DESERT TORTOISE COUNCIL
3807 Sierra Highway #6-4514
Acton, CA 93510
www.deserttortoise.org
eac@deserttortoise.org

Via email and BLM NEPA eplanning portal

March 25, 2023

Attn: Randy Porter
Ridgecrest Field Office
Bureau of Land Management
300 S. Richmond Rd.
Ridgecrest, CA 93555
rporter@blm.gov

RE: Gold Discovery Group Drilling Exploration Project Environmental Assessment (DOI-BLM-CA-D050-2023-0007-EA)

Dear Mr. Porter,

The Desert Tortoise Council (Council) is a non-profit organization comprised of hundreds of professionals and laypersons who share a common concern for wild desert tortoises and a commitment to advancing the public's understanding of desert tortoise species. Established in 1975 to promote conservation of tortoises in the deserts of the southwestern United States and Mexico, the Council routinely provides information and other forms of assistance to individuals, organizations, and regulatory agencies on matters potentially affecting desert tortoises within their geographic ranges.

As of June 2022, our mailing address has changed to:
Desert Tortoise Council
3807 Sierra Highway #6-4514
Acton, CA 93510.

Our email address has not changed. Both addresses are provided above in our letterhead for your use when providing future correspondence to us.

We appreciate this opportunity to provide comments on the above-referenced project. Given the location of the proposed project in habitats likely occupied by Mojave desert tortoise (*Gopherus agassizii*) (synonymous with Agassiz's desert tortoise), our comments pertain to enhancing

protection of this species during activities funded, authorized, or carried out by the Bureau of Land Management (BLM), which we assume will be added to the Decision Record for this project as needed. Please accept, carefully review, and include in the relevant project file the Council's following comments and attachments for the proposed project.

The Mojave desert tortoise is among the top 50 species on the list of the world's most endangered tortoises and freshwater turtles. The International Union for Conservation of Nature's (IUCN) Species Survival Commission, Tortoise and Freshwater Turtle Specialist Group, now considers the Mojave desert tortoise to be Critically Endangered (Berry et al. 2021), "… based on population reduction (decreasing density), habit loss of over 80% over three generations (90 years), including past reductions and predicted future declines, as well as the effects of disease (upper respiratory tract disease/mycoplasmosis). *Gopherus agassizii* (sensu stricto) comprises tortoises in the most well-studied 30% of the larger range; this portion of the original range has seen the most human impacts and is where the largest past population losses had been documented. A recent rigorous rangewide population reassessment of *G. agassizii* (sensu stricto) has demonstrated continued adult population and density declines of about 90% over three generations (two in the past and one ongoing) in four of the five *G. agassizii* recovery units and inadequate recruitment with decreasing percentages of juveniles in all five recovery units." It is one of three turtle and tortoise species in the United States to be critically endangered.

This status, in part, prompted the Council to join Defenders of Wildlife and Desert Tortoise Preserve Committee (Desert Tortoise Council 2020) to petition the California Fish and Game Commission in March 2020 to elevate the listing of the Mojave desert tortoise from threatened to endangered in California.

Description of Proposed Action and Alternatives

Gold Discovery Group, LLC (Proponent) has submitted a plan of operations for drilling and gathering samples near Johannesburg, Randsburg, and the former town of Atolia, California. Two alternatives are described in the EA, the Proposed Action Alternative and the No Action Alternative.

Proposed Action: The Proposed Action is to access mining claims for mineral exploration on land managed by the BLM.

The Proposed Action is located in the general vicinity of Johannesburg, Randsburg, and the former town of Atolia in eastern Kern County and western San Bernardino County, California. The drill sites appear to be within 3 miles of US Highway 395. The proposed project area is open to mineral entry under the Mining Law of 1872, but is within the Fremont-Kramer Area of Critical Environmental Concern (ACEC) and/or the Fremont-Kramer unit of Critical Habitat for the Mojave desert tortoise (please see Figure 1).

The Federal Land Policy and Management Act (FLPMA) requires BLM to respect the rights of locators established by the Mining Law of 1872, including a claimant's rights of ingress and egress, while also taking any action necessary to prevent unnecessary or undue degradation of the public

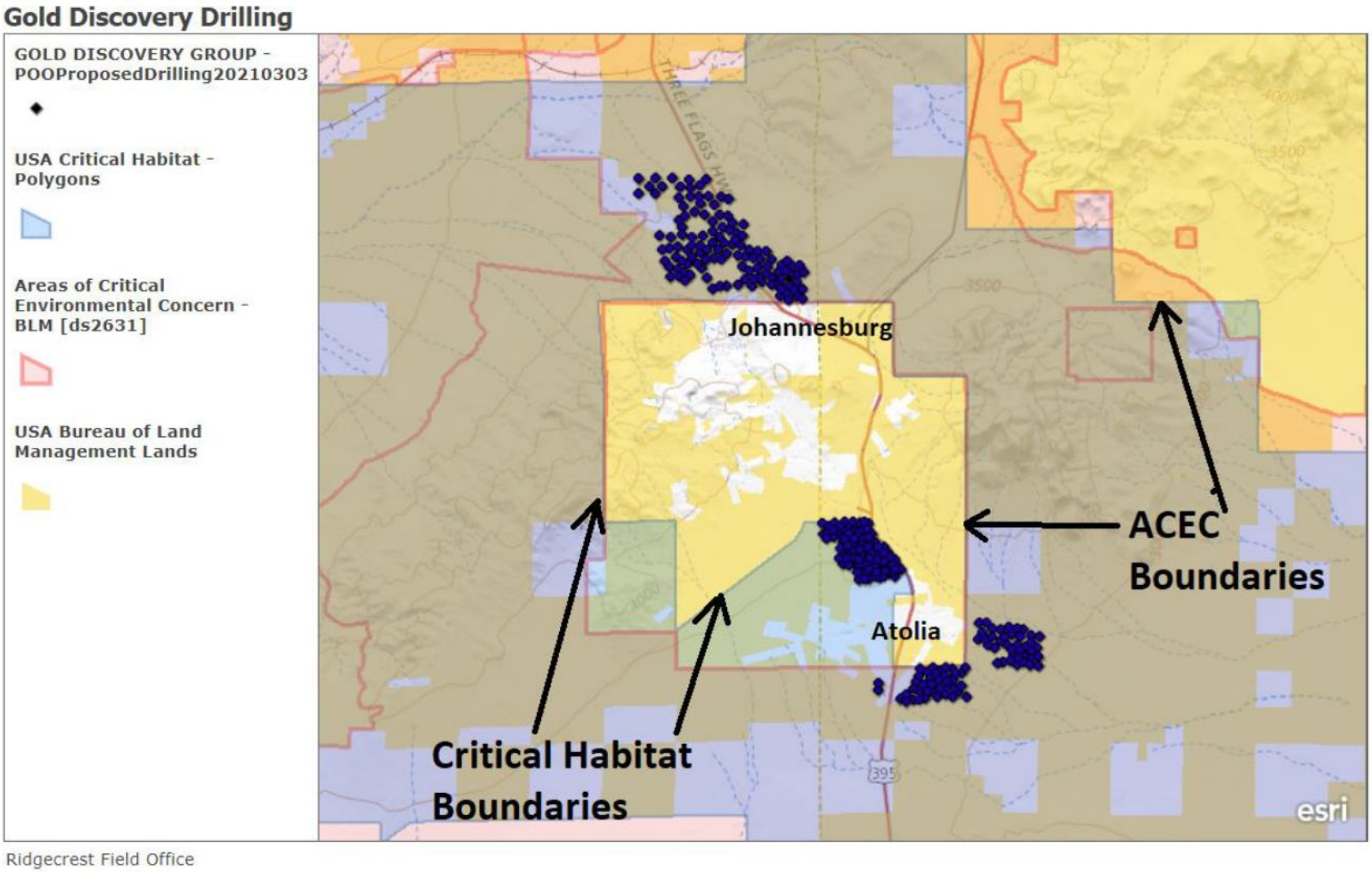


Figure 1. Relationship of drilling area(s) (black circles) to the Fremont-Kramer ACEC and Mojave Desert Tortoise Critical Habitat designated by U.S. Fish & Wildlife Service. The Kern – San Bernardino County boundary runs north-south through the middle of the figure.

lands, consistent with the mining laws. [impose closure during certain times of the year, monitoring by qualified biologists, etc.

Alternatives

BLM describes two alternatives in the EA, the No Action Alternative and the Proposed Action Alternative as described by the Project Proponent.

No Action Alternative: BLM would withhold authorization to implement the Proposed Action. Current land use in the area would continue.

Proposed Action Alternative: The Proponent would drill and gather samples at depth from 293 small drilling locations on BLM land. The proponent proposes to drive a four-wheeled mobile drill rig to each drill site, operating on large, heavy-equipment rubber tires each approximately 2 feet in width, would use existing county and BLM roads (including both active and inactive BLM designated routes), and would drive some cross-country. Off-road travel is estimated as 25.5 miles. One pickup truck or similar light-duty vehicle would follow the drill rig's tracks. Disturbance would consist of tire tracks and the direct drilling of 8-inch diameter hollow-stemmed auger drill holes. Average drill depth is estimated as 30 feet. Drill cuttings would be temporarily stockpiled on the tracks, then backfilled into the hole promptly after samples have been gathered from the cuttings. This Alternative would take about 2 years to implement.

Comments on the Environmental Assessment

Alternatives

To comply with section 102(2)E) of the National Environmental Policy Act (NEPA), there should be one or more additional action alternatives presented in the EA that are sufficiently broad and meet the purpose and need of the Proposed Action. This requirement is supported by BLM's NEPA Handbook (2008). The range of alternatives presented in the EA should be sufficiently broad and comply with and BLM's Handbook on NEPA (BLM 2008). The BLM NEPA Handbook directs BLM to "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal that involves unresolved conflicts concerning alternative uses of available resources…".

In the EA, BLM said they "considered several additional alternatives requiring compliance with mitigation requirements deriving sole authority from Title II of FLPMA (e.g., certain DRECP CMAs); however, these alternatives were but eliminated from detailed analysis because the BLM lacks authority to impose such requirements for actions evaluated under the Mining Law of 1872, except to prevent undue or unnecessary degradation of public lands (43 USC 1732(b))." We request that BLM describe these alternatives that were dismissed in the EA.

The EA should include alternatives that "prevent undue or unnecessary degradation of public lands" such as those that alter the timing of the drilling and refilling so it occurs outside of tortoise active seasons/immediately following precipitation events and migratory bird breeding season, require vertical mulching or similar methods to obscure the routes the Proponent used/tracks the Proponent made to access the drill sites that are not open routes, test surface soil before and after

drilling for metals such as arsenic and mercury (see "Environmental Contaminants" below), etc. The inclusion of additional action alternatives is further supported by BLM's statement in the EA that "BLM will decide whether to approve, approve with modification, or deny the proposal for Gold Discovery Group LLC to gather drilling samples from certain unpatented placer mining claims. We request that BLM develop and add these action alternatives to the EA. The Proposed Action Alternative would be the alternative developed by the Proponent. Other action alternatives would be those that BLM develops with modifications to the Proposed Action Alternative.

We request that BLM select an action alternative that prevents undue or unnecessary degradation of tortoise habitat especially with respect to the release and spread of environmental contaminants/metals from drilling activities.

Segmentation

We presume the results from the samples collected from drilling would be used to determine whether additional drilling samples would be requested and/or a larger mining plan of operation would be proposed. While unknown at this time, we remind BLM that future exploration/mining activity should not be segmented under the National Environmental Policy Act (NEPA). BLM's analysis should include the past, current, and future proposed mining activities associated with this project. Please see "Cumulative Impacts" section below.

Section 1.4.1 of the EA lists several "Conservation Management Actions" (CMAs) that would be implemented during the proposed action. However, many of these CMAs are inconsistent in their wording and requirements. For example, LUPA-BIO-2 says, "Designated biologist(s) will conduct, and oversee where appropriate, activity-specific required biological monitoring during pre-construction, construction, and decommissioning to ensure that avoidance and minimization measures are appropriately implemented and are effective." However, LUPA-BIO-5 says, "All activities, as determined appropriate on an activity-by-activity basis, will implement a worker education program…carried out during all phases of the project (site mobilization, ground disturbance, grading, construction, operation, closure/decommissioning or project abandonment, and restoration/reclamation activities." The inconsistency is that biological monitoring is not required for all phases of the Proposed Action, specifically restoration/reclamation activities. We request these CMAs be amended to require monitoring during all phases of the Proposed Action.

In addition, the biological opinion issued by the U.S. Fish and Wildlife Service (USFWS 2017) for BLM's 2016 Land Use Plan Amendment (LUPA) for the California Desert Conservation Area says, BLM has "adopted numerous conservation and management actions, which it defines as the "specific set of avoidance, minimization, and compensation measures, and allowable and non-allowable actions for siting, design, pre-construction, construction, maintenance, implementation, operation, and decommissioning activities on (Bureau) land. The Bureau will apply these conservation and management actions to all future activities." We request that BLM list all conservation and management actions from the LUPA in the EA and require that they be implemented for the Proposed Action.

1.5 Relationship to Statutes, Regulations, and Other National Environmental Policy Act Document

Section 7 of the Endangered Species Act: In the EA, BLM says, "The proposed project is covered by the BLM 2017 Biological Opinion (BO) (USFWS 2017) for Activities in the California Desert Conservation Area, with tortoise conservation measures and reporting requirements." We reviewed this BO and were unable to find an analysis of the effects of mining activities to the tortoise or its critical habitat/habitats given the known environmental contaminants/metals that occur on the surface in the Project area because of past and ongoing mining activities.

In the biological opinion, the USFWS says, under "Construction of Non-Linear Facilities" where mines are mentioned once, "the Bureau will require the proponents to site activities in areas with lower densities and to implement measures that have proven effective in the past in reducing mortality and injury."

We were unable to find a discussion/analysis of effects of exposure to tortoises from mining activities that unearth, spread, and expose tortoises/tortoise critical habitat to environmental contaminants/metals including arsenic, from inhalation, ingestion, surface contact, etc. Please see the "Environmental Contaminants" section below. This analysis should include the effects of short-term and long-term exposure via these several exposure pathways from past, ongoing, and proposed mining activities and vehicle use in the area. Rather only the use of construction equipment and resulting direct effects of its use to tortoises and habitats were discussed/analyzed. Reinitiation of formal consultation is required (50 Code of Federal Regulations 402.16) "where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if… 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…" We conclude the biological opinion did not analyze the impacts of environmental contaminants/metals to the tortoise and tortoise critical habitat/habitat and should not be use as the document for compliance with section 7(a)(2) of the Federal Endangered Species Act for this Proposed Action.

In addition, the USFWS conducted it analysis of effects to the tortoise with the understanding that BLM "will require project proponents to install fencing to preclude desert tortoises from entering work areas prior to removing all individuals that they can locate on the project site. During construction of the perimeter fencing and during other ground-disturbing activities that are outside of the fenced facility (i.e., access roads), the authorized biologists will perform pre-activity clearance surveys and move desert tortoises out of harm's way if they re-enter work areas."

We request that BLM reinitiate formal consultation with the USFWS for the Proposed Action. We request that BLM correct the EA to require fencing activities with clearance surveys and all other tortoise conservation measures and reporting requirements that were listed in the biological opinion.

State and/or County Permit, Approval, or Clearance 1.5 State approvals: In this section, we did not find a discussion of requirements to comply with the California Endangered Species Act or California Fish and Game Code 1600, Lake and Streambed Alteration Agreement. Please add to the EA that compliance with these regulatory requirements is required. BLM should also add that their authorization of the Plan of Operation for the Proposed Action is not valid until all other regulatory requirements are met.

1.6.2 Issues Identified for Detailed Analysis

BLM says "[w]here these [performance] measures may not mitigate impacts of the proposed action below significance, the following issues were retained for detailed analysis." BLM identified two resource issues for detailed analysis: 1) How would vegetation removal associated with the proposed exploratory drilling impact wildlife habitat (including special status animal and plant species) in the Fremont-Kramer Area of Critical Environmental Concern, and 2) How would this project affect cultural resources, Native American and/or religious concerns?

Given BLM's wording in this section, we interpret this to mean these impacts are significant. Consequently, BLM is required to analyze these impacts in an environmental impact statement, not an environmental assessment.

We suggest that BLM explain why they are not preparing an environmental impact statement when they consider these two resource issues as not mitigated below the level of significance.

1.6.3 Issues Not Presented in Detail

In this section, BLM says "An issue was dismissed from detailed analysis if the issue was not present, would not be impacted, or if potential impacts would be mitigated through implementation of Conservation Management Actions, Project Design Features (Section 2.1.1), and/or required performance measures." NEPA requires analysis if the impacts before implementing mitigation measures. There is no guarantee that the mitigation measures in the NEPA document will be implemented, and if implemented, will be successful. We request that BLM comply with NEPA and its implementing regulations especially with respect to analysis of direct, indirect, and cumulative impacts to the tortoise and tortoise critical habitat and the development of alternatives other than the Proposed Action and No Action alternatives.

Table 1.3. Issues Not Presented in Detail

BLM dismissed 1) the potential impacts from waste (hazardous materials) generated by the construction and operation of the proposed action, and 2) and the potential spread of noxious weeds and invasive plants. For the first issue, BLM must be unaware of the data and analysis on the presence of environmental contaminants/metals (e.g., arsenic, etc.) on the surface from past and ongoing mining activities in the Randsburg and Atolia mining areas. When drilling or excavation occurs, the rock is brought to the surface and arsenic and other metals/environmental contaminants are deposited where they are transported by wind, water, and vehicles. Please see the "Environmental Contaminants" section below for more information.

The Council request that BLM include in the EA a scientific analysis of the direct, indirect and cumulative impacts of these metals/environmental contaminants on the tortoise/tortoise critical habitat and other special status species and their habitats.

For noxious weeds and invasive plants, BLM provided information to dismiss noxious weeds as a resource issue. However, we did not find information in the EA that discussed/analyzed the

Proposed Action with respect to invasive plant species. The Council requests that BLM revise this section and provide information on the occurrence of invasive plant species in the project area. From photographs provided in the EA, we see *Schismus* sp. present in January 2021). After the above average winter rains of 2022-2023, there will likely be other invasive plants germinating and growing. The NEPA document should analyze how the proposed action is likely to contribute to the spread and proliferation of invasive plant species along 25.5 miles of off-road travel and additional areas traveled including turn-around areas, and the conservation measures BLM will require of the Proponent to ensure that invasive plant species are not brought to, spread around, and/or provided with a germination advantage over native species through surface disturbance and timing.

2.1.1 Project Design Features

LUPA-BIO-9 requires that BLM "[i]mplement measures to prevent leaks, spills, or releases which might impact water resources." However, this Conservation Management Action (CMA) does not apply to leaks, spills, or releases which might affect terrestrial resources or air quality. As BLM states in the EA, FLPMA requires BLM to respect the rights of locators established by the Mining Law of 1872, including a claimant's rights of ingress and egress, while also "taking any action necessary to prevent unnecessary or undue degradation of the public lands."

Please see the "Environmental Contaminants" section below for a discussion on the sources, presence, and spread of environmental contaminants including metals from mining activities in the Project area. We believe preventing leaks, spills, or releases of environmental contaminants during all phases of mining activities should be one of BLM's major priorities. BLM should require appropriate management actions and monitoring of environmental contaminants/metals to prevent unnecessary or undue degradation of the public lands including the tortoise and tortoise critical habitat/habitat.

We request that BLM require a trust fund or other funding mechanism to ensure that effective long-term post-mining restoration is implemented in tortoise critical habitat. BLM's Surface Management Manual and Handbook require that "BLM will require financial assurances, including long-term trusts, to ensure reclamation of the land" (BLM 2012a, 2012b). Please ensure this requirement is added to the EA and the document that authorized the Proposed Action.

LUPA-BIO-10 requires BLM to "[i]mplement measures to prevent the introduction or subsidy of invasive weeds and non-native species." However, it does not require monitoring of invasive weeds and non-native species in the action area to determine the effectiveness of LUPA-BIO-10 or implementation of actions to manage weedy to control these weeds/species in the action area. We request that this CMA be amended to require these monitoring and management actions.

LUPA-SW-1 Measures to protect soil and water resources – We request that BLM expand this CMA to describe what measures would be implemented for the Proposed Action to protect soil and water resources. Please see the "Environmental Contaminants" section below for the resource issues that would be addressed to protect soil and surface water resources.

There is no compensation required for the Proposed Action. We understood that the DRECP imposed compensation for any surface disturbance in critical habitat for the tortoise at a 5:1 ratio. Please add this compensation requirement to the Performance Standards or explain in the NEPA document why compensation is not required.

The effectiveness of implementing standard conservation management actions to minimize take for the tortoise is questionable. While these actions may reduce the direct loss or take of tortoise, indirect take occurs at a rate greater than recruitment. Given the ongoing downward trend in the demographic status of the tortoise and declining recruitment of juvenile tortoises (Allison and McLuckie 2018; please see Appendix A – Demographic Status and Trend of the Mojave Desert Tortoise including the Western Mojave Recovery Unit, which is attached) with the three populations in the western Mojave Recovery Unit below the population viability threshold for several years, the Council concludes that the standard conservation management actions implemented by BLM since the tortoise was listed in 1989 have not been effective in reversing this downward population trend. Additional effective conservation management actions are needed with appropriate science-based monitoring and adaptive management to ensure their effectiveness in halting the decline in tortoise numbers and densities

Environmental Impacts

3.1.2.1 Wildlife, Alternative A: Proposed Action, Special Status Wildlife Species, Mojave Desert Tortoise: We were unable to find a description or analysis in the EA of the impacts of metals and other environmental contaminants on the tortoise/tortoise critical habitat. Chaffee and Berry (2006) reported in the Rand and Atolia mining districts, that samples of soils are generally highly enriched with at least six elements/metals (arsenic, chromium, lithium, nickel, antimony, and gold). High concentration levels for arsenic, gold, and antimony were also found in mineralized samples from old mine dumps and tailings piles (Chaffee, M.A., 2006, unpub. data, in Chaffee and Berry 2006). Soil anomalies for arsenic, gold, cadmium, mercury, antimony, and tungsten extend as far as 15 km (9.3 miles) outward from the present area of mining. Soils containing anomalous Hg were found at least 6 km (3.7 miles) away from tailings.

Arsenic is probably the most potentially toxic element to tortoises of all those determined for this study (Chaffee and Verry 2006). High arsenic concentrations were found almost exclusively in plant samples collected in or near areas known to be contaminated by mining of arsenic-rich ores in the Project area. The highest arsenic concentrations were found in 13 different species with five species in the legume family and are favored foods for (Jennings, 1993, 2002). However, the other eight species are also consumed by tortoises.

Chaffe and Berry (2006) attributed the source of these elevated levels of metals to mining activities that produced dust contaminated with these metals. This contaminated dust was/continues to be distributed by wind, vehicles, and rainfall including flash flooding. The highest concentration of arsenic in soils was 510 ppm. The anomalous concentrations of arsenic and mercury may be the source of elevated levels of these elements found in ill tortoises from the region.

An analysis of plants collected in the area that are used a forage by tortoises revealed the plant material was strongly enriched in seven elements - calcium, cadmium, potassium, molybdenum,

strontium, and zinc. In contrast, concentrations of most other elements were significantly lower in plants as compared to soils. They suggested that the distribution and abundance of these metals should be evaluated in tortoise forage plants to determine their role in systemic uptake in plants and consumption by tortoises.

Kim et al. (2012) studied the origins of arsenic in the Project area. Mineral deposits in the western Mojave Desert contain unusually high concentrations of arsenic and is common in veins in the Kelly and Randsburg ore deposits. It is also common in the processed tailings at both of these mines.

Kim et al. (2012) reported that airborne mobilization of mine tailings is diffuse and covers large areas, while fluvial transport is more localized. It is directed down narrow and semi-linear washes, which facilitates the movement of tailings across significant distances and into ephemeral lakes or playas (Kim et al 2012). For fluvial transport at sites in the Randsburg area, arsenic deposition was recorded 1 km (0.6 mile) to >5 km (>3.1 miles) downstream from the mine/tailings in washes, and concentrations were greater than 2,000 mg/kg (or 2,000 ppm) than in the tailings and background samples. Kim at el. (2012) detected pulses of arsenic on the surface. Pulses of arsenic transport nearest the initial tailings source originated through recent storm events that were relatively short in duration, while pulses further downstream represent a much longer timeframe of transport and mine migration. Where the wash is not highly incised into the alluvial fan, transport of tailings occurs as sheet wash on the alluvial fan and in the smaller channels that extend on either side of the main wash. The future variability in such events as a result of climate change may significantly impact the migration of contaminated tailings, particularly if the frequency or severity of storm events increases (Kim et al. 2012). Now that arsenic has been documented as being transported and concentrated through the Project area and beyond via fluvial transport, it is likely that other metals/environmental contaminants are also being transported and concentrated in a similar manner.

In further research, Kim et al. (2014) studied the aeolian transport of arsenic in the Project area. They reported that mine tailings are susceptible to weathering and windborne transport, and this significantly increases the spatial extent of arsenic contamination in topsoils and potential exposure of humans to toxic metal(loid)s.

Aeolian transport is the dominant mechanism of soil contamination by mine tailings in Randsburg Historic Mining District (RHMD). Field studies of surface arsenic concentrations and surface enrichment of arsenic demonstrate the decay with distance is strongly dependent on prevailing wind direction, which in the RHMD is primarily from west to east. Surface contamination based on depth profiling of residential lots in Red Mountain, CA is pervasive and appears to extend to approximately 15 cm depth, providing a baseline for recommended soil removal in order to remediate contaminated Residences (Kim et al. 2014). All samples analyzed from the RHMD have the potential to exceed the de minimis cancer risk threshold for humans based on average PM10 concentrations, with multiples as high as nearly 23 times the threshold value. Materials at the mine sites examined exhibit the potential to exceed minimum risk level for non-cancer-related health risks under chronic exposure conditions. This suggests that long-term residents located closest to/ downwind of these mine sites face possible adverse health effects due to the inhalation of fine-grained mine tailings mobilized through aeolian processes. Recreational OHV users, who mobilize

large dust clouds with their vehicles and who drive directly through such clouds regularly, are also at potential risk for acute short-term exposure (Kim et al. 2014).

From these finding, we conclude that impacts to the tortoise from fluvial and aeolian exposure to arsenic and other environmental contaminants may be as great or greater than to humans. Tortoises are outsider within the 15 cm depth of deposition and therefore exposed 24 hours a day. Tortoises also have more exposure pathways for environmental contaminants than humans and would have more opportunities for exposure than humans.

Tortoises intentionally consumes soil (geophagy) and small rocks (lithophagy) (Sokol 1971) to support digestive and nutritional needs. Because tortoises forage in washes and use washes for movement corridors, they are more likely to encounter the dust of metals/environmental contaminants downgradient from locations of mining activities than many other wildlife species. Because of intentional consumption of soil and rocks and foraging/movements in washes, tortoises are likely exposed to a greater level of metals in the project area from ingestion than animals that accidentally consume contaminated soil and rocks or spend little time foraging in washes.

Olfaction is important to the tortoise. When moving about, tortoises touch their nose to the soil and rocks, and actively sniff (Berry 1972). This behavior is repeated as the tortoise walks over the ground. This sniffing behavior means that tortoises are more likely to be exposed to metals/environmental contaminants in the dust deposited on the soil and plants through inhalation than birds or most mammals.

In summary, the physiology and behavior/ecology of the Mojave desert tortoise means there are multiple pathways for tortoises to be exposed to these metals/environmental contaminants in this area of the Fremont-Kramer critical habitat unit and tortoise population. These pathways include:

- Intentional ingestion of soil (geophagy) and small rocks (lithophagy) that may be contaminated with metals
- Ingestion of dust contaminated with metals deposited on plants that tortoises use for forage
- Inhalation of dust contaminated with metals when sniffing the ground
- Inhalation of dust contaminated with metals deposited by wind when in burrows
- Inhalation of dust contaminated with metals when excavating/modifying a burrow
- Dermal/eye contact with dust contaminated with metals when excavating/modifying a burrow.
- Ingestion of plants in down-gradient washes and/or slopes that may be contaminated with metals from uptake through their roots

Heavy metals have been identified as a factor contributing to mycoplasmal disease in tortoises (Jacobsen et al. 1991, Jacobsen et al. 2014). For comparison, the U.S. Environmental Protection Agency (USEPA) established the maximum level of inorganic arsenic in drinking water for humans as 10 ppb. The concentrations reported above are >2,000 ppm for arsenic transported by water. USEPA considers arsenic a hazardous air pollutant, defined as a substance that may cause an increased mortality or serious illness in humans after significant exposure (Centers for Disease Control 2023). Kim et al. (2014) reported windborne exposed mine wastes containing elevated levels of toxic metals and metalloids including arsenic (As), a known carcinogen, in the area of the Proposed Action. While we were unable to find studies on the impacts of these

metals/environmental contaminants on the Mojave desert tortoise, there is literature on their effects to other species. This information should be included in the analysis of impacts from exposure to environmental contaminants/metals and applied to impacts to reproduction, growth, and survival of the tortoise as surface activity in the area results in the spread of and increased exposure to environmental contaminants including arsenic.

We request that the NEPA document describe that past and ongoing mining in the area has resulted in deposition of metals/environmental contaminants on the surface, this deposition results in exposure to tortoises and other wildlife through (1) direct exposure (i.e., exposure to eyes and skin; inhalation – tortoises sniff the ground much like a dog and sniff plants before foraging on them; and direct consumption – tortoises eat small rocks (lithophagy), soil (geophagy) to aid digestion, and plants including dust deposited on them) drinking water from puddles and (2) indirect exposure (consuming plants that have absorbed the heavy metals through their roots. The EA should analyze the impacts of the deposition and exposure pathways for the tortoise and other special status species, and require monitoring of tortoises and tortoise habitats for these environmental contaminants/metals. Laser ablation of tortoise scutes is a method that can be used to measure arsenic concentrations and the relative timing of uptake of arsenic (Seltzer and Berry 2005).

In designating critical habitat for the tortoise, the USFWS (1994) identified the following primary constituent elements/physical and biological features: 1) Sufficient space to support-viable-populations within 'each of the recovery units and provide for movements, dispersal, and gene flow; 2) sufficient quantity and quality of forage species and the proper soil conditions to provide for the growth of such species; 3) suitable substrates for burrowing, nesting, and overwintering; burrows, caliche caves, and other sheltersites; 4) sufficient vegetation for shelter from temperature extremes and predators; and 5) habitat protected from disturbance and human-caused mortality.

Destruction or adverse modification of critical habitat is defined at 50 CFR 402.02 as a direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species. The regulations also clearly state that such alterations include, but are not limited to, alterations adversely modifying any of those physical or biological features that were the basis for determining the habitat to be critical.

The Endangered Species Act's definition of critical habitat indicates that the purpose of critical habitat is to contribute to a species' conservation, which by definition equates to recovery. Section 7 prohibitions against the destruction or adverse modification of critical habitat apply to actions that would impair survival and recovery of the listed species, thus providing a regulatory means of ensuring that Federal actions within critical habitat are considered in relation to the goals and recommendations of a recovery plan. As a result of the link between critical habitat and recovery, the prohibition against destruction or adverse modification of the critical habitat should provide for the protection of the critical habitat's ability to contribute fully to a species' recovery. Thus, the adverse modification standard may be reached closer to the recovery end of the survival continuum, whereas the jeopardy standard traditionally has been applied nearer to the extinction end of the continuum.

The presence of dust from metals/environmental contaminants on plants consumed by tortoises and on the soil surface in critical habitat is likely adversely impacting numbers 2 and 5. We request that BLM analyze in the EA how this contaminated dust is affecting the primary constituent element. In addition, we request that BLM reinitiate section 7 consultation with USFWS so the USFWS may analyze the effects of metals/environmental contaminants to tortoise critical habitat in a biological opinion. BLM should assist the USFWS in its evaluation of the Proposed Action by providing detailed information on the habitat conditions of areas/levels and extent of contamination, etc.

Because functioning critical habitat is interwoven with a species recovery, the demographic status of a species and its trend is an indication of whether critical habitat is providing the physical and biological features/primary constituent elements for survival and recovery of the listed species. In reviewing the demographic status of the tortoise (please see "Appendix A: Demographic Status and Trend of the Mojave Desert Tortoise including the Western Mojave Recovery Unit" which is attached) with its ongoing downward trend in four of the five recovery units and densities below the level needed for population viability, we conclude that designated critical habitat for the tortoise is not providing the primary constituent elements/physical and biological features needed by this species to survive and recover. We request that BLM address this conclusion in the EA with the data and analyses.

Cumulative Impacts

We could not find a cumulative effects section in the EA. Please see G*rand Canyon Trust* v. *F.A.A.*, 290 F.3d 339, 345-46 (D.C. Cir. 2002) in which the court ruled that agencies must analyze the cumulative impacts of actions in environmental assessments. We request that BLM revise their NEPA document to include a section that analyzes the cumulative impacts of the Proposed Action.

The EA should include an analysis of all impacts to the tortoise/critical habitat within the region including an up-to-date list of future state, federal, and private actions affecting the tortoise species on state, federal, and private lands.

In the cumulative effects analysis, please ensure that the Council on Environmental Quality's (CEQ) "Considering Cumulative Effects under the National Environmental Policy Act" (1997) is followed. BLM refers to this document in its NEPA Handbook (BLM 2008). BLM"s analysis should include CEQ's the eight principles, when analyzing cumulative effects of the Proposed Action to the tortoise and its critical habitat/habitats. CEQ states, "Determining the cumulative environmental consequences of an action requires delineating the cause-and-effect relationships between the multiple actions and the resources, ecosystems, and human communities of concern. The range of actions that must be considered includes not only the project proposal but all connected and similar actions that could contribute to cumulative effects." The analysis "must describe the response of the resource to this environmental change." Cumulative impact analysis should "address the *sustainability* [emphasis added] of resources, ecosystems, and human communities." For example, the EA should include data on the likelihood that the tortoise population in the Western Mojave Recovery Unit will be sustained into the future given its status and trend.

CEQ's eight principles are listed below:

1. Cumulative effects are caused by the aggregate of past, present, and reasonable future actions.
The effects of a proposed action on a given resource, ecosystem, and human community, include the present and future effects added to the effects that have taken place in the past. Such cumulative effects must also be added to the effects (past, present, and future) caused by all other actions that affect the same resource.

2. Cumulative effects are the total effect, including both direct and indirect effects, on a given resource, ecosystem, and human community of all actions taken, no matter who (federal, non-federal, or private) has taken the actions.
Individual effects from disparate activities may add up or interact to cause additional effects not apparent when looking at the individual effect at one time. The additional effects contributed by actions unrelated to the proposed action must be included in the analysis of cumulative effects.

3. Cumulative effects need to be analyzed in terms of the specific resource, ecosystem, and human community being affected.
Environmental effects are often evaluated from the perspective of the proposed action. Analyzing cumulative effects requires focusing on the resources, ecosystem, and human community that may be affected and developing an adequate understanding of how the resources are susceptible to effects.

4. It is not practical to analyze the cumulative effects of an action on the universe; the list of environmental effects must focus on those that are truly meaningful.
For cumulative effects analysis to help the decision maker and inform interested parties, it must be limited through scoping to effects that can be evaluated meaningfully. The boundaries for evaluating cumulative effects should be expanded to the point at which the resource is no longer affected significantly or the effects are no longer of interest to the affected parties.

5. Cumulative effects on a given resource, ecosystem, and human community are rarely aligned with political or administrative boundaries.
Resources are typically demarcated according to agency responsibilities, county lines, grazing allotments, or other administrative boundaries. Because natural and sociocultural resources are not usually so aligned, each political entity actually manages only a piece of the affected resource or ecosystem. Cumulative effects analysis on natural systems must use natural ecological boundaries and analysis of human communities must use actual sociocultural boundaries to ensure including all effects.

6. Cumulative effects may result from the accumulation of similar effects or the synergistic interaction of different effects.
Repeated actions may cause effects to build up through simple addition (more and more of the same type of effect), and the same or different actions may produce effects that interact to produce cumulative effects greater than the sum of the effects.

7. Cumulative effects may last for many years beyond the life of the action that caused the effects.
Some actions cause damage lasting far longer than the life of the action itself (e.g., acid mine damage, radioactive waste contamination, species extinctions). Cumulative effects analysis need to apply the best science and forecasting techniques to assess potential catastrophic consequences in the future.

8. Each affected resource, ecosystem, and human community must be analyzed in terms of its capacity to accommodate additional effects, based on its own time and space parameters.

Analysts tend to think in terms of how the resource, ecosystem, and human community will be modified given the action's development needs. The most effective cumulative effects analysis focuses on what is needed to ensure long-term productivity or sustainability of the resource.

The CEQ recognizes synergistic and interactive effects as a part of cumulative impacts analysis (Principal #6). Also note that CEQ provides a specific example on mining impacts (Principal #7) The Council requests that BLM implement Principal #8 specifically with respect to the Fremont-Kramer tortoise population and the tortoise in the West Mojave Recovery Unit (i.e., the sustainability of the tortoise in these areas), and Principals #6 and #7 for the tortoise when conducting its analysis in the NEPA document of the Proposed Action. This would include the impacts of environmental contaminants/metals from past, current, and future activities on the tortoise and tortoise critical habitat/habitats.

We request that the EA include these eight principles in its analysis of cumulative impacts to the Mojave desert tortoise, and address the sustainability of the tortoise in tortoise conservation areas (TCAs). The EA should include an analysis of all proposed mitigation and how its implementation during all phases of the Proposed Action (including monitoring for effectiveness and adaptive management) would result in "no net loss in quantity and quality of Mojave desert tortoise habitat….and using offsite mitigation (compensation) for unavoidable residual habitat loss."

To help BLM understand the complexity of the cumulative and interactive nature of multiple anthropogenic threats to desert tortoise populations and to help develop BLM's analysis of cumulative impacts in the EA, we have included a map of some of these multiple threats and their relationships to other threats (Tracy et al. 2004) (please see Figure 2).

For BLM to conduct an adequate cumulative impacts analysis, BLM would need to track and map all projects that result in the loss and/or degradation of habitat for the tortoise, especially critical habitat. This would include projects with indirect impacts (e.g., fluvial transports of arsenic and other environmental contaminants, etc.), whether these impacts fragment habitat and populations (e.g., roads and routes of travel, pipelines and other linear features, adjacent projects, etc.), promote the spread and proliferation of invasive plant species (projects that result in surface disturbance), provide food water and nesting subsidies for common ravens, etc. This tracking system should include location data and maps that are updated as each project is entered into the cumulative impact tracking system. Absent this system, BLM is unable to do an adequate job of analyzing cumulative impacts as required under NEPA. We request that BLM implement such a system and use it when analyzing the impacts to the tortoise and tortoise habitat in BLM NEPA documents.

For regional and cumulative impacts, the BLM should require the Proponent to participate in an effort to address regional and cumulative impacts from common raven predation. For example, in California, the Proponent should contribute to the National Fish and Wildlife Foundation's Raven Management Fund to help mitigation for regional and cumulative impacts. Unfortunately, this Fund that was established in 2010 has not revised its per acre payment fees to reflect increased labor and supply costs during the past decade to provide for effective implementation. The National Fish and Wildlife Foundation should revise the per acre fee.

Appendix C: Required Performance Standards

Under "Mining wastes," BLM says, "[a]ll tailings, dumps, deleterious materials or substances, and other waste produced by the operations shall be disposed of so as to prevent unnecessary or undue degradation and in accordance with applicable Federal and state Laws."

We request that "operations" include exploratory drilling. In addition, we request the Proponent test the substances drilled, and placed beside the drill holes, and placed in the drill holes for presence of environmental contaminants/metals that are deleterious to human health and the environment (e.g., arsenic, etc.). The test results should be reported to BLM, USFWS, CDFW, California Department of Toxic Substances Control and California Office of Environmental Health Hazard Assessment.

Under "Reclamation," BLM says, " Reclamation shall include, but shall not be limited to:

(A) Saving of topsoil for final application after reshaping of disturbed areas have been completed;
(B) Measures to control erosion, landslides, and water runoff;
(C) Measures to isolate, remove, or control toxic materials;

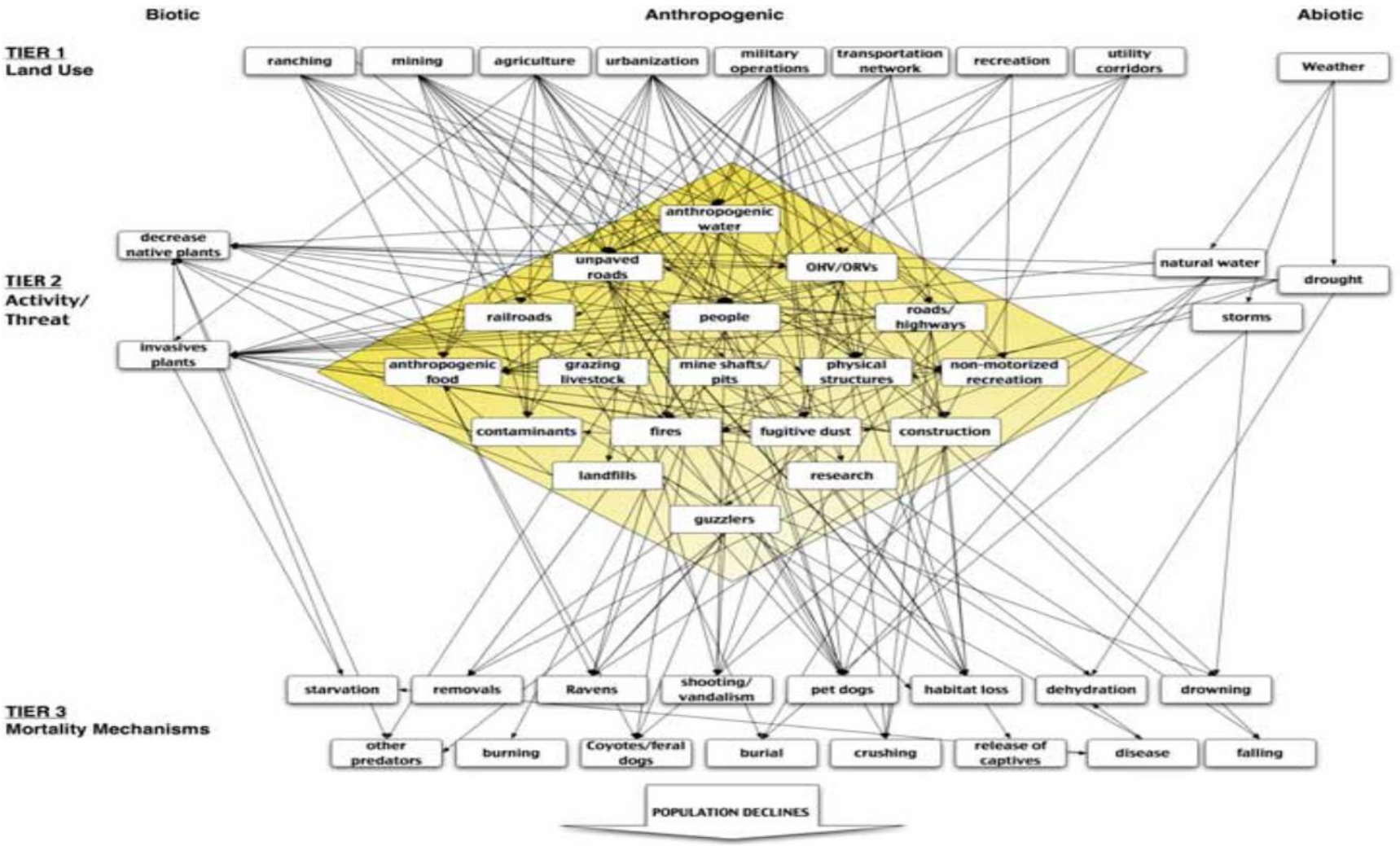


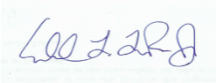
Figure 2. Network of threats demonstrating the interconnectedness between multiple human activities that interact to cause mortality and prevent recovery of tortoise populations. Tier 1 includes the major land use patterns that facilitate various activities (Tier 2) that impact tortoise populations through a suite of mortality factors (Tier 3). Just one land use results in several activities that are threats to the tortoise and cause numerous mortality mechanisms most of which are indirect (from Tracy et al. 2004).

(D) Reshaping the area disturbed, application of the topsoil, and revegetation of disturbed areas, where reasonably practicable; and
(E) Rehabilitation of fisheries and wildlife habitat.

We request that BLM specify to the Proponent what the final results are for rehabilitation of wildlife habitat when the BLM approves one of the action alternatives.

We appreciate this opportunity to provide comments on this project and trust they will help protect tortoises during any resulting authorized activities. Herein, we reiterate that the Desert Tortoise Council wants to be identified as an Affected Interest for this and all other projects funded, authorized, or carried out by the BLM that may affect species of desert tortoises, and that any subsequent environmental documentation for this project is provided to us at the contact information listed above. Additionally, we ask that you respond in an email that you have received this comment letter so we can be sure our concerns have been registered with the appropriate personnel and office for this project.

Respectfully,



Edward L. LaRue, Jr., M.S.
Desert Tortoise Council, Ecosystems Advisory Committee, Chairperson

Attachment: Appendix A – Demographic Status and Trend of the Mojave Desert Tortoise including the Western Mojave Recovery Unit

Cc: Michelle Shelly Lynch, District Manager, California Desert District, Bureau of Land Management, BLM_CA_Web_CD@blm.gov
Rollie White, Assistant Field Supervisor, Palm Spring Fish and Wildlife Office, U.S. Fish and Wildlife Office, rollie_white@fws.gov
Ann McPherson, Environmental Review, U.S. Environmental Protection Agency, mcpherson.ann@epa.gov
Julie Vance, Regional Manager, Region 4 – Central Region, California Department of Fish and Wildlife, Fresno, CA, Julie.Vance@wildlife.ca.gov
Jaime Marquez, Environmental Scientist, Region 4, California Department of Fish and Wildlife, Fresno, CA Jaime.Marquez@wildlife.ca.gov
Trisha A. Moyer, Region 6 – Desert Inland Region, Habitat Conservation Program Supervisor, California Department of Fish and Wildlife, Bishop, CA, Patricia.Moyer@wildlife.ca.gov
Heidi Calvert, Regional Manager, Region 6 – Inland and Desert Region, California Department of Fish and Wildlife, Heidi.Calvert@wildlife.ca.gov
Brandy Wood, Region 6 – Desert Inland Region, California Department of Fish and Wildlife, Brandy.Wood@wildlife.ca.gov

Literature Cited

Berry, K. H. 1972. Report on tortoise relocation project, July 1971 to November 1971. Division of Highways, State of California (Caltrans), in partial fulfillment of Contract F-9353.

Berry, K.H., L.J. Allison, A.M. McLuckie, M. Vaughn, and R.W. Murphy. 2021. *Gopherus agassizii*. The IUCN Red List of Threatened Species 2021: e.T97246272A3150871. https://dx.doi.org/10.2305/IUCN.UK.2021-2.RLTS.T97246272A3150871.en

[BLM] U.S. Bureau of Land Management. 2008c. H-1790-1 - National Environmental Policy Act Handbook. National Environmental Policy Act Program, Office of the Assistant Director, Renewable Resources and Planning, Washington, D.C. January 2008.

[BLM] U.S. Bureau of Land Management. 2012a. MS – 3809 – Surface Management Manual. Office of Assistant Director, Minerals and Realty Management, Washington, D.C. September 17, 2012. https://www.blm.gov/sites/blm.gov/files/MS-3809_0.pdf

[BLM] U.S. Bureau of Land Management. 2012b. H – 3809-1 – Surface Management Handbook. Office of Assistant Director, Minerals and Realty Management, Washington, D.C. September 17, 2012. https://www.blm.gov/sites/blm.gov/files/H-3809-1.pdf

Centers for Disease Control. 2023. Arsenic Toxicity: What Are the Standards and Regulation for Arsenic Exposure? Agency for Toxic Substances and Disease Registry. Accessed March 21, 2023. https://www.atsdr.cdc.gov/csem/arsenic/standards.html

Chaffee, M.A., and K.H. Berry. 2006. Abundance and distribution of selected elements in soils, stream sediments, and selected forage plants from desert tortoise habitats in the Mojave and Colorado deserts, USA. Journal of Arid Environments 67 (2006): 35–87.

Desert Tortoise Council. 2020. A Petition to the State of California Fish and Game Commission to change the status of *Gopherus agassizii* from Threatened to Endangered. Formal petition submitted on 11 March 2020.

Jacobson, E.R., J.M. Gaskin, M.B. Brown, R.K. Harris, C.H. Gardiner, J.L. LaPointe, H.P. Adams, and C. Reggiardo. 1991. Chronic upper respiratory-tract disease of free-ranging desert tortoises (*Xerobates agassizii*). Journal of Wildlife Diseases, v. 27, p. 296–316.

Jacobson, E.R., M.B. Brown, L.D. Wendland, D.R. Brown, P.A. Klein, M.M. Christopher, and K.H. Berry. 2014. Mycoplasmosis and upper respiratory tract disease of tortoises—A review and update: The Veterinary Journal, v. 201, p. 257–264.

Jennings, W.B. 1993. Foraging ecology of the desert tortoise (*Gopherus agassizii*) in the western Mojave Desert. M.S. Thesis, University of Texas, Arlington.

Jennings, W.B., 2002. Diet selection by the desert tortoise in relation to the flowering phenology of ephemeral plants. Chelonian Conservation and Biology 4: 353–358.

Kim, C.S., D.H. Stack, and J.J. Rytuba. 2012. Fluvial transport and surface enrichment of arsenic in semiarid mining regions—Examples from the Mojave Desert, California. Journal of Environmental Monitoring 14: 1,798–1,813.

Kim, C.S., T.L. Anthony, D. Goldstein, and J.J. Rytuba. 2014. Windborne transport and surface enrichment of arsenic in semi-arid mining regions: Examples from the Mojave Desert, California. Aeolian Research 14 (2014): 85–96.

Seltzer, M.D., and K.H. Berry. 2005. Laser ablation ICP-MS profiling and semiquantitative determination of trace element concentrations in desert tortoise shells—Documenting the uptake of elemental toxicants. Science of the Total Environment, v. 339, p. 253–265.

Sokol, O. M. 1971. Lithophagy and geophagy in reptiles. Journal of Herpetology 5: 69–71.

[USFWS] U.S. Fish and Wildlife Service. 1994. Endangered and threatened wildlife and plants; determination of critical habitat for the Mojave population of the desert tortoise. Federal Register 55(26):5820-5866. Washington, D.C.

[USFWS] U.S. Fish and Wildlife Service. 2017. Biological Opinion for Activities in the California Desert Conservation Area. FWS-KRN/SBD/INY/LA/IMP/RIV-17B0532-17F1029. Issued September 1, 2017.

Appendix A
Demographic Status and Trend of the Mojave Desert Tortoise
including the Western Mojave Recovery Unit

Status of the Population of the Mojave Desert Tortoise: The Council provides the following information for resource and land management agencies so that these data may be included and analyzed in their project and land management documents and aid them in making management decisions that affect the Mojave desert tortoise (tortoise).

There are 17 populations of Mojave desert tortoise described below that occur in Critical Habitat Units (CHUs) and Tortoise Conservation Areas (TCAs); 14 are on lands managed by the BLM; 8 of these are in the California Desert Conservation Area (CDCA).

As the primary land management entity in the range of the Mojave desert tortoise, the Bureau of Land Management's (BLM's) implementation of a conservation strategy for the Mojave desert tortoise in the CDCA through implementation of its Resource Management Plan and Amendments through 2014 has resulted in the following changes in the status for the tortoise throughout its range and in California from 2004 to 2014 (**Table 1**, **Table 2**; USFWS 2015, Allison and McLuckie 2018). The Council believes these data show that BLM and others have failed to implement an effective conservation strategy for the Mojave desert tortoise as described in the recovery plan (both USFWS 1994a and 2011), and have contributed to tortoise declines in density and abundance between 2004 to 2014 (**Table 1, Table 2**; USFWS 2015, Allison and McLuckie 2018) with declines or no improvement in population density from 2015 to 2021 (**Table 3**; USFWS 2016, 2018, 2019, 2020, 2022a, 2022b).

Important points from these tables include the following:

Change in Status for the Mojave Desert Tortoise Range-wide
● Ten of 17 populations of the Mojave desert tortoise declined from 2004 to 2014.

● Eleven of 17 populations of the Mojave desert tortoise are below the population viability threshold. These 11 populations represent 89.7 percent of the range-wide habitat in CHUs/TCAs.

Change is Status for the Western Mojave Recovery Unit – Nevada and California
● This recovery unit had a 51 percent decline in tortoise density from 2004 to 2014.

● Tortoises in this recovery unit have densities that are below viability.

Change in Status for the Superior-Cronese Tortoise Population in the Western Mojave Recovery Unit.
● The population in this recovery unit experienced declines in densities of 61 percent from 2004 to 2014. In addition, there was a 51 percent decline in tortoise abundance.

● This population has densities less than needed for population viability (USFWS 1994a).

Table 1. Summary of 10-year trend data for the 5 Recovery Units and 17 CHUs/TCAs for Mojave desert tortoise. The table includes the area of each Recovery Unit and CHU/TCA, percent of total habitat for each Recovery Unit and CHU/TCA, density (number of breeding adults/km^2 and standard errors = SE), and the percent change in population density between 2004 and 2014. Populations below the viable level of 3.9 breeding individuals/km^2 (10 breeding individuals per mi^2) (assumes a 1:1 sex ratio) or showing a decline from 2004 to 2014 are in red.

Recovery Unit: Designated Critical Habitat Unit[1]/Tortoise Conservation Area	**Surveyed area (km^2)**	**% of total habitat area in Recovery Unit & CHU/TCA**	**2014 density/km^2 (SE)**	**% 10-year change (2004–2014)**
Western Mojave, CA	**6,294**	**24.51**	**2.8 (1.0)**	**–50.7 decline**
Fremont-Kramer	2,347	9.14	2.6 (1.0)	–50.6 decline
Ord-Rodman	852	3.32	3.6 (1.4)	–56.5 decline
Superior-Cronese	3,094	12.05	2.4 (0.9)	–61.5 decline
Colorado Desert, CA	**11,663**	**45.42**	**4.0 (1.4)**	**–36.25 decline**
Chocolate Mtn AGR, CA	713	2.78	7.2 (2.8)	–29.77 decline
Chuckwalla, CA	2,818	10.97	3.3 (1.3)	–37.43 decline
Chemehuevi, CA	3,763	14.65	2.8 (1.1)	–64.70 decline
Fenner, CA	1,782	6.94	4.8 (1.9)	–52.86 decline
Joshua Tree, CA	1,152	4.49	3.7 (1.5)	+178.62 increase
Pinto Mtn, CA	508	1.98	2.4 (1.0)	–60.30 decline
Piute Valley, NV	927	3.61	5.3 (2.1)	+162.36 increase
Northeastern Mojave	**4,160**	**16.2**	**4.5 (1.9)**	**+325.62 increase**
Beaver Dam Slope, NV, UT, AZ	750	2.92	6.2 (2.4)	+370.33 increase
Coyote Spring, NV	960	3.74	4.0 (1.6)	+ 265.06 increase
Gold Butte, NV & AZ	1,607	6.26	2.7 (1.0)	+ 384.37 increase
Mormon Mesa, NV	844	3.29	6.4 (2.5)	+ 217.80 increase
Eastern Mojave, NV & CA	**3,446**	**13.42**	**1.9 (0.7)**	**–67.26 decline**
El Dorado Valley, NV	999	3.89	1.5 (0.6)	–61.14 decline
Ivanpah Valley, CA	2,447	9.53	2.3 (0.9)	–56.05 decline
Upper Virgin River	**115**	**0.45**	**15.3 (6.0)**	**–26.57 decline**
Red Cliffs Desert	115	0.45	15.3 (6.0)	–26.57 decline
Range-wide Area of CHUs - TCAs/Range-wide Change in Population Status	**25,678**	**100.00**		**–32.18 decline**

[1] U.S. Fish and Wildlife Service. 1994b. Endangered and threatened wildlife and plants; determination of critical habitat for the Mojave population of the desert tortoise. Federal Register 55(26):5820-5866. Washington, D.C.

Table 2. Estimated change in abundance of adult Mojave desert tortoises in each recovery unit between 2004 and 2014 (Allison and McLuckie 2018). Decreases in abundance are in red.

Recovery Unit	Modeled Habitat (km^2)	2004 Abundance	2014 Abundance	Change in Abundance	Percent Change in Abundance
Western Mojave	23,139	131,540	64,871	-66,668	-51%
Colorado Desert	18,024	103,675	66,097	-37,578	-36%
Northeastern Mojave	10,664	12,610	46,701	34,091	270%
Eastern Mojave	16,061	75,342	24,664	-50,679	-67%
Upper Virgin River	613	13,226	10,010	-3,216	-24%
Total	**68,501**	**336,393**	**212,343**	**-124,050**	**-37%**

Table 3. Summary of data for Agassiz's desert tortoise, *Gopherus agassizii* (=Mojave desert tortoise) from 2004 to 2021 for the 5 Recovery Units and 17 Critical Habitat Units (CHUs)/Tortoise Conservation Areas (TCAs). The table includes the area of each Recovery Unit and CHU/TCA, percent of total habitat for each Recovery Unit and CHU/TCA, density (number of breeding adults/km^2 and standard errors = SE), and percent change in population density between 2004-2014 (USFWS 2015). Populations below the viable level of 3.9 breeding individuals/km^2 (10 breeding individuals per mi^2) (assumes a 1:1 sex ratio) (USFWS 1994a, 2015) or showing a decline from 2004 to 2014 are in **red.**

Recovery Unit: Designated CHU/TCA &	**% of total habitat area in Recovery Unit & CHU/TCA**	**2004 density/ km^2**	**2014 density/ km^2 (SE)**	**% 10-year change (2004–2014)**	**2015 density/ km^2**	**2016 density/ km^2**	**2017 density/ km^2**	**2018 density/ km^2**	**2019 density/ km^2**	**2020 density/ km^2**	**2021 density/ km^2**
Western Mojave, CA	**24.51**		**2.8 (1.0)**	**–50.7 decline**							
Fremont-Kramer	9.14		2.6 (1.0)	–50.6 decline	4.5	No data	4.1	No data	2.7	1.7	No data
Ord-Rodman	3.32		3.6 (1.4)	–56.5 decline	No data	No data	3.9	2.5/3.4*	2.1/2.5*	No data	1.9/2.5*
Superior-Cronese	12.05		2.4 (0.9)	–61.5 decline	2.6	3.6	1.7	No data	1.9	No data	No data
Colorado Desert, CA	**45.42**		**4.0 (1.4)**	**–36.25 decline**							
Chocolate Mtn AGR, CA	2.78		7.2 (2.8)	–29.77 decline	10.3	8.5	9.4	7.6	7.0	7.1	3.9
Chuckwalla, CA	10.97		3.3 (1.3)	–37.43 decline	No data	No data	4.3	No data	1.8	4.6	2.6
Chemehuevi, CA	14.65		2.8 (1.1)	–64.70 decline	No data	1.7	No data	2.9	No data	4.0	No data
Fenner, CA	6.94		4.8 (1.9)	–52.86 decline	No data	5.5	No data	6.0	2.8	No data	5.3
Joshua Tree, CA	4.49		3.7 (1.5)	+178.62 increase	No data	2.6	3.6	No data	3.1	3.9	No data
Pinto Mtn, CA	1.98		2.4 (1.0)	–60.30 decline	No data	2.1	2.3	No data	1.7	2.9	No data
Piute Valley, NV	3.61		5.3 (2.1)	+162.36 increase	No data	4.0	5.9	No data	No data	No data	3.9

Northeastern Mojave AZ, NV, & UT	**16.2**		**4.5 (1.9)**	**+325.62 increase**							
Beaver Dam Slope, NV, UT, & AZ	2.92		6.2 (2.4)	+370.33 increase	No data	5.6	1.3	5.1	2.0	No data	No data
Coyote Spring, NV	3.74		4.0 (1.6)	+ 265.06 increase	No data	4.2	No data	No data	3.2	No data	No data
Gold Butte, NV & AZ	6.26		2.7 (1.0)	+ 384.37 increase	No data	No data	1.9	2.3	No data	No data	2.4
Mormon Mesa, NV	3.29		6.4 (2.5)	+ 217.80 increase	No data	2.1	No data	3.6	No data	5.2	5.2
Eastern Mojave, NV & CA	**13.42**		**1.9 (0.7)**	**–67.26 decline**							
El Dorado Valley, NV	3.89		1.5 (0.6)	–61.14 decline	No data	2.7	5.6	No data	2.3	No data	No data
Ivanpah Valley, CA	9.53		2.3 (0.9)	–56.05 decline	1.9	No data	No data	3.7	2.6	No data	1.8
Upper Virgin River, UT & AZ	**0.45**		**15.3 (6.0)**	**–26.57 decline**							
Red Cliffs Desert**	0.45	29.1 (21.4-39.6)**	15.3 (6.0)	–26.57 decline	15.0	No data	19.1	No data	17.2	No data	
Rangewide Area of CHUs - TCAs/Rangewide Change in Population Status	**100.00**			**–32.18 decline**							

*This density includes the adult tortoises translocated from the expansion of the MCAGCC, that is resident adult tortoises and translocated adult tortoises.

**Methodology for collecting density data initiated in 1999.

Change in Status for the Mojave Desert Tortoise in California

- Eight of 10 populations of the Mojave desert tortoise in California declined from 29 to 64 percent from 2004 to 2014 with implementation of tortoise conservation measures in the Northern and Eastern Colorado Desert (NECO), Northern and Eastern Mojave Desert (NEMO), and Western Mojave Desert (WEMO) Plans.

- Eight of 10 populations of the Mojave desert tortoise in California are below the population viability threshold. These eight populations represent 87.45 percent of the habitat in California that is in CHU/TCAs.

- The two viable populations of the Mojave desert tortoise in California are declining. If their rates of decline from 2004 to 2014 continue, these two populations will no longer be viable by about 2030.

Change in Status for the Mojave Desert Tortoise on BLM Land in California

- Eight of eight populations of Mojave desert tortoise on lands managed by the BLM in California declined from 2004 to 2014.

- Seven of eight populations of Mojave desert tortoise on lands managed by the BLM in California are no longer viable.

Change in Status for Mojave Desert Tortoise Populations in California that Are Moving toward Meeting Recovery Criteria

- The only population of Mojave desert tortoise in California that is not declining is on land managed by the National Park Service, which has increased 178 percent in 10 years.

Important points to note from the data from 2015 to 2021 in Table 3 are:

Change in Status for the Mojave Desert Tortoise in the Western Mojave Recovery Unit:

- Density of tortoises continues to decline in the Western Mojave Recovery Unit
- Density of tortoises continues to fall below the density needed for population viability from 2015 to 2021

Change in Status for the Mojave Desert Tortoise in the Colorado Desert Recovery Unit:

- The population that had the highest density in this recovery unit had a continuous reduction in density since 2018 and fell substantially to the minimum density needed for population viability in 2021.

Change in Status for the Mojave Desert Tortoise in the Northeastern Mojave Recovery Unit:

- Two of the three population with densities greater than needed for population viability declined to level below the minimum viability threshold.
- The most recent data from three of the four populations in this recovery unit have densities below the minimum density needed for population viability.
- The population that had the highest density in this recovery unit declined since 2014.

Change in Status for the Mojave Desert Tortoise in the Eastern Mojave Recovery Unit:
- Both populations in this recovery unit have densities below the minimum density needed for population viability.

Change in Status for the Mojave Desert Tortoise in the Upper Virgin River Recovery Unit:
- The one population in this recovery unit is small and appears to have stable densities.

The Endangered Mojave Desert Tortoise: The Council believes that the Mojave desert tortoise meets the definition of an endangered species. In the FESA, Congress defined an "endangered species" as "any species which is in danger of extinction throughout all or a significant portion of its range…" In the California Endangered Species Act (CESA), the California legislature defined an "endangered species" as a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant, which is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes (California Fish and Game Code § 2062). Because most of the populations of the Mojave desert tortoise were non-viable in 2014, most are declining, and the threats to the Mojave desert tortoise are numerous and have not been substantially reduced throughout the species' range, the Council believes the Mojave desert tortoise should be designated as an endangered species by the USFWS and California Fish and Game Commission. Despite claims by USFWS (Averill-Murray and Field 2023) that a large number of individuals of a listed species and an increasing population trend in part of the range of the species prohibits it from meeting the definitions of endangered, we are reminded that the tenants of conservation biology include numerous factors when determining population viability. The number of individual present is one of a myriad of factors (e.g., species distribution and density, survival strategy, sex ratio, recruitment, genetics, threats including climate change, etc.) used to determine population viability. In addition, a review of all the available data does not show an increasing population trend (please see Tables 1 and 3).

Literature Cited in Appendix on Status and Trend of the Mojave Desert Tortoise

Allison L.J. and A.M. McLuckie. 2018. Population trends in Mojave desert tortoises (*Gopherus agassizii*). Herpetological Conservation and Biology. 2018 Aug 1. 13(2):433–452. http://www.herpconbio.org/Volume_13/Issue_2/Allison_McLuckie_2018.pdf
or
https://www.fws.gov/media/allison-and-mcluckie2018mojave-desert-tortoise-population-trends

[USFWS] U.S. Fish and Wildlife Service. 1994a. Desert tortoise (Mojave population) Recovery Plan. U.S. Fish and Wildlife Service, Region 1, Portland, Oregon. 73 pages plus appendices. https://ecos.fws.gov/docs/recovery_plan/940628.pdf

[USFWS] U.S. Fish and Wildlife Service. 1994b. Endangered and threatened wildlife and plants; determination of critical habitat for the Mojave population of the desert tortoise. Federal Register 55(26):5820-5866. Washington, D.C.

[USFWS] U.S. Fish and Wildlife Service. 2011. Revised Recovery Plan for the Mojave Population of the Desert Tortoise (*Gopherus agassizii*). U.S. Fish and Wildlife Service, California and

Nevada Region, Sacramento, California. https://www.fws.gov/sites/default/files/documents/USFWS.2011.RRP%20for%20the%20Mojave%20Desert%20Tortoise.pdf

[USFWS] U.S. Fish and Wildlife Service. 2015. Range-wide Monitoring of the Mojave Desert Tortoise (*Gopherus agassizii*): 2013 and 2014 Annual Reports. Report by the Desert Tortoise Recovery Office, U.S. Fish and Wildlife Service, Reno, Nevada. https://www.fws.gov/sites/default/files/documents/USFWS.2015%20report.%20Rangewide%20monitoring%20report%202013-14.pdf

[USFWS] U.S. Fish and Wildlife Service. 2016. Range-wide Monitoring of the Mojave Desert Tortoise (*Gopherus agassizii*): 2015 and 2016 Annual Reporting. Report by the Desert Tortoise Recovery Office, U.S. Fish and Wildlife Service, Reno, Nevada. https://www.fws.gov/sites/default/files/documents/USFWS.2016%20report.%20Rangewide%20monitoring%20report%202015-16.pdf

[USFWS] U.S. Fish and Wildlife Service. 2018. Range-wide Monitoring of the Mojave Desert Tortoise (*Gopherus agassizii*): 2017 Annual Reporting. Report by the Desert Tortoise Recovery Office, U.S. Fish and Wildlife Service, Reno, Nevada. https://www.fws.gov/sites/default/files/documents/USFWS.2018%20report.%20Rangewide%20monitoring%20report%202017.pdf

[USFWS] U.S. Fish and Wildlife Service. 2019. Range-wide Monitoring of the Mojave Desert Tortoise (*Gopherus agassizii*): 2018 Annual Reporting. Report by the Desert Tortoise Recovery Office, U.S. Fish and Wildlife Service, Reno, Nevada. https://www.fws.gov/sites/default/files/documents/USFWS.2019%20report.%20Rangewide%20monitoring%20report%202018.pdf

[USFWS] U.S. Fish and Wildlife Service. 2020. Range-wide Monitoring of the Mojave Desert Tortoise (*Gopherus agassizii*): 2019 Annual Reporting. Report by the Desert Tortoise Recovery Office, U.S. Fish and Wildlife Service, Reno, Nevada. 42 pages. https://www.fws.gov/sites/default/files/documents/2019_Rangewide%20Mojave%20Desert%20Tortoise%20Monitoring.pdf

[USFWS] U.S. Fish and Wildlife Service. 2022a. Range-wide Monitoring of the Mojave Desert Tortoise (Gopherus agassizii): 2020 Annual Reporting. Report by the Desert Tortoise Recovery Office, U.S. Fish and Wildlife Service, Reno, Nevada. https://www.fws.gov/sites/default/files/documents/USFWS.2022%20report.%20Rangewide%20monitoring%20report%202020.pdf

[USFWS] U.S. Fish and Wildlife Service. 2022b. Range-wide Monitoring of the Mojave Desert Tortoise (*Gopherus agassizii*): 2021 Annual Reporting. Report by the Desert Tortoise Recovery Office, U.S. Fish and Wildlife Service, Reno, Nevada. https://www.fws.gov/sites/default/files/documents/USFWS.2022%20report.%20Rangewide%20monitoring%20report%202021.pdf