupied by Chiricahua leopard frogs, Pond 3. The loss of this site represents the loss of an unknown number of individual frogs and, because an egg mass has been located previously at this site, the loss of this site also represents the loss of future reproduction at this site. Conservation measures have been included as part of the proposed action to reduce or offset effects to the Chiricahua leopard frog at this site. These measures include the coordination and funding of a salvage effort to relocate any frogs or egg masses that occur in the site to another appropriate site as determined by the Service and the Chiricahua Leopard Frog Recovery Team. In addition, one-time funding of \$20,000 will be provided to be used for the implementation of recovery actions in Recovery Unit 1 of the Chiricahua Leopard Frog Recovery Plan. The use of this funding will be determined by the Service and the Chiricahua Leopard Frog Recovery Team.

Indirect effects from the proposed action potentially include the fragmentation of dispersal habitat and effects to dispersal from dust, noise, vibration, and lighting associated with the operation of the stockpile. However, the configuration of the project footprint and the construction of a stormwater management channel should eliminate the potential for these types of indirect effects. Chiricahua leopard frogs occupying other known aquatic sites in the vicinity of the project will not be affected with regard to breeding and dispersal due to their distance from the project area and the continued presence of those aquatic habitats and washes providing connecting habitat corridors should allow for the continued function of the metapopulation in this recovery unit.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this BO. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Cumulative impacts from private actions include potential future mining operations at the Sierrita Mine Complex and other adjacent mining operations. Many of these operations may have a Federal nexus, but some of them do not. Additionally, future development activities at

the Caterpillar Proving Grounds, urban development in areas around south Tucson, Green Valley, Nogales, Rio Rico, and along the Santa Cruz River may result in cumulative effects related to recreation, roadway development, and other urban impacts. Again, while some of these activities are likely to have a Federal nexus, some will not. Some consideration for the conservation of the Pima Pineapple cactus and the Chiricahua leopard frog may be afforded through Pima County's development processes, including the implementation of the Multi-species Conservation Plan. However, for Pima Pineapple cacti occurring in areas without any protective measures under the Act or through Pima County, the only protection available for is through the Arizona Native Plant Law, which provides only for salvage for scientific and educational purposes. Regardless of the process or the outcome of salvaged Pima pineapple cactus transplants, Pima pineapple cactus habitat will continue to be lost, cumulatively impacting the potential for the survival and recovery of this species.

CONCLUSION

Pima Pineapple Cactus - After reviewing the current status of the Pima pineapple cactus, the environmental baseline for the action area, the effects of the proposed development rock stockpile extension, and the cumulative effects, it is our biological opinion that FMSI's Sierrita Mine stockpile extension project, as proposed, is not likely to jeopardize the continued existence of the pineapple cactus. No critical habitat has been designated for this species; therefore, none will be affected. This conclusion is based on the full implementation of the project as described in the Description of the Proposed Action section of this document, particularly the conservation measures that were incorporated into the project design and proposed action, as well as the discussion of effects found in the "Effects of the Action" section above, and the following:

- A very small number of individual Pima pineapple cacti (8) will be directly or indirectly affected by the proposed action. The affected Pima pineapple cacti will be transplanted within the conservation lands.
- The loss of occupied Pima pineapple cactus habitat (approximately 215 acres) is offset by the conservation in perpetuity of approximately 215 acres of Pima pineapple cactus habitat being protected in perpetuity within conservation lands established within the Sierrita Mine property as described in the proposed action and the BA.

Chiricahua Leopard Frog - After reviewing the current status of the Chiricahua leopard frog; the environmental baseline for the action area, the effects of the proposed activities, and the cumulative effects, it is our biological opinion that the proposed action is not likely to jeopardize the continued existence of the Chiricahua leopard frog. This conclusion is based on the full implementation of the project as described in the Description of the Proposed Action section of this document, particularly the conservation measures that were incorporated into the project design and proposed action, as well as the discussion of effects found in the "Effects of the Action" section above, and the following:

- Chiricahua leopard frogs are known to occur in only one site (Pond 3) within the project area. While this site will be eliminated due to the proposed action, this site is not designated as critical habitat, nor is it included as a special management area in the Chiricahua Leopard Frog Recovery Plan. Loss of this site will not significantly affect the

ability to maintain the current metapopulation of Chiricahua leopard frogs in this area for the conservation of the species.

- Prior to elimination of Pond 3 as part of the proposed action and during the active season of the Chiricahua leopard frog, the Applicant will fund the coordination and implementation of the salvage and translocation of any frogs, tadpoles, and egg masses in Pond 3 to an appropriate alternative site determined by the Service and AGFD in conjunction with the Chiricahua leopard frog local recovery group for recovery unit 1.
- The Applicant will provide \$20,000 in funding to implement Chiricahua leopard frog recovery actions in Recovery Unit 1. These actions will help offset the effects of the proposed action on Chiricahua leopard frog conservation and recovery.

INCIDENTAL TAKE STATEMENT

Pima Pineapple Cactus - Sections 7(b)(4) and 7(o)(2) of the Act generally do not apply to listed plant species. However, limited protection of listed plants from take is provided to the extent that the Act prohibits the removal and reduction to possession of federally-listed endangered plants from areas under Federal jurisdiction, or for any act that would remove, cut, dig up, or damage or destroy any such species on any other area in knowing violation of any regulation of any State or in the course of any violation of a State criminal trespass law. Neither incidental take nor recovery permits are needed from the Service for implementation of the proposed action.

Because incidental take does not apply to listed plants, there are no reasonable and prudent measures for the Pima pineapple cactus. We support the proposed conservation measures for this species that are included in the proposed action. While not mandatory, we have the following suggestions that, if implemented, will improve the effectiveness of these conservation measures and will enhance their contribution to the conservation and recovery of the Pima pineapple cactus:

1. We recommend that the protocol used to transplant the extant Pima pineapple cacti to the conservation area be reviewed by the Service. When implemented, this protocol should be documented and reported to the Service so that the information can be used in developing the most effective and efficient Pima pineapple cactus transplanting protocol that will benefit the conservation of this species.
2. We recommend that the Pima pineapple cacti that are transplanted to the conservation area be monitored for a period of at least 3 years to document the effectiveness of this effort. We would appreciate receiving monitoring reports that will help document the effectiveness of using transplanting as a conservation measure for this species and help us determine if this approach can be used to further the conservation of the Pima pineapple cactus.
3. We recommend that the Pima pineapple cactus conservation area be surveyed for existing Pima pineapple cactus plants. We would appreciate a report documenting where the existing Pima pineapple cacti are located and where transplanted cacti are replanted. We would also

appreciate receiving documentation of the restrictive covenant or other legal instrument used to conserve this area in perpetuity.

4. We would appreciate receiving regular reports documenting the continued status of the Pima pineapple cactus conservation area.

5. We recommend that seeds of the individual cacti that will be impacted by the project be collected and placed in a secure seed bank facility such as the Agricultural Research Service National Center for Genetic Resources Preservation in Fort Collins, Colorado for long-term storage and future use in restoration. Care should be taken to ensure that seed collection permits are in place prior to collection and that collection follow the protocols set forth by the Center for Plant Conservation.

Chiricahua Leopard Frog – We anticipated that incidental take of Chiricahua leopard frogs will occur as a result of the proposed action. Incidental take will occur in the form of the complete loss of an occupied Chiricahua leopard frog site (Pond 3). Take will be reduced through the implementation of a conservation measure that will salvage adult and juvenile frogs, tadpoles, and egg masses that occur in Pond 3 prior to the extension of the stockpiles and construction of the stormwater management channel. This conservation measure is part of the proposed action. We anticipate that the incidental take for the proposed action will be the loss of one occupied site, Pond 3. Specific numbers of adults, juveniles, tadpoles, and egg masses that may be lost are unknown. Therefore, total incidental take authorized under this BO is all Chiricahua leopard frogs of any life stage taken as a result of the removal of Pond 3 as part of the proposed action.

The Applicant has included a number of measures and design elements within their proposed action that should reduce the potential for take of Chiricahua leopard frogs. In addition to these measures and design elements, we conclude that the following list of Reasonable and Prudent Measures and Terms and Conditions are also needed to reduce the potential for take of Chiricahua leopard frog from the proposed development rock stockpile extension project.

The following reasonable and prudent measures are necessary and appropriate to minimize take of Chiricahua leopard frogs:

1. The salvage of Chiricahua leopard frogs and egg masses from Pond 3 must be conducted by entities that have the appropriate permits and expertise. The number of frogs or egg masses translocated and the location to which they were translocated must be reported to the Service. Follow-up monitoring of the translocation site for at least two years should be included in the funding provided by the Applicant for this conservation measure.
2. Documentation should be provided to the Service regarding the provision of \$20,000 for the implementation of Chiricahua leopard frog recovery actions in Recovery Unit 1.

In order to be exempt from the prohibitions of section 9 of the Act, the Corps shall ensure that the Applicant complies with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

1. The following terms and conditions implement Reasonable and Prudent Measure 1 for the Chiricahua leopard frog:
 - a. Coordination must occur and be documented indicating that the Arizona Game and Fish Department and/or the Service have agreed to conduct the salvage and translocation of any Chiricahua leopard frogs or egg masses from Pond 3. These are the only entities with appropriate expertise and that are currently permitted to conduct these activities.
 - b. The Applicant shall provide documentation to the Service that funding has been provided to conduct the translocation activities.
 - c. Salvage and translocation of Chiricahua leopard frogs must occur during the time of year when frogs are active (April to October) and must occur prior to the extension of the stockpiles and construction of the stormwater management channel. The Applicant will notify the Service and the Arizona Game and Fish Department at least 30 days prior to the beginning of activities to extend the stockpiles and construct the stormwater management channel.
 - d. The Applicant must coordinate with the Arizona Game and Fish Department and/or the Service to provide a report documenting the number of frogs and/or egg masses translocated. This report must also include documentation of the site to which these frogs and/or egg masses were translocated.
 - e. The completion of annual monitoring reports for the translocation site must also be coordinated by the Applicant and provided to the Service for the two years of post translocation monitoring.
2. The following term and condition implements Reasonable and Prudent Measure 2 for the Chiricahua leopard frog:
 - a. The Applicant shall provide a report to the Service documenting the date that funding was provided for the implementation of recovery actions in Recovery Unit 1. The report should also document to what entity the funding was provided and document assurances that the funding will be available and will only be used to fund Chiricahua leopard frog recovery activities in Recovery Unit 1.

Disposition of Dead or Injured Listed Species (Chiricahua Leopard Frog)

Upon locating a dead, injured, or sick listed species, initial notification must be made to the FWS's Law Enforcement Office, 2450 W. Broadway Rd, Suite 113, Mesa, Arizona, 85202,

telephone: 480/967-7900) within three working days of its finding. Written notification must be made within five calendar days and include the date, time, and location of the animal, a photograph if possible, and any other pertinent information. The notification shall be sent to the Law Enforcement Office with a copy to this office. Care must be taken in handling sick or injured animals to ensure effective treatment and care, and in handling dead specimens to preserve the biological material in the best possible state.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

- 1) We recommend that Corps work with FMSI and FWS to monitor the success of the Pima pineapple cactus transplant efforts associated with this and other projects.
- 2) We recommend that Corps work with FMSI to address invasive species issues (plants and animals) within the Sierrita Mine Complex, particularly the Pima pineapple cactus conservation areas and stock ponds.
- 3) We recommend that Corps, in cooperation with FWS, develop long-term conservation strategies for the Pima pineapple cactus (conservation banking, on-site set asides, transplanting, etc.) and incorporate those strategies into the CWA 404 permitting process.

In order for us to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, we request notification of the implementation of any conservation recommendations.

REINITIATION NOTICE

This concludes formal consultation on the action(s) outlined in the reinitiation request. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

Our office appreciates the Corps' efforts to identify and minimize effects to listed species from this project. For further information please contact Scott Richardson (520) 670-6150 (x242) or Jean Calhoun (520) 670-6150 (x223). Please refer to the consultation number 02EAAZ00-2016-F-0336 in future correspondence concerning this project.

Sincerely,



Steven L. Spangle
Field Supervisor

For

Cc (hard copy):

- Field Supervisor, Fish and Wildlife Service, Phoenix, AZ (2)
- Assistant Field Supervisor, Fish and Wildlife Service, Tucson, AZ (Attn: Jean Calhoun)

Cc (electronic copy):

- Chief, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ (pep@azgfd.gov)
- Regional Supervisor, Arizona Game and Fish Department, Tucson, AZ (Attn: John Windes)
- U.S. Army Corps of Engineers, Phoenix, AZ (Attn: Michael Langley)

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APPENDIX A.

Lesser Long-nosed Bat (*Leptonycteris curasoae yerbabuena*)

Environmental Baseline

This species is known from grasslands, arid scrublands, and oak woodlands below 5500 ft. in elevation. In Arizona, these bats arrive in mid- April, roosting in caves, abandoned mine shafts and tunnels. Young are typically born in maternity colonies in mid-May. Females and young remain in maternity roosts and forage on primarily saguaros below about 3500 ft. until approximately mid-July. At this time, the range expands and bats are found up to about 5500 ft. in areas of semi-desert grassland and lower oak woodland, foraging primarily on agaves. These bats typically leave southern Arizona by late September to early October. While there are small caves and some mine shafts in the Sierrita Mountains in the general vicinity of the project, no roost sites or maternity colonies are known to be within the action area for the proposed stormwater controls.

The primary threats to the lesser long-nosed bat are roost site loss or disturbance and impacts to forage availability (FWS 2007b). Other threats that have contributed to the current endangered status of the species include roost disturbance and deterioration, border activities, recreation, vandalism, fire, vampire bat control, mine closures, and forage availability. The effects of climate change (i.e., decreased precipitation and water resources) are a threat to many species, including the lesser long-nosed bat (Lenart 2007). For example, temperatures rose in the twentieth century and warming is predicted to continue over the twenty-first century. Although climate models are less certain about predicted trends in precipitation, the southwestern United States is expected to become warmer and drier. In addition, precipitation is expected to decrease in the southwestern United States, and many semi-arid regions will suffer a decrease in water resources from climate change as a result of less annual mean precipitation and reduced length of snow season and snow depth. Approximately half of the precipitation within the range of the lesser long-nosed bat typically falls in the summer months; however, the impacts of climate change on summer precipitation are not well understood. Drought conditions in the southwestern United States have increased over time and may have contributed to loss of lesser long-nosed bat populations since the species was originally listed in 1988, and possibly historically. Climate change trends are likely to continue, and the impacts on species will likely be complicated by interactions with other factors (e.g., interactions with habitat-disturbing activities and impacts to forage resources).

Lesser long-nosed bats are likely to forage within the general vicinity of the Sierrita Mine Complex, using species of agave and columnar cacti, as well as hummingbird feeders. *Agave palmeri* in the action area typically occurs in relatively small numbers in the foothills portion of the Sierrita Mountains. Saguaro cacti are not numerous within the action area.

Conclusion

The Service concurs with the Corps' determination that the action may affect, but is not likely to adversely affect lesser long-nosed bat, based upon the following:

- There are no known roost sites within the action area; therefore, the effects to roosts will be discountable.
- There are no significant occurrences of saguaro cacti or agaves within the action area, therefore the effects to lesser long-nosed bat forage resources will be insignificant.