United States Department of the Interior

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Memorandum

To: Gabe Garcia, Field Office Manager, U.S. Bureau of Land Management, Bakersfield Office, Bakersfield, California

From: Field Supervisor Sacramento Fish and Wildlife Office,Sacramento, California

Subject: Programmatic Biological Opinion on Oil and Gas Activities on Bureau of Land Management Lands in the San Joaquin Valley

This memorandum is in response to the Bureau of Land Management's (BLM) request to initiate formal section 7 consultation under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) (Act), and provides our programmatic biological opinion (PBO) on oil and gas activities on BLM lands in the San Joaquin Valley of California. The geographic scope of the program includes surface and subsurface lands administered by the BLM Bakersfield Field Office, primarily in Kings and Kern Counties, with occasional projects in a small portion of San Luis Obispo County.

The BLM authorizes actions related to oil and gas development by third party applicants that hold federal fluid mineral leases or are otherwise associated with the development of oil and gas reserves in the San Joaquin Valley. The program covers the BLM authorization of individual actions or groups of actions by a single applicant within a given lease and/or section that, within a given fiscal year, disturb less than 10 acres of habitat or, for linear actions, are less than 10 miles long.

The BLM requested formal consultation on the effects of BLM-approved oil and gas activities on the federally listed as endangered San Joaquin kit fox (*Vulpes macrotis mutica*), blunt-nosed leopard lizard (*Gambelia sila*), giant kangaroo rat (*Dipodomys ingens*), Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*), Kern mallow (*Eremalche kernensis*), San Joaquin wooly-threads (*Monolopia congdonii*), California jewelflower (*Caulanthus californicus*), and Bakersfield cactus (*Opuntia basilaris* var. *treleasei*).

The U.S. Fish and Wildlife Service (Service) has previously issued programmatic biological opinions to the BLM relating to oil and gas activities over the same geographic area in 1996 and 2001. The 2001 PBO will expire at the end of 2017, unless extended. This PBO will replace the 2001 PBO.

Consultation History

December 2015 — The Service received a request for formal consultation on the project form BLM.

January 2016	The Service issued a memo to BLM requesting additional information on project-related effects.
January 2016 – April 2017	The Service met with BLM to discuss various aspects of the project and consultation.
April 2017	The Service received a revised request for formal consultation on the project from BLM.
April 2017 – August 2017	The Service met with BLM to discuss various aspects of the project and consultation.
August 2017	The Service received a revised request for formal consultation on the project from BLM.
December 2017	The Service requested and received confirmation on the proposed conservation measures.

PROGRAMMATIC BIOLOGICAL OPINION

Description of the Action

The BLM routinely authorizes third-party actions associated with the exploration, development, and production of onshore oil and gas deposits. Exploration activities include geophysical exploration and the drilling of exploratory wells. Development activities include both the installation of new infrastructure, such as wells, pipelines, power and communication lines, and other production facilities, and the abandonment of existing infrastructure when it is no longer needed. Production activities include the routine operation and maintenance of existing infrastructure, as well as emergency actions necessary to safeguard life or to prevent significant environmental degradation.

BLM occasionally authorizes third-party actions that are similar in nature to actions associated with development and production of onshore oil and gas deposits, but which are not servicing onshore oil and gas deposits. These actions include activities such as the installation, maintenance, and removal of power lines, communication lines, and non-oil and gas pipelines (such as water pipelines). These actions are also proposed for coverage under this program.

The annual disturbance limit for all project activities will be 140 acres. The BLM can authorize actions under the program so long as the cumulative amount of new habitat disturbance is below the annual limit. Unallocated habitat disturbance acres within a given year will not be carried over as credit in following years. If, in any given year, the annual limit is reached, the BLM will contact the Service before proceeding with additional actions.

The term of this program is fifteen years.

Oil and Gas Related Authorizations by the BLM

Exploration

Oil and Gas Geophysical Exploration

The purpose of geophysical exploration for oil and gas is to profile and map location, depth, and dimensions of subsurface pools or pockets potentially containing oil and gas reserves. Reflective seismology, also known as 'seismic,' is a geophysical exploratory method that uses reflected energy (seismic waves) to estimate the properties of the Earth's subsurface structure. Use of seismic techniques to explore for hydrocarbon deposits may reduce surface disturbance by limiting the number of unsuccessful wells drilled.

Seismic surveys require a controlled source of energy (the source point), such as buried biodegradable explosives (shot hole) or specialized vibrators known by the trademark name Vibroseis. Vibrators are large trucks that shake a vibrating pad against the ground through a known frequency band. The different subsurface layers of the Earth's crust reflect back the generated energy waves, and these reflected waves are recorded on the surface using geophones (receiver points). In 3D seismic surveys, the source points are arranged along the ground surface in parallel lines with parallel lines of receiver points forming a perpendicular or diamond-patterned grid with source lines. Thus, ground disturbance caused by seismic exploratory activity is dispersed relatively evenly across the landscape.

For projects that involve collecting seismic data from multiple points, source and receiver equipment is deployed in a rolling/"leap frogging" manner. As the seismic data is collected from one area of the project site, receiver equipment from the back of the project will be picked up, moved to the front of the project, and laid out in a new area where the seismic sources will again generate seismic data. In so doing, only a small portion of each project area is disturbed at any one time during active seismic recording operations. The receiver lines are "leap frogged" in this manner throughout the project to its completion.

The basic field components of a seismic survey are the logistic support activity, geodetic survey activity, source point activity, and receiver activity. Each of these activities is briefly described below.

1. Logistic Support: Logistic activities include placement of equipment and vehicle staging areas, fueling, tire and maintenance stations, helicopter staging and landing areas, and any fly camps where the distance is too far to drive the vibrator trucks back to the main staging area.

2. Geodetic Survey: Geodetic survey activities involve geodetic crews locating predetermined latitude and longitude coordinates of the receiver and source points using a mobile global position system (GPS) and temporarily marking each point with pin flags, wooden lathes, paint, or a GPS waypoint with uncorrected accuracy of one meter accuracy or greater. Modes of travel may include all-terrain vehicle (ATV), four-wheel drive truck, or on foot, depending on the terrain, travel distance, and environmental sensitivity of the survey site. Geodetic crews would use established roads and trails where practical. Trucks would only travel on authorized roads and two-track trails.

3. Source Point Activity: Source point activities depend upon the methods used to create the seismic energy waves at each source point, including buried biodegradable explosives (shot

hole) or vibrator trucks. Shot hole explosives would generally be used for all source points with a slope greater than 30 degrees.

For shot hole source points, source point crews drill small diameter holes using a drill rig, place explosive charges into the holes, and backfill the holes with drill cuttings and bentonite. Drill cuttings would be used to plug a minimum of the upper two feet of the hole. Drill holes would be a maximum of 90 feet deep (minimum 20 feet deep), and packed with a maximum of 20 pounds of explosives. Typically, each shot hole source point would be drilled and loaded 30 to 60 days prior to detonation. Drill rigs can be tractor mounted, buggy mounted, or portable. All the drills use the same procedures but the portable drill breaks down into components that are transported by helicopter. Tractor drills weigh 12,000 lbs and use standard farm tractor tires used throughout the San Joaquin Valley. Buggy drills weigh 18,000-22,000 lbs and usually use 'terra' balloon tires. Track drills, which weigh approximately 30,000 lbs and travel on two-foot wide tracks, may also be used in terrain too steep for tractor-mounted drills. These drill rigs have a combined tire width of four feet. Steepness of slope usually dictates what type of drill (tractor, buggy, track, or heliportable) is used for cross-country drilling operations. Typically, heliportable drills are used for the steepest terrain, and the tractor drills are typically used on the flattest terrain. Track drills would be used in steeper terrain where sensitive resources are sparse and can be avoided.

For vibroseis source points, a convoy of a maximum of four vibrator trucks would shake the ground (an event) at each source point. Each truck is approximately 12 feet wide by 30 feet long with a three foot by eight foot vibrator pad and weighs approximately 60,000 pounds. Each event consists of a maximum of 20 shaking events (sweeps) at a location. Each sweep lasts for a maximum of 60 seconds. Stacking would be used to avoid sensitive biological and cultural resources, oil wells and pipelines, and topographically inaccessible source points. Stacking is when there are multiple events at a source point to record data for adjacent but inaccessible source points. At any one point, there would be a maximum of six stacked events for a maximum of 120 minutes of cumulative shaking at any one location. After the completion of an event or a stack of events, the vibroseis units would move to the next source point or the next parallel source line. The process would continue in this manner until all source points have been occupied.

4. Receiver Point Activity: Receiver point activities include the deployment and recovery of geophone receivers. Geophone receivers transmit reflected seismic signals to a recording station mounted on a specialized truck (the doghouse) using radio signals. The following methods may be used to transport the recording equipment or necessary repair equipment for malfunctioning geophones to and from staging areas: helicopter, lightweight four-wheel drive truck, ATV, or by foot. The method selected would depend on the terrain and sensitivity of resources. Locations of staging areas and drop sites would change as receiver lines are moved and data acquisition progresses. Placement of staging and drop sites would be determined in the field by consulting with appropriate landowners and consideration of conservation measures.

   At helicopter staging areas, recording equipment would be placed in cache bags to be flown by helicopter to drop sites. The helicopter would transport equipment from the staging area using a long line equipped with a four-hook carousel suspended from the helicopter. The carousel is remotely controlled and enables the pilot to release the equipment without landing the aircraft. This process helps minimize potential environmental disturbance. The helicopter would deploy one bag at a time at predetermined drop points along receiver lines.

In general, the helicopter would operate approximately 50 to 100 feet above the ground and would gently lay the equipment bags on the ground. Primary landing zones would be located on established staging areas on previously disturbed ground devoid of sensitive resources. In non-emergency situations, if the aircraft is required to land in locations other than established staging areas, the helicopter would land within 30 feet of a source or receiver line and bypass areas flagged for avoidance.

Receiver ground crews manually place recording equipment at the predetermined receiver points. At each receiver point, crewmembers connect an array of geophones. Each geophone would be placed into the soil using an attached metal spike. Recording equipment would be laid out in this manner throughout the project area. All of the recording equipment is connected to an in-field truck mounted control center or "doghouse" where all communications, project coordination, and data collection occurs.

The doghouse would be used to retrieve and record the seismic data generated by each source point. In areas where dynamite is used as the energy source, immediately prior to data recording, crewmembers would use a global positioning system and magnetometer to locate shot holes and buried cap leads. The cap leads, at the source point to be recorded, would be connected to a detonating device and remotely detonated by a signal sent from the doghouse.

Exploratory Wells

Oil and gas exploratory wells are drilled to discover entirely new fields (wildcat wells), expand existing fields (extension wells), or to discover previously untapped reservoirs within existing fields (new pool wells). Wildcat wells generally occur outside existing fields. Extension wells and new pool wells generally occur adjacent to or within existing fields. Drilling of exploratory wells involves the same stages as wells drilled for other purposes. These stages are described below.

Development

Wells

Wells are drilled for exploratory purposes, to extract oil and gas, to produce water, to monitor water quality or reservoir temperature, or to inject gas (e.g., steam) or fluids. Well drilling typically includes the following stages:

1. Grading: Each well requires the existence of a graded well pad and access road. If these are not already in existence, they must be built prior to drilling. The area within the project boundary required to install these features depends upon the level of existing disturbance at the location and the slope angle. On a steeper slope, a larger area within the project boundary is required to create a well pad of a given size because more cut and fill is required to level the pad. Additionally, if multiple wells can be drilled from a single well pad, then the disturbance required per well will be less.

   Roads and well pads are constructed using standard cut and fill construction techniques. Most often, onsite soils are sufficient to balance the location, but soils may be imported from other locations. Roads are generally 20 feet wide, and a 200-foot by 250-foot area is generally required to safely drill and maintain each well. However, the area within the

project boundary may be smaller or larger, depending upon the well depth and the type of well drilled.

Prior to building a road or well pad, vegetation is grubbed from the location. The topsoil is removed and stockpiled on a nearby area of existing disturbance. Woody brush is stored separately from the topsoil. Following grading or the completion of the well, the topsoil and then brush are usually re-spread on cut slopes, fill slopes, and/or drilling sump locations to facilitate interim restoration. If the entire area within the project boundary is required for continued operations (usually only applies to flat landscapes), the topsoil is used to restore any nearby unnecessary area(s) of disturbance. If the well is exploratory, then the topsoil and brush may be stockpiled for reclamation until it is determined whether abandonment of the location is required.

2. Drilling: Drilling can proceed once grading is completed. A drilling reserve pit (sump) may be excavated on or adjacent to the well pad area to temporarily store fluids and solids produced during drilling operations; alternatively, portable tanks are utilized for this purpose. The drilling rig includes a power system, a hoisting system, rotating equipment, and a circulation system. A diverter system is installed on the conductor pipe to divert fluids to either the reserve pit or portable tanks. Ancillary facilities, including pipe racks, temporary storage tanks, vehicles, and the drilling supervisor's trailer are placed on the well pad or another designated staging area.

   As drilling progresses and the well is deepened, steel casing is installed and cemented in the well to prevent the sides of the wellbore from collapsing or caving, protect the well bore against abnormal pressure, and protect underground water and mineral bearing formations. Potential hydrocarbon formations are evaluated during the drilling program. Drilling operations are conducted 24 hours per day and 7 days per week. A well may take one day to several weeks to drill, depending upon the well depth and any difficulties encountered.

   Following drilling, the reserve pit is fenced and, when required by regulation, covered with netting. Prior to abandoning the reserve pit, any liquid is removed or solidified. The reserve pit is closed by mixing non-hazardous solids with drying material and then backfilling. Abandonment usually occurs within 6 months of well completion or well plugging.

3. Completion: A smaller rig, called a workover or completion rig, is usually moved in to complete the well. In many circumstances, the well is stimulated to enhance flow between the formation and wellbore. Stimulation involves treating the formation with acid or other substances to dissolve any restrictive material, to improve permeability, and to clean the area around the well. Any hazardous materials associated with well stimulation are restricted to tanks. Finally, tubing is inserted in the casing to serve as a flow path.

Pipelines

Production and injection wells require the installation of at least one pipeline to transport fluids and gas to and/or from the well head. Most often, a series of pipelines are involved with transporting fluids and gas between the well and the tank setting, compressor site, or steam/water injection source. These pipelines are generally composed of steel and border areas of disturbance, such as well pads or roads. Pipelines are typically only buried where roads or other vehicle-accessible areas are crossed, otherwise being supported by blocks (i.e., sleepers), steel supports, or the ground surface. Manifolds or splitters are used to inter-connect pipes.

Power and Other Communication Lines

Production wells generally require a power source to operate the pumping unit, and this power is most often provided through overhead power lines. Power lines may also be installed to operate other equipment, such as remote communication devices. From distribution lines, spanning and service poles are installed using an auger truck and bucket truck. Off-road travel is sometimes required for spanning poles, but service poles are usually placed on disturbed surfaces.

Occasionally, fiber-optic or other communication lines may be installed for oil field operations. These may be strung overhead on poles or be buried.

Other Production Facilities

Additional production facilities include separators, free-water knockouts, heater-treaters, tanks, production sumps, steam generators, oil and gas meters, gauging facilities, pumps, buildings, storage and equipment yards, gas compression plants, water treatment plants, lease automatic custody transfer (LACT) units, compressors, etc. As for wells, grading of roads and pads is required for the installation of such facilities if these are not already in existence. Pipes are used to connect various pieces of equipment. Where a power source is required, overhead electrical lines or generators are utilized. Secondary containment is required around facilities treating or storing produced fluids and any hazardous materials, consisting of earthen berms, cement structures, or plastic bins. Additionally, under IM 2013-033, the BLM established policy for reducing preventable causes of direct wildlife mortality and included recommendations to cover features that contain hazardous freestanding liquids or pose an entrapment hazard. Final prescriptive requirements are determined on project by project basis and are formalized through the National Environmental Policy Act (NEPA) process.

Abandonment

Abandonment occurs when a production facility no longer serves a purpose due to either dilapidation or a lack of need for the facility. Upon abandonment, all equipment associated with the facility is either disposed of off-lease or abandoned in place, and any hazardous materials are transported to an appropriate off-lease disposal facility. In-place abandonment only occurs if the removal of equipment would result in more substantial environmental impacts than leaving it in place, such as when a non-hazardous pipeline is buried under high quality habitat for listed species. In such cases, state regulations require that the pipeline be flushed with fresh water, filled with an inert substance, and capped.

The protection of sub-surface resources is an important component of well abandonment. When a well is abandoned, part of the casing is removed and salvaged, one or more cement plugs are placed in the borehole to prevent the migration of fluids between different formations, and the top of the well bore is capped. Finally, a permanent marker is buried in place with the operator's name, the well number, and the well location.

Restoration only follows facility abandonment in certain circumstances. If the facility is dilapidated but still necessary, then a replacement facility will likely be installed in place of the abandoned facility, and no restoration work will occur. If the facility is no longer needed, then the area of disturbance associated with the facility is restored unless the operator can show that they plan to use the location for a different facility. When the site is to be restored, the operator is not released from

liability until the location meets BLM final reclamation standards, at which time a Final Abandonment Notice is approved.

Production

Operation and Maintenance

Various activities are required for the operation and maintenance of approved production facilities. Some operation and maintenance activities are foreseeable at the time of facility approval, such as well extraction and injection, routine well maintenance, the removal of small amounts of stained soils from pads (fluid release of <10 barrels), routine acidizing jobs, recompletion in the same interval, and well cleanout work. Additional approval is not required for these activities so long as additional surface disturbance beyond what was originally approved is not required. Additional surface disturbance includes soil excavation, off-road travel, vegetation removal, and any other alteration to surface resources.

Where operation and maintenance activities were not foreseeable at the time of facility approval, additional authorization is required. Activities requiring additional approval include re-drilling, deepening, performing casing repairs, plugging back, altering casing, re-completion in a different interval, performing water shut off, combining production between zones, converting to injection, and any non-emergency activity that would result in additional surface disturbance.

Hydraulic fracturing

Hydraulic fracturing (also known as hydrofracturing, "fracking", or "fracing") is the high-pressure injection of a mix of fluids and substances called "proppants" into an oil or gas reservoir. The mix, injected under pressure, fractures the reservoir rock. When the fluids are removed, the proppants (typically sand, but bauxite and ceramic beads are also sometimes used) keep open the cracks left by the fracturing, allowing oil or natural gas to flow back to the well. In a typical well, 99.5% of the mixture is water and sand. Fracturing the rock is necessary to extract oil or natural gas from formations in which the pore space in the rock making up the oil or natural gas reservoir is too tight to allow the flow of fluids or gasses to the well.

In California, most oil and natural gas reservoirs are "conventional." That is, the reservoirs are found in layers of underground rock ("reservoir rock") beneath a layer of less permeable rock ("cap rock"). Conventional reservoirs typically were under pressure, and when they were first tapped, many would have had a natural "artesian" flow to the surface through the wells. Some would even have appeared as "gushers." Today, after recovery of some of the reservoirs' hydrocarbons, most of California's oil and gas reservoirs require some form of stimulation to flow. One way to stimulate flow is to fracture the rocks in the reservoir, creating channels through which the oil and/or natural gas can reach the well. The fluids are injected into the reservoir at high enough pressures to cause breaks in the reservoir rock. This type of hydraulic fracturing is conducted below the pressure at which the cap rock would fracture. This practice complies with BLM and the Division of Oil, Gas, & Geothermal Resources (DOGGR) regulations to protect groundwater and public health and safety.

In California, less than 10% of new wells on BLM mineral estate are hydraulically fractured; elsewhere in the country, 90% or more of new wells are hydraulically fractured.

Although BLM does not require authorization for hydraulic fracturing, all operators in California are required to comply with DOGGR regulations. Currently, DOGGR has very stringent regulations for hydraulic fracturing, including but not limited to well construction, chemical disclosure, groundwater monitoring both before and after the operations are conducted, and others.

Non-oil and Gas Related Authorizations by the BLM

Power and Other Communication Lines

Numerous power and communication lines exist and occasional new lines are proposed on BLM lands throughout the geographic scope of the proposed project area. Existing lines require periodic maintenance such as pole replacement, pole butt removal, re-conductoring, insulator replacement, repair of wire bonds, and repair of bolted connectors. Surface-disturbing work may require the use of mini-excavators, backhoes, or off-road travel by bucket trucks. Installation of new poles requires similar equipment.

Non-oil and Gas Pipelines

Occasionally the BLM authorizes the installation and maintenance of pipelines for non-oil and gas production, such as water pipelines. Pipelines are generally composed of steel. Pipelines are typically only buried where roads or other vehicle-accessible areas are crossed, otherwise being supported by blocks (i.e. sleepers), steel supports, or the ground surface.

Administrative Process

BLM derives its authority to regulate the aforementioned activities from the following laws: the Federal Land Planning and Management Act (FLPMA) and the Mineral Leasing Act (MLA). The type of authorization issued depends upon if BLM surface is traversed, lease and unit boundaries, ownership of a facility, location of the custody transfer point, and whether the facility is for the exclusive benefit of a single lease or unit.

FLPMA gives BLM the authority to grant Rights-of-Ways (ROWs) and Temporary Use Permits (TUPs) for new and existing oil and gas facilities such as roads, powerlines, communication lines, and pipelines on lands with BLM surface ownership. FLPMA also gives BLM the authority to conduct compliance checks on ROWs. If a violation is discovered BLM issues a notice of noncompliance to the ROW holder. Holders must correct the violation in an allotted timeframe. If the holder fails to comply with instructions from the authorized officer, further disciplinary action may be taken such as a cease and desist order.

Under MLA, BLM approves Applications for Permit to Drill or Reenter for wells (APDs), Sundry Notices for subsequent lease operations, Notices of Intent to Conduct Oil and Gas Geophysical Exploration Operations, and Rights-of-Ways for oil and gas pipelines and parts thereof within a federal oil and gas lease. The 1987 amendment to MLA gave BLM the authority to conduct inspection and enforcement actions over lease operations. If a violation is discovered, BLM may issue a verbal warning, an incident of noncompliance letter, or a written order. In response, grantees (lessees) will have an opportunity to return to compliance or they may be fined or their lease may be cancelled.

Actions authorized within the BLM Bakersfield Field Office must be consistent with the Bakersfield Resource Management Plan (BLM 2014), Decision 6 on page 21 states: Administratively delineate and manage Conserved Lands for the protection and to promote the recovery of federally listed

species on public lands identified as reserves [reserve areas, Red Zones] or corridors [habitat corridors, Green Zones] in collaboration and coordination with the Service and the California Department of Fish and Wildlife (CDFW) (Figure 1: Map 2017 Oil & Gas Programmatic Biological Assessment – Reserve Areas (Red Zones) and Habitat Corridors (Green Zones):

- Manage public lands within reserves [reserve areas, Red Zones] or corridors [habitat corridors, Green Zones] as conserved land to promote consistency with the direction established by the USFWS and CDFW through the *Recovery Plan for Upland Species of the San Joaquin Valley* (Service 1998) and other pertinent recovery or conservation plans, subject to and consistent with underlying statutory authority;

- Manage reserves [reserve areas, Red Zones] to restrict surface disturbance on public lands in reserves [reserve areas, Red Zones] to not exceed 10 percent of any 640-acre section, aliquot section, or aggregate of adjacent aliquot sections;

- Manage corridors [habitat corridors, Green Zones] to restrict surface disturbance on public lands in corridors [habitat corridors, Green Zones] to not exceed 25 percent of any 640-acre section, aliquot section, or aggregate of adjacent aliquot sections;

- Allow certain areas of high intensity oil and gas development within reserves [reserve areas, Red Zones] and corridors [habitat corridors, Green Zones] to be identified and managed separately from the reserve [reserve areas, Red Zones] and corridor [habitat corridor, Green Zones] system. These areas will not be subject to the 10 percent and 25 percent surface disturbance limit; and

- Include certain areas outside the reserve [reserve areas, Red Zones] and corridor [habitat corridor, Green Zones] system to be managed as corridors [habitat corridors, Green Zones] including the application of corridor [habitat corridor, Green Zone] disturbance restrictions.

Conservation Measures

General Measures

1. Habitat disturbance will be minimized and conducted in a manner that reduces, as much as possible, the potential for take of individuals of a federally-listed species. The extent of disturbance will be reduced to the smallest possible area, considering the existing travel network, topography, placement of facilities, location of burrows, nesting sites, dens, public health and safety, and other limiting factors.

2. To the extent possible, recently disturbed areas will be used for stockpiling excavated materials, storage of equipment, digging of slurry and borrow pits, locations of trailers, parking of vehicles, and other surface-disturbing actions.

3. Natural drainage patterns will be maintained to the maximum extent possible. Large draws and drainages with saltbush will be avoided to the maximum extent possible. If a drainage cannot be avoided, the BLM will be contacted for further guidance.

4. Work area boundaries will be delineated with flagging, temporary fencing, or other markers to minimize surface disturbance associated with vehicle straying.

5. Existing roads and routes of travel authorized as open or administrative use only will be used to the maximum extent possible. Cross-country travel by vehicles is prohibited unless specifically authorized by the BLM for the project or as required during an emergency response.

6. The use of reduced-impact methods such as helicopters or all-terrain vehicles (ATVs) will be considered for projects that require cross-country travel (for example project survey staking, power pole installation, maintenance and replacement, geophone placement and retrieval, etc.).

7. Project employees will be directed to exercise caution when commuting within listed species habitats. In order to minimize wildlife casualties, the daytime speed limit on unpaved roads not maintained by the county will be a maximum of 20 MPH. If conditions warrant, the maximum speed may be lowered to 10 MPH, for example along a narrow road in highly sensitive habitat; this determination will be made by the monitoring biologist (for general guidance on biologist qualifications see IV. B. General Project Monitoring Requirements). The maximum speed will be posted in the project area. Unless specified for reducing impacts to blunt-nosed leopard lizards, actions between dusk and dawn, when some federally-listed species are active and vulnerable to vehicle or equipment-induced injury or mortality, will be minimized. However, if nighttime actions are required or specified, then a 10 MPH speed limit will be required on unpaved roads not maintained by the county.

8. All vehicle operators will check for wildlife under vehicles and equipment prior to operation. If wildlife are observed, vehicles and equipment will not be moved until observed wildlife egresses.

9. All personnel operating on the federal lease will be provided written guidance governing vehicle use restrictions, speed limits on unpaved roads, and fire prevention and hazards.

10. Trash and food items, including wrappers, cans, bottles, and food scraps, will be contained in closed, wildlife proof containers and removed weekly or more frequently.

11. Firearms will be prohibited from project sites.

12. All pets will not be permitted on project sites.

13. Prior to the initiation of project activities, a worker education program will be conducted by a monitoring biologist (for general guidance on biologist qualifications see IV. B. General Project Monitoring Requirements) for all employees working in federally-listed species habitats. If, at a later time, new employees are set to work on the project site, those employees will receive the worker education program from the monitoring biologist. Visitors to the project site, such as company executives, administrative staff, or company guests, are not required to receive the worker education program as their time in the project area will be of a short duration. If visitors elect not to receive the program, then they will be escorted by a worker who has received the education program. If the visitors opt to receive the worker education program, then will not be required to be escorted by another worker, unless species specific provisions apply, such as active season blunt-nosed leopard lizard measures. The education program will include:

a. Identification of federally-listed species and their habitats;

b. Biological mitigation measures, stipulations, and notification requirements;

c. An explanation of the status of the species, its protection under the Endangered Species Act, and penalties for failure of compliance;

d. A sign-in sheet with the name and signature of the monitoring biologist who presented and the names and signatures of the education program attendees;

   i. The sign-in sheet will be maintained by the company as a record of completion and a copy will be turned in with the 60 day compliance report. The sign-in sheet will also be available upon request by the Service/BLM.

e. A fact sheet conveying the above information for distribution to the education program participants and anyone else who may enter the project site.

14. All excavated, steep-walled trenches will have exit ramps maintained at intervals no greater than 500 feet and at a slope no greater than 1:1. Trenches will be checked in the morning before beginning work and at the end of the each day. Before trenches are filled, they will be thoroughly inspected for animals. All animals will be allowed to exit unharmed. If an animal does not exit the trench within a reasonable period of time, the BLM will be contacted for further guidance. All instances of a federally-listed species discovered within a trench will be tallied and reported.

15. All excavated, steep-walled holes will have exit ramps maintained at a slope no greater than 1:1. Alternatively, holes may be covered completely with a cover that is able to support a human walking across it. Holes will be checked in the morning before beginning work and at the end of the each day. Before holes are filled, they will be thoroughly inspected for animals. If an animal does not exit the hole within a reasonable period of time, the BLM will be contacted for further guidance. All animals will be allowed to exit unharmed. All instances of a federally-listed species discovered within a hole will be tallied and reported.

16. Well cellars will be covered and kept drained. Grating or flooring shall be installed and maintained in good condition so as to exclude people and animals. Cellars should be protected from as much runoff water as practical. Except where necessary to allow for mechanical function, all gaps and openings shall not be greater than one inch in any direction.

17. All releases of potentially hazardous materials, including produced fluids, will be contained closest to the source site as possible. The released materials will be cleaned up immediately and disposed of properly. If a release of potentially hazardous materials, including produced fluids, occurs within federally-listed species habitat, the monitoring biologist will be contacted immediately and will assist with clean up and containment. The Service and/or BLM will be notified of the release of potentially hazardous materials and the remedial action taken by the operator as soon as possible, but not later than 24 hours after the release occurs or is discovered. Within 48 hours of being notified of a release that may affect federally-listed species, the BLM will issue additional clean-up provisions to the operator. Within 60 days of completing clean-up activities, a compliance report will be submitted by the monitoring biologist to the BLM.

18. Federally-listed species and other animals shall be protected from the hazards posed by sumps. All exposed oil sumps shall be screened or eliminated (California Laws for Conservation of Oil and Gas 1995). The operator will prevent avian and terrestrial animal access to fluids pits that contain or have the potential of containing salinity sufficient to cause harm, surfactants, or Resource Conservation and Recovery Act-exempt hazardous substances. All screening of sumps shall meet the following specifications: be not greater than one inch nominal mesh, be of sufficient strength to restrain entry of wildlife, and be supported in such a manner so as to prevent contact with the sump fluid. Oil sumps shall be filled with earth after proper removal of harmful materials.

19. The operator will take actions necessary to prevent wildlife and livestock access, including avian wildlife, to all open-topped tanks that contain or have the potential to contain salinity sufficient to cause harm to wildlife or livestock, hydrocarbons, or Resource Conservation and Recovery Act of 1976-exempt hazardous substances. At a minimum, the operator will net, screen, or cover open-topped tanks to exclude wildlife and livestock and prevent mortality. If the operator uses netting, the operator will cover and secure the open portion of the tank to prevent wildlife entry. The operator will net, screen, or cover the tanks until the operator removes the tanks from the location or the tanks no longer contain substances that could be harmful to wildlife or livestock.

20. The operator will prevent all hazardous, poisonous, flammable, and toxic substances from coming into contact with soil and water. At a minimum, the operator will install and maintain an impervious secondary containment system for any tank or barrel containing hazardous, poisonous, flammable, or toxic substances sufficient to contain the contents of the tank or barrel and any drips, leaks, and anticipated precipitation. The operator will properly dispose of fluids within the containment system that do not meet applicable state or U. S. Environmental Protection Agency livestock water standards in accordance with state law; the operator must not drain the fluids to the soil or ground. The operator will design, construct, and maintain all secondary containment systems to prevent wildlife and livestock exposure to harmful substances. At a minimum, the operator will install effective wildlife and livestock exclosure systems such as fencing, netting, expanded metal mesh, lids, and grate covers.

21. The operator will construct, modify, equip, and maintain all open-vent exhaust stacks on production equipment to prevent birds and bats from entering, and to discourage perching, roosting, and nesting. Production equipment includes, but may not be limited to, tanks, heater-treaters, separators, dehydrators, flare stacks, in-line units, and compressor mufflers.

22. If the above guidance cannot be followed, the BLM will be contacted for further instruction. If new guidance becomes available, the BLM will notify company representatives.

General Project Monitoring Requirements

1. Each project will have a field contact representative (FCR), who will be responsible for overseeing compliance with protective stipulations for federally-listed species. The FCR may be a project manager, project representative, or BLM employee. The FCR will have the authority to halt all actions that are in violation of the stipulations. The FCR will have a copy of all appropriate stipulations when surface disturbing actions are being conducted on the site. The Service and BLM will be notified in writing of the name and telephone number of the FCR prior to project initiation. Notification may be completed by email.

2. For the purposes of this program, biologists will be discussed in four categories; the categories are not mutually exclusive. All biologists will have on file with BLM their qualifications, such as a resume. Unless requested by the BLM, once qualifications are on file, biologists will not be required to re-submit qualifications. Biologists will document qualifications in one or more of the below categories:

    a. A "botanist" is an individual who demonstrates the ability to distinguish federally-listed plant species from non-listed plant species that may inhabit the area as well as the ability to accurately document habitat features and plant communities associated with federally-listed species.

    b. A "monitoring biologist" is an individual who demonstrates the ability to distinguish federally-listed species from non-listed species that may inhabit the area as well as the ability to accurately document habitat features and signs of federally-listed species. Potential monitoring biologist responsibilities are outlined below in IV.B.4.

    c. An "approved biologist" is an individual who meets i, ii, iii, and/or iv, below in addition to the qualifications of a monitoring biologist. A biologist can be an approved biologist for certain species and not others (i.e. an approved biologist for San Joaquin kit fox and a monitoring biologist for blunt-nosed leopard lizard depending on experience). An approved biologist is qualified to do all of the tasks of a monitoring biologist and is also qualified to supervise monitoring biologists for the species they are approved for. Potential approved biologist responsibilities are outlined below in IV.B.4.

        i. Demonstrate substantial experience assisting with or, under supervision, completing San Joaquin kit fox den excavations.

        ii. Demonstrate substantial experience assisting with or, under supervision, completing blunt-nosed leopard lizard burrow excavations.

        iii. Demonstrate substantial experience assisting with or, under supervision, completing giant kangaroo rat burrow excavations.

        iv. Demonstrate substantial experience assisting with or, under supervision, completing Tipton kangaroo rat burrow excavations.

    d. A "trapping biologist" is an individual who has substantial experience trapping and handling the federally-listed species of concern. The trapping biologist must demonstrate their qualifications to the BLM prior to conducting trapping in one of two ways:

        i. The trapping biologist may demonstrate their qualifications by presenting a valid 10(a)(1)(A) permit that lists them as an authorized individual.

        ii. If the trapping biologist is not listed as an authorized individual on a 10(a)(1)(A) permit, the individual must present documentation of their experience (such as a written log of hours working on projects trapping and handling the species of concern under the supervision of a biologist with a 10(a)(1)(A) permit, references from those individuals, etc.) and must receive written approval (a letter or email) from the BLM biologist prior to conducting trapping. The BLM may seek concurrence from the Service.

3. The BLM and Service reserve the option to disqualify a biologist from any or all of the categories listed above given reasonable cause, such as evidence the individual knowingly acted in a dishonest manner, misrepresented field data, or otherwise failed to uphold their responsibilities. These individuals can apply for reinstatement in the category they were disqualified from after one calendar year and with the presentation of materials that demonstrates how deficiencies were resolved or will be avoided in the future.

4. Monitoring biologists will be required to be present on site during all habitat disturbing actions to minimize direct take of federally-listed species. The monitoring biologist will be contacted as soon as possible following the release of potentially hazardous materials, including produced fluids, into habitat. Approved biologists will be required to conduct or supervise all kit fox den and blunt-nosed leopard lizard burrow excavation/destruction; monitoring biologists may conduct kit fox den and blunt-nosed leopard lizard burrow excavation/destruction under the supervision of an approved biologist. The Service/BLM will determine if further monitoring will be required to minimize project impacts and will so state in the BLM's authorizations. The monitoring biologist will have the authority to halt all non-emergency actions should an imminent threat to an individual or individuals arise. Work will proceed only after the imminent threat to the individual(s) has been resolved. Potential responsibilities of the monitoring biologist include:

    a. Monitoring project avoidance, minimization, and compensation compliance;

    b. Notifying field crews of compliance requirements and potential or actual incidences of non-compliance;

    c. Documenting and reporting incidences of non-compliance;

    d. Surveying ahead of crews as needed to locate and avoid sensitive species and habitat features;

    e. Routing authorized cross-country travel to minimize impacts to habitat features.

5. If the BLM observes and documents non-compliance, or receive and confirm notice from a third party of noncompliance with project stipulations, then monitoring biologists may be required.

6. Within 24 hours' notice from the applicant, Service, or BLM, a monitoring biologist will be available onsite.

7. Any contractor, employee, or third party responsible for inadvertently taking a federally-listed wildlife species will immediately report the incident to the FCR who will then notify the Service and BLM within 24 hours by phone and by email. All non-emergency actions will cease immediately until guidance is received from the Service and BLM. Notification must include the date, time, location, and other pertinent information of the incident or of the finding of a dead or injured animal. Written notification will be provided to the Service and BLM within three working days of the inadvertent take and will include the same notification information listed above.

8. Any contractor, employee, or third party responsible for inadvertently violating the terms or conditions of the project will immediately report the incident to the FCR who will then notify the BLM within 24 hours by phone and by email. Such violations may include

unauthorized habitat disturbance, destruction of a protected plant population, or impacts to wildlife that do not fall into the take provision above. All non-emergency actions will cease immediately until guidance is received from the BLM. Notification must include the date, time, location, and other pertinent information of the incident.

General Project Reporting Requirements

1. In order to conduct the project inspection for the compliance report, the monitoring biologist will be contacted immediately following well completion, approved Sundry operations (facility construction, reconstruction, alteration, or abandonment), ROW and TUP actions, and emergency clean-up activities. If there will be a substantial delay between authorized activities (such as a delay between the installation of a pipeline and bringing the pipeline online) additional interim compliance reports may be required.

2. Within 60 days of completion of any approved project, emergency activity, or Operations and Maintenance (O&M) Plan active season (see II.A. Oil and Gas Related Authorizations by the BLM for description of O&M activities and see V.B.4.j. for potential requirement to write and implement an O&M Plan), a brief compliance report will be provided to the designated BLM contact. If 60 days is an insufficient time period for completion of the compliance report, a formal extension can be requested. Extension requests may be submitted by email.

3. The compliance report must include, if applicable:

    a. Final acreage of temporary and permanent habitat disturbance based on the project inspection;

    b. Pre- and post-project photographs of impacted areas;

    c. Aerial maps and shapefiles (such as .shp, KML, etc.) displaying the locations of temporary and permanent habitat disturbance and restoration treatments;

    d. All observations of federally-listed species or BLM Special Status species, including GPS coordinates, shapefiles, and/or mapped locations, and the approximate time and date of observation;

    e. All observed impacts to federally-listed species or BLM Special Status species, including removal of plants, burrow collapse or destruction, den excavation or plugging, discovery within a steep-walled hole or trench, and take. Include a brief description of measures taken to avoid den or burrow collapse, or include a brief description of den or burrow excavation activities and an approximate number of dens and burrows impacted;

    f. A description of restoration treatments conducted or planned to facilitate re-colonization by vegetation and wildlife. Include a description of if and how topsoil was disturbed, stockpiled, and/or used in restoration of the project area or other nearby sites;

    g. A brief description of significant actions taken to comply with the provisions of the BLM authorization;

    h. Location of compensation lands (such as a map, legal description, or assessor's parcel number);An overall evaluation of compliance with the provisions and suggestions for changes or improvements to the provisions such as follow-up actions;

i. A copy of the worker education program sign-in sheet(s) with names and signatures of all attendees (see IV. A. General Project Mitigation Requirements);

j. Any other information deemed useful or relevant by the monitoring biologist.

4. All reports must:

a. Be signed and submitted by the monitoring biologist conducting the work in the field, or

b. Be reviewed and signed by the monitoring biologist conducting the work in the field, or

c. Include, as an attachment, the original report prepared and signed by the monitoring biologist conducting the work in the field. An email report submitted to the BLM by the monitoring biologist conducting the work in the field may be accepted as signature.

5. Additional reporting requirements such as weekly or monthly compliance reports may be stipulated at the time of project authorization or may be required at the discretion of the BLM.

General Project Survey Requirements

1. Reconnaissance level surveys will be conducted by a monitoring biologist to document federally-listed species sign and habitat features. The surveys will pre-date the project initiation date by no more than three years or, in the case of emergency activities, immediately following containment of the release. The reconnaissance level survey area will consist of the area within the project boundary, including access routes and approved cross-country travel routes, plus an additional appropriate survey area beyond the project boundary. The additional appropriate survey area may be based on factors such as surrounding land uses, past survey results, etc. and will be a minimum of 250 feet unless a reasonable justification can be made (for instance the proximity of large scale permanent disturbance such as an orchard or similar circumstance). Reconnaissance level surveys will include daytime line transect surveys which will be conducted by walking the survey area at approximately 30 to 90 foot intervals. Transect width will be adjusted based on factors such as vegetation height, and topography. The surveys will not be intended to determine species presence or absence on a particular site, although any federally-listed species observed shall be noted during these surveys. The surveys shall identify whether or not habitat for any federally-listed species exists within or in the vicinity of the project footprint. Based on the results of reconnaissance level surveys as well as information such as known distribution and historical range, additional surveys may be required to confirm presence/absence; see Species Specific Survey, Monitoring, Reporting, and Mitigation Requirements.

2. Pre-project surveys will be conducted by a monitoring biologist to determine if there has been any change since the reconnaissance level survey in the potential for federally-listed species by identifying wildlife sign, important habitat features, and other indicators of habitat use. The pre-project surveys will occur no less than fourteen days and no more than thirty days prior to the project initiation start date. The pre-project survey area will consist of the area within the project boundary, including access routes and approved cross-country travel routes, plus an additional appropriate survey area beyond the project boundary. The additional appropriate survey area may be based on factors such as surrounding land uses, past survey results, etc. and will be a minimum of 250 feet unless a reasonable justification can be made (for instance the proximity of large scale permanent disturbance such as an

orchard or similar circumstance). Pre-project surveys will include daytime line transect surveys which will be conducted by walking the survey area at approximately 30 to 90 foot intervals. Transect width will be adjusted based on factors such as vegetation height, and topography.

3. Under certain circumstances, the reconnaissance level survey and pre-project survey may be one survey. This scenario could arise if the project is in an area where no additional, species-specific surveys (such as blunt-nosed leopard lizard or Kern mallow) are required, or if an acceptable earlier survey can be submitted (for example a plant survey that was completed in a year where conditions were suitable for germination and the survey was done in sufficient detail).

4. If new reconnaissance or protocol level survey standards or new measures for minimizing take or impact are published, the BLM will coordinate with the Service to determine if those will be implemented in addition to or in place of the requirements outlined in this program.

Species specific measures

San Joaquin Kit Fox

1. The following exclusion zones are based on the 2011 *USFWS Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance.* At the Service/BLM's discretion, the exclusion zone radius may be altered based on publication of new guidance, sensitivity of the den site, proximity of existing disturbance, or other factors.

    a. For potential and atypical dens, an exclusion zone with a minimum radius of 50 feet as measured outward from the entrance or cluster of entrances will be maintained. Atypical dens may include pipes, culverts, and similar structures with a diameter of approximately 4-inches or greater. Removal of atypical dens that cannot be seen through will follow the monitoring and plugging procedure described for natural dens.

    b. For known dens, an exclusion zone with a minimum radius of 100 feet as measured outward from the entrance or cluster of entrances will be maintained.

    c. For natal/pupping dens both occupied and unoccupied, the Service and BLM must be contacted.

    d. Actions within exclusion zones will be limited to essential vehicle and equipment operation on authorized roads and to foot traffic. Actions within exclusion zones will be confined to daylight hours unless, at the discretion of the Service/BLM, operations at other times of day would be beneficial to listed species. At the Service/BLM's discretion, other actions may be allowed.

2. If, in the opinion of the monitoring biologist, a kit fox den exclusion zone cannot be maintained, but the den can be avoided during construction, then the empty den may be temporarily plugged by or under the supervision of an approved biologist with one-way doors or materials such as sandbags, rocks, etc. until construction has concluded. If this option is utilized, at the end of construction, the temporary plug will be removed by or under the supervision of an approved biologist.

a. Occupied natal/pupping dens will not be plugged until the pups and adults have vacated and then only after the Service and BLM have granted permission.

b. Prior to temporary plugging of any den using methods other than one-way doors, the den will be monitored for a minimum of five consecutive nights to determine its current status. Activity at the den will be monitored by placing tracking medium or an infra-red beam camera at the entrance.

i. If no kit fox activity is observed during this period, the den will be plugged immediately upon the conclusion of monitoring to preclude subsequent use.

ii. Only when the den is determined to be unoccupied may the den be temporarily plugged by or under the supervision of an approved biologist.

1. Use of the den can be discouraged during this period by installing one-way doors or partially plugging its entrance(s) with materials such as sandbags, soil, or rocks in such a manner that any resident animal can escape easily.

2. If the animal is still present after five or more consecutive nights of discouraging use and monitoring, an approved biologist will contact the Service/BLM to obtain further guidance.

3. If, in the opinion of the monitoring biologist, a kit fox den exclusion zone cannot be maintained, and the den cannot be avoided during construction, then limited destruction may be allowed. The following guidance on den destruction is based on the *2011 USFWS Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance*. At the Service and BLM's discretion, den destruction guidelines may be altered based on publication of new guidance or other circumstances.

a. Occupied natal/pupping dens will not be destroyed until the pups and adults have vacated and then only after the Service and BLM have granted permission.

b. Prior to destruction of any den, the den will be monitored for a minimum of five consecutive nights to determine its current status. Activity at the den will be monitored by placing tracking medium or an infra-red beam camera at the entrance.

i. If no kit fox activity is observed during this period, the den will be destroyed by or under the supervision of an approved biologist immediately to preclude subsequent use.

ii. If kit fox activity is observed at the den during this period, the den will be monitored for a minimum of five additional consecutive nights from the time of the observation to allow any resident animal to move to another den during its normal activities. Only when the den is determined to be unoccupied may the den be excavated by or under the supervision of an approved biologist.

1. Use of the den can be discouraged during this period by installing one-way doors or partially plugging its entrance(s) with materials such as sandbags, soil, or rocks in such a manner that any resident animal can escape easily.

2. If the animal is still present after five or more consecutive nights of discouraging use and monitoring, the approved biologist will contact the Service

and BLM to obtain permission to excavate the den when it is temporarily vacant, for example during the animal's normal foraging activities.

4. All construction pipes, culverts, or similar structures with a diameter of approximately four (4) inches or greater that are stored on the lease for one or more overnight periods will be thoroughly inspected for kit foxes before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a kit fox is discovered inside a pipe, that section of pipe should not be moved until the Service/BLM has been contacted and further guidance has been received. Any kit fox found will be allowed to escape unimpeded.

5. If kit fox dens must be destroyed during project activities, BLM may require the installation of artificial dens as mitigation.

Blunt-Nosed Leopard Lizard

1. For the purposes of this program, potential blunt-nosed leopard lizard burrows are burrows in suitable habitat that measure 1.5 inches or more in at least one dimension and that cannot be confirmed as collapsed.

2. Blunt-nosed leopard lizard species specific survey requirements:

    a. If project activities can avoid all burrows by 50 feet, then additional blunt-nosed leopard lizard surveys will not be required.

    b. If project activities will take place within 50 feet of existing burrow entrances and in the judgment of the monitoring biologist, the combination of soil hardness and activity impact is not expected to collapse those burrows, then those project activities may take place under the supervision of the monitoring biologist and additional blunt-nosed leopard lizard surveys will not be required.

        i. Activities authorized by the monitoring biologist within 50 feet of burrow entrances will be documented and included in all reports, including the compliance report.

    c. If project activities will or are likely to result in burrow impacts, protocol-level surveys will be required. Protocol-level surveys must be conducted using the May 2004 CDFW *Approved Survey Methodology for the Blunt-Nosed Leopard Lizard.* The protocol-level survey area will consist of the area within the project boundary, including cross-country travel routes, plus an additional appropriate survey area beyond the project boundary. The additional appropriate survey area may be based on factors such as surrounding land uses, past survey results, etc. and will be a minimum of 250 feet unless a reasonable justification can be made (for instance the proximity of large scale permanent disturbance such as an orchard or similar circumstance).

        i. If protocol-level surveys for blunt-nosed leopard lizard are negative and are accepted by the BLM:

            1. Project activities may proceed until the negative survey expires.

            2. A negative survey result will be valid until April 1st of the following year unless a blunt-nosed leopard lizard is observed within 1000 feet of the project area. If a

blunt-nosed leopard lizard is observed within 1000 feet of the project area, BLM will be contacted for further guidance.

3. Alternatively, an exclusion barrier may be constructed around the project area where burrows will be impacted. A properly maintained exclusion barrier extends the valid period of the negative protocol-level survey result until the exclusion barrier is removed or to April 1st, whichever is later.

ii. If surveys are positive for blunt-nosed leopard lizard or if the species is known to occur within the project area:

1. An exclusion barrier such as flashing or other approved fencing material may be installed around the burrow disturbance area. Protocol-level surveys will be conducted within the exclusion barrier and all blunt-nosed leopard lizards will be allowed to egress or will be removed until a negative survey result is achieved within the burrow disturbance area. This negative survey result will be valid until the exclusion barrier is removed.

2. Additional avoidance and minimization measures such as active season avoidance measures (see below for active season avoidance measures) and an onsite biological monitor during all surface disturbing activities will be required.

3. Exclusion barrier guidelines:

a. The exclusion barrier will be 36-inches or more above ground, preclude burrowing underneath the fence, and reinforced with materials such as rebar or fence posts. Wood stakes will not be used on the outside of the barrier as animals can use them to climb up and in to the exclosure.

b. Exclusion barrier installation will occur under the supervision of an approved biologist and in a manner that avoids all burrows by a distance determined by the approved biologist. If a burrow is inadvertently destroyed by trenching during installation, the burrow will be carefully hand excavated to ensure no blunt-nosed leopard lizards are entrapped within the collapsed burrow.

c. Exit ramps made from materials such as silt fencing, wood, or soil will be constructed inside the barrier exclosure so that blunt-nosed leopard lizards can exit to outside the barrier.

d. Prior to burrow disturbance, protocol level surveys will be completed within the barrier exclosure. Unless additional days are deemed necessary by the approved biologist, surveys may conclude when protocol level surveys have reached a negative result.

i. All blunt-nosed leopard lizards observed within the barrier exclosure will be allowed to exit or will be removed by a trapping biologist from the barrier exclosure prior to project activities using one of the methods below.

3. A portion of the fence may be removed or a ramp may be erected so that the lizard can exit the barrier exclosure. An approved biologist will monitor the location of the lizard to ensure it has moved outside the barrier exclosure. The barrier fence will be immediately replaced to prevent any lizard from re-entering the barrier exclosure.

4. Blunt-nosed leopard lizards may be noosed by a trapping biologist. An approved biologist will maintain visual contact of the individual lizard or burrow entrance until the lizard can be captured for removal by the trapping biologist. Noosed lizards will be released outside the barrier exclosure into adjacent habitat 75-150 feet away.

5. If an observed lizard is not immediately removed via partial fence removal, ramp erection, or capture, surveys for blunt-nosed leopard lizards will continue until the lizard has egressed or been successfully removed from the barrier exclosure. If the lizard is not observed within 12 days of survey, the Service and BLM will be contacted for further guidance.

    ii. Burrows inside the barrier exclosure may be destroyed after the survey, monitoring, and blunt-nosed leopard lizard removal requirements described above have been met.

    iii. Burrow excavation is required if blunt-nosed leopard lizards are observed within the exclusion barrier. Burrows will be carefully dug out by or under the supervision of an approved biologist and in a manner that avoids direct mortality. After verifying that no lizards are present, the burrow will be immediately destroyed.

6. If a blunt-nosed leopard lizard is encountered during excavations, it will be allowed to egress unharmed, and the BLM and Service will be contacted within 24 hours by phone and by email for further guidance.

7. If eggs are found within a burrow, the BLM and Service will be contacted within 24 hours by phone and by email for further guidance. The eggs will be transported to an approved facility or individual and cared for in a manner that results in a high likelihood of successful hatching and release into adjacent undisturbed habitat.

    e. Barriers will be properly maintained until they are no longer necessary. Maintenance may include patching small holes, repairing tears, replacing degraded segments, and keeping underground portions buried.

    f. An approved biologist will determine when the exclusion barrier should be removed, for instance: after the burrows have been destroyed or after construction is complete or kept in place during project operations and maintenance to reduce the potential take of blunt-nosed leopard lizards. An approved biologist will determine if adding additional exclosure fencing, such as along the access route, would reduce the potential take of lizards. The exclosure will be removed and disposed of properly when no longer necessary or functional.

4. In areas where blunt-nosed leopard lizards are known or likely to occur or where surveys are positive, the following blunt-nosed leopard lizard active season avoidance measures will be implemented when appropriate. This includes during construction and subsequent operations and maintenance (O&M) activities.

    a. The monitoring biologist or field contact representative will notify BLM that active season measures are being implemented. Initial notification may be by phone message or email.

    b. The monitoring biologist will be onsite for project activities during appropriate temperatures for blunt-nosed leopard lizard activity.

c. When possible, project activities will be conducted at night or during blunt-nosed leopard lizard inactivity periods.

d. The Service/BLM may require the monitoring biologist to escort all traffic through any area where blunt-nosed leopard lizards have been observed.

e. All personnel will be advised to reduce speeds to 10 mph on sections of the access/egress route with potential to support blunt-nosed leopard lizards.

f. If a blunt-nosed leopard lizard is observed, the BLM will be provided with the GPS coordinates of the sighting within 48 hours. Written documentation, including GPS coordinates of lizard observations, will be included in all reports.

g. The monitoring biologist will complete daily compliance reports. Daily compliance reports will be summarized in a weekly compliance report; the weekly compliance report will be sent to BLM. The weekly report will describe actions taken to avoid blunt-nosed leopard lizard impacts. The weekly report may be submitted by email to BLM.

h. When the monitoring biologist determines that temperature patterns at the project site no longer support blunt-nosed leopard lizard activity for the season and receives agreement from BLM, active season measures may be discontinued.

i. A report will be submitted to BLM within 60 days of the decision to discontinue active season measures. If 60 days is an insufficient time period for completion of the compliance report, a formal extension of a reasonable timeframe can be requested. Extension requests can be submitted by email.

j. The Service/BLM may require a written blunt-nosed leopard lizard active season Operations and Maintenance Plan (O&M Plan). The O&M Plan would outline the practices and mitigation measures that would be implemented to avoid impacts to blunt-nosed leopard lizards from O&M activities.

5. Should a blunt-nosed leopard lizard be encountered during construction activities during the inactive season, it will be held in captivity by a permitted facility or individual and released into adjacent undisturbed habitat at the earliest period of suitable weather within the active season. The BLM and Service will be notified of the discovery within 24 hours by phone and by email.

6. In the event of an emergency and subsequent clean-up in an area where blunt-nosed leopard lizards are known or likely to occur, an approved biologist will be contacted within 24 hours to conduct emergency excavation of affected burrows and potential burrows as soon as the emergency has been contained. Under the supervision of an approved biologist, a monitoring biologist may excavate affected burrow and potential burrows. If an affected lizard is discovered, the Service and/or BLM will be contacted for guidance.

7. At the Service/BLM's discretion, existing information may be used to conclude that blunt-nosed leopard lizards have been locally extirpated from the project area or are otherwise unlikely to occur within the project area at the time of project activities. In these areas, truncated surveys, burrow excavation, or other acceptable methodologies may be required to document that no blunt-nosed leopard lizards are present or have become reestablished in the area. If blunt-nosed leopard lizards become reestablished or have a reasonable likelihood

of becoming reestablished, then the full protocol survey and protective measures above will be required.

a. A locally extirpated determination will be based on substantial evidence with concurrence from the BLM and Service. Substantial evidence may include multiple years of negative protocol level survey reports, past and current distribution information, scientific research, and/or species expert statements. The evidence will be submitted to the BLM, and if the BLM agrees the evidence is substantial, the BLM will submit the information to the Service. If the Service concurs with the BLM decision, then blunt-nosed leopard lizards will be treated as locally extirpated and subject to the modified requirements outlined above for subsequent project activities in the project area.

Giant Kangaroo Rat and Tipton Kangaroo Rat

1. Maintain an exclusion zone around active burrows and precincts with a minimum radius of 50 feet as measured outward from the burrow entrance or cluster of entrances. Actions within exclusion zones will be limited to essential vehicle and equipment operation on authorized roads and to foot traffic. Actions within exclusion zones will be confined to daylight hours unless, at the discretion of the Service/BLM, operations at other times of day would be beneficial to listed species. At the Service/BLM's discretion, the exclusion zone radius may be altered based on publication of new guidance, sensitivity of the site, proximity of existing disturbance, or other factors.

2. If project activities will take place within 50 feet of existing burrow and precinct entrances and in the judgment of the monitoring biologist, the combination of soil hardness and activity impact is not expected to collapse those burrows, then those project activities may take place under the supervision of the monitoring biologist.

   a. Activities authorized by the monitoring biologist within 50 feet of burrow and precinct entrances will be documented and included in all reports, including the compliance report.

3. If the minimum exclusion zone cannot be maintained and the monitoring biologist believes activities will collapse burrows then a trapping biologist may be required to implement a trap and release program at the Service/BLM's discretion. Project specific guidance on trapping, temporary holding, release location, and release method will be provided by the Service/BLM prior to the start of trapping.

Kern Mallow, California Jewelflower, San Joaquin Woolly-Threads, and Bakersfield Cactus

1. Survey Requirements: For annual species, a botanist will survey during the growing season when reference populations are flowering. Survey will occur in the area within the project boundary, including proposed cross-country travel routes, plus an additional appropriate survey area beyond the project boundary. Surveys during low precipitation years will be expected to underestimate the size and extent of the populations; this is because, for annual species, the population resides mostly in the seedbank and many years is not expressed above ground. To implement minimization measures, it is best to survey the entire lease during productive years for the species. Additional surveys may be necessary to define population boundaries. Surveys for Bakersfield cactus may be done at any time of the year.

a. If habitat is of unknown suitability, reconnaissance level surveys will be conducted by a botanist using meandering walk-over surveys.

   i. If reconnaissance level surveys determine that habitat is not suitable, no further surveys will be required.

   ii. If reconnaissance level surveys determine that habitat is suitable, site-specific surveys will be conducted by walking line transacts with approximately 30 to 45-foot intervals during the appropriate season (flowering for annual species, anytime for Bakersfield cactus). Transect width will be adjusted based on factors such as vegetation height, topography, and level of specificity required to map populations.

b. If habitat is known to be suitable, site-specific surveys will be conducted by a botanist by walking line transacts with approximately 30 to 45-foot intervals during the appropriate season (flowering for annual species, anytime for Bakersfield cactus). Transect width will be adjusted based on factors such as vegetation height, topography, and level of specificity required to map populations.

c. If federally-listed plant species is detected within the survey area, BLM will be contacted within a week by phone and by email to provide additional guidance on appropriate survey area. A larger survey area may be advised as greater knowledge of population distribution may facilitate project authorization.

d. At the discretion of the BLM botanist, existing information may be used to conclude that the habitat is not suitable and/or that the site is not occupied. If this is determined, then surveys are not required. The BLM botanist may also use existing information to determine that project impacts are acceptable without detailed surveys.

2. Measures for Minimizing Impact

a. Maintain an exclusion zone around populations with a minimum radius of 50 feet as measured outward from the individual plant, cluster of plants, or mapped population boundaries. Actions within exclusion zones will be limited to essential vehicle and equipment operation on authorized roads and to foot traffic. The locations of federally-listed plants will be avoided and temporarily fenced or prominently flagged by or under the supervision of a botanist to prevent inadvertent encroachment by vehicles and equipment during the activity. If the minimum exclusion zone cannot be maintained, the Service/BLM will be contacted for further guidance.

b. If populations cannot be avoided, surface disturbance should be scheduled after seed set and prior to germination. This period is generally from May to September, but varies relative to yearly temperature and precipitation patterns.

c. Collection of seed by a biologist with proper plant collecting permits, with reseeding undertaken at the site following the activity during appropriate seasonal time-frames and weather conditions favorable for germination and growth, may also be required.

d. In areas where soils will be disturbed by earthmoving equipment, the topsoil will be stockpiled. If the site is to be reclaimed within one year, the topsoil will be replaced. If reclamation will occur later than one year, any topsoil removed will be used as part of restoration measures on nearby suitable areas. Topsoil will not be stockpiled for longer

than the beginning of the next growing season. The disturbance, stockpiling, and/or use of topsoil will be reported in the compliance report (see IV. C. General Project Reporting Requirement).

e. Impacts to populations of federally-listed plants may be considered minimized when:

i. The lease has had accurate surveys for federally-listed plants; and

ii. The population boundaries are well-defined (mapped); and

iii. The previous measures for minimizing impacts have been implemented.

f. Plants that are considered waifs or an incidental occurrence and a small population size (less than 10 individuals) may be disturbed at the Service/BLM's discretion.

Habitat Restoration

1. Restoration will be required on unused portions of reserve areas (Red Zones) and habitat corridors (Green Zones), including abandoned, unused, or unnecessary roads, of the project area or oil and gas lease when deemed necessary by the BLM to maintain or improve habitat values. Restoration will be required when reserve area (Red Zone) and habitat corridor (Green Zone) limits are exceeded and when a project or lease is abandoned. Restoration activities will be supervised by an onsite monitoring biologist.

2. The following are examples of actions that may be required as part of restoration. With approval from BLM, alternative methods may also be implemented to meet restoration goals:

a. All trash will be removed from the site and disposed of properly.

b. All cement, asphalt, and oil-contaminated soils will be removed from the site and disposed of properly. Exceptions may be made for historic disturbances, such as asphaltic flows or buried cement footers, where removal may cause more disturbance to occupied habitat and environmental features.

c. All pipelines and other oilfield infrastructure no longer in use will be removed from the site and disposed of properly.

d. Topographic contours will be restored to the maximum extent possible.

e. Non-compacted soils or areas previously deep ripped will be disced to a depth of approximately 8 inches or to a depth appropriate to the site as approved by the BLM.

f. Compacted sites will be deep ripped to a depth of 12 to 18 inches or to a depth appropriate to the site as approved by the BLM.

g. Slopes greater than 30 per cent will be treated by erosion control methods such as discing along the contour, imprinting, mulching, or installing wattles.

h. Sites will be seeded using methods such as drill or broadcast seeding with a site-appropriate seed mix, approved by the BLM Botanist. Exact seeding mixes and rates will depend on the site characteristics, the species chosen, and the current availability of

native seed. Seed mixes will include dominant shrubs and native grasses and herbs compatible with the adjacent plant community. The best time for seeding is generally late summer to early fall prior to the onset of the rainy season.

i. Sites will be considered restored when it can be documented that they support functional, native or naturalized habitat. Evidence of attainment of this goal will be provided by the project applicant. Restoration in drainages, streambeds, and similar habitats where water is a substantial component may require conformance with conditions of a CDFW Streambed Alteration Agreement or other state or local permit. Demonstration of restoration may include documentation of:

   i. Visual continuity or similarity with adjacent native/naturalized, undisturbed habitat or a designated reference site.

   ii. Topography that follows natural contours and allows for the natural flow of water across the landscape.

   iii. Indiscernible boundary lines or areas between the disturbed and undisturbed areas.

   iv. Presence of habitat that supports threatened and endangered species.

   v. Vegetation community composition within the normal or desired range. Ratios of native and non-native plants within normal or desired parameters. Presence and abundance of reproducing plants. Presence and abundance of biological soil crusts. Presence, abundance, ratios, and ranges as compared to pre-disturbance levels as well as comparisons to adjacent native/naturalized, undisturbed habitat or a designated reference site.

   vi. Evidence or presence of animals or animal sign on the site. Presence and abundance of desired species. Evidence, presence, and abundance of reproducing species. Presence and abundance as compared to pre-disturbance levels as well as comparisons to adjacent native/naturalized, undisturbed habitat or a designated reference site.

   vii. Evidence of species diversity for both plants and animals.

   viii. Evidence of soil stability (minimal erosion).

   ix. Absence of signs of vehicle or other trespass. Absence of trash and contaminated soils.

Compensation and Replacement

1. Allocation of compensation lands and method of allocation will be approved by the BLM prior to project approval. A preliminary estimate of compensation acres will be provided to the applicant by the BLM based on the authorized action, and final compensation acreage will be adjusted upon completion of construction. Allocation of suitable compensation lands can be accomplished in one of four ways:

   a. Project applicant purchases suitable mitigation credits at a Service-approved mitigation bank prior to project approval.

b. Project applicant may, with Service and BLM approval, record a conservation easement, in a form approved by the Service prior to recording and granted to an entity acceptable to the Service, over privately-owned lands prior to project approval.

c. Project applicant may purchase lands deemed acceptable by the BLM and Service and may:

i. Transfer the lands to the BLM, Service, or CDFW and provide evidence to the BLM that the land was transferred prior to project approval.

ii. Place a conservation easement, in a form approved by the Service prior to recording and granted to an entity acceptable to the Service, on the lands and maintain the lands as a privately-owned mitigation site, and prior to project approval, provide the following to the BLM as evidence:

1. Copies of all executed and recorded conservation easements;

2. Written confirmation from the approved endowment manager of receipt of the full endowment and all required reports.

iii. Transfer the lands to an entity acceptable to the BLM and Service that can effectively manage federally-listed species and their habitats, encumber the lands with a conservation easement in a form acceptable to the Service, and prior to project approval, provide the following to the BLM as evidence of the completed transfer:

1. Written documentation of the land transfer;

2. Copies of all executed and recorded conservation easements;

3. Written confirmation from the approved endowment manager of receipt of the full endowment and all required reports.

General compensation and replacement requirements

1. Acres of habitat used for compensation or replacement must meet requirements (a) and (b) or (a), (b), and (c) outlined below. Additionally, the land must implement the habitat protection strategy outlined in the *Recovery Plan for Upland Species of the San Joaquin Valley, California.*

a. If a project impacts lands in a reserve area (Red Zone), the compensation land must also be in a reserve area (Red Zone). If the project occurs in habitat corridor (Green Zone), compensation can be in habitat corridor (Green Zone) or reserve area (Red Zone). If a project impacts lands outside of the reserve area (Red Zone) and habitat corridor (Green Zone) strategy, the compensation land must be in either a reserve area (Red Zone) or habitat corridor (Green Zone). In all cases, compensation or replacement land must be of equal or greater habitat value as the land impacted.

b. The land must possess the same species as the impacted acres. For example, impacts to a kit fox natal den must be compensated with land that supports breeding populations of kit foxes. Lands used for compensation for project impacts to Kern mallow, San Joaquin woolly-threads, blunt-nosed leopard lizards, giant kangaroo rats, and Tipton kangaroo rats must be known by the Service to contain these species.

c. If a parcel of land outside the reserve areas (Red Zone) and habitat corridor (Green Zone) strategy is determined by the Service and BLM to meet the standards for inclusion in the zonal strategy, then it can be added to the strategy and used as compensation land.

2. Compensation is required for impacts to potential federally-listed species habitat.

   a. For permanent impacts, compensation will be 3:1. Permanent impacts cause high-intensity or longer-term disturbances, such as those that result from soil excavation, topsoil removal, removing or crushing shrubs, destroying cryptogrammic crust, or off-road driving that result in significant topsoil impacts. Once operators compensate for permanent disturbance within a project area, they will not be required to compensate for the same acreage again if the area is included in a future project proposal, and the operator can demonstrate or provide documentation the area was previously compensated for at the permanent rate.

   b. For temporary impacts, compensation will be 1.1:1. Only low-intensity or short-term disturbances, such as those that result from brief off-road travel during dry soil conditions, will be considered temporary.

3. Compensation lands will be required for emergency actions that cause impacts to habitat. As soon as possible but not later than 24 hours after the emergency occurs, the BLM will be provided written notification of the estimated acreage of the disturbance. Disturbance impacts will be presumed to be temporary unless upon subsequent visitation it is determined that restoration has been unsuccessful. Within 48 hours of notification receipt, the BLM will issue clean-up provisions to the operator, including an estimation of compensation acres required. The compliance report will include the final disturbance calculation, ownership of the proposed compensation lands, and location of the proposed compensation lands.

4. Compensation lands will be required for all unauthorized impacts to habitat. The compensation ratio will be commensurate with impact type (temporary or permanent).

5. Replacement acres will be required at a 1:1 ratio for impacts that occur on BLM surface within reserve areas (Red Zones) or habitat corridors (Green Zones). This will be in addition to the temporary or permanent compensation ratio.

6. Compensation for actions on Protected Lands will be determined on an individual project basis in consultation with the Service. Protected Lands include all lands reserved for conservation purposes (i.e. lands managed for endangered species habitat such as other Federal lands, State Ecological Reserves, conservation banks, and private surfaces with conservation easements).

7. The following is a list of compensation lands that have been approved for use in the past; the list serves as an example of areas that could be considered for future project impacts (Appendix 3: Map 2017 Oil & Gas Programmatic Biological Assessment – Example Conservation Areas): Lokern Natural Lands Area, Buena Vista Valley, Semitropic Ridge, Allensworth, Kettleman Hills, Kern Water Bank, Coles Levee Ecosystem Preserve, or any Specialty Preserve agreed to by the BLM and the Service. Habitat corridor areas and small specialty preserves determined by the BLM, Service, and CDFW to be important for species conservation and recovery will be acceptable as compensation habitat so long as they meet the in kind compensation requirement.

Action Area

The action area is defined in 50 CFR § 402.02, as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." For the purposes of the effects analysis, the action area includes surface and subsurface lands administered by the BLM Bakersfield Field Office, primarily in Kings and Kern Counties, with occasional projects in a small portion of San Luis Obispo County (see Figure 1).

Analytical Framework for the Jeopardy Determination

Section 7(a)(2) of the Endangered Species Act requires that Federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of listed species. "Jeopardize the continued existence of" means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR § 402.02).

The jeopardy analysis in this biological opinion considers the effects of the proposed Federal action, and any cumulative effects, on the rangewide survival and recovery of the listed species. It relies on four components: (1) the *Status of the Species*, which describes the rangewide condition of the species, the factors responsible for that condition, and its survival and recovery needs; (2) the *Environmental Baseline*, which analyzes the condition of the species in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the species; (3) the *Effects of the Action*, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the species; and (4) the *Cumulative Effects*, which evaluates the effects of future, non-Federal activities in the action area on the species.

Status of the Species

San Joaquin kit fox

Please refer to the *San Joaquin Kit Fox (Vulpes macrotis mutica) 5-year Review: Summary and Evaluation* (Service 2010a) for the current status of the species. No change in the species' listing status was recommended in the 5-year review. Threats evaluated during that review have continued to act on the species since the review was published. To date no project has proposed a level of effect for which the Service has issued a biological opinion of jeopardy for the species.

Blunt-nosed leopard lizard

Please refer to the *Blunt-nosed Leopard Lizard (Gambelia sila) 5-year Review: Summary and Evaluation* (Service 2010b) for the current status of the species. No change in the species' listing status was recommended in the 5-year review. Threats evaluated during that review have continued to act on the species since the review was published. To date no project has proposed a level of effect for which the Service has issued a biological opinion of jeopardy for the species.

Giant kangaroo rat

Please refer to the *Giant Kangaroo Rat (Dipodomys ingens) 5-year Review: Summary and Evaluation* (Service 2010c) for the current status of the species. No change in the species' listing status was

recommended in the 5-year review. Threats evaluated during that review have continued to act on the species since the review was published. To date no project has proposed a level of effect for which the Service has issued a biological opinion of jeopardy for the species.

Tipton kangaroo rat

Please refer to the *Tipton Kangaroo Rat (Dipodomys nitratoides nitratoides) 5-year Review: Summary and Evaluation* (Service 2010d) for the current status of the species. No change in the species' listing status was recommended in the 5-year review. Threats evaluated during that review have continued to act on the species since the review was published. To date no project has proposed a level of effect for which the Service has issued a biological opinion of jeopardy for the species.

Kern mallow

Please refer to the *Eremalche kernensis (Kern Mallow) 5-year Review: Summary and Evaluation* (Service 2013a) for the current status of the species. No change in the species' listing status was recommended in the 5-year review. Threats evaluated during that review have continued to act on the species since the review was published. To date no project has proposed a level of effect for which the Service has issued a biological opinion of jeopardy for the species.

San Joaquin woolly-threads

Please refer to the *Monolopia (=Lembertia) congdonii (San Joaquin Woolly-threads) 5-year Review: Summary and Evaluation* (Service 2010e) for the current status of the species. No change in the species' listing status was recommended in the 5-year review. Threats evaluated during that review have continued to act on the species since the review was published. To date no project has proposed a level of effect for which the Service has issued a biological opinion of jeopardy for the species.

California jewelflower

Please refer to the *Caulanthus californicus (California jewelflower) 5-year Review: Summary and Evaluation* (Service 2013b) for the current status of the species. No change in the species' listing status was recommended in the 5-year review. Threats evaluated during that review have continued to act on the species since the review was published. To date no project has proposed a level of effect for which the Service has issued a biological opinion of jeopardy for the species.

Bakersfield cactus

Please refer to the *Bakersfield Cactus (Opuntia treleasei = Opuntia basilaris var. treleasei) 5-year Review: Summary and Evaluation* (Service 2011) for the current status of the species. No change in the species' listing status was recommended in the 5-year review. Threats evaluated during that review have continued to act on the species since the review was published. To date no project has proposed a level of effect for which the Service has issued a biological opinion of jeopardy for the species.

Environmental Baseline

The majority of BLM administered lands within the Action Area are undeveloped or minimally developed non-native grassland, alkali sink, and valley saltbush scrub habitats.

San Joaquin kit fox

San Joaquin kit fox are known to occur or are likely to occur on over 94,000 acres of BLM surface and 200,000 acres of BLM mineral estate in Kings, Kern, and portions of San Luis Obispo Counties. Kit fox are presumed to occur on all BLM surface and mineral estate lands in the San Joaquin Valley and foothills that 1) support native and non-native grassland, alkali sink, and valley saltbush scrub habitats; 2) have relatively low relief; and 3) occur below 3,000 feet elevation. Kit fox are likely to occur on natural lands which may have a wide variety of land uses such as livestock grazing, linear utility rights of way, communication sites, small facilities, mining activities, active oil fields, and small water impoundments. Kit fox can also occur on some privately owned active and fallowed agricultural lands (above BLM mineral estate), and occur near and within cities, towns and rural residential settings. The most suitable habitats on BLM lands are relatively flat with a high proportion of desert habitats that include non-native grassland, scattered saltbush scrub, and a low footprint of human activities (such as roads, oil wells, and utilities).

BLM surface and mineral estate occurs within several areas identified as core and satellite population areas in the *Recovery Plan for Upland Species of the San Joaquin Valley*. Over 59,000 acres of BLM surface and 34,500 acres of mineral estate occur in the Western Kern County San Joaquin Kit Fox Core Area. BLM surface represents 17% and BLM mineral estate represents 10% of the core area. BLM manages significant surface and mineral estate in the Lokern, Buena Vista Valley/Hills, and Kettleman Hills recovery areas. San Joaquin kit fox may also occur, to a lesser extent, in the steeper slopes of the Temblor Range, Sierra Nevada Foothills, Sierra Madre foothills, and Kettleman Hills where grassland and saltbush scrub habitats dominate the landscape.

Blunt-nosed leopard lizard

Potential habitat for blunt-nosed leopard lizards occurs on approximately 52,000 acres of BLM surface and 100,000 acres of BLM mineral estate in Kings, Kern, and portions of San Luis Obispo Counties. Blunt-nosed leopard lizards are presumed to occur on large blocks of BLM surface and mineral estate that 1) support native and non-native grassland, alkali sink, and valley saltbush scrub habitats; 2) have relatively low relief; and 3) occur below 3,000 feet elevation in the foothills of the San Joaquin Valley. Blunt-nosed leopard lizards do not occur on active agricultural lands (privately owned lands above BLM mineral estate), but may occur on some long-term fallowed lands if there is an open habitat structure and such parcels are connected to extant occupied habitat. Blunt-nosed leopard lizards can occur in active oil fields, and near towns and rural residential settings. The most suitable habitats on BLM lands are relatively flat San Joaquin desert habitats such as non-native grassland, valley sink scrub, and valley saltbush scrub with scattered saltbush across the landscape. There appears to be a greater abundance where there is a low footprint of human activities (such as roads, oil wells, utilities). In Kings and Kern Counties, BLM lands occur within several areas identified as preserves in the *Recovery Plan for Upland Species of the San Joaquin Valley* such as Lokern, Buena Vista Valley, Kettleman Hills, and Semitropic. Blunt-nosed leopard lizards may also occur to a lesser extent in the lower slopes of the Temblor Range, Sierra Nevada foothills, Sierra Madre foothills, and Kettleman Hills where grassland and saltbush scrub habitats dominate the landscape.

Giant kangaroo rat

Giant kangaroo rats are known to occur in several areas on BLM surface and mineral estate. Giant kangaroo rat distribution has been variable over the past 20 years, ranging from isolated small populations to widespread coverage across portions of the landscape. Within the area covered by distribution records and in Kings, Kern, and portions of San Luis Obispo Counties, BLM manages

41,000 acres of surface and 19,000 acres of mineral estate. Nearly all of the giant kangaroo rat records on BLM surface (outside of the Carrizo Plain National Monument) occur in western Kern County in the Lokern, Buena Vista Valley, Midway Valley, and Temblor Range areas. BLM surface accounts for about 16.6% and BLM mineral estate accounts for 7.8% of the giant kangaroo rat range in western Kern County.

Giant kangaroo rats occur in native and non-native grassland, and valley saltbush scrub habitats in the western foothills of the San Joaquin Valley. Populations are most abundant, and can dominate the landscape in the Lokern and Buena Vista Valley areas. Periodically, populations expand up into the Temblor Range on ridgelines and steeper slopes, but appear to recede back to less rugged terrain in lower population levels. Giant kangaroo rats do not occur on active agricultural lands, but may become established as fields are fallowed for several years if those parcels are connected to occupied habitat. Giant kangaroo rats can occur in active oilfields, and near towns and rural residential settings where suitable habitat persists. Giant kangaroo rats occur on natural lands, which may have a wide variety of land uses such as livestock grazing, linear utility rights of way, communication sites, small facilities, oil fields, and adjacent to water impoundments. The most suitable habitats on BLM lands are relatively flat with a high proportion of non-native grassland habitats, scattered saltbush across the landscape, and a low footprint of human activities (such as roads, oil wells, and utilities). In Kings and Kern Counties, BLM lands occur within several areas identified as preserves in the *Recovery Plan for Upland Species of the San Joaquin Valley* where giant kangaroo rats occur such as Lokern and Buena Vista Valley.

Tipton kangaroo rat

Tipton kangaroo rats are known to occur on BLM surface at Atwell Island, North Lokern, NPR-2 and within the Alkali Sink ACEC near Copus Road, a total of approximately 3,500 acres of BLM surface. Tipton kangaroo rats may also occur on other scattered tracts of BLM surface that are east of, or next to, the California Aqueduct and that support the alkali sink habitat used by Tipton kangaroo rat, a total of approximately 1,600 acres of BLM surface.

In addition to the BLM surface with mineral estate, in Kings and Kern Counties, BLM manages 32,000 acres of mineral estate inside the current and historic Tipton kangaroo rat distribution area, as presented in the February 2010 Tipton Kangaroo Rat 5-year Review. Approximately 17,000 acres is mineral estate at Lemoore Naval Air Station. Of the 15,000 acres outside Lemoore Naval Air Station, nearly 1,600 acres of mineral estate overlaps CNDDB occurrence records for Tipton kangaroo rats. Based on 2011 aerial photography, it is estimated that about 400 acres of mineral estate may be habitat for Tipton kangaroo rats. The about 400 acres of habitat includes mineral estate at north and south Semitropic Ridge, Delano State Prison, Lost Hills Airport and Buttonwillow Ridge. The almost 1,200 acres that is not habitat includes active agriculture, industrial, urban land uses or does not appear to be alkali sink habitat.

Kern mallow

In Kings and Kern Counties, specimens identified as Kern mallow have been reported from the Lokern area, Bittercreek National Wildlife Refuge, and many areas in the oilfields of western Kern County. The species is common on BLM surface and mineral estate on the west side of the San Joaquin Valley, from the Bittercreek National Wildlife Refuge to the Kings County boundary. Kern Mallow is one of the focal species for which the Lokern-Buena Vista ACEC was established.

San Joaquin wooly-threads

The range of San Joaquin woolly-threads is within the San Joaquin Valley from San Benito and Fresno Counties south to Kern County. BLM has surface and mineral estate throughout this region and includes properties with populations of San Joaquin woolly-threads. This includes approximately 2,500 acres of surface and 1,400 acres of mineral estate in the Kettleman Hills (Kings County) and 80 acres of surface and 120 acres of mineral estate in the northwest corner of Kern County. The species has potential to be present on other BLM surface and mineral estate in the above areas, as well as on public surface and mineral estate in the vicinity of Bakersfield and on the west side of the San Joaquin Valley north of Highway 58.

Bakersfield cactus

Bakersfield cactus is present on BLM mineral estate in Kern County. Populations have been identified on five parcels (720 acres) just west of the junction of Interstate 5 and Highway 99, on the corner of a 40 acre parcel bordering Caliente Creek, and on three parcels (120 acres) just south of Highway 178 on the east side of Bakersfield. There is a strong possibility that the species also occurs on the numerous scattered parcels of BLM mineral estate and occasional surface on the east side of the valley in Kern County from the northern county border to the grapevine on the south.

California jewelflower

California jewelflower was previously widespread in the southern San Joaquin Valley, but now is primarily restricted to three metapopulations: Santa Barbara Canyon near Cuyama Valley; the Carrizo Plain (both within the Bakersfield Field Office); and the Kreyenhagen Hills (within the Central Coast BLM Field Office). None of these areas are within the proposed action area, however, there is much BLM surface and mineral estate within the historic range of the species, and a recent population was discovered in western Kern County on private land.

Effects of the Action

Habitat disturbance impacts under this PBO will be limited to 140 acres annually. The average amount of annual disturbance approved by BLM under the existing oil and gas programmatic biological opinion over the last 15 years was 59.51 acres. The average annual amount of impacts to listed species habitat over the same time was:

- San Joaquin kit fox – 28.99 acres
- Blunt-nosed leopard lizard – 10.48 acres
- Giant kangaroo rat – 6.89 acres
- Tipton kangaroo rat – 0.00 acres (0.07 in a single year)
- Kern mallow – 10.29 acres

The 15-year operational term of the existing oil and gas programmatic biological opinion included years with varying levels of oil prices. As the price of oil plays a large part in determining the number of approvals BLM would be expected to issue in a given year, the Service believes the data from the last 15 years provides a reasonable estimation of what we would expect over the 15 years of this program even with potentially fluctuating oil prices.

Activities described in the Description of the Action above and covered in this PBO could result in the mortality of or injury to terrestrial species due to habitat loss, habitat degradation, direct

interaction or behavioral changes. Impacts are expected to be greatest in areas where oil and gas operations do not currently occur or where it occurs in low densities. Increases in oil and gas density in areas where there is existing development could result in impacts to species that are known to co-occur with low to medium density oil development but those impacts are expected to be of a lesser magnitude.

Oil and gas related activities could result in the loss of occupied and unoccupied habitat through conversion to varying densities of oil and gas exploration and production activities. Development or exploration activities in habitat that is occupied could result in direct interactions with individuals leading to injury or mortality from crushing, entombment or vehicle strikes. Activities in areas that are currently not occupied but could be in the future or in areas that provide breeding or feeding opportunities could result in both temporal and permanent removal of that habitat. Impacts from that loss of habitat include behavioral changes that could force individuals to travel farther for successful breeding and foraging opportunities reducing overall fitness (the ability of a species to survive and reproduce). Reduced fitness could result from an increase in interactions with predators or humans and human activities resulting in increased chances of injury or mortality.

The approval of oil and gas activities by BLM includes requirements to avoid and minimize impacts to species including project design features that affect both how and when activities would occur in species habitat, worker training, monitoring, reporting and species-specific surveys and avoidance measures. To offset individual project-related impacts to species, BLM will require that lands are restored or preserved through the placement of conservation easements, the purchase of credits at appropriate conservation banks or the transfer to BLM, the Service or CDFW to be managed for listed species. The amount of conservation land required will be based on the quality of land impacted and the type of impacts that will occur. This component of the action will have the effect of protecting and managing lands for the species' conservation in perpetuity. The conserved lands will provide suitable habitat for breeding, feeding, or sheltering commensurate with or better than habitat lost as a result of the approved activities.

Impacts to specific species are discussed below.

San Joaquin kit fox

Oil field-related activities could result in vehicle collisions with kit foxes or entrapment in dens, open trenches or sumps resulting in death or injury. Oil spills or discharge of produced fluids could result in injury or death of individuals through direct ingestion or ingestion of impacted prey species. Project-related noise, including seismic exploration and well operation and exploration, could result in species avoidance of areas on a temporary or permanent basis.

Blunt-nosed leopard lizard

Oil field-related activities could result in vehicle collisions with the lizard or entrapment in burrows, open trenches or sumps resulting in death or injury. Oil spills or discharge of produced fluids could result in injury or death of individuals through ingestion of impacted prey species, flooding of occupied burrows or drowning in open spill or discharge areas. Project-related vibration, including seismic exploration and well operation and exploration, could result in species avoidance of areas on a temporary or permanent basis. Individual lizards may be trapped, handled, marked, and tagged during capture or hold and release activities. Trapped lizards may also be susceptible to injury or mortality during trapping and handling. Lizards could be injured or killed during burrow excavation.

Kangaroo rat species

Nighttime oil field-related activities could result in vehicle collisions with the kangaroo rats and all oil field-related activities could result in entrapment in burrows, open trenches or sumps resulting in death or injury. Oil spills or discharge of produced fluids could result in injury or death of individuals through ingestion, flooding of occupied burrows or drowning in open spill or discharge areas. Project-related vibration, including seismic exploration and well operation and exploration, could result in collapse of occupied burrows leading to entombment and species avoidance of areas on a temporary or permanent basis. Individual kangaroo rats may be trapped, handled, marked, and tagged during capture or hold and release activities. Trapped kangaroo rats may be susceptible to injury or mortality during trapping and handling. Kangaroo rats could be injured or killed during burrow excavation.

Plant Species

Oil and gas related activities could result in the direct loss of plants and seed banks. Individual plants may be damaged by oil and gas activities that occur within occupied habitat. Activities could also prevent plants from colonizing from an area of adjacent habitat by converting existing habitat. These activities could also increase the potential for non-native plants to occur within and nearby development areas which could directly compete with the listed plant species resulting in a reduction of occupied or available habitat. Soil compaction could degrade occupied habitat preventing future growth and germination of the plants in the compacted area.

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 biological opinion. 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. During this consultation, the Service did not identify any future non-Federal actions that are reasonably certain to occur in the action area of the proposed project.

Conclusion

After reviewing the current status of the San Joaquin kit fox, blunt-nosed leopard lizard, giant kangaroo rat, Tipton kangaroo rat, Kern mallow, San Joaquin wooly-threads, California jewelflower, and Bakersfield cactus, the environmental baseline for these species within the action area, the effects of the proposed action and the cumulative effects, it is the Service's biological opinion that BLM's approval of oil and gas activities on BLM lands in the San Joaquin Valley of California, as proposed, is not likely to jeopardize the continued existence of these species. The Service reached this conclusion because the effects will not rise to the level of precluding recovery of the species or reducing the likelihood of their survival. Annual impacts under this PBO will be limited to 140 acres. Even if the maximum amount of annual disturbance is reached each year, large-scale impacts are not expected. Although the loss of habitat during the term of the program would contribute to the overall reduction of habitat for the species during this time, the conservation measures, including the conservation of lands through easement, credit purchase or transfer, will contribute to the long-term preservation and management of the species.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by Service regulations at 50 CFR 17.3 as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the same regulations as an act which actually kills or injures wildlife. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by BLM so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, for the exemption in section 7(o)(2) to apply. BLM has a continuing duty to regulate the activity covered by this incidental take statement. If BLM (1) fails to assume and implement the terms and conditions or (2) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, BLM must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR §402.14(i)(3)].

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 or the malicious damage of such plants on areas under federal jurisdiction, or the destruction of endangered plants on non-federal areas in violation of State law or regulation or in the course of any violation of a State criminal trespass law.

Amount or Extent of Take

The Service anticipates that incidental take of the San Joaquin kit fox will be difficult to detect for the following reasons: their shy nature may cause harmed or harassed individuals to avoid human activity, and the species is nocturnal, which may result in some harm, harassment, and mortality being unobservable. There is a risk of harm, harassment, injury and mortality as a result of the proposed construction activities, the permanent and the temporary loss / degradation of suitable habitat; therefore, the Service anticipates take incidental to the proposed action as; (1) the injury and mortality of one San Joaquin kit fox annually, and (2) the harm, and harassment of all San Joaquin kit foxes within the individual project areas approved by BLM, not to exceed a cumulative total of 140 acres a year.

The Service anticipates that incidental take of blunt-nosed leopard lizard, giant kangaroo rat and Tipton kangaroo rat will be difficult to detect due to their life history and ecology. Specifically, blunt-nosed leopard lizards can be difficult to locate due to their cryptic appearance and finding a dead or injured individual is unlikely due to their relatively small size. Giant and Tipton kangaroo

rats are nocturnal which may result in some harm, harassment, and mortality being unobservable. Losses of blunt-nosed leopard lizard, giant kangaroo rat and Tipton kangaroo rat may also be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, or additional environmental disturbances. The Service anticipates:

- The observed injury or mortality of one (1) blunt-nosed leopard lizard throughout the life of the program from non-trapping related activities.
- The annual injury or mortality of two (2) blunt-nosed leopard lizards resulting from trapping related activities.
- Harm and harassment of all blunt-nosed leopard lizards within 150 acres of occupied habitat throughout the life of the project.
- The annual injury or mortality of two (2) giant kangaroo rats resulting from trapping related activities.
- Harm and harassment of all giant kangaroo rats within 12 acres of occupied habitat annually.
- The annual injury or mortality of two (2) Tipton kangaroo rats resulting from trapping related activities.
- Harm and harassment of all Tipton kangaroo rats within 10 acres of occupied habitat annually.

Effect of the Take

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species.

Reasonable and Prudent Measures

All necessary and appropriate measures to avoid or minimize effects on the included listed species resulting from implementation of this project have been incorporated into the project's proposed conservation measures. Therefore, the Service believes the following Reasonable and Prudent Measure is necessary and appropriate to minimize incidental take of these species:

1. All conservation measures, as described in the biological assessment and restated here in the Project Description section of this biological opinion, shall be fully implemented and adhered to. Further, this Reasonable and Prudent Measure shall be supplemented by the Terms and Conditions below.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, BLM must ensure compliance with the following terms and conditions, which implement the reasonable and prudent measure described above. These terms and conditions are nondiscretionary.

1. BLM shall include full implementation and adherence to the conservation measures as a condition of any permit, authorization or contract issued for the project.

2. In order to monitor whether the amount or extent of incidental take anticipated from implementation of the project is approached or exceeded, BLM shall adhere to the reporting requirements in the biological assessment including the following measure:

> BLM will provide the Service with an annual report of the number of projects or actions undertaken or authorized under the program, the observed impacts, the effectiveness of mitigation, and the amount of new and prior surface disturbance and incidental take. BLM and Service will coordinate annually to discuss the program and determine if any adjustments need to be made to the annual limit, the description of covered actions or any other portion of the program.

Salvage and Disposition of Individuals:

Injured listed species must be cared for by a licensed veterinarian or other qualified person(s), such as an "approved biologist" as described in the biological assessment. Dead individuals must be sealed in a resealable plastic bag containing a paper with the date and time when the animal was found, the location where it was found, and the name of the person who found it, and the bag containing the specimen frozen in a freezer located in a secure site, until instruction s are received from the Service regarding the disposition of the dead specimen. The Service contact person is the San Joaquin Valley Division Chief at the SFWO at (916) 414-6544.

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. The Service recommends the following action:

1. BLM should continue to work with the Service to assist us in meeting the goals of the *Recovery Plan for Upland Species of the San Joaquin Valley.*

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION—CLOSING STATEMENT

This concludes reinitiation of formal consultation on the oil and gas activities on BLM lands in the San Joaquin Valley of California. As provided in 50 CFR §402.16, reinitiation of formal consultation is required and shall be requested by the Federal agency or by the Service where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and:

(a) If the amount or extent of taking specified in the incidental take statement is exceeded;

(b) If new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered;

(c) If the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion; or

(d) If a new species is listed or critical habitat designated that may be affected by the identified action.

If you have any questions regarding this biological opinion, please contact Justin Sloan, Senior Fish and Wildlife Biologist, at (559) 221-1828 or Patricia Cole, Chief, San Joaquin Valley Division, at (916) 414-6544, or the letterhead address.

LITERATURE CITED

Bureau of Land Management [BLM]. 2014. Bakersfield Field Office Record of Decision and Approved Resource Management Plan.

U.S. Fish and Wildlife Service [Service]. 1998. Recovery Plan for Upland Species of the San Joaquin Valley, California. Region 1, Portland, OR. 319 pp.

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U.S. Department of the Interior
Bureau of Land Management

California
Bakersfield Field Office

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