

AERA BLOCK 12 DEVELOPMENT PROJECT DRAFT ENVIRONMENTAL ASSESSMENT

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Contents

Chapter 1	Purpose and Need	1
1.1	Introduction	1
1.1.1	Incorporation by Reference	2
1.2	Background	2
1.3	Species Covered by the HCP	3
1.4	Purpose and Need for the Proposed Action	3
Chapter 2	Proposed Action and Alternatives	4
2.1	Alternatives and HCP Development Process	4
2.2	Alternative 1: No Action Alternative.....	4
2.3	Alternative 2: Proposed Action Alternative	5
2.3.1	Location	5
2.3.2	Permit Term.....	6
2.3.3	Covered Species	6
2.3.4	Covered Activities.....	6
2.3.5	Conservation Strategy	12
2.4	Alternatives not Considered in the EA.....	13
2.4.1	No Take Alternative.....	13
2.4.2	Alternate Project Location	13
Chapter 3	Affected Environment and Environmental Consequences	14
3.1	Air Quality	17
3.1.1	Affected Environment	17
3.1.2	Environmental Consequences.....	18
3.2	Biological Resources	23
3.2.1	Affected Environment	23
3.2.2	Environmental Consequences.....	32
3.3	Climate Change	44
3.3.1	Affected Environment	44
3.3.2	Environmental Consequences.....	45
3.4	Cultural Resources and Paleontological Resources	47
3.4.1	Affected Environment	47
3.4.2	Environmental Consequences.....	47
3.5	Geology, Seismicity, Soils, and Mineral Resources.....	50
3.5.1	Affected Environment	50
3.5.2	Environmental Consequences.....	51

3.6	Hazards and Hazardous Materials	53
3.6.1	Affected Environment	53
3.6.2	Environmental Consequences	54
3.7	Hydrology and Water Quality	56
3.7.1	Affected Environment	56
3.7.2	Environmental Consequences	58
3.8	Socioeconomics and Environmental Justice	60
3.8.1	Affected Environment	60
3.8.2	Environmental Consequences	62
Chapter 4	Additional Topics Required by NEPA.....	63
4.1	Unavoidable Adverse Effects	63
4.2	Short-Term vs. Long-Term Productivity	63
4.3	Irreversible and Irrecoverable Commitment of Resources	64
Chapter 5	Cumulative Effects	64
Chapter 6	References Cited	66
Appendix A	Air Quality Modeling Results	
Appendix B	Preparers	
Appendix C	Abbreviations	
Appendix D	Oil and Gas EIR Mitigation Measures	

Tables

2-1	Proposed Development and Surface Disturbance	7
2-2	Proposed Wells in the Project Site	8
3.1-1	Federal and State Attainment Status of Study Area in Kern County within the San Joaquin Valley Air Basin.....	18
3.1-2	Federal <i>de minimis</i> Thresholds for the Study Area (tons per year)	19
3.1-3	Annual Criteria Pollutant Emissions from Construction of the Project (tons per year)	21
3.2-1	Elevation in the Study Area	24
3.2-2	Land Cover in the Study Area	25
3.2-3	Oil & Gas EIR Mitigation Measures (Kern County Planning and Community Development Department 2015)	44
3.3-1	Estimated Greenhouse Gas Emissions from Proposed Action Construction (metric tons/year)	46
3.8-1	Race and Hispanic/Latino Origin by Percentage	61
3.8-2	Labor Force and Unemployment Rates.....	61
3.8-3	Family and Individual Income and Poverty Levels	62
5-1	Cumulative Impacts.....	65

Chapter 1

Purpose and Need

1.1 Introduction

This environmental assessment (EA) has been prepared by the U.S. Fish and Wildlife Service (Service) pursuant to the National Environmental Policy Act (NEPA). It evaluates the effects of issuing an incidental take permit (ITP) under Section 10 (a)(1)(B) of the federal Endangered Species Act (ESA) for activities covered by the *Block 12 Development Project Habitat Conservation Plan (HCP)* for which permit applicant, Aera Energy, LLC (Aera) (applicant) has applied. For the purposes of this EA, activities covered under the HCP are referred to as the Block 12 Development Project (project), and issuance of the ITP and approval of the HCP are referred to as the proposed action. Under Section 10(a)(2)(A) of the ESA, any application for an ITP must include a “habitat conservation plan” that details the impacts of the incidental take allowed by the ITP on affected species and how the impacts of incidental take will be minimized and mitigated to the maximum extent practicable.

The purpose of the project is to expand the applicant’s oil-producing facilities in the South Belridge Oil Field. This expansion would include the construction, drilling and completion, operations and maintenance, and plugging and abandonment of 131 wells, to include 98 oil producers and 33 steam injectors, for the extraction of heavy oil. Steam injection would enhance these operations. The applicant began permitting efforts for the project in 2011. Biological surveys conducted in 2011, 2013, and 2016 documented the presence, sign of, or suitable habitat for Kern mallow, blunt-nosed leopard lizard, giant kangaroo rat, San Joaquin antelope squirrel, and San Joaquin kit fox. As a result, the applicant is applying for federal take authority for blunt-nosed leopard lizard, giant kangaroo rat, San Joaquin antelope squirrel, and San Joaquin kit fox. The applicant is working in parallel with the Service and the California Department of Fish and Wildlife (CDFW) to ensure that the terms of a Section 2081(b) ITP the applicant is obtaining from CDFW for giant kangaroo rat, San Joaquin antelope squirrel, and San Joaquin kit fox are as consistent as possible with the HCP.

Covered activities under a project ITP would include those listed below.

- Site preparation activities associated with the project's well pad locations, roadways, pipeline corridors, and utilities, including vegetation clearing, grading, dust control, and compaction of soil.
- Pipeline installation, consisting of steam, hydrocarbon, and condensate vapor-recovery pipelines.
- Mobilization/drilling in the well pad disturbance areas (i.e., staging [for ancillary facilities, pipe racks, temporary staging tanks, vehicle parking, and the drilling supervisor’s trailer], mobilization [assembling the drill rig], and drilling).
- Completion activities once drilling reaches the target depth. This activity involves fully testing the well to determine if it has economic production potential and, if so, installing the pumping or steam injection unit.
- Emergency cleanup, as necessary, if a spill and/or blowout occurs during drilling that releases gas and/or oil.

- Production as well as operations and maintenance, including monitoring and inspection, well workover, pipeline testing/maintenance, and vegetation maintenance.
- Well plugging and abandonment when a well is no longer productive or needed. This activity involves dismantling wellhead equipment and associated facilities.

The project would result in the expansion of oil production facilities into approximately 55 acres of undeveloped land. The oil production facilities have an expected lifespan of 35 years, by the end of which all wells would be plugged and abandoned and associated facilities would be decommissioned.

The project also includes the protection, long-term management, and monitoring of the proposed offsite mitigation properties, called the Section 20 and Section 28 properties. Covered activities are described in more detail in Chapter 2, *Proposed Action and Alternatives*.

ESA and its implementing regulations prohibit take of any fish or wildlife species that is federally listed as threatened or endangered without prior approval pursuant to either Section 7 or Section 10(a)(1)(B) of the ESA. Under ESA Section 3, *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.” Additionally, under 50 Code of Federal Regulations (CFR) Part 17.3, the term *harm* in the take definition is further defined to mean any act that actually kills or injures a federally listed species, including significant habitat modification or degradation.

Issuance of a Section 10 ITP constitutes a discretionary federal action by the Service and is thus subject to NEPA, which requires that all federal agencies assess the effects of its action on the human environment.

1.1.1 Incorporation by Reference

NEPA allows incorporation by reference of existing materials to reduce unnecessary bulk. This EA incorporates by reference information or analysis from the following documents: 1) The *Final EIR for revisions to the Kern County Zoning Ordinance – 2015 C focused on Oil and Gas Permitting* (Kern County Planning and Community Development Department 2015) referenced in this document as the “Oil and Gas EIR”; 2) the Kern County Oil and Gas Permitting Handbook (2016); and 3) the document prepared for a portion of the project, the *Initial Study/Mitigated Negative Declaration for the T11-Block 12 Development Project*, June 2014, in accordance with CEQA Guidelines Sections 15250 to 15253, to evaluate the project’s environmental impacts pursuant to CDFW’s regulatory programs. CDFW is conducting a review in conjunction with a request by the applicant for a Section 2081 ITP under CESA with a proposed term of 30 years. As required by NEPA regulation (40 CFR 1502.21), the incorporated part of the referenced materials are briefly summarized or described, and such summaries appear in the particular resource sections below where the materials are raised.

1.2 Background

The ITP requested by the applicant would cover impacts on four federally listed species associated with the expansion of the applicant’s oil-producing facilities in the South Belridge Oil Field. This expansion would include constructing new oil-producing wells, installing steam injectors to enhance oil reservoir production, and laying recovery pipelines. The covered activities also include long-term

management and monitoring on the proposed mitigation properties, the Section 20 and Section 28 properties, because of the need for offsite mitigation to offset the take of covered species.

1.3 Species Covered by the HCP

The HCP proposes coverage for five species—the Kern mallow, blunt-nosed leopard lizard, giant kangaroo rat, San Joaquin antelope squirrel, and San Joaquin kit fox. It would provide for long-term protection, monitoring, and management of the species at a level that would offset the impacts of the taking on the covered species from the covered activities. Although the HCP includes the Kern mallow as a covered species, a resultant incidental take permit would not include take coverage for the Kern mallow as such coverage is not available for ESA listed plants. The methods suggested in the HCP for addressing impacts to the Kern mallow will be taken into consideration in the context of determining whether the proposed project will likely jeopardize the continued existence of the plant, or destroy or adversely modify critical habitat for such species.

1.4 Purpose and Need for the Proposed Action

The underlying purpose of and need for the proposed federal action is to respond to Aera's application for an ITP submitted in accordance with the ESA's § 10(a)(1)(B). Section 10 of the ESA directs the Service to issue ITPs to non-federal entities for take of endangered and threatened species when the criteria in § 10(a)(2)(B) are satisfied by the applicant. The Service will review Aera's § 10 application to determine if it meets issuance criteria, and will otherwise ensure that issuance of the ITP and implementation of the associated HCP complies with applicable Federal laws, regulations, directives, and policies. The Service fulfills its review responsibilities by ensuring the issuance of the ITP and implementation of the HCP for Aera's project -- which may result in incidental take of covered species as a result of constructing new oil-producing wells, installing steam injectors to enhance oil reservoir production, and laying recovery pipelines, and the long-term management and monitoring on the proposed mitigation properties -- will:

- Protect, conserve, and enhance the survival of the covered species (i.e., the Kern mallow, blunt-nosed leopard lizard, giant kangaroo rat, San Joaquin antelope squirrel, and San Joaquin kit fox) and their habitat in the covered lands.
- Provide a means and take steps to conserve the ecosystems on which the covered species depend.

This purpose and need establishes the basis for determining whether other viable alternatives to the proposed action may meet the intended purpose, applicant's objectives, and reduce potential effects. The Service has prepared this EA to inform the public of the Proposed Action and alternatives and their effects, to seek information from the public, and to use information collected and analyzed to make informed decisions concerning this ITP application.

Chapter 2

Proposed Action and Alternatives

As referenced in the Council for Environmental Quality's (CEQ's) NEPA regulations regarding the contents of an EA (40 CFR 1508.9[b]), NEPA Section 102(2)(E) requires federal agencies to develop, study, and briefly describe alternatives to any proposed action with the potential to result in unresolved resource conflicts. This chapter presents the alternatives evaluated in this EA (the No Action Alternative and Proposed Action Alternative). It also includes a summary of alternatives considered but not carried forward for detailed analysis in this EA.

2.1 Alternatives and HCP Development Process

The Service and permit applicant, Aera (applicant) considered a full range of alternatives to meet the purpose and need of the proposed action, including the proposed HCP, consideration of alternate site locations, and an alternative that avoids take of the covered species.

The size and configuration of the project were largely informed by the applicant's objectives to expand the existing operations in the oil field. Expansion would need to take place in an adjacent or connected location to minimize the cost, project footprint, and adverse effects on covered species and on the natural environment of expansion facilities such as roads and pipelines. The configuration of facilities was designed to achieve the necessary well spacing to feasibly extract the oil resource and realize their objective for the project, which is to economically expand oil production in the South Belridge Oil Field. With these criteria in mind, the Service considered alternatives that would meet the applicant's objectives while minimizing project-related environmental effects, including take of covered species.

The following sections describe alternatives analyzed in detail in this EA, and other alternatives considered but eliminated from detailed consideration in the EA.

2.2 Alternative 1: No Action Alternative

Under the No Action Alternative, the applicant would not construct the proposed oil extraction facilities. There would be no take of federally listed species as a result of the project, and no extraction of the identified energy resources. The project site and mitigation properties would continue to be unused vacant land.

The No Action Alternative would be implemented if the applicant chose not to pursue the proposed expansion plans, or if the Service denied the ITP application. Permit denial would likely prevent the applicant from proceeding with the covered activities because of the chance that the covered activities would result in take of the covered species. In either scenario, failure to implement the project would avoid all potential project-related impacts on listed species, including the potential for take of listed species.

2.3 Alternative 2: Proposed Action Alternative

Under the Proposed Action Alternative, the applicant would construct and operate the project, an expansion of oil production in the existing California Division of Gas and Geothermal Resources (DOGGR) South Belridge Oil Field, which is within the Belridge Producing Complex on privately owned surface and mineral land (HCP Figure 1-1).

As illustrated in HCP Figures 1-1 and 3-1, the project would develop 131 wells, including 98 oil producers and 33 steam injectors, and associated facilities on approximately 55 acres, mostly in Block 12 of the South Belridge Oil Field but also in Blocks 7 and 10. The project would include construction, drilling and completion, operations and maintenance, and plugging and abandonment of 131 wells, to include 98 oil producers and 33 steam injectors, for the extraction of heavy oil. Steam injection would enhance these operations.

The Proposed Action Alternative would also include conservation measures to offset potential impacts on covered species. Conservation measures would include design features and general avoidance and minimization measures that apply to all covered species, species-specific measures that would be implemented to benefit Kern mallow, blunt-nosed leopard lizard, giant kangaroo rat, San Joaquin antelope squirrel, and San Joaquin kit fox, and conservation of lands.

To mitigate for an earlier and smaller version of the project that was never constructed, the applicant previously purchased 80.8 credits (80.8 acres) at the Coles Levee Ecosystem Preserve and 32 credits (31.4 acres) at the Kern Water Bank Authority Conservation Bank.

The Coles Levee Ecosystem Preserve credits provide mitigation to partially offset the effects of the covered activities on Kern mallow, blunt-nosed leopard lizard, San Joaquin antelope squirrel, and San Joaquin kit fox. The Kern Water Bank Authority Conservation Bank credits provide mitigation to partially offset the effects of the covered activities on blunt-nosed leopard lizard and San Joaquin kit fox. The applicant will fully offset the effects of the project by supplementing these mitigation credits with portions of two offsite mitigation properties, called Section 20 (67 acres) and Section 28 (42 acres).

2.3.1 Location

The project site (394 acres), Section 20 mitigation property (67 acres), and the Section 28 (42 acres) mitigation property compose the permit area, where all covered activities would occur. Project development and avoidance and minimization measures would occur in the project site, and long-term habitat preservation and management activities would occur at the mitigation properties.

The project site is within the boundaries of the South Belridge Oil Field, in an unincorporated portion of western Kern County, approximately 40 miles west of Bakersfield, 25 miles north of Taft, and 8 miles north of McKittrick (HCP Figure 1-1). The project would be located within Sections 11

and 12, Township 29 South, Range 21 East, which encompasses the geographic area where the impacts of the covered activities would occur. This portion of the permit area also includes areas not proposed for development but in which covered species will be relocated from construction areas.

The mitigation properties are located within Township 28 South, Range, 22 East Section 20 and Township 29 South, Range, 22 East, Section 28, respectively. The Section 20 property is located approximately 4 miles to the northeast of the project site, 1.5 miles south of Lerdo Highway, and 0.1 mile east of the California Aqueduct. Section 28 is located approximately 3 miles southeast of the project site and approximately 1.5 miles east of State Route 33 (HCP Figure 1-1).

2.3.2 Permit Term

The permit term is the time period when all covered activities receive take authorization under the ITP, consistent with the requirements of the HCP. The permit term is also the time period when all mitigation actions must be successfully completed to offset the impacts of the covered activities. The proposed permit term for the ITP is 35 years. The term would encompass all construction and testing activities as well as the full operational life of the project, through drilling and completion, operations and maintenance, and plugging and abandonment. This permit term would be long enough to allow for full and successful implementation of the conservation strategy.

2.3.3 Covered Species

Coverage is proposed for five species—the Kern mallow, blunt-nosed leopard lizard, giant kangaroo rat, San Joaquin antelope squirrel, and San Joaquin kit fox. In exchange for incidental take authorization, the HCP would provide for long-term mitigation, monitoring, and management of the applicable species at a level that would be able to offset any impacts from covered activities.

2.3.4 Covered Activities

The project for which permit application has been made involves an expansion of oil production operations in the existing DOGGR South Belridge Oil Field. The project is within the Belridge Producing Complex on privately owned surface and privately owned mineral land in an unincorporated portion of western Kern County, California (HCP Figure 3-2). This expansion of existing facilities would include construction, drilling and completion, operations and maintenance, and plugging and abandonment of oil-producing wells, steam injection wells, pipelines, access roads, and overhead electric lines.

The HCP covers the proposed project on Block 12, and on Blocks 7 and 10. All development would occur within the development envelope shown in HCP Figure 3-1. The activities in Blocks 7, 10, and 12 of the project area may occur concurrently.

Covered activities are described in detail according to the following project stages: construction, drilling and completion, operations and maintenance, well plugging and abandonment, and covered activities that would occur on the mitigation properties associated with HCP implementation.

Construction Activities and Schedule

Construction includes site preparation activities, pipeline and utility installation activities, mobilization/drilling activities, and completion activities. Construction is planned to begin in the fall

and winter months, generally beginning in September of one year and ending in January of the next calendar year. These project elements would be completed either sequentially or concurrently.

The applicant has stated that the majority of construction would take place in the first 1 to 5 years of the permit term, subject to business conditions. Subsequent construction of new wells would be largely influenced by the data obtained during the first few years of well production. Additional wells and associated facilities may be constructed throughout the permit term, but all wells covered under the permit would be decommissioned within the 35-year permit term. Table 2-1 lists the construction activities estimated to result in surface disturbance; these activities are further described in the following sections. All covered activities will apply the avoidance and minimization measures described in Chapter 5, *Conservation Strategy*, of the HCP to avoid or minimize direct and indirect impacts on the covered species.

Table 2-1 provides a summary of all surface disturbance associated with the construction activities for the project including well pads, access roads, pipelines, and ancillary facilities.

Table 2-1. Proposed Development and Surface Disturbance

Feature^a	Block 12	Blocks 7 & 10	Project Area Total
Well Pads			
Number of Producing Wells	34	64	98
Number of Steam Injection Wells	25	8	33
Number of Total Wells	59	72	131
New Well Pad Disturbance ^b (acres)	13	15	28
Replacement Well Pad Disturbance (acres)	3 ^c	6 ^d	9
Total Wells Disturbance (acres)	16	21	37
Access Roads^e			
Road Disturbance (acres)	2	3 ^f	5
Pipelines^g			
Temporary Pipeline Disturbance ^f (acres)	5	4	9
Permanent Pipeline Disturbance ^g (acres)	1	3	4
Total Pipeline Disturbance (acres)	6	7	13
Surface Disturbance Totals			
Block 12 Total Temporary Surface Disturbance (acres)	5	NA	5
Blocks 7 and 10 Total Temporary Surface Disturbance (acres)	NA	4	4
Block 12 Total Permanent Surface Disturbance (acres)	19	NA	19
Blocks 7 and 10 Total Permanent Surface Disturbance (acres)	NA	27	27
Complete Total (acres)			55

^a All disturbance estimates are rounded to the nearest acre.

^b Disturbance associated with new well pads includes a 170- by 75-foot footprint for the well pad and a 12- by 50-foot footprint for drilling sumps, or approximately 0.42 acre per well pad and sump. The well-pad footprint includes ancillary facilities.

^c Assumes 17 total replacement wells, with 0.155 acre of disturbance for each replacement well.

^d Assumes 36 total replacement wells, with 0.155 acre of disturbance for each replacement well.

^e Roads assumed to have a 10- to 20-foot width, depending on the service of the road.

Feature ^a	Block 12	Blocks 7 & 10	Project Area Total
^f Pipeline construction and installation assumed to result in a 20-foot-wide temporary disturbance corridor.			
^g A 10-foot-wide permanent disturbance corridor is assumed where pipelines are not located adjacent to roads or well pads.			

Wells and Sumps

The project includes construction of 131 wells in the project site, including 59 wells in the Block 12 section and 72 wells in the Blocks 7 and 10 section (Table 2-2). These well count totals include replacement wells. For Block 12, 17 wells (10 producing wells and 7 steam injector wells) are anticipated to fail at least once during the 35-year permit term and would be replaced. For Blocks 7 and 10, all wells are anticipated to fail at least once during the 35-year permit term and would be replaced.¹

Table 2-2. Proposed Wells in the Project Site

Project Section	Producers	Steam Injectors	Replacement Wells	Total Wells
Block 12	24	18	17 ^a	59
Blocks 7 and 10	32	4	36 ^b	72
Total	38	40	53	131

^a Assumes that 10 replacement wells will be producers and seven replacement wells will be steam injectors.

^b Assumes that all wells would need to be replaced at some point.

New wells and replacement wells would be installed on well pads. Each well pad would require grading an approximately 170- by 75-foot (0.3-acre) disturbance area, with an additional temporary sump excavation area of approximately 12 by 50 feet (0.01 acre) for drilling mud and cuttings. Sumps would be excavated to depths of 15 to 20 feet, with the soil stockpiled onsite for use as backfill upon completion. The total area required for well pads and sumps would be approximately 0.3 acre per well pad and sump. Well replacement typically occurs during the first 3 years of the initial drill. Replacement wells would be drilled using as much of the existing pads and other ancillary infrastructure as possible; however, the applicant assumes that replacement wells would require approximately half of the disturbance of new well pads on average, or 0.155 acre (Table 2-1).

In total, well pads, replacement wells, and sumps would result in approximately 33 acres of surface disturbance in the project site over the permit term (Table 2-1). This total is based on the Block 12 development layout (HCP Figure 1-1) that includes co-location of facilities to limit new disturbance, well pads, replacement wells, and sumps resulting in 16 acres of surface disturbance and the estimated number and average dimensions of new well pads, replacement wells, and sumps in the Blocks 7 and 10 section, resulting in an estimated 17 acres of disturbance (Table 2-1).

¹ Well failure forecasts are based on the professional judgment of Aera's geologists. They consider historical and current well failure rates, which may vary, depending on production and economic conditions.

Mobilization and Drilling

Designated staging areas within the well pad disturbance areas would be prepared one at a time and include temporary ancillary facilities, pipe racks, temporary staging tanks, vehicle parking, and the drilling supervisor's trailer. Permanent tanks, offices, or parking would not be constructed in the project site.

Once staging is complete for a site, a 90-foot-high drilling rig would be mobilized and drilling would commence. Two drilling rigs may be active in this area, dependent upon business conditions. However, it is most likely that a single drilling rig would be active in the project site at one time in a designated staging area. Drilling rigs would require the use of a power system, hoisting system, rotating equipment, a circulation system, and a blowout prevention system. Sumps would be used to store drilling fluids, cuttings, and water produced during drilling operations.

Each proposed well is expected to take 3 days to rig up, drill, and rig down, barring any unforeseen events, such as equipment malfunction or drilling difficulties. As described above, the majority of drilling is anticipated to occur within the first 1 to 5 years of the project. Additional wells and associated facilities may be constructed throughout the permit term.

Mobilization/drilling would include the use of a drilling rig, backhoe, forklifts, and trucks. During drilling, between 10 and 12 workers would be onsite. Drilling operations would be conducted 24 hours per day, 7 days per week. Approximately 2.5 acre-feet of water would be required for drilling operations over the entire course of the project (35 years). This water would be used primarily for drilling fluids and cement; a water truck would supply the onsite tap.

Completion

Completion activities would occur concurrently with mobilization/drilling activities. Once drilling activities reach the target depth, the wells would be fully tested and evaluated, then either completed and put into production or plugged and abandoned (activities associated with plugging and abandonment are described below). If a well is determined to have economic production potential, the well would be completed, and the pumping unit or steam injection unit would be mounted on a gravel base on the well pad. There would be no permanent concrete foundation, and trenching would not be required.

Upon completion of a well, any free liquid would be removed from the associated temporary sump and transferred to the next well to be drilled. The sump would be closed by mixing non-hazardous solids with drying materials, then backfilling the sump using stockpiled soils. Sump closure would occur 2 days after completion and require approximately 1 day to complete. Each sump would be reclaimed within 5 days after drilling is complete.

Completion activities would include the use of a clean-out run-on pump rig, cranes, manlifts, and trucks. Completion of both injection and production wells would require up to eight workers.

Access Roads, Pipelines, and Utility Corridors

New access roads would be 10 to 20 feet wide, depending on the service of the road. Roads to well pads would be approximately 10 feet wide, although central arterial roads will be approximately 20 feet wide. Pipeline corridors would be approximately 20 feet wide. The project would utilize existing infrastructure, as well as co-locate pipeline corridors along roads, to the greatest extent

possible to minimize new disturbance. Overhead electrical lines would be co-located within rights-of-way for pipeline corridors and other designated disturbance areas or along roadways.

New pipelines installed within the project site would connect the new wells to the existing pipeline infrastructure. Steam pipelines, ranging from 3 to 8 inches in diameter, would be installed to carry steam to the steam injection wells from existing steam generation facilities on the South Belridge Oil Field. Flow pipelines, approximately 2 to 3 inches in diameter, and condensate vapor recovery pipelines, ranging from 3 to 10 inches in diameter, would be installed to carry oil, produced water, and condensate vapor from the production wells to the existing dehydration facility on the South Belridge Oil Field.

Pipelines would be placed a minimum of 12 inches above ground, supported by either sleepers or T-supports. Sleepers would be installed on the surface and staked into place. T-supports would be installed by auguring holes, placing the supports, and then cementing the units into place. Pipelines will likely be carbon steel, cement lined, or other materials, as appropriate. Electric overhead lines would be installed concurrently with the pipelines.

Pipeline installation would require the use of forklifts, cranes, and backhoes. Installation of overhead electrical distribution lines would require the use of bucket trucks, tensioners, and manlifts. Pipeline installation would begin 3 months prior to mobilization and drilling and be expected to take 64 workdays.

Temporary disturbance corridors would be created for pipeline installation, repair, or replacement. These temporary corridors are expected to be approximately 20 feet wide on average and would amount to approximately 9 acres of temporary surface disturbance. Temporary disturbance would be reclaimed after construction activities are completed (Table 2-1). Access roads, pipelines, and utility corridors would result in approximately 9 acres of permanent surface disturbance in the project site over the permit term (Table 2-1).

Permanent Ancillary Facilities

Permanent ancillary facilities would include new manifolds, steam splitters, and the remote cyclic steam or other permanent infrastructure required for completing new wells. These facilities would be installed on concrete pads. Permanent ancillary facilities would be located adjacent to well pads and roads where possible (see the Wells and Sumps discussion above). These facilities are included in the surface disturbance estimate for well pads (Table 2-1).

Emergency Clean-Up

Cleanup of the blowout or spill is a covered activity if the cleanup activity is contained within the project site depicted on HCP Figure 3-1. (Any spill outside the project site would not be a covered activity.) Emergency cleanup procedures typically include:

- Manual cleanup with shovels to separate oil from sand, hoes to remove oil-coated grasses and weeds, and pruning shears to trim oil-coated branches from plants
- Mechanical cleanup with powered equipment such as backhoes and/or bobcats to remove oil-contaminated soil in large areas and/or create berms for oil spill containment

Operations and Maintenance Activities

Operations and maintenance (O&M) activities would require the use of both light and heavy equipment. Such activities would be limited to areas that were already disturbed by construction activities associated with monitoring and inspection, well workover, pipeline testing or maintenance, and vegetation management.

Maintenance includes visual inspection and servicing of each well at least once a month, pursuant to the requirements listed in California Code of Regulations (CCR) Title 14, Section 1777, for maintenance and monitoring of production facilities, safety systems, and equipment. If downhole components of a well (e.g., tubing, safety valves, electrical submersible pumps) malfunction, a “workover” of the well may be necessary. A workover rig typically removes the wellhead in this situation and replaces the completion string.

Inspection, replacement, and maintenance of pipelines and pipeline corridors, including vegetation removal to allow for visual inspection, would occur at regular intervals. Pipelines are replaced when they are determined to be deficient.

A variety of trucks, hand tools, and a workover rig may be used during O&M activities. O&M activities would commence upon completion of construction activities and be expected to continue throughout the permit term.

Well Plugging and Abandonment

Well plugging and abandonment occur when a well is dry or no longer economically productive. When this occurs, the associated wellhead equipment and facilities, including associated pipelines, are dismantled, salvaged, and stored at a central storage location within the Belridge Producing Complex. Facility closure and site reclamation would commence once this process is complete and require all construction materials, cellars, production pads, and other permanent surface infrastructure to be removed. The resulting excavations would be filled with earth and properly compacted to prevent settling.

Well plugging and abandonment activities would take place within previously disturbed areas and require approximately 1 day per well to complete. Once the project site is abandoned, areas that were previously occupied by the well and ancillary facilities would be restored to the condition of the surrounding areas and original contours by removing artificial embankments, backfilling excavations, and grading and reseeding using vegetation or native seeding at the appropriate time of year.

A variety of trucks and accessory equipment, including pumps, portable tanks, and other equipment, may be used to plug and abandon wells. Restoration may include the use of trucks and hand tools.

Covered Activities Associated with HCP Implementation

Activities associated with HCP implementation include all management, avoidance and minimization, and monitoring actions required by the HCP that have the potential to take the covered species or other actions that might be necessary to achieve HCP biological goals and objectives. Management actions that would be used onsite and offsite are described below. The following Covered Activities associated with HCP implementation have the potential to result in take of Covered Species. Section references are to the HCP sections.

- Avoidance and minimization measures, including Covered Species trapping and relocation (Section 5.3)
- Management of mitigation properties (Section 5.4.3), including:
 - Fence repair and installation and road maintenance (limited ground disturbance)
 - Controlled livestock grazing (placement of water troughs and water supply pipeline infrastructure, temporary fencing)
 - Vegetation management (mechanical removal and herbicide² application for treating invasive plants)
 - Biological monitoring (floristic surveys, scent station monitoring, small mammal trapping)
- Remedial measures to address changed circumstances (Section 6.4.2)

The primary focus of the avoidance and minimization measures is to avoid or minimize take (i.e., death or injury) of individuals of covered species and impacts on high-quality habitat that may be affected by covered activities in the project site. Other forms of take (e.g., harm or harassment of covered species) may still occur. Measures to be implemented with the HCP are summarized in Section 5.3.1 of the HCP. Management actions will occur on offsite mitigation properties to maintain and enhance these lands as covered species habitat as described. Monitoring, including compliance monitoring to ensure that the applicant meets the terms of the permit and the HCP and effectiveness monitoring to ensure that the HCP's biological goals and objectives are achieved, will occur at the project site and offsite mitigation properties. Habitat management and monitoring on the mitigation properties will also be governed by a habitat management and monitoring plan that is approved by the Service prior to commencing covered activities.

2.3.5 Conservation Strategy

The Conservation Strategy includes design features as well as general and species-specific avoidance and minimization measures described in the HCP (Section 5.3) that apply to covered species.

In addition, the applicant will permanently preserve and maintain habitat for the Covered Species in western Kern County to offset the effects of the taking that would result from project implementation. The applicant will conserve a total of 214.2 acres for compensatory mitigation of the estimated 46 acres of permanent habitat loss and degradation and 9 acres of temporary habitat disturbance resulting from the project. All land that is protected for the purpose of mitigation will be placed under a permanent conservation easement prior to project disturbance and managed in perpetuity to support habitat for the benefit of covered species.

All 66.5 acres of the Section 20 property and at least 42 acres of the Section 28 property will be put under permanent conservation easement prior to impacts from covered activities occurring. Long-term management of these easements will be specified in a habitat management and monitoring plan approved by the Service. This management and monitoring plan will include, but will not be limited to, sections 5.6, *Monitoring*, and 5.7, *Adaptive Management* of the HCP.

² Herbicides would be applied according to label instructions. This includes limits on applications to avoid impacts on wildlife. Activities associated with the application of herbicide that may result in take of a Covered Species are covered by the HCP. However, take resulting from the herbicide itself would not be covered because USFWS is not able to issue ITPs for herbicide use.

2.4 Alternatives not Considered in the EA

The following alternatives were considered but not carried forward for analysis in this EA. This section discusses these alternatives, and the rationale for their elimination.

2.4.1 No Take Alternative

Under the No Take Alternative, the applicant would construct the project in a way that would avoid take of any covered species, and therefore would not need an ITP from the Service. To construct a project that would not take the covered species, the applicant would need to avoid all occupied habitat, and to avoid most or all of the unoccupied but suitable habitat for the covered species. With these constraints, Aera would be left to develop the well pads, pipelines, roads, and other facilities on the portion of the project site with barren/disturbed land cover or small, low-quality patches of allscale scrub, nonnative grassland, or desert scrub that have little to no potential to support the covered species. These areas total approximately 110 acres, or only 28 percent of the project site. Confining all new project development to these areas would not allow the applicant to achieve the necessary well spacing to feasibly extract the oil resource and realize their goals for the project, which is to economically expand oil production in the South Belridge Oil Field. Therefore, the No Take Alternative would be infeasible.

2.4.2 Alternate Project Location

To achieve the project goals, it is necessary for the applicant to expand oil-producing facilities in the South Belridge Oil Field. The applicant is currently operating extensively in this area. The expansion of an existing operation would need to take place in an adjacent or connected location to minimize the cost, project footprint, and adverse effects on covered species of expansion facilities such as roads and pipelines. The proposed project location has the potential to produce 400 barrels of oil daily from each complete well brought into production.

The applicant has stated that the project site is already optimized to minimize adverse effects on covered species. The project location is based on data gathered from existing wells and test wells indicative of underground oil resources to be extracted by the project. The combination of a site adjacent to existing oil facilities, maximizing the use of already disturbed areas with existing facilities, and infrastructure already in place for oil extraction and production (e.g., a heavy-oil-gathering system, a dehydration facility, approved disposal wells) make this the ideal project location. No other project site on lands owned by the applicant has the combination of the proposed project site of existing infrastructure and facilities, suitable topography, and availability of economically viable oil. Extracting the same quantity of oil on other sites owned by the applicant would require constructing additional and longer roads and pipelines to access the more remote drilling sites, resulting in greater loss of occupied and unoccupied habitat of the covered species than for the proposed project site. For these reasons, alternative project locations were rejected as not reducing the take of covered species or the effects to the human environment.

Chapter 3

Affected Environment and Environmental Consequences

Issues Addressed

This chapter describes the affected environment (i.e., the environmental and regulatory setting) and the potential environmental consequences (i.e., direct and indirect effects) that could result from implementation of the proposed action alternative or the no action alternative.

The following resource areas are those on which the proposed action would have measurable impacts sufficient for analysis. They are described and analyzed in individual sections through the following chapter.

- Air Quality
- Biological Resources
- Climate Change
- Cultural Resources
- Geology, Seismicity, Soils, and Mineral Resources
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Socioeconomics and Environmental Justice

Mitigation measures referenced from the Kern County Oil and Gas EIR in this chapter are described more fully in Appendix D.

Issues not Addressed

This EA does not specifically address potential effects related to the topics described below, for the reasons described below.

Agricultural Resources

Under the Farmland Mapping and Monitoring Program, the majority of the study area is designated as grazing land, with the northern portion designated as vacant or disturbed land. The study area is not currently in agricultural production. In addition, the study area is not located within an area subject to a Williamson Act contract. While the mitigation sites are zoned agricultural, (see below) they are not currently actively farmed, and would be protected by a conservation easement from a change in the current use. There would be no effect on agricultural resources.

Land Use and Planning

The study area consists of land developed by oil and gas activities; agricultural land, grassland, and scrubland. The nearest residential communities in the vicinity of the study area include McKittrick, approximately 8 miles to the south, and Buttonwillow, approximately 12 miles to the east. Those

communities would remain unaffected. There is currently no established community within the study area, and a habitat conservation plan or natural community conservation plan (NCCP) applicable to the study area has not been adopted. Therefore, these issues are not considered further in this section.

According to the Kern County General Plan, the project site is designated as Mineral and Petroleum (8.4). The Proposed Action Alternative would be consistent with all of the Kern County General Plan goals and policies that apply to the project site. There would be no effects related to land use.

According to the Kern County General Plan, the mitigation sites are designated as Intensive Agriculture (8.1) and Extensive Agriculture (8.3). These lands would be protected under a conservation easement, which would require continuation of current land management practices. There would be no effects related to land use.

Noise

The closest noise-sensitive land use is the Belridge Elementary School approximately 5.5 miles (29,000 feet) from the project site and a residence located over 7 miles (36,960 feet) from the project site. The project is well beyond any minimum distances required for noise mitigation. Therefore, there would be no construction-related or operational noise effects.

Recreation

Both the project site and offsite mitigation lands are on private property that does not provide public access for any purpose, including recreational use. In addition, none of the covered activities would affect access to existing recreational facilities, or substantively increase use of those facilities. Long-term operation of the proposed oil and gas facilities would require no new permanent employees and would not involve activities that could increase the use of existing neighborhood or regional parks or other recreational facilities, accelerate physical deterioration of such facilities, or require the construction or expansion of recreational facilities. Because the proposed action would have no effect on recreational use, access, or opportunities, the potential effects of the alternatives on recreation are not considered in this EA.

Transportation and Traffic

The Congestion Management Program (CMP) for the study area requires a level of service (LOS) no worse than LOS E. State Route (SR) 33 is listed as LOS C, and no roadways in the project vicinity is currently classified as a deficient roadway, therefore, the proposed action would not conflict with a CMP and there would be no impact.

No public transit service is available in the study area and no bikeways or pedestrian sidewalks are identified on SR 33 in the vicinity of the project site. Therefore, the proposed action would not conflict with policies, plans, or programs regarding these alternative transportation modes, or degrade the performance of such facilities. There would be no impact.

The proposed action would add 4 to 12 new passenger vehicle/pickup truck trips and 2 new heavy truck trips per day to the local roadway system during construction. During operations and maintenance, passenger vehicle/pickup truck trips per month would increase by two. This negligible increase in traffic trips would not affect the existing traffic circulation system or

substantially degrade the traffic operation of the surrounding roadway network to an unacceptable LOS.

Existing roads would not be altered by the proposed action. Access roads would be constructed to facilitate access to the new wells pads and other related facilities, but would be private and used only for oil field activities and would not increase traffic-related hazards.

The minimal amount of increased traffic during construction would not result in inadequate emergency access as not changes to the existing road system are proposed.

There would be no adverse traffic-related effects under the Proposed Action Alternative, although traffic would be slightly greater than the No Action Alternative due to additional traffic to and from the project site during construction.

The project site is well outside of any of the Elk Hills-Buttonwillow Airport's safety zones and is not in the direct flight path for approach or departure from the airport. Therefore, the proposed action would not result in a change in air traffic patterns or otherwise result in a safety risk. There would be no impact.

Visual Resources

No sensitive viewers are within sight of the project site. The closest residence is approximately 7.5 miles away from the project site and does not have a view of the study area, and the closest school is 5.5 miles north of the project site. In general, these viewers would have low sensitivity to changes in their surroundings because the project site is similar to existing oil field facilities nearby. Interstate 5 is located 13 miles east of the project site and SR 33 bisects the project site but neither is a scenic highway. Viewers who frequently travel SR 33, who generally possess low visual sensitivity to their surroundings, may have glimpses of the project site, but it would appear similar to adjacent existing oil fields. Therefore, there would be no effects related to visual resources.

Water Quantity

Under the proposed action, water would be required for drilling operations over the entire course of the project (35 years). Approximately 2.5 acre-feet of water would be required for drilling fluids and cement. A water truck would supply the onsite tap. Another 2.5 acre-feet of water would be needed during construction for dust control. Potable water would come from Aera's existing water entitlement (8,600 acre-feet annually) from the Belridge Water Storage District, which provides water from the State Water Project. The water demands of the project would not require the construction of new water facilities or present an increased demand for water that cannot be fulfilled by the existing water entitlement. Therefore, implementation of the proposed action would not require new or expanded water supply entitlements, and so this potential impact is not discussed further in this section.

Water Quality - Wastewater Treatment

No new or expanded water or wastewater treatment facilities or landfills would be needed for operation of the project. The only wastewater that would be generated would be during well production. The production water would be conveyed through existing pipelines then separated at the existing Dehydration Facility 2 which is located within the Belridge Producing Complex. The majority of this water would be reused for steam injection operations. No new wastewater

treatment facilities would be required as a result of the proposed action. Therefore, there would be no adverse effect although effects would be greater than under the No Action Alternative, under which no additional wastewater from the proposed action would be generated.

Permit Area and Study Area Definition

As described in Section 1.2, *Background*, the project site (394 acres), Section 20 mitigation property (66.45 acres), and the Section 28 mitigation property (28 acres) compose the permit area (also called “covered lands”), where all covered activities would occur. Project development and avoidance and minimization measures would occur in the project site, and long-term habitat preservation and management activities would occur at the mitigation properties.

The “study area,” as the term is used in this chapter, represents the area considered in characterizing the affected environment, and may vary by resource. In some cases, the study area is concurrent with the permit area, or project site and offsite mitigation lands. For other resource areas, the study area extends beyond the boundary of the covered lands to account for potential effects on resources affected by the covered activities. For example, the air quality section encompasses the entire airshed where the proposed action would occur. For each resource topic with a study area different from the covered lands, the study area is described in that section’s introduction.

3.1 Air Quality

3.1.1 Affected Environment

Section 4.3.3 of the Oil and Gas EIR presents the regulatory setting related to Air Quality for oil and gas projects in Kern County. This section is incorporated by reference.

Table 3.1-1 summarizes the attainment status of the study area in western Kern County within the San Joaquin Valley Air Basin (SJVAB) with regards to the National Ambient Air Quality Standards (NAAQS) and the California equivalents (CAAQS).

Table 3.1-1. Federal and State Attainment Status of Study Area in Kern County within the San Joaquin Valley Air Basin

Pollutant	National Ambient Air Quality Standards	California Ambient Air Quality Standards
8-hour ozone	Extreme nonattainment	Nonattainment
CO	Attainment	Attainment
PM2.5	Moderate nonattainment	Nonattainment
PM10	Attainment	Nonattainment
NO ₂	Attainment	Attainment
SO ₂	Attainment	Attainment

Sources: California Air Resources Board 2017b; U.S. Environmental Protection Agency 2017b.

CO = carbon monoxide; PM2.5 = particulate matter less than or equal to 2.5 microns; PM10 = particulate matter less than or equal to 10 microns; NO₂ = nitrogen dioxide; SO₂ = sulfur dioxide

Sensitive Receptors

Sensitive receptors are defined as locations where human populations, especially children, seniors, and sick persons, are located and where there is reasonable expectation of continuous human exposure according to the averaging period for the air quality standards (i.e., 24-hour, 8-hour, and 1-hour) such as residences, hospitals, and schools. The nearest communities are McKittrick, approximately 8 miles to the south, and Buttonwillow, approximately 12 miles to the east. The nearest residence to the project site is approximately 7.5 miles to the south.

3.1.2 Environmental Impacts

Approach and Methods

Criteria pollutant emissions generated by the project were quantified using assumptions for the construction of 67 proposed wells from the T11-Block 12 Development Project Initial Study/Mitigated Negative Declaration (IS/MND) (Dudek 2014), which analysis is incorporated by reference, and the Road Construction Emissions Model (version 8.1.0). The Road Construction Emissions Model uses EMFAC2014 and OFFROAD emissions factors to estimate annual construction emissions. It was assumed at the time of this analysis that construction activities would commence in 2018 and conclude in 2021. Construction emissions were scaled by a factor of 131/67, which is the ratio of currently proposed wells divided by the number of proposed wells considered in the T11-Block 12 Development Project IS/MND.

Significance Criteria

General Conformity

EPA enacted the Federal General Conformity regulation (40 Code of Federal Regulations [CFR] Parts 5, 51, and 93) in 1993. The purpose of the General Conformity rule is to ensure that federal actions do not generate emissions that interfere with state and local agencies' SIPs and emission-reduction strategies to ensure attainment of the NAAQS.

The General Conformity rule applies to all federal actions located in nonattainment and maintenance areas, unless one or more of the following criteria are satisfied.

- The action is exempt from General Conformity (i.e., the action is covered by Transportation Conformity or is listed in the General Conformity rule).
- The action is covered by a Presumed-to-Conform approved list.
- The action's emissions are *de minimis*.

Consequently, to fulfill general conformity requirements, a General Conformity evaluation must be undertaken to identify whether the total ozone, PM10, and PM2.5 emissions for the proposed action are subject to the General Conformity rule. The General Conformity evaluation must consider both direct and indirect sources of emissions for all nonattainment and/or maintenance pollutants, which include regulated precursor emissions. Regulated precursor emissions for ozone include reactive organic gases (ROG) and nitrogen oxides (NO_x). Regulated precursor emissions for PM2.5 include sulfur dioxide (SO₂), NO_x, and ROG. Therefore, the General Conformity analysis evaluates each of these direct and indirect (precursor) emissions.

The General Conformity evaluation is made by comparing all emission sources (e.g., haul trucks, offroad equipment) to the applicable General Conformity *de minimis* thresholds. Table 3.1-2 summarizes the *de minimis* thresholds applicable to the study area.

Table 3.1-2. Federal *de minimis* Thresholds for the Study Area (tons per year)

Pollutant	Threshold
NO _x	10
ROG	10
PM2.5	100
PM10	100
SO ₂	100

Sources: U.S. Environmental Protection Agency 2017c.

The General Conformity evaluation addresses the first three significance criteria; emissions in excess of the federal *de minimis* threshold could conflict with applicable air quality plans, violate existing or projected air quality standards, or contribute to a cumulative air quality effect.

Effects on Human Health

With respect to potential health effects from action-generated emissions, the analysis focuses on those pollutants with the greatest potential to result in an adverse, material impact on human health, which are (1) diesel particulate matter (DPM), (2) locally concentrated CO (i.e., CO hotspots), and (3) Valley Fever.

Since the EPA has not adopted quantitative thresholds to assess potential health risks, the following criteria adopted by San Joaquin Valley Air Pollution Control District (SJVAPCD) (SJVAPCD 2015a) were used to determine whether action generated emissions would result in an adverse impact on sensitive receptors.

- Result in exposure to DPM resulting in a maximum incremental cancer risk greater than 20 in 1 million, or a health hazard index greater than 1.
- Creates CO hotspots near sensitive receptors (i.e., degrade intersections to level of service [LOS] E or worse) that exceed the CAAQS.

The presence of *C. immitis* in the study area does not guarantee that construction activities would result in increased incidence of Valley Fever. Propagation of *C. immitis* is dependent on climatic conditions, with the potential for growth and surface exposure highest following early seasonal rains and long dry spells. *C. immitis* spores can be released when filaments are disturbed by earthmoving activities, although receptors must be exposed to and inhale the spores to be at increased risk of developing Valley Fever. Moreover, exposure to *C. immitis* does not guarantee that an individual will become ill—approximately 60 percent of people exposed to the fungal spores are asymptomatic and show no signs of an infection (U.S. Geological Survey 2000). SJVAPCD Regulation VIII and Rule 3135 would reduce the risk of contracting Valley Fever by reducing dust during construction.

With respect to potential effects from odors, SJVAPCD Rule 4102 prohibits the discharge of nuisance odors that could endanger the comfort or health of the public and any actions related to odors are based on citizen complaints to local governments and the SJVAPCD.

Effects

No Action Alternative

Federal approvals are not required for the No Action Alternative because neither construction or operation of the Block 12 Development Project would occur. Therefore, the No Action Alternative is not subject to General Conformity. There would be no construction or operational emissions, and as such, no conflict with air quality plans or potential to violate ambient air quality standards. Likewise, receptors would not be exposed to increased pollutant concentrations or odors. Accordingly, there would be no adverse air quality effects under the No Action Alternative.

Proposed Action Alternative

Construction

Construction of the project has the potential to affect ambient air quality through the use of heavy-duty construction equipment, construction worker vehicle trips, truck hauling trips, and earthmoving. Table 3.1-3 summarizes estimated annual emissions that would be generated by construction of the proposed action. Note that all off-road construction diesel engines are required to meet at least Tier 3 California emission standards, pursuant to Oil and Gas EIR Mitigation Measure MM 4.3-3. Please refer to Appendix A, Air Quality Modeling Results for modeling assumptions and calculations.

Table 3.1-3. Annual Criteria Pollutant Emissions from Construction of the Project (tons per year)

Year	ROG	NO _x	PM10	PM2.5	SO _x
2018	0.1	1.0	0.4	0.1	<0.1
2019	0.5	9.9	0.7	0.5	<0.1
2020	0.5	9.7	0.6	0.4	<0.1
2021	0.3	5.1	0.2	0.2	<0.1
<i>de minimis</i> Threshold	10	10	100	100	100 ^b
Threshold exceeded?	No	No	No	No	No

^a The *de minimis* threshold is for sulfur dioxide (SO₂) but is used to evaluate SO_x (sulfur oxides) generated during construction.
 ROG = reactive organic gases; NO_x = nitrogen oxides; PM10 = particulate matter less than 10 microns in diameter; PM2.5 = particulate matter less than 2.5 microns in diameter.
 Please refer to Appendix A for modeling assumptions and calculations.

As shown in Table 3.1-3, annual criteria pollutant emissions would not exceed any of the federal *de minimis* thresholds. This effect would not be adverse.

Operation

Project operation includes oil production, and future plugging and abandonment of wells if they are no longer productive. During well plugging and abandonment, the associated equipment and facilities would be disassembled, salvaged, and stored; rehabilitation of the site would follow if there were no other wells around a particular well pad.

Aera Energy has a Title V Operating Permit for its operations in the Belridge Oil Field and is classified as a Major Source as defined by SJVAPCD Rule 2201. The Belridge Oil Field expansion proposed in this project via the installation and operation of stationary source equipment is subject to Aera's existing Title V Operating Permit. Aera Energy also has an SJVAPCD permit for Vapor Collection and Control System Serving 1657 Thermally Enhanced Wells (SJVAPCD Permit No. S-1547-359). Aera Energy is currently operating 1,461 of the 1,657 permitted wells. The installation of 131 wells as proposed in this project would not cumulatively result in more operating wells than are permitted under Aera's SJVAPCD permit. As such, the proposed project requires no additional permitting action for the installation of the wells.

The proposed project would not involve the installation or use of new stationary, portable, or mobile combustion devices for operation, nor would it generate new employee vehicle trips. However, operation of the production wells could result in ROG emissions associated with component leaks from the new wells, piping, and devices.

To address these fugitive emissions, Aera Energy's operations are subject to the following regulatory compliance standards:

- Compliance with its Title V (Federal Major Source) permit for the Belridge Oil Field, which incorporates requirements for compliance with federal, state, and SJVAPCD rules and regulations, including:
 - Performance standards and facility-wide requirements regarding inspection and maintenance of components to detect and minimize potential leaks of ROGs and GHGs.

- Compliance with SJVAPCD Rule 4401, which applies to steam-enhanced crude oil production wells and limits the ROG emissions by establishing the requirements for an inspection and maintenance program to detect and repair leaks discovered at aboveground components at steam-enhanced oil recovery wells and their associated systems.

Of the 131 wells proposed, the 98 production wells and associated systems may have fugitive emissions of volatile organic compounds (VOCs)³ and SO_x. These wells and their associated VOC and SO_x emissions are covered by SJVAPCD Permit No. S-1547-359 for a vapor collection and control system. The new wells operated under the proposed action would be subject to the existing permit conditions. Such conditions include compliance with SJVAPCD Rule 2201 which requires any additional emissions of VOC or SO_x generated by the project, in excess of the permitted levels, to be fully offset. Accordingly, there would be no net increase in emissions, and operation of the proposed action would not conflict with adopted air quality attainment plans, violate ambient air quality standards, or cumulatively contribute to an air quality effect. This impact would not be adverse.

Exposure of Sensitive Receptors to Substantial Pollutant Concentrations

Diesel Particulate Matter

Diesel-fueled engines used during construction could expose sensitive receptors to DPM, which is considered carcinogenic. However, DPM generated during construction is expected to be minor and would not exceed 0.7 tons per year during concurrent construction (see Appendix A). These emissions would dissipate as a function of distance and would be lower at the nearest sensitive receptor (which is about 7.5 miles south of the project site). Moreover, emissions could occur over a total of 4 years, for up to 8.1 months each year of construction activity, which is significantly lower than the 30-year exposure period typically associated with chronic cancer health risks. No DPM is expected during project operation. Consequently, neither construction nor operation of the proposed action is expected to expose sensitive populations to substantial pollutant concentrations or exceed SJVAPCD thresholds. This effect would not be adverse.

Localized Carbon Monoxide

Implementation of the proposed action would not alter or worsen the current congestion (i.e., no changes in LOS) on any streets in the study area (see above under *Transportation and Traffic*). Likewise, the proposed action would not alter the design of any roadways or generate a significant number of new vehicle trips. Temporary construction vehicles would not reduce the LOS at affected intersections to unacceptable levels. Accordingly, the proposed action would not exceed SJVAPCD's (2015b) screening criteria, where an adverse effect on localized CO concentrations would occur for traffic volumes that do not negatively affect or degrade intersections to unacceptable LOS. Therefore, the proposed action would not contribute to or worsen localized CO concentrations within the study area from construction traffic. This effect would not be adverse.

Valley Fever

Disturbance of soil containing *Coccidioides* fungus could expose the general public to spores known to cause Valley Fever. Over 75 percent of Valley Fever cases in California have been in people who live in the San Joaquin Valley. Kern County has a relatively high Valley Fever rate, with more than 10

³ CARB uses the term *ROG* for air quality analysis and defines it the same as the federal term *VOC*. In this analysis, *ROG* is assumed to be equivalent to *VOC*.

cases reported per 100,000 people per year between 2008 and 2012 (California Department of Public Health 2016). Construction activities in areas known to contain *Coccidioides* fungus may expose workers and the public to spores that could result in Valley Fever. Compliance with SJVAPCD Regulation VIII and Rule 3135 (dust controls) would reduce the risk of contracting Valley Fever. This effect would not be adverse.

Creation of Objectionable Odors Affecting a Substantial Number of People

Although offensive odors rarely cause any physical harm, they can be unpleasant, leading to considerable distress among the public and often generating citizen complaints to local governments and air districts. Odor emissions related to the proposed action would primarily occur during the construction period, when emissions from equipment may be evident in the area adjacent to the construction zone. The construction activities would be short term and are not likely to result in nuisance odors that would violate SJVAPCD nuisance standards. Similarly, there is a potential to generate sulfur-related odors during minor and routine operation and maintenance activities. However, the nearest sensitive receptor is located approximately 7.5 miles to the south. Therefore, the proposed action would not result in substantial odor emissions affecting a substantial number of people. This effect would not be adverse.

3.2 Biological Resources

For the purposes of this section, the study area is equivalent to the permit area. This analysis considers potential impacts on all biological resources in the study area and gives special consideration to special-status species. For the purposes of this analysis, special-status species are defined as those listed as threatened or endangered under the federal ESA, CESA, or those listed as a candidate under either act; designated as fully protected by CDFW; designated as a Species of Special Concern by CDFW; given a rating of 1 or 2 by the California Native Plant Society (CNPS); or otherwise considered sensitive by local jurisdictions.

3.2.1 Affected Environment

Topography

The study area is situated in the southern end of the San Joaquin Valley where the valley is approximately 60 miles wide. The San Joaquin Valley is a sediment-filled depression bound on the west by the California Coast Ranges and on the east by the Sierra Nevada range. This area is classified as a forearc basin, or a basin that formed in front of a mountain range (San Joaquin Valley Geology 2015).

Site topography of the study area is generally flat with a gentle slope from northeast to southwest (Dudek 2016a). Elevation of the entire study area ranges from approximately 286 to approximately 625 feet above mean sea level (Table 3.2-1) (California Geological Survey 2010).

Table 3.2-1. Elevation in the Study Area

Elevation (feet)	Block 12 Project Area	Section 20 Mitigation Site	Section 28 Mitigation Site
Minimum Elevation	486	286	467
Maximum Elevation	625	301	293
Mean Elevation	550	293	519

Source: California Geological Survey 2010.

Climate

Kern County has a desert climate, with long, hot, dry summers and brief, cool, moist winters (Peel et al. 2007). Rainfall averages approximately 6.5 inches annually, primarily occurring during winter and spring, but can vary widely year-to-year (National Oceanic and Atmospheric Administration 2013).

Hydrology

The entire study area is located in the Tulare Lake Bed subbasin (Hydrologic Unit Code [HUC] 18030012). At the watershed level, the project site is located within the Upper Kern River Flood Canal watershed (HUC 1803001212), the Section 20 mitigation site is located within the Lower Kern River Flood Canal watershed (HUC 1803001216) and the Section 28 mitigation site is located within the Browns Canyon watershed (HUC 1803001211).

Streamflow is produced by local and basinwide rainfall in addition to snowmelt from the Sierra Nevada. Water diversions for agricultural, municipal, habitat restoration, and industrial uses occur upstream of and within the county (California Department of Water Resources 2003). Surface runoff from precipitation has the potential to enter the study area via ephemeral drainages. There are no perennial surface water features within the study area.

Land Cover

A land cover type is defined as the dominant character of the land surface discernible from aerial photographs, as determined by vegetation, water, or human uses. Land cover types are the most widely used units in analyzing ecosystem function, habitat diversity, natural communities, wetlands and streams, and covered species habitat. The majority of the land cover in the study area is composed of alkali desert scrub (approximately 52 percent). The land cover of the study area is shown in Table 3.2-2 and HCP Figure 3-6. Land cover for the project site and mitigation sites is described in the following subsections.

Table 3.2-2. Land Cover in the Study Area

Land Cover Type	Project Site		Section 20 Mitigation Site		Section 28 Mitigation Site		Total Study Area	
	Acres	%	Acres	%	Acres	%	Acres	%
Alkali Desert Scrub	259.1	65.8	4.2	6.3	312.8	48.8	576.0	52.3
Annual Grassland	24.1	6.1	58.2	87.5	327.6	51.2	409.9	37.2
Barren	110.7	28.1	—	0.0	—	0.0	110.7	10.1
Cropland	—	0.0	4.1	6.2	—	0.0	4.1	0.4
Total	393.9	100	66.5	100	640.4	100	1,100.7	100.0

Source: California Department of Fish and Wildlife 2017a.

Alkali desert scrub, annual grassland, barren, and cropland land cover types, as defined by CDFW's California Wildlife Habitat Relationships data (California Department of Fish and Wildlife 2017a), occur in the study area and are illustrated on HCP Figure 3-6.

Project Site

The Block 12 project site is largely composed of developed land associated with the active oil field; however, relatively large patches of natural habitat occur in the southern portion of the project site (Dudek 2016a). Land cover in the project site is composed of developed land or barren areas (111 acres) associated with the active oil field in the northern portion. The southern portion consists of mostly continuous natural habitat (283 acres). Vegetation in the project site is mostly sparse to dense shrub cover interspersed with non-native grasses and forbs and other herbaceous vegetation (South Valley Biology Consulting 2012). Land cover in the project site includes alkali desert scrub (259 acres), annual grassland (24 acres) and barren land cover (California Department of Fish and Wildlife 2017a).

Native vegetation present in the project site is characterized as allscale scrub community and non-native annual grassland. Native annual species include Sierra tidytips, small fescue (*Vulpia microstachys* ssp. *pauciflora*), snake's head, common peppergrass (*Lepidium nitidum* var. *nitidum*), sleeping combseed, and common fiddleneck. Non-native grass and disturbed areas contain non-native grass species such as smooth barley and red brome along with non-native forb species such as London rocket (*Sisymbrium irio*), redstem filaree (*Erodium cicutarium*), cheeseweed (*Malva parviflora*), and California mustard (*Guillenia lasiophylla*). Disturbed lands make up a large portion of the project site and vegetation in these areas, where present, is highly fragmented, composed of scattered non-native grasses and forbs, and is not intact and large enough to be considered a distinct vegetation community (Dudek 2016a).

Section 20 Mitigation Site

The Section 20 mitigation site is surrounded on its northern, eastern, and southern sides by pistachio orchards and includes 66.5 acres of robust herbaceous plant community that is a mixture of non-native grasses, and both native and non-native herbaceous plants (South Valley Biology Consulting 2017a). The majority of the Section 20 property (approximately 58 acres) is composed of annual grassland (California Department of Fish and Wildlife 2017a). The land cover is dominated by non-native grasslands with allscale-dominated saltbush scrub occurring in a narrow, relatively open stand along the western portion of the property. The property is connected to mature saltbush

and mesquite scrub habitats that occur on the adjacent property owned by CDFW and along the eastern side of the California Aqueduct. In addition to allscale shrub, common plant species on the property include California mustard, cheeseweed, common peppergrass, fiddleneck, foxtail barley, Kern tarplant (*Hemizonia pallida*), London rocket, Mediterranean grasses, red brome, redstem filaree, Russian thistle (*Salsola tragus*), and snake's head. The only permanent disturbance on the property is a dirt roadway that runs north-south along the western portion of the property and the perimeter roadways.

Although the property is somewhat isolated by the presence of the pistachio orchards, there is clear connectivity to the property through high-quality saltbush and mesquite scrub habitats along the western side of the property, which would provide movement of wildlife from this property to and from other habitat areas.

Section 28 Mitigation Site

The Section 28 mitigation site is surrounded on all sides by grassland and saltbush scrub habitat that likely support similar plant and wildlife species (South Valley Biology Consulting 2017b). The Section 28 mitigation site is nearly evenly split between alkali desert scrub (313 acres) and annual grassland (326 acres) (California Department of Fish and Wildlife 2017a). Vegetation communities identified on the Section 28 mitigation site are non-native grasslands dominating most of the southern half of the property, with saltbush scrub dominated by spiny saltbush (*Atriplex spinifera*), and allscale occurring over most of the rest of the property. Other common plant species included California goldfields (*Lasthenia californica*), California mustard, cheeseweed, common peppergrass, Devil's lettuce (*Amsinckia tessellata*), fiddleneck, foxtail barley, Kern mallow (*Eremalche kernensis*), London rocket, Mediterranean grass, pineapple weed (*Matricaria discoidea*), purple owl's clover (*Castilleja exserta*), pygmy stonecrop (*Crassula connate*), red brome, redstem filaree, Russian thistle, silver saltweed (*Atriplex argentea*), snake's head, spreading pygmyleaf (*Loeflingia squarrosa*), tansy phacelia (*Phacelia tanacetifolia*), white horehound (*Marrubium vulgare*), and white mallow (*Eremalche exilis*). There are numerous swales and dry washes traversing the property from southwest to northeast. The property has not undergone any past disturbances from oil and gas activities or agricultural cultivation; the only developed portions of the property are a pipeline service roadway that runs from northwest to southeast across the southwestern half of the property, and a small, partially overgrown roadway that runs from west to east in the northwest portion of the property (South Valley Biology Consulting 2017b).

The Section 28 mitigation site is a large block of non-native grassland and saltbush scrub habitat that is surrounded on all sides by similar lands, and is located in the Lokern region, an area that is widely known to support some of the highest quality habitats for protected upland species in the San Joaquin Valley.

Special-Status Species

Special-status species are animals and plants that are legally protected under ESA, CESA, or other regulations, and species that are considered sufficiently rare by the scientific community to qualify for such listing. The list of special-status species with potential to occur in the study area or vicinity was derived from the following sources.

- Species list obtained from the Service website for the quadrangles encompassing the study area, surrounding U.S. Geological Survey (USGS) 7.5-minute quadrangles, and Kern County (U.S. Fish and Wildlife Service 2017)

- California Natural Diversity Database (CNDDDB) (California Department of Fish and Wildlife 2017b)
- CNPS's online Inventory of Rare and Endangered Plants of California (California Native Plant Society 2017)
- Surveys of the project site and vicinity (Dudek 2016a, 2016b, 2013; South Valley Biology Consulting 2012).

Plants

Thirty-three special-status plant species have potential to occur within the Belridge quadrangle and eight surrounding USGS 7.5-minute quadrangles (California Department of Fish and Wildlife 2017b). Of these, one species, Kern mallow, was observed within the project site during a 2011 botanical survey (South Valley Biology Consulting 2012). The following species were not observed during botanical surveys and the project site does not provide habitat for them. As such, these species are not expected to occur on the project site.

- Recurved larkspur (*Delphinium recurvatum*).
- Oil neststraw (*Stylocline citroleum*)
- Munz's tidy-tips (*Layia munzii*).
- Diamond-petaled California poppy (*Eschscholzia rhombipetala*).
- Cottony buckwheat (*Eriogonum gossypinum*).
- San Joaquin bluecurls (*Trichostema ovatum*).
- California jewelflower (*Caulanthus californicus*).
- Hoover's eriastrum (*Eriastrum hooveri*).
- San Joaquin woollythreads (*Monolopia congdonii*).
- Bakersfield cactus (*Opuntia treleasei*).
- California alkali grass (*Pucconellia simplex*).
- Coulter's goldfields (*Lasthenia glabrata* ssp. *coulteri*).
- Deltoid bract saltbush (*Atriplex subtilis*).
- Earlimart orache (*Atriplex erecticaulis*).
- Forked fiddleneck (*Amsinckia furcata*).
- Golden violet (*Viola aurea*).
- Hall's tarplant (*Deinandra halliana*).
- Heartscale (*Atriplex cordulata*).
- Horn's milkvetch (*Astragalus hornii* var. *hornii*).
- Kern Canyon clarkia (*Clarkia xantiana* ssp. *parvifolia*).
- Kings gold (*Tropidocarpum californicum*).
- Lemmon's jewelflower (*Caulanthus coulteri* var. *lemmonii*).

- Lost Hills crownscale (*Atriplex vallicola*).
- Oval-leaved snapdragon (*Antirrhinum ovatum*).
- Pale-yellow layia (*Layia heterotricha*).
- Round-leaved filaree (*California macrophylla*).
- San Jacinto Valley crownscale (*Atriplex coronata* var. *natatior*).
- Showy golden madia (*Madia radiata*).
- Slough thistle (*Cirsium crassicaule*).
- Tejon poppy (*Eschscholzia lemmonii* ssp. *kernensis*).
- Temblor buckwheat (*Erigonum temblorense*).
- White pygmy-poppy (*Canbya candida*).

Kern Mallow

Kern Mallow is the one present ESA listed plant species. . A full species description of the Kern Mallow can be found in the Oil and Gas EIR (4.4-53) (Kern County Planning and Community Development Department 2015) - incorporated by reference.

HCP Figure 3-7 displays all CNDDDB occurrences of the species within 10 miles of the study area. Botanical surveys conducted in spring 2011 confirmed the presence of three Kern mallow populations within the study area (South Valley Biology Consulting 2012). Historical drought data for Region 2 of California's Climate Divisions classified spring 2011 to vary between "moderately moist" and "very moist," which indicates that the surveys were not conducted during a drought when Kern mallow would be less likely to be present (National Oceanic and Atmospheric Administration 2017). More recent surveys have identified suitable habitat in the study area; however, the vegetation has been degraded due to previous disturbances associated with the oil field (Dudek 2016a). CNDDDB records indicate one small, presumed extant population approximately 0.5 mile from the project site (California Department of Fish and Wildlife 2017b).

The Section 20 mitigation site does not have high-quality habitat for Kern mallow. There is no recent incidence of Kern mallow within the Section 20 mitigation site (South Valley Biology Consulting 2017a). The nearest CNDDDB occurrence is approximately 1 mile southwest of the site (California Department of Fish and Wildlife 2017b) (HCP Figure 3-7).

The Section 28 mitigation site has high-quality habitat for Kern mallow throughout the 640 acres available on this property. Kern mallow was observed in high numbers within the Section 28 mitigation site and it is likely that the population in 2017 numbered in the thousands of individuals on the property (South Valley Biology Consulting 2017b). There are multiple occurrences of Kern mallow within and surrounding the Section 28 property according to CNDDDB data (California Department of Fish and Wildlife 2017b) (HCP Figure 3-7).

Wildlife

Twenty-two special-status wildlife species have potential to occur within the Belridge and eight surrounding USGS 7.5-minute quadrangles (California Department of Fish and Wildlife 2017b). Seven of these species have been observed within the study area.

- San Joaquin coachwhip (*Masticophis flagellum ruddocki*).
- Burrowing owl (*Athene cunicularia*).
- Loggerhead shrike (*Lanius ludovicianus*).
- San Joaquin antelope squirrel (*Ammospermophilus nelsoni*).
- Giant kangaroo rat (*Dipodomys ingens*).
- American badger (*Taxidea taxus*).
- San Joaquin kit fox (*Vulpes macrotis mutica*).

Six of the species have not been observed within the study area, but have potential to occur on the site because suitable habitat occurs in the project site.

- Blunt-nosed leopard lizard (*Gambelia sila*).
- Silvery legless lizard (*Anniella pulchra pulchra*).
- Blainville's horned lizard (*Phrynosoma blainvillii*).
- Le Conte's thrasher (*Toxostoma lecontei*).
- Short-nosed kangaroo rat (*Dipodomys nitratooides brevinasus*).
- Tulare grasshopper mouse (*Onychomys torridus*).

Nine wildlife species have potential to occur in the project region but are not expected to occur on the project site for the reasons identified below.

- Western spadefoot (*Spea hammondi*). Suitable habitat is absent.
- Southwestern pond turtle (*Actinemys marmorata*). Suitable habitat is absent.
- Tricolored blackbird (*Agelaius tricolor*). Suitable nesting habitat and seasonal foraging habitat are absent.
- Swainson's hawk (*Buteo swainsoni*). Large trees suitable for raptor nesting are absent.
- Western snowy plover (*Charadrius alexandrinus nivosus*). Suitable nesting and foraging habitat are absent.
- Mountain plover (*Charadrius montanus*). Species does not nest in California, and suitable winter foraging habitat is absent.
- Pallid bat (*Antrozous pallidus*). Suitable habitat is absent.
- Tipton kangaroo rat (*Dipodomys nitratooides nitratooides*). Site is outside species' known range.
- Mastiff bat (*Eumops perotis californicus*). Suitable roosting habitat is absent.

The following discussion provides further context and species-specific information for the four ESA listed species necessitating coverage through issuance of an ITP.

Blunt-Nosed Leopard Lizard

Section 4.4.2 of the Oil and Gas EIR presents the setting for biological resources, including blunt-nosed leopard lizard, for oil and gas projects in Kern County (Kern County Planning and Community Development Department 2015). This section is incorporated by reference.

Blunt-nosed leopard lizard habitat occurs on the Block 12 project site (Dudek 2013, 2016b). Dudek (2013) suggested that the Block 12 portion of the project site supports moderate-quality blunt-nosed leopard lizard habitat. There are abundant rodent burrows east of Lost Hills Road and sparse herbaceous cover with scattered shrubs. Habitat is of lesser quality in the western portion of the project site (Blocks 7 and 10), which has a higher proportion of annual grassland vegetation cover and fewer rodent burrows, especially west of Lost Hills Road as evidenced by a lack of giant kangaroo rat precincts in this area (South Valley Biology Consulting 2017c). No adult or juvenile lizards were observed in the project site during protocol-level surveys in 2011 at Block 12 or 2016 at Block 11 (South Valley Biology Consulting 2012; Dudek 2016b). A CNDDDB search resulted in identification of several lizard observations near the project site (California Department of Fish and Wildlife 2017b) (HCP Figure 3-8).

Suitable habitat for blunt-nosed leopard lizard occurs throughout the Section 20 mitigation site; however, it is unlikely that blunt-nosed leopard lizard occurs there. The conversion of so much of the adjacent lands to active agricultural operations may have eliminated this species from the surrounding area, despite the presence of suitable habitat onsite; therefore, the Section 20 property likely does not contain high-quality blunt-nosed leopard lizard habitat (South Valley Biology Consulting 2017a). Protocol surveys were conducted in May, July, and August, 2016, and no blunt-nosed leopard lizards were observed (South Valley Biology Consulting 2017a).

Blunt-nosed leopard lizard is not likely high in number on the Section 28 mitigation site given the relatively low density of small mammal burrows on the property despite the availability of suitable habitat for this species on surrounding and nearby properties (South Valley Biology Consulting 2017b). As a result, the Section 28 property has moderate-quality habitat for blunt-nosed leopard lizard. A survey conducted on April 22, 24, and 25, 2016, recorded five observations of blunt-nosed leopard lizards in the northwest portion of the Section 28 mitigation site.

Giant Kangaroo Rat

Section 4.4.2 of the Oil and Gas EIR presents the setting for biological resources, including giant kangaroo rat, for oil and gas projects in Kern County (Kern County Planning and Community Development Department 2015). This section is incorporated by reference.

Any suitable habitat for giant kangaroo rat present within the project site is likely not high quality due to the levels of existing disturbance throughout the property. HCP Figure 3-9 displays all CNDDDB occurrences for the species within 10 miles of the study area. The nearest CNDDDB occurrence is approximately 2 miles from the site (California Department of Fish and Wildlife 2017b) (HCP Figure 3-9). The giant kangaroo rat is known to occur in the project site east of Lost Hills Road, based on surveys conducted in 2011, 2013, 2015, and 2017. There is no evidence of giant kangaroo rat presence west of Lost Hills Road, despite the availability of suitable habitat (South Valley Biology Consulting 2012, 2017c; Dudek 2013). Given these results, the project site supports occupied giant kangaroo rat habitat east of Lost Hills Road, with potential habitat occurring west of Lost Hills Road with no signs of occupancy.

The Section 20 mitigation site has high-quality habitat available throughout for giant kangaroo rat, amounting to 60 acres. Based on surveys conducted on April 17, 2017, the Section 20 mitigation site contained abundant sign of giant kangaroo rat over almost the entire property, indicating substantial high-quality habitat (South Valley Biology Consulting 2017b). Appropriate-sized burrows, abundant fresh scats, recent grass clipping and haystacking, and vertical pits used to cache seed were observed during this survey (South Valley Biology Consulting 2017b). On May 25, 2017,

biologists conducted live trap surveys at the Section 20 property for giant kangaroo rat to confirm presence. Three giant kangaroo rats were captured (Cypher 2017a).

The Section 28 mitigation site has moderate- to high-quality habitat available throughout for giant kangaroo rat. Areas with sign of giant kangaroo rat were observed at several locations on the Section 28 mitigation site, including appropriately sized burrows and scats for this species (South Valley Biology Consulting 2017a; Cypher 2017b). On May 31, 2017, biologists conducted live trap surveys for giant kangaroo rat with 50 traps on the western side of the property to confirm presence. Two giant kangaroo rats were captured (Cypher 2017b). Dr. Cypher (2017b) confirmed that habitat quality appeared to be homogeneous over the entire property, with giant kangaroo rat likely to occur across the entire 640-acre property, constituting a large population.

San Joaquin Antelope Squirrel

Section 4.4.2 of the Oil and Gas EIR presents the setting for biological resources, including San Joaquin antelope squirrel, for oil and gas projects in Kern County (Kern County Planning and Community Development Department 2015). This section is incorporated by reference.

The Block 12 project site contains moderate-quality habitat for San Joaquin antelope squirrel. The Lokern Ecological Preserve, located to the south and east of the project site, is also known to be inhabited by this species (Dudek 2013). CNDDDB occurrence of this species overlaps the project site (California Department of Fish and Wildlife 2017b) (HCP Figure 3-10). The San Joaquin antelope squirrel was observed within the Block 12 project site during surveys conducted in 2013 (Dudek 2013). The project site includes CNDDDB occurrences of San Joaquin antelope squirrel. While recent surveys noted that the project site does not provide typical habitat described for this species due to heavy oil production and little vegetation, this species has been known to occur within disturbed areas of oil production and could occur in suitable habitat patches. The southern portion of the Block 12 project site provides highly suitable habitat for this species (Dudek 2016a) and this species was identified during surveys conducted between May 25 and August 8, 2016, in the South Belridge field (Dudek 2016b).

The Section 20 mitigation site contains 60 acres of high-quality habitat for San Joaquin antelope squirrel. Weather conditions were not conducive for San Joaquin antelope squirrel during field surveys at the Section 20 mitigation site; however, several observations of this species were made on this property during spring and summer 2016 surveys (Dudek 2016a; South Valley Biology Consulting 2017b).

The Section 28 mitigation site contains high-quality habitat for San Joaquin antelope squirrel. This species is expected to occur over most of the 640-acre property (South Valley Biology Consulting 2017a). A San Joaquin antelope squirrel was observed by biologists during April 11, 2017 field surveys of the Section 28 mitigation site.

San Joaquin Kit Fox

Section 4.4.2 of the Oil and Gas EIR presents the setting for biological resources, including San Joaquin kit fox, for oil and gas projects in Kern County (Kern County Planning and Community Development Department 2015). This section is incorporated by reference.

There are several San Joaquin kit fox CNDDDB occurrences within 10 miles of the study area (California Department of Fish and Wildlife 2017b) (HCP Figure 3-11). The Block 12 project site contains moderate-quality habitat for San Joaquin kit fox. Surveys conducted in 2011 in the Block 12

project site note the presence of potential kit fox burrows (South Valley Biology Consulting 2012) and spotlight surveys resulted in observations of eight individuals on or near the project site (Dudek 2013). Recent surveys of the Block 12 project site confirmed that there is onsite habitat suitable for denning and foraging. Kit foxes are often seen denning or foraging along well pads, flowlines, and around office buildings. There are CNDDDB occurrences throughout the Block 12 project site (California Department of Fish and Wildlife 2017b) (HCP Figure 3-11).

The Section 20 mitigation site contains high-quality foraging and transient habitat for San Joaquin kit fox throughout. One potential kit fox den and one relatively fresh kit fox scat was observed during the April 2017 field survey at the Section 20 mitigation site (South Valley Biology Consulting 2017a).

The Section 28 mitigation site contains high-quality foraging and transient habitat for San Joaquin kit fox throughout. Four potential San Joaquin kit fox dens were observed on the Section 28 mitigation site during field surveys in April 2017; however, no sign (e.g., scat, tracks, prey remains) was observed. It is likely that kit foxes are present occasionally as a foraging transient on this property as it is known to occur in many areas surrounding the mitigation site (South Valley Biology Consulting 2017a).

3.2.2 Environmental Consequences

This section describes the methods and assumptions used to determine the direct and indirect effects of the proposed action on biological resources.

Approach and Methods

The methods of analysis of impacts on biological resources are based on professional standards and information cited throughout this section. The key effects were identified and evaluated based on the environmental setting and biological resources known to occur in the study area, and the expected magnitude, intensity, and duration of activities related to the proposed action.

Permanent impacts on biological resources were quantified using the estimated amount of land cover that would be converted as a result of construction of new facilities. Temporary effects on biological resources were quantified using the estimated amount of land cover that would be temporarily disturbed during construction of the proposed action, but would be restored to preconstruction conditions within 1 year of disturbance. The discussion of impacts also reflects ongoing maintenance and monitoring at the offsite mitigation lands, including continued grazing and vegetation management.

Impacts on biological resources identified during surveys conducted within the project site were determined using geographic information system (GIS) software (South Valley Biology Consulting 2012; Dudek 2013). The proposed action footprint and associated temporary impact areas were overlain on the habitats, wetland data, and other biological resource data mapped within the project site (e.g., trees, nests) to quantify the permanent and temporary impacts associated with the ground-disturbing activities.

Proposed Action Alternative Potential Effect Mechanisms

Covered Species

Construction

Surface disturbance and associated vegetation removal for the construction of well pads, pipelines, access roads, and ancillary facilities would permanently remove potentially suitable habitat for covered species. However, the increase in bare areas may attract some covered species that prefer more open barren habitats adjacent to undisturbed habitat. The increase in traffic and vehicles used for construction would result in an increased potential for wildlife-vehicle collisions. The excavation of sumps would result in an increased potential for wildlife entrapment and mortality, especially for smaller species. Drilling activities may result in spills of gas or oil that would degrade suitable habitat, or potentially result in mortality if wildlife species mistake pooled oil for water.

Indirect effects on covered species would include displacement or avoidance resulting from increased human activity and noise from equipment operation and increased presence of vehicles. Additional indirect effects would include the spread of noxious and invasive weed species, which would reduce habitat quality. Traffic on unpaved roads creates potential for dust effects that can reduce the quality of forage and habitat.

Production/Operations and Maintenance

O&M activities would be limited to areas that were already disturbed by construction activities and so are not expected to be a major source of direct habitat loss. Vegetation removal would be a component of production activities that facilitates visual inspection; therefore, a limited amount of direct removal of habitat could still occur during production activities. Vegetation removal for visual inspection would occur in areas that are recently disturbed by construction and would result in greater effects on covered species that are more adaptable to disturbed landscapes and that moved back into these areas shortly after the completion of construction. Incidental releases of chemicals (e.g., fuel spills) could also result in habitat loss and mortality of covered species, depending on the level of exposure.

Many of the direct effects on covered species from oil production and O&M would be the same as for construction activities; maintenance and servicing of wells would occur once a month. While there would be less vehicular traffic during these activities than during construction, there would still be the potential for wildlife-vehicle collisions. Indirect effects would be similar to those discussed for construction activities. Increased human activity during inspection, replacement, and maintenance of pipelines and pipeline corridors as well as the use of workover rigs would result in displacement of covered species or their avoidance of the affected areas due to noise and vehicle presence. There would be less potential for the spread of noxious and invasive species during production than during construction; however, vehicles used during production would still have the potential to introduce weeds and degrade covered species habitat.

Well Plugging and Abandonment

Well plugging and abandonment activities that would affect covered species include dismantling and salvage of wellhead equipment, facilities, and pipelines, as well as facility closure and site reclamation. The resulting excavations would be filled with earth and properly compacted to prevent settling. These activities would occur within previously disturbed areas; therefore, new

surface disturbance and vegetation removal would not occur. If covered species are using these areas, potential exists for entrapment and mortality after existing facilities are removed prior to earth filling and reclamation. Wildlife-vehicle collisions, displacement or avoidance resulting from noise and human presence, and habitat degradation would all be potential direct and indirect effects on covered species during well plugging and abandonment.

Significance Criteria

NEPA regulations do not provide any guidance on thresholds of significance for biological resources. The U.S. Fish and Wildlife Service (USFWS) has determined that to inform its decision on the significance of effects on the human environment it is appropriate to use Appendix G of the State CEQA Guidelines; factual or scientific information and data; views of the public in the affected area; the policy/regulatory environment of affected jurisdictions; and regulatory standards of federal, state, regional, and local agencies. Therefore, in accordance with Appendix G of the State CEQA Guidelines and professional judgment, this analysis assumes that an effect would be considered significant if an alternative could lead to any of the following conditions.

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the Service or CDFW.
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marshes, vernal pools, coastal wetlands) through direct removal, filling, hydrological interruption, or other means.
- Substantially reduce the habitat of a common native terrestrial plant or wildlife species. For purposes of this analysis, an effect would be considered substantial if it would cause a common native terrestrial plant or wildlife population to drop below self-sustaining levels.
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.
- Conflict with the provisions of an adopted habitat conservation plan, NCCP, or other approved local, regional, or state habitat conservation plan.

Effects

No Action Alternative

Under the No Action Alternative, the proposed action would not be implemented and there would be no impact on biological communities, special-status species, or waters of the United States as a result of proposed development and management activities in the study area. There would be no take of federally listed species as a result of the proposed action, and the offsite mitigation lands would not be set aside in perpetuity as habitat for the covered species.

Proposed Action Alternative

Effects on Listed Species

Kern Mallow

Potential Direct and Indirect Effects

Direct effects on Kern mallow would result from direct removal or harm of individual plants or existing seed bank. Grading, excavating, stockpiling, or other earth-disturbing activities associated with construction or production O&M activities would directly remove Kern mallow and its habitat. Compacted soil conditions caused by heavy equipment movement during construction, production O&M, or well plugging and abandonment could inhibit seed germination and root penetration in the soil surface, resulting in potential loss of Kern mallow habitat. The increased human presence could also increase the potential for trampling of individual Kern mallow plants.

Incidental contaminant releases associated with construction and production O&M activities (e.g., fuel spills) could permanently affect Kern mallow habitat or individuals. The likelihood of contaminant contact occurring is low with implementation of best management practices that would prevent, contain, and clean up the contaminant, but potential effects could include loss of individual plants through smothering and toxic effects, and overall degradation of habitat, which could inhibit plant growth.

Indirect effects on Kern mallow would be associated with the potential for increased noxious and invasive weed invasion and spills of hazardous materials that would degrade existing suitable habitat for this species. Invasive species could out-compete Kern mallow, especially in areas adjacent to roads or other disturbed areas. However, Kern mallow has been observed to reinvade disturbed sites when existing populations remained in adjacent areas to provide sources of seed (U.S. Fish and Wildlife Service 1998). Disturbance during construction could also reduce pollinator populations, indirectly affecting the productivity of populations in or near the study area.

The operation of construction, production, and maintenance equipment could generate fugitive dust from ground-disturbance activities. Fugitive dust that accumulates on Kern mallow could inhibit photosynthesis and affect plant growth. More tolerant invasive weeds in the study area (either existing or introduced during construction) could further colonize and aggressively outcompete native vegetation affected by dust, potentially disrupting the overall plant ecosystem. The magnitude and duration of dust exposure, tolerance of native vegetation, and aggressiveness of invasive weeds would determine overall vegetation response and intensity of effect, but could result in a reduction Kern mallow suitable habitat.

Impact Assessment

The impact assessment for Kern mallow assumes the permanent loss of 46 acres of habitat within the study area. Areas of permanent habitat loss would occur where the applicant develops project facilities (e.g., wells, well pads, roads, pipelines). Even after facilities are decommissioned and these areas reclaimed, disturbance could result in a new soil regime in which Kern mallow would not be able to germinate, or would germinate and survive at reduced levels due to habitat degradation, so the impact assessment assumes permanent habitat loss for project facilities.

Temporary habitat loss of 9 acres of habitat would occur during construction from pipeline disturbance corridors and construction staging areas. These activities would result in temporary

reductions in habitat quality and loss of available habitat for Kern mallow that would be reclaimed after construction activities are complete (within 1 year) and could provide habitat for Kern mallow during the rest of the permit term.

Best management practices, general avoidance and minimization measures, and species-specific avoidance and minimization measures are presented in Section 5.3.1 of the HCP and will be incorporated into the implementation of covered activities to avoid and minimize effects on Kern mallow and its habitat in the study area.

Impacts resulting from habitat loss and other adverse effects are not expected to result in an adverse effect on the long-term conservation of Kern mallow for the following reasons.

- The amount of Kern mallow habitat that will be permanently removed (46 acres) is a small proportion (approximately 16 percent) of the approximately 282 acres of habitat available in the study area.
- This species has been observed to reinvade disturbed sites when existing populations remained in adjacent areas to provide sources of seed (U.S. Fish and Wildlife Service 1998). The species has a population east and south of the study area in the Lokern Ecological Preserve, and individual plants will be avoided in the study area where feasible to maintain the local population. Therefore, the species is expected to reinvade portions of the study area.
- The removal of 46 acres of suitable habitat is a very small fraction of the available suitable habitat in Kern County. Kern mallow occurs along Lokern Road in western Kern County and in the Lokern Ecological Reserve, a 31,000-acre area of marsh, valley sink scrub, and valley saltbush scrub habitat located to the east and south of the study area (HCP Figure 3-7). The Lokern Ecological Reserve is a protected and managed site that supports extensive areas of suitable habitat for the species.
- The permit area location, expanding from and immediately adjacent to existing development and operations at the southern end of the South Belridge Oil Field, would limit adverse effects from habitat fragmentation.
- The avoidance and minimization measures identified in Section 5.3.1 of the HCP will minimize effects on Kern mallow.
- The protection and management of the mitigation sites will provide 122.8 acres of habitat for the species, ensuring that this habitat is maintained as suitable in perpetuity.

Blunt-Nosed Leopard Lizard

Potential Direct and Indirect Effects

Direct mortality of blunt-nosed leopard lizards would be unlikely because of the lack of evidence of habitat occupancy onsite and the avoidance and minimization measures that will be used to prevent impacts on individuals. However, covered activities (construction, production O&M, and well plugging/abandonment) have the potential to result in the death or injury of blunt-nosed leopard lizard should they occur in the study area during implementation of covered activities.

Direct effects on blunt-nosed leopard lizard would include increased risk of mortality due to vehicular traffic collisions, especially between spring and fall when this species is most active. Construction, well plugging, and abandonment activities (e.g., pad and access road building, earth

moving) may cause mortality if vehicles or other construction equipment traveling off of established roads lead to the collapse of small mammal burrows occupied by blunt-nosed leopard lizards. Removal or collapse of burrows could also occur from any excavation activities to repair, replace, or decommission infrastructure.

Indirect effects on blunt-nosed leopard lizards may result from edge effects from construction. These edge effects largely result from nearby human activities such as noise, motion, and night lighting; the introduction of non-native species; spills of hazardous materials that can further degrade habitat; and increased predation (e.g., injury or death from the introduction of more native or non-native predators adapted to disturbance). In addition, these activities could lead to increased disruption of life-history requirements, decreased reproductive success, and increased avoidance by individuals or groups of blunt-nosed leopard lizards. The loss of habitat as a result of covered activities would not result in additional habitat fragmentation because the proposed action is located at the southern edge of a large oil field, with existing development to the north, west, and east (HCP Figure 3-8). Suitable habitat immediately south of the project site would remain accessible by blunt-nosed leopard lizard.

Impact Assessment

The impact assessment for blunt-nosed leopard lizard assumes the permanent loss of 46 acres of habitat and the temporary loss of 9 acres of habitat within the study area where 283 acres of suitable habitat are present. Areas of permanent habitat loss would occur where the applicant develops project facilities (e.g., wells, well pads, roads, pipelines). Even after reclamation, disturbance could result in long-term avoidance by blunt-nosed leopard lizard such that affected habitat is no longer used by this species. Temporary habitat loss would occur during construction from pipeline disturbance corridors and construction staging areas. These activities would result in temporary reductions in habitat quality and loss of available suitable habitat for blunt-nosed leopard lizard that would be restored after construction activities are complete (within 1 year) and could provide habitat for blunt-nosed leopard lizard during the permit term.

Best management practices, general avoidance and minimization measures, and species-specific avoidance and minimization measures are presented in Section 5.3.1 of the HCP and will be incorporated into the implementation of covered activities to avoid and minimize effects on blunt-nosed leopard lizard and its habitat in the study area.

The resulting impacts from the permanent and temporary loss or conversion of blunt-nosed leopard lizard habitat and other effects described above are not expected to result in an adverse effect on the long-term conservation of the blunt-nosed leopard lizard for the following reasons.

- The amount of blunt-nosed leopard lizard habitat that will be permanently removed (46 acres) is a small proportion (approximately 16 percent) of the amount available in the project site.
- The permit area location at the southern end of the South Belridge Oil Field would limit adverse effects from habitat fragmentation.
- The avoidance and minimization measures identified in Section 5.3.1 of the HCP will minimize effects on blunt-nosed leopard lizards.
- Blunt-nosed leopard lizard occurs in the Buttonwillow Ecological Reserve, Elk Hills Conservation Area, and Lokern Ecological Preserve, protected areas that support the species population in the vicinity of the study area; therefore, the regional resiliency of the population should be strong.

- The protection and management of the mitigation sites will provide 154.8 acres of habitat for the species, ensuring that this habitat is maintained as suitable in perpetuity

Giant Kangaroo Rat

Potential Direct and Indirect Effects

Direct effects on giant kangaroo rat resulting from covered activities include potential death or injury and habitat degradation or loss. All types of covered activities (construction, production, O&M, and well plugging/abandonment) could result in the death or injury of giant kangaroo rat. Grading, excavating, stockpiling, or other construction-related earth-moving activities could crush or bury giant kangaroo rat. Giant kangaroo rats that are active aboveground during construction or earth-moving activities and are unable to escape the area could be directly injured or killed by construction vehicles or equipment, or by placement of construction materials on the ground in areas where giant kangaroo rats are active.

Giant kangaroo rats that are utilizing underground burrows (i.e., birthing and rearing young) in areas where construction activities are occurring could become entombed in burrows that collapse from construction equipment, resulting in injury or death. Similar injury or mortality effects on giant kangaroo rat could also result from vehicle and equipment use during O&M activities. Avoidance measures described in Chapter 5 of the HCP, including avoidance of active giant kangaroo rat precincts and implementation of a giant kangaroo rat relocation plan, will reduce threats and the likelihood of mortality of giant kangaroo rats that are affected by project activities.

Incidental contaminant releases associated with construction and production O&M activities (e.g., fuel spills) could result in harassment, injury, or mortality of individual giant kangaroo rats if the contaminant release were to occur directly on an individual or if an individual were to come in contact with a contaminant before it was contained and cleaned up. The likelihood of contaminant contact occurring is low with implementation of best management practices that would contain and clean up the contaminant, but potential effects could include death or injury from sub-acute toxic effects, which could include reduced or delayed reproduction, reduced feeding behavior, or increased juvenile mortality.

Indirect effects on giant kangaroo rat may result from edge effects due to construction and production O&M activities. Edge effects largely resulting from nearby human activities such as noise, motion, and night lighting; the introduction of non-native species; spills of hazardous materials that can further degrade habitat; and increased predation (e.g., injury or death from the introduction of more native or non-native predators adapted to disturbance). In addition, these activities could lead to increased disruption of life history requirements, decreased reproductive success, and increased avoidance by individuals or groups of giant kangaroo rat. Construction and production O&M activities could displace giant kangaroo rat by forcing them to abandon the area to avoid harm, potentially resulting in significant impairment or disruption of normal behavioral patterns. This displacement could reduce productivity and survival as the species would expend more energy locating replacement habitat. In addition, the species would be less familiar with new habitat areas and would be at an increased risk of predation, limiting survival of adults or offspring.

Covered activities that result in soil compaction through the use of heavy construction or maintenance equipment could result in harm or harassment to giant kangaroo rat. The weight of some construction equipment could compact soil and destroy giant kangaroo rat seed caches (tiny pit patches approximately 1 inch deep where seeds are stored) (U.S. Fish and Wildlife Service 1998).

Seed caches are often scattered throughout the home range of individuals. Seed caches that are compacted to a density at which the giant kangaroo rat could not access the seeds would result in loss of a food source and would affect foraging and feeding behaviors, especially during times of drought. The loss of seed caches could also displace giant kangaroo rat and cause them to abandon an area.

The loss of habitat as a result of covered activities would not result in additional habitat fragmentation because the proposed action is located at the southern edge of a large oil field, with existing development to the north, west, and east (HCP Figure 3-9). Suitable habitat to the south of the project site would remain accessible by giant kangaroo rat.

Impact Assessment

The impact assessment for giant kangaroo rat assumes the permanent loss of 46 acres of occupied habitat and the temporary loss of 9 acres of occupied habitat within the project site. Areas of permanent habitat loss would occur where the applicant develops project facilities (e.g., wells, well pads, roads, pipelines). Even after reclamation, disturbance could result in long-term avoidance by giant kangaroo rat such that the project site is no longer used by this species. Temporary habitat loss would occur during construction from pipeline disturbance corridors and other construction staging areas. These activities would result in temporary reductions in habitat quality and loss of available suitable habitat for giant kangaroo rat that would be restored after construction activities are complete (within 1 year) and could provide habitat for giant kangaroo rat during the permit term. Take would occur in the form of mortality, harm, and harassment.

Best management practices, general avoidance and minimization measures, and species-specific avoidance and minimization measures are presented in Section 5.3.1 of the HCP and will be incorporated into the implementation of covered activities to avoid and minimize effects on giant kangaroo rat and its habitat in the study area.

The resulting impacts from habitat loss and other adverse effects is not expected to result in adverse effects on the long-term conservation of giant kangaroo rat for the following reasons.

- The amount of giant kangaroo rat habitat that will be permanently removed (46 acres) is a small proportion (approximately 16 percent) of the approximately 282 acres of habitat available in the project site.
- Giant kangaroo rats displaced by the proposed action can disperse to large habitat patches elsewhere in the project site and south and east of the project site. Additionally, some of this habitat is protected as part of the Lokern Ecological Reserve.
- The permit area location at the southern end of the South Belridge Oil Field would limit adverse effects from habitat fragmentation.
- Implementation of the avoidance and minimization measures identified in Section 5.3.1 of the HCP will substantially minimize the potential for direct mortality of individuals and the effects on occupied giant kangaroo rat burrows.
- The protection and management of the mitigation sites will provide 102 acres of occupied habitat for the species, ensuring that this habitat is maintained as suitable in perpetuity.

San Joaquin Antelope Squirrel

Potential Direct and Indirect Effects

Direct effects to San Joaquin antelope squirrel resulting from covered activities include potential death or injury and habitat degradation or loss. All types of covered activities (construction, production O&M, and well plugging/abandonment) could result in the death or injury of antelope squirrels. Grading, excavating, stockpiling, or other construction-related ground-moving activities could crush or bury San Joaquin antelope squirrels. San Joaquin antelope squirrels that are active aboveground during construction and are unable to escape the area could be directly injured or killed by construction vehicles or equipment, or by placement of construction materials on the ground in areas where squirrels are active.

San Joaquin antelope squirrels that are using underground burrows (i.e., predator avoidance, denning) in areas where construction activities are occurring could become entombed in burrows that collapse from construction equipment, resulting in injury or death. Injury or mortality could also result from vehicle and equipment use during O&M activities. Avoidance measures described in Chapter 5 of the HCP, will be incorporated into the implementation of covered activities to avoid and minimize effects on San Joaquin antelope squirrel and its habitat in the study area.

Incidental contaminant releases associated with construction and O&M activities (e.g., fuel spills) could result in harassment, injury, or mortality of individual San Joaquin antelope squirrel if the contaminant release were to occur directly on an individual or if an individual were to come in contact with a contaminant before it was contained and cleaned up. The likelihood of contaminant contact occurring is low with implementation of best management practices that would contain and clean up the contaminant, but potential effects could include death or injury from sub-acute toxic effects, which could include reduced or delayed reproduction, reduced feeding behavior, or increased juvenile mortality.

Indirect effects on San Joaquin antelope squirrel may result from edge effects due to construction and production O&M activities. Edge effects largely resulting from nearby human activities such as noise, motion, and night lighting; the introduction of non-native species; spills of hazardous materials that can further degrade habitat; and increased predation (e.g., injury or death from the introduction of more native or non-native predators adapted to disturbance). In addition, these activities could lead to increased disruption of life history requirements, decreased reproductive success, and increased avoidance by individuals or groups of San Joaquin antelope squirrel. Construction and production O&M activities could displace San Joaquin antelope squirrel by forcing them to abandon the area to avoid harm, potentially resulting in significant impairment or disruption of normal behavioral patterns. This displacement could reduce productivity and survival as the species would expend more energy locating replacement habitat. In addition, the species would be less familiar with new habitat areas and would be at an increased risk of predation, limiting survival of adults or offspring.

The loss of habitat as a result of covered activities would not result in additional habitat fragmentation because the project occurs at the southern edge of a large oil field, with existing development to the north, west, and east (HCP Figure 3-10). Suitable habitat to the south of the project site would remain accessible by San Joaquin antelope squirrel.

Impact Assessment

The impact assessment for San Joaquin antelope squirrel assumes the permanent loss of 46 acres of suitable habitat and the temporary loss of 9 acres of suitable habitat within the project site. Areas of permanent habitat loss would occur where the applicant develops project facilities (e.g., wells, well pads, roads, pipelines). Even after reclamation, disturbance could result in long-term avoidance by San Joaquin antelope squirrel such that the project site is no longer used by this species. Temporary habitat loss would occur during construction from pipeline disturbance corridors and other construction staging areas. These activities would result in temporary reductions in habitat quality and loss of available suitable habitat for San Joaquin antelope squirrel that would be restored after construction activities are complete (within 1 year) and could provide habitat for San Joaquin antelope squirrel during the permit term. Take would occur in the form of mortality, harm, and harassment.

Best management practices, general avoidance and minimization measures, and species-specific avoidance and minimization measures are presented in Section 5.3.1 of the HCP and will be incorporated into the implementation of covered activities to avoid and minimize effects on San Joaquin antelope squirrel and its habitat in the study area.

The resulting impacts from habitat loss and other adverse effects is not expected to result in adverse effects on the long-term conservation of San Joaquin antelope squirrel for the following reasons.

- The amount of San Joaquin antelope squirrel habitat that will be permanently removed (46 acres) is a small proportion (approximately 16 percent) of the approximately 282 acres of habitat available in the project site.
- The permit area location at the southern end of the South Belridge Oil Field would limit adverse effects from habitat fragmentation.
- Implementation of the avoidance and minimization measures identified in Section 5.3.1 of the HCP will substantially minimize the potential for direct mortality of individuals and the effects on occupied San Joaquin antelope squirrel burrows.
- The protection and management of the mitigation sites will provide 182.8 acres of habitat for the species, ensuring that this habitat is maintained as suitable in perpetuity.

San Joaquin Kit Fox

Potential Direct and Indirect Effects

Direct effects on San Joaquin kit fox resulting from covered activities include potential harm and harassment and habitat degradation or loss. All types of covered activities (construction, production O&M, and well plugging/abandonment) could result in harm or harassment of San Joaquin kit fox. Kit foxes could traverse through the project site during construction, production O&M, or well plugging and could be harassed or injured by construction vehicles, personnel, or equipment. San Joaquin kit foxes are unlikely to move through the area while construction activities are actively occurring because they are largely nocturnal and because construction activities generally occur during the day. However, human-made structures such as culverts or pipes that are stored or built onsite may be used as dens (U.S. Fish and Wildlife Service 1998). Therefore, if kit foxes are in the area, they may be present at the start-up of daily project activities. Harm or harassment of San Joaquin kit foxes could occur during covered activities as a result of increased human presence in

the project site, including increased vehicular traffic in the project site and along West Side Highway, Lost Hills Road, and Delfern Road.

Indirect effects on San Joaquin kit fox may result from edge effects from project construction and operation. These edge effects largely result from nearby human activities such as noise, motion, and night lighting; the introduction of non-native species; spills of hazardous materials that can further degrade habitat; and increased predation (e.g., injury or death from the introduction of more native or non-native predators adapted to disturbance). Increased use of the site by predators (e.g., coyotes, red foxes, domestic dogs) attracted to the project site by trash discarded by construction personnel could also indirectly affect San Joaquin kit fox. In addition, these activities could lead to increased disruption of life-history requirements, decreased reproductive success, and increased avoidance by individuals or groups of San Joaquin kit fox.

If San Joaquin kit foxes are forced to abandon the area to avoid harm, this could result in impairment or disruption of normal behavioral patterns. This displacement could reduce productivity and survival as the species would expend more energy in locating replacement habitat. In addition, the species would be less familiar with new habitat areas and would be at an increased risk of predation or vehicle collisions, limiting survival of adults or offspring. San Joaquin kit foxes migrating or foraging near construction or production activities could also be affected by noise, lighting, and vibration from these activities; such disturbance could disrupt kit fox movement within and around the project site. The loss of habitat as a result of covered activities would not result in additional habitat fragmentation because the proposed action is located at the southern edge of a large oil field, with existing development to the north, west, and east (HCP Figure 3-11). Suitable habitat immediately south of the project site would remain accessible by San Joaquin kit fox.

Impact Assessment

The impact assessment for San Joaquin kit fox assumes the permanent loss of 46 acres of suitable habitat and the temporary loss of 9 acres of suitable habitat within the project site. Areas of permanent habitat loss would occur where the applicant develops project facilities (e.g., wells, well pads, roads, pipelines). Even after reclamation, disturbance could result in long-term avoidance by San Joaquin kit fox such that the project site is no longer used by this species. Temporary habitat loss would occur during construction from pipeline disturbance corridors and other construction staging areas. These activities would result in temporary reductions in habitat quality and loss of available suitable habitat for San Joaquin kit fox that would be restored after construction activities are complete (within 1 year) and could provide habitat for San Joaquin kit fox during the permit term. Take would occur in the form of harm and harassment (not mortality).

Best management practices, general avoidance and minimization measures, and species-specific avoidance and minimization measures are presented in Section 5.3.1 of the HCP and will be incorporated into the implementation of covered activities to avoid and minimize effects on San Joaquin kit fox and its habitat in the study area.

The resulting impacts from habitat loss and other adverse effects is not expected to result in adverse effects on the long-term conservation of San Joaquin kit fox for the following reasons.

- The amount of San Joaquin kit fox habitat that will be permanently removed (46 acres) is a small proportion (approximately 16 percent) of the approximately 282 acres of habitat available in the project site.

- Kit fox individuals may avoid displacement and adapt to the expanded human presence in the project site. San Joaquin kit foxes are adaptable to human presence and will use pipes, culverts, and other human-made structures for dens.
- The permit area location at the southern end of the South Belridge Oil Field would limit adverse effects from habitat fragmentation.
- Implementation of the avoidance and minimization measures identified in Section 5.3.1 of the HCP, including implementing a den replacement plan, will substantially minimize the potential for direct mortality of individuals and reproduction effects. San Joaquin kit fox populations are heavily influenced by survival rates of adults and juveniles and by annual fecundity rates, so limiting these effects will in turn limit effects on the local population.
- The protection and management of the mitigation sites will provide 214.8 acres of habitat for the species, ensuring that this habitat is maintained as suitable in perpetuity.

Effects on Non-Listed Special-Status Plant and Wildlife Species

Potential Direct and Indirect Effects

Several non-listed special-status species plant and wildlife species have the potential to occur within the project site. All types of covered activities (construction, production O&M, and well plugging/abandonment) could result in adverse direct impacts to these species. Grading, excavating, stockpiling, or other earth-disturbing activities associated with construction or production O&M activities could directly remove non-listed special-status plants and their habitat. These types of activities have the potential to affect any of the non-listed special-status species plant and wildlife species that have the potential to occur within the project site. Covered activities (construction, production O&M, and well plugging/abandonment) have the potential to result in the death or injury of any non-listed special-status reptiles, birds, and mammals should they occur in the study area during implementation of covered activities.

Similarly, indirect effects on any non-listed special-status plants that have the potential to occur within the project site would be associated with the potential for increased noxious and invasive weed invasion and spills of hazardous materials that would degrade existing suitable habitat for this species. Indirect effects to non-listed wildlife species would largely result from nearby human activities such as noise, motion, and night lighting; the introduction of non-native species; spills of hazardous materials that can further degrade habitat; and increased predation (e.g., injury or death from the introduction of more native or non-native predators adapted to disturbance). In addition, these activities could lead to increased disruption of life-history requirements, decreased reproductive success, and increased avoidance by individuals.

Impact Assessment

The impact assessment for non-listed special-status plants and wildlife assumes the permanent loss of 46 acres of suitable habitat and the temporary loss of 9 acres of suitable habitat within the project site, for the total 55 acres shown in Table 2-1. Areas of permanent habitat loss would occur where the applicant develops project facilities (e.g., wells, well pads, roads, pipelines). Even after reclamation, disturbance could result in a new soil regime in which non-listed special-status plants would not be able to germinate, or would germinate and survive at reduced levels due to habitat degradation, so the impact assessment assumes permanent habitat loss for project facilities; and disturbance could result in long-term avoidance by non-listed special-status wildlife species such

that the project site is no longer used by these species. Temporary habitat loss would occur during construction from pipeline disturbance corridors and other construction staging areas. These activities would result in temporary reductions in habitat quality and loss of available suitable habitat for non-listed special-status plants and wildlife that would be restored after construction activities are complete (within 1 year) and could provide habitat during the permit term.

The resulting impacts from habitat loss and other adverse effects are not expected to result in adverse effects on the long-term conservation of non-listed special-status plants and wildlife species for the following reasons.

- The amount of suitable habitat that will be permanently removed (46 acres) is a small proportion (approximately 16 percent) of the approximately 282 acres of habitat available in the project site.
- The permit area location at the southern end of the South Belridge Oil Field would limit adverse effects from habitat fragmentation.
- Implementation of the best management practices, general avoidance and minimization measures, and species-specific avoidance and minimization measures identified in Section 5.3.1 of the HCP will substantially minimize the potential for direct mortality of individuals and the effects on occupied habitat for non-listed special-status plants and wildlife.
- The protection and management of the mitigation sites will provide 182.8 acres of habitat for these species, ensuring that this habitat is maintained as suitable in perpetuity.
- Implementation of the mitigation measures from the Oil and Gas EIR listed in Table 3.2-3 below will be required of the project by Kern County and will reduce the potential for the proposed action to affect non-listed special-status plants and wildlife species.

Table 3.2-3. Oil & Gas EIR Mitigation Measures (Kern County Planning and Community Development Department 2015)

Species	Mitigation Measure
Non-Listed Special-Status Plants	MM 4.4-1, 4.4-3, and 4.4-12
San Joaquin Whipsnake, Silvery Legless Lizard, and Blainville's Horned Lizard	MM 4.4-1 and 4.4-3
Burrowing Owl	MM 4.4-1 and 4.4-4
Nesting Birds	MM 4.4-1 and 4.4-10
Non-listed Special-Status Rodents	MM 4.4-1 and 4.4-3
American Badger	MM 4.4-1 and 4.4-7

3.3 Climate Change

3.3.1 Affected Environment

Sections 4.7.1 through 4.7.3 of the Oil and Gas EIR presents the setting related to Climate Change for oil and gas projects in Kern County (Kern County Planning and Community Development Department 2015). These sections are incorporated by reference. Section 4.7.2 presents in detail the

connection between GHGs and climate change, including the basis for evaluating the effects of a project on climate change by calculating GHG emissions.

3.3.2 Environmental Consequences

Approach and Methods

Greenhouse gas (GHG) emissions generated during construction were quantified using assumptions for the construction of 67 proposed wells from the Draft IS/MND prepared for the T11-Block 12 Development Project (Dudek 2014), incorporated by reference, and the Road Construction Emissions Model (version 8.1.0). The Road Construction Emissions Model uses EMFAC2014 and OFFROAD emissions factors to estimate annual construction emissions. It was assumed at the time of this analysis that construction activities would commence in 2018 and conclude in 2021. Construction emissions were scaled by a factor of 131/67, which is the ratio of currently proposed wells divided by the number of proposed wells from the T11-Block 12 Development Project IS/MND.

Significance Criteria

Section 4.7.3 of the Oil and Gas EIR describes the federal regulatory background for GHG emissions. NEPA regulations do not provide any guidance on thresholds of significance for GHG emissions. The Service has determined that to inform the decision on the significance of effects on the human environment it is appropriate to use Appendix G of the State CEQA Guidelines; factual or scientific information and data; views of the public in the affected area; the policy/regulatory environment of affected jurisdictions; and regulatory standards of federal, state, regional, and local agencies. Therefore, in accordance with Appendix G of the State CEQA Guidelines, this analysis assumes that an effect would be considered significant if an alternative could generate a significant amount of GHG emissions, either directly or indirectly or conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

GHG emissions and conflicts with applicable GHG plans were evaluated based on project consistency with Assembly Bill (AB) 32 and Senate Bill (SB) 32. AB 32 and SB 32 outline the state's GHG targets and establish the state's framework for emissions reductions, as articulated by AB 32 and the 2017 Scoping Plan required under AB 32. Both identify cap-and-trade as an integral part of the state's ability to comply with AB 32 and SB 32. Accordingly, if the proposed action conflicts with the cap-and-trade program, it would conflict with AB 32, SB 32, and the state's overall GHG reduction goals, resulting in an adverse GHG effect.

Effects

No Action Alternative

Neither construction nor operation of the Block 12 Development Project would occur under the No Action Alternative. Accordingly, there would be no construction or operational emissions effect, and as such, no conflict with any GHG reductions plans. Accordingly, there would be no adverse GHG effect under the No Action Alternative.

Proposed Action Alternative

Construction of the proposed action would generate emissions of carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O) from mobile and stationary construction equipment, as well as from employee and haul truck vehicles.

Table 3.3-1 summarizes estimated annual GHG emissions that would be generated by construction of the proposed action. Please refer to Appendix A, Air Quality Modeling Results for modeling assumptions and calculations.

Table 3.3-1. Estimated Greenhouse Gas Emissions from Proposed Action Construction (metric tons/year)^a

Year	CO ₂	CH ₄	N ₂ O	CO ₂ e ^b
2018	236	<0.1	<0.1	238
2019	2,092	0.1	0.1	2,111
2020	2,060	0.1	0.1	2,078
2021	1,069	0.1	<0.1	1,078
Total	5,457	0.3	0.1	5,505
Annual Average	1,364	0.1	<0.1	1,376

^a Emissions include implementation of Oil and Gas EIR Mitigation Measure MM 4.3-4, which is required to control criteria pollutant emissions (refer to Section 3.2, *Air Quality*).

^b Refers to carbon dioxide equivalent, which includes the relative warming capacity (i.e., global warming potential of each greenhouse gas).

As shown in Table 3.3-1, construction of the proposed action would generate approximately 5,505 metric tons (MT) of carbon dioxide equivalent (CO₂e) over the 4-year construction period, or an average of 1,376 MT CO₂e per year. As with project-generated construction criteria air pollutants, GHG emissions generated during construction of the proposed action would be short term in nature, lasting only for the duration of the construction period, and would not represent a long-term source of GHG emissions. Emissions would also be negligible compared to total statewide and national GHG emissions.

The production phase, or operation, of the proposed project would not involve installation or use of new stationary, portable, or mobile combustion devices for operations nor generate new employee vehicle trips that would produce substantial GHG emissions during operations. The only minor source of GHG emissions would be from potential leaks of CH₄. As noted in Section 3.2 of this EA, Aera's operations are subject to compliance with its Title V (federal major source) permit for the Belridge Oil Field, which includes performance standards and has facility-wide requirements regarding inspection and maintenance of components to detect and minimize potential leaks of CH₄ (e.g., compliance with Rule 4401, Steam Enhanced Crude Oil Production Wells).

As an independent energy company engaged in the production, development, and exploration of crude oil, and natural gas within the State of California, Aera and its facilities are subject to CARB's cap-and-trade regulation. Emissions generated during operation of the proposed wells would be accounted for under Aera's annual emissions limit. Aera would purchase allowances, if required, consistent with the cap-and-trade regulation, which will offset GHG emissions and help the state achieve its emission reduction targets outlined under AB 32 and SB 32. Compliance with the cap-and-trade regulation would avoid or offset the impact of project-specific GHG emissions on global

climate change, and ensure consistency with adopted statewide emissions targets. Therefore, the proposed action would not have an adverse effect on global climate change.

3.4 Cultural Resources and Paleontological Resources

3.4.1 Affected Environment

For the purposes of this section, the study area is concurrent with the boundaries of the project site but does not include offsite permit areas (Section 20 and Section 28 mitigation properties) because management activities are not expected to affect any cultural resources or listed or eligible historic properties that may occur on the mitigation properties as described below. Information used in this section was compiled, in part, from the Draft IS/MND for the T11-Block 12 Development Project completed in 2016 (Dudek 2016c), and incorporated by reference as indicated below. In addition, Sections 4.5.1 through 4.5.3 of the Oil and Gas EIR presents the setting related to cultural and paleontological resources for oil and gas projects in Kern County (Kern County Planning and Community Development Department 2015). These sections are incorporated by reference.

3.4.2 Environmental Consequences

Approach and Methods

This section considers the potential environmental consequences of the proposed action on cultural resources based on information collected for the study area during the records search and pedestrian survey. Potential impacts related to cultural resources were assessed based on the Draft IS/MND prepared for the T11-Block 12 Development Project (Dudek 2016) and the Oil and Gas EIR, and these documents are incorporated by reference herein. Potential impacts on paleontological resources were assessed based on information presented in Section 4.5 of the Oil and Gas EIR, also incorporated by reference.

Cultural Resources within the Area of Potential Effects

Cultural resources investigations were conducted by Dudek in March 2016. Results are detailed below. For the purposes of this analysis, the area of potential effects (APE) is defined as the maximum possible area of direct impact resulting from the proposed action, including all areas that would be subject to ground disturbance. The APE does not include the Section 20 and 28 mitigation properties because only very minimal ground disturbance is proposed in those areas from management actions.

Records Search

A records search for the project site and vicinity was conducted in March 2016. Results of the search indicate a total of four previous cultural resources studies have covered a portion of the project site and four additional studies have been conducted within the vicinity. No previously recorded cultural resources were identified within the project site.

Fieldwork

On March 18 and 21, 2016, a field reconnaissance survey of 1,920 acres of which the project site is a part, was conducted by Dudek archaeologists (Dudek 2016c). The ground surface was examined for evidence of cultural deposits. The entire project site was surveyed by walking in parallel transects or covered via vehicle inspection to look for surface artifacts or features. No cultural artifacts or features were identified during this survey. Portions of the study area appear to have been previously disturbed by road construction, off-road driving, and the excavation of drainage ditches.

Native American Consultation

As part of the cultural resources study for the proposed action (Dudek 2014), the Native American Heritage Commission (NAHC) was consulted on June 17, 2013 to request a search of the Sacred Lands File for cultural resources in the study area. NAHC records indicated no previously identified sacred lands or areas of cultural importance within the study area. Letters were sent to Native American Tribes and individuals identified by NAHC, requesting information they may have relating to cultural resources that may be affected by the proposed action. To date, no responses have been received.

Paleontological Resources

As presented in detail in Sections 4.5.1 through 4.5.3 of the Oil and Gas EIR, approximately 65% of rock units in Kern County have limited paleontological resource potential. The remaining 35% have the potential to contain unique paleontological resources.

Significance Criteria

An adverse effect on cultural resources is any effect that alters, directly or indirectly, the qualities that make a resource eligible for listing in the National Register of Historic Places. Likewise, an adverse effect on paleontological resources is an effect that destroys a unique paleontological resource.

NEPA and the National Historic Preservation Act (NHPA) establish the federal policy of preserving important historic, cultural, and natural aspects of our national heritage during federal project planning. All federal or federally assisted projects requiring action pursuant to NEPA Section 102 must take into account impacts on cultural resources (42 United States Code Sections 4321–4347). NEPA analysis should identify the potential for an action to adversely affect resources that are listed or may be eligible for listing in the National Register of Historic Places (NRHP). Because NEPA does not have regulations that establish impacts thresholds for cultural resources in particular, the NHPA Section 106 criteria for adverse effect are typically used to identify adverse effects under NEPA.

The Section 106 criteria of adverse effect state that projects that would have an adverse effect on historic properties are those that would alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association (36 CFR 800.5[a][1]). For the purposes of this analysis, "alteration of qualifying characteristics" may include but is not necessarily limited to the following.

- Physical destruction of all or part of a property.

- Alteration of built-environment resources that is not consistent with the federal standards for treatment of historic properties (36 CFR 68).
- Removal of a property from its historical location.
- Alteration of the significant features of a property or introduction of incongruous elements to the setting.
- For federally owned properties, transfer of the property out of federal control without adequate and legally enforceable mechanisms to ensure preservation.
- Neglect of a property that results in deterioration (36 CFR 800.5[a][2]).

Effects

No Action Alternative

Under the No Action Alternative, the proposed action would not be implemented and the project site and mitigation properties would continue to be unused vacant land. No adverse effects on known archaeological, historic, or paleontological resources would occur, and no new ground-disturbing activities would occur or have the potential to affect previously unknown cultural or paleontological resources.

Proposed Action Alternative

Potential Effects on Historic and Archaeological Resources

The project site consists of undeveloped land; there are no historical resources on the site and no other information in the archives indicating that the project site would otherwise qualify as a historical resource under Section 106.

No archaeological artifacts or cultural features were identified by Dudek (2016c) in the records search or during the pedestrian survey of the project site, and no known archaeological resources were identified within 0.5 mile of the project site. These results indicate that there is a very low potential for the inadvertent discovery of cultural resources during construction of the proposed project or during operations and maintenance. The potential exists for encountering unrecorded, buried prehistoric or historic-period archaeological resources during construction of the covered activities. Oil and Gas EIR Mitigation Measures MM 4.5-1 and MM 4.5-4 require that projects submit an application plan to determine if any further cultural resources studies will be needed and address inadvertent discoveries of archaeological resources.

A search of the NAHC Sacred Lands File did not indicate previously identified sacred lands or areas of cultural importance. The records search did not indicate any formal cemeteries in the study area. Therefore, the potential for discovery of human remains during implementation of the proposed action is low. However, in the unlikely event that human remains are encountered during implementation of the proposed action, Oil and Gas EIR Mitigation Measure MM 4.5-5 would reduce impacts on human remains.

With implementation of Oil and Gas EIR Mitigation Measures MM 4.5-1, MM 4.5-4, and MM 4.5-5, the effects of the Proposed Action Alternative would not be significant.

Potential Effects on Paleontological Resources

Ground-disturbing activities during project construction could inadvertently uncover fossil material. Implementation of Oil and Gas EIR Mitigation Measure MM 4.5-2 would reduce the potential for the proposed action to affect paleontological resources. Therefore, the effects of the Proposed Action Alternative would not be significant.

3.5 Geology, Seismicity, Soils, and Mineral Resources

3.5.1 Affected Environment

Potential impacts related to geological and mineral resources were assessed based on the Draft IS/MND prepared for the T11-Block 12 Development Project (Dudek 2016) and the Oil and Gas EIR, and these documents are incorporated by reference herein. In addition, Sections 4.6.1 through 4.6.3 and Sections 4.11-1 through 4.11-3 of the Oil and Gas EIR presents the setting related to geological and mineral resources for oil and gas projects in Kern County. These sections are incorporated by reference.

Project Site Topography and Soils

The project site is located on privately owned surface and mineral land in the southern end of the Belridge Oil Field. Topography is generally flat throughout the project site. Elevation ranges from 500 feet above mean sea level at the eastern boundary to approximately 580 feet above mean sea level at the western boundary.

As discussed in the HCP, soils in the area are composed primarily of Kimberlina sandy loam, 2 to 5 percent slopes (approximately 49 percent); Panoche clay loam, 0 to 2 percent slopes (approximately 40 percent); and Kimberlina gravelly sandy loam, 2 to 5 percent slopes (approximately 11 percent). Smaller areas are composed of Panoche clay loam, saline-alkali, 0 to 2 percent slopes (approximately 0.4 percent) and Milham sandy loam, 0 to 2 percent slopes (approximately 0.1 percent).

Seismicity and Faults

The project is not within an Alquist–Priolo Fault Zone and fault rupture impacts are not anticipated since there are no known active faults that cross on or near the project site. The San Andreas fault is the closest known active regional fault and is about 12 miles west of the project site. Other major fault lines in the area include White Wolf, Garlock, and Kern County faults, located on the central and eastern portions of the County (Kern County 2009:Figure 13).

Additional hazards such as ground-shaking, liquefaction, and slope failures are discussed in detail in the Oil and Gas EIR, and are incorporated by reference.

Mineral Resources

The project site is located within an area classified as MRZ-2a, which includes areas underlain by mineral resources. The project site lies within the DOGGR Designated South Belridge Oil Field. Dominant activities in and around the project site include oil and natural gas production and agriculture.

3.5.2 Environmental Consequences

Approach and Methods

Potential impacts in the study area related to geology, soil and mineral resources, and seismicity that could occur as a result of implementing the alternatives were assessed based on the analysis of impacts of oil and gas projects presented in Sections 4.6-4, 4.6-4, 4.11-4, and 4.11-5 of the Oil and Gas EIR, and the Draft IS/MND prepared for the T11-Block 12 Development Project (Dudek 2014), which are incorporated by reference.

Significance Criteria

An alternative would be considered to have a significant impact if it expose people or structures to increased risk related to strong seismic ground shaking, expansive soils, landslides or other slope failure, result in substantial soil erosion or the loss of topsoil or result in the loss of availability of a known mineral resource.

Effects

No Action Alternative

Under the No Action Alternative, the proposed action would not be implemented and the project site and mitigation properties would continue to be unused vacant land. Therefore, no impacts on geological, soils, and mineral resources in the study area would occur beyond those associated with existing conditions. Seismic risks to people and structures in the study area would remain unchanged and generally low, given the lack of built habitable infrastructure.

Proposed Action Alternative

Exposure to Risk from Fault Rupture, Seismic Ground Shaking, Slope Failure and Landslides

Because, as described above, no active faults intersect the project site, fault rupture is unlikely to occur during project implementation.

Due to the flat nature of the site, as described above, potential impacts related to landslides are considered negligible.

It is recognized that the project, which includes the drilling of 98 oil producer wells and 33 steam injectors, is located in a seismically active area. The potential of negative impacts from the project are relatively low based on the following factors.

The project is not designed for human occupancy on a permanent or semi-permanent basis, thus potential risk of seismic phenomena (including seismic shaking and secondary effects such as liquefaction) affecting users would be very limited. Furthermore, the small number of personnel required for operation and maintenance of said infrastructure would be onsite on a temporary basis only (once a month).

Additionally, well construction utilizes large-capacity (deep drilling) rigs that have a low center of gravity with heavy base substructures, and that taper up to a smaller top member. This low center of gravity design effectively allows the rig to withstand shaking and movement without falling over.

Furthermore, the project would be subject to DOGGR regulations which require considerations for seismic safety in the design of oil and gas wells. These requirements include Sections 1722.2 and 1722.3 of Title 14, Division 2, Subchapter 4, which require well casings to take into account known geological conditions. Consequently, any new wells and infrastructure associated with the project would be designed by an engineer to resist any seismic-related impacts pursuant to Sections 1722.2 and 1722.3.

Soil Erosion and Loss of Topsoil

The project would not result in substantial soil erosion or the loss of topsoil because the project site is flat and the project features do not include substantial earthwork and the creation of new slopes that could increase soil erosion rates. Furthermore, the project would comply with the Statewide Construction General Permit that requires implementation of a stormwater pollution prevention plan (SWPPP) to address erosion and sedimentation at the project site during construction activities. As a part of compliance with the SWPPP, temporary best management practices (BMPs), such as silt fences, straw wattles, sediment traps, gravel sandbag barriers or other effective BMPs would be implemented to control runoff and erosion during construction activities. Implementation of erosion and sediment control BMPs would prevent substantial soil erosion and sedimentation from exposed soils.

Expansive Soils

The project's fine-grained, cohesive clay soils expand when moisture is added and can stress infrastructure within the surface. Well casing installation must conform to Sections 1722.2 and 1722.3 of Title 14, Division 2, Subchapter 4 of DOGGR regulations, which require that well casings take into account known geological conditions and known engineering factors. During the drilling process, steel casing would be installed and cemented in the wells to prevent the sides of the well bores from collapsing or caving. Thus, constructing the project on Quaternary alluvium soil will not create a risk to life or property, and impacts related to expansive soils are not anticipated.

Subsidence

Subsidence in oil and gas fields is monitored by DOGGR, who regulates oil and gas withdrawal and re-pressuring of fields. Specifically, under PRC Title 3, Article 5.5, Section 3315 et seq., DOGGR maintains underground pressures via re-pressuring operations requirements (e.g., fluid reinjection) where needed. In addition to this DOGGR program, project features include injecting produced water into the producing oil reserve, so significant subsidence is not anticipated as result of the project.

Historic land subsidence (occurring from the 1950s through 1960s) in the San Joaquin Valley has primarily resulted from the overdraft of groundwater and associated aquifer-system compaction (hydrocompaction) from crop irrigation. Subsequent surface water imports via the California Aqueduct and the associated decrease in groundwater pumping (starting in the late 1960s) has resulted in a steady recovery of water levels and reduced rate of compaction. Approximately 2.5 acre-feet of water would be needed for site preparation (to be used primarily for dust control) and an additional 2.5 acre-feet of water would be required for drilling operations (to be used primarily for drilling fluid and mud). However, the water would be supplied by Aera and not from a local groundwater source. Thus, implementation of the project is not expected to increase ground subsidence in the project site or its vicinity.

Mineral Resources

The project site lies within the DOGGR Designated South Belridge Oil Field in an area classified as MRZ-2a (areas underlain by mineral resources). Activities in and around the project site include oil and natural gas production and agriculture, which are consistent with the Kern County General Plan land use designation. The continuation of oil exploration and production activities under the project would allow continued access and use of these resources; thus, the project would not result in the loss of availability of a known mineral resource.

3.6 Hazards and Hazardous Materials

3.6.1 Affected Environment

Information used in this section was compiled, in part, from the Oil and Gas EIR and the Draft IS/MND for the T11-Block 12 Development Project completed in 2014 (Dudek 2014). In addition, Sections 4.8.1 through 4.8.3 of the Oil and Gas EIR presents the setting related to hazards for oil and gas projects in Kern County. These sections are incorporated by reference.

Hazardous Waste Sites Database Search

A search of the California Department of Toxic Substance Control database for hazardous waste sites was conducted for the study area. Results indicate that the study area is not located on a listed hazardous waste materials site. The database search, compiled pursuant to Government Code Section 65962.5, included all available federal, state, regional, and local agency database listings.

Nearby Schools and Airports

The school nearest to the study area is located approximately 5.5 miles northwest of the project site (Belridge Elementary School). McKittrick Elementary School is approximately 7.5 miles south of the project site.

The public use airport closest to the study area is Elk Hills-Buttonwillow Airport, located approximately over 7.5 miles southeast of the project site and offsite mitigation lands. The nearest private airstrip is Belridge Airstrip is located over 4.0 miles from the project site and offsite mitigation lands.

Fire Protection

The study area is in a rural area surrounded by oil fields and associated facilities. The study area generally consists of low-density shrubland, which poses a threat for wildland fires.

The project site and mitigation sites have remained relatively undisturbed and have not undergone historical disturbances from oil and gas activities.

The project site is located in a Local Responsibility Area (California Department of Forestry and Fire Protection 2007); therefore, fire protection would be provided by Kern County. In the event of a wildland fire, the Kern County McKittrick Station (Station 24) at 23246 Second Street would provide initial response fire protection services for the project site. If needed, the California Department of Forestry and Fire Protection would also provide fire protection services to the project site.

Historically, the risk for wildland fires in DOGGR designated oil fields has been low. County and Aera fire regulations, as well as industry standard policies and BMPs such as no smoking onsite, vegetation management, and properly bonded and grounded metal containers, would reduce the potential for wildland fire.

3.6.2 Environmental Consequences

Approach and Methods

Potential impacts related to hazards and hazardous materials were assessed based on the Oil and Gas EIR, the Kern County Oil and Gas Permitting Handbook (Kern County Planning and Natural Resources Department 2016), and the Draft IS/MND prepared for the T11-Block 12 Development Project (Dudek 2014), and are incorporated by reference. In particular, Sections 4.8.4 and 4.8.5 of the Oil and Gas EIR presents an assessment of the hazards and hazardous materials impacts of oil and gas projects in Kern County. These sections are incorporated by reference.

Significance Criteria

An alternative would be considered to have a significant impact if it would create a substantial hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials, through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment, impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan, or expose people or structures to a significant risk of loss, injury, or death involving wildland fires.

Effects

No Action Alternative

Under the No Action Alternative, the proposed action would not be implemented and the project site and mitigation properties would continue to be unused vacant land. Adjacent oil field production and grazing activities would presumably continue. No impacts related to hazards or hazardous materials would occur in the study area beyond those related to current land uses, such as the risk of wildland fire.

Proposed Action Alternative

Hazards to the Public or Environment Related to Construction

Construction of the proposed project would involve small quantities of commonly used materials, such as fuels, oils, lubricants, hydraulic fluids, and solvents to operate construction equipment as well as to drill at existing oil and gas sites. Any of these materials could be accidentally released into the environment during routine use and could affect construction personnel or the environment. Implementation of Oil and Gas EIR Mitigation Measures MM 4.8-1 through MM 4.8-9 would reduce the potential for the proposed action to affect the public or the environment through the routine transport, use, or disposal of hazardous materials.

Although the potential for hazards related to construction of the project under the Proposed Action Alternative would be greater than under the No Action Alternative, this impact would not be significant.

Hazards to the Public or Environment Related to Operation and Maintenance

Operations and maintenance activities under the proposed action would include production pipelines transporting oil and production water and the use of both light and heavy equipment. Inspection, replacement, and maintenance of pipelines and pipeline corridors, including vegetation removal to allow for visual inspection, would occur at regular intervals. There is also a potential for an accidental release during drilling operations if there is a blowout.⁴ Any of these materials could be accidentally released into the environment during routine use and could affect construction personnel or the environment.

To help reduce the potential of releasing hazardous materials into the environment in the case of a blowout, surface casings would be set and cemented and blowout prevention equipment would be installed at each wellhead and tested to minimize the potential releases associated with blowouts. Requirements for well casing design and blowout prevention equipment would be regulated by the DOGGR, in accordance with 14 CCR, Division 2, Chapter 4, Subchapter 1, Article 3, Sections 1722.2, 1722.3, and 1722.6. In addition, all production facilities storing fluids would have secondary containment as required by 14 CCR Section 1773.1. Implementation of Oil and Gas EIR Mitigation Measures MM 4.8-1 through MM 4.8-14 would also reduce hazard risks to personnel, the public and the environment.

Although the potential for hazards related to operations and maintenance of the project under the Proposed Action Alternative would be greater than under the No Action Alternative, this impact would not be significant.

Impairment of, Implementation of, or Physical Interference with an Adopted Emergency Response Plan or Emergency Evacuation Plan

During construction, there would be a temporary increase in traffic and vehicles used, generating 4 to 12 passenger car/pickup truck round trips per day and 2 heavy truck round trips per day. The majority of construction-related haul trips would occur internally on private roads within the Belridge Oil Field complex. This increase is not anticipated to interfere with emergency vehicles, routes, or emergency response plans.

During operations and maintenance, vehicle use would be similar to existing conditions. Operations and maintenance would not alter any existing or adopted emergency response plans or emergency evacuation plans for the local area.

This impact would be only marginally increased under the Proposed Action as compared to the No Action Alternative where construction-related traffic would not occur.

⁴ A blowout is the uncontrolled release of crude oil from an oil well after pressure control systems have failed.

Exposure of People or Structures to a Substantial Risk Involving Wildland Fires

The proposed project is located in an area that poses a threat for wildland fires. Construction activities (e.g., use of heavy equipment, welding) under the proposed action have the potential to ignite fires.

Historically, the risk for wildland fires in DOGGR Designated Oil Fields has been low. Regulations and industry standard policies/BMPs would minimize the potential for wildland fire. In addition, once facilities are built, few personnel would be required onsite, thereby lowering the potential for human-caused fires.

The mitigation properties would largely remain as-is and very few people would visit these sites (e.g., only for periodic management and monitoring activities). As a result, the wildland fire risk on the mitigation properties would be slightly lower than that for the project site. Implementation of standard policies/BMPs would ensure impacts associated with wildland fires would not be significant. This impact would be greater than the risk for human-caused fires in the study area under the No Action Alternative, where no new infrastructure or personnel would be required.

3.7 Hydrology and Water Quality

3.7.1 Affected Environment

Information used in this section was compiled, in part, from the Oil and Gas EIR and the Draft IS/MND for the T11-Block 12 Development Project completed in 2014 (Dudek 2014) and are incorporated by reference. Sections 4.9.1 through 4.9.3 of the Oil and Gas EIR presents the setting related to hydrology and water quality for oil and gas projects in Kern County. These sections are incorporated by reference.

Flood Zones

The project site is within Federal Emergency Management Agency (FEMA) Zone X (unshaded), areas of minimal flood hazard, usually depicted on Flood Insurance Rate Maps as above the 500-year flood level (Federal Emergency Management Agency 2008). The Section 20 and 28 mitigation properties are also in FEMA Zone X (Federal Emergency Management Agency 2008), outside of the special flood hazard area. In addition, the proposed action would not include the construction of any housing. As a result, the potential for increased flooding as a result of the proposed action is not discussed further in this section.

Hydrology

Section 4.9.3 of the Oil and Gas EIR presents the environmental setting related to hydrology and water quality for oil and gas projects in Kern County. This section is incorporated by reference.

Project Area Surface Water

The study area is located within the larger Tulare Lake Bed Subbasin (HUC 18030012). The project site is within the Upper Kern River Flood Canal watershed (HUC 1803001212) which covers approximately 461.86 square miles. The Section 20 mitigation site is in the Lower Kern River Flood Canal watershed (HUC 1803001216) and the Section 28 mitigation site is in the Browns Canyon

watershed (HUC 1803001211). The project site is within the Kern County Basin Management Area, which includes the Kern River and the Poso Creek drainage areas, as well as the drainage areas of westside streams in Kern County (Central Valley Regional Water Quality Control Board 2002).

There are no streams, rivers, identifiable drainage features, wetlands, or other waters of the U.S. present on the project site. Streamflow is produced by local and basinwide rainfall in addition to snowmelt from the Sierra Nevada. Water diversions for agricultural, municipal, habitat restoration, and industrial uses occur upstream of and within the county. Surface runoff from precipitation has the potential to enter the permit area via ephemeral drainages. There are no perennial surface water features within the permit area.

Salt Creek is immediately south of the project site. Adobe Canyon Creek is approximately 2 miles southeast of the project site, and Chico Martinez Creek is approximately 3 miles northwest of the project site. The California Aqueduct and Soda Lake are approximately 3 miles east and 16 miles southwest of the site, respectively. Although Soda Lake has standing water during wet periods, it is a closed drainage basin, and dry during most of the year. Lake Isabella Dam is located approximately 40 miles northeast of Bakersfield. However, the project site is located outside of the Lake Isabella Dam inundation area.

Water Quality

Water quality in a typical surface waterbody is influenced by processes and activities that take place within the watershed. Most oil field wastewaters contain salts, oil and grease, and organics that present a threat to the beneficial uses of underlying groundwater quality. Oil field wastewaters are considered either designated or non-designated wastes (Central Valley Regional Water Quality Control Board 2002). Because of the closed nature of the Tulare Lake Basin, there is little subsurface outflow. As a result, salts accumulate within the basin due to importation and evaporative use of the water. The accumulation of salts is the predominant water quality concern in the basin (Central Valley Regional Water Quality Control Board 2016). During rain events, some surface waters in the basin appear brown indicating there is a large quantity of sediments in the water. Improperly graded subdivisions are believed to contribute large quantities of sediment as well as eroding roads, grazing, and other activities. These sediments may be impairing the municipal, recreational, and habitat beneficial uses of affected waterbodies.

Although there are no streams within the study area listed as being impaired for any constituents, the *Tributary Rule* states that upstream unimpaired water must not contribute to downstream water quality impairments. Soda Lake list as impaired under Section 303(d) of the Clean Water Act as impaired for (unionized) ammonia (State Water Resources Control Board 2015). Although there are no beneficial uses-listed water resources within the study area, the *Water Quality Control Plan for the Tulare Lake Basin* identifies Agricultural Supply (AGR), Industrial Service Supply (IND), Industrial Process Supply (PRO), Water Contact Recreation (REC-1), Non-Contact Water Recreation (REC-2), Warm Freshwater Habitat (WARM), Wildlife Habitat (WILD), Rare, Threatened or Endangered Species (RARE), and Groundwater Recharge (GWR) as beneficial uses (Central Valley Regional Water Quality Control Board 2016).

Groundwater type on the west side of the groundwater basin are primarily sodium sulfate to calcium-sodium sulfate. In the western portion of the basin, water quality in shallow groundwater presents problems for agriculture. The average total dissolved solid in groundwater is 400–450 milligrams per liter (mg/L) with a range of 150–5,000 mg/L. High total dissolved solid, sodium chloride, and sulfate are associated with the axial trough of the subbasin. Elevated arsenic

concentrations exist in some areas associated with lakebed deposits (California Department of Water Resources 2006).

Groundwater

The proposed action is in the San Joaquin Valley Groundwater Basin, within the San Joaquin Valley - Kern County subbasin. The San Joaquin Valley is bound on the west by the Coast Ranges, on the south by the San Emigdio and Tehachapi Mountains, on the east by the Sierra Nevada and on the north by the Sacramento-San Joaquin Delta and Sacramento Valley. The study area lies within the western edge of the San Joaquin Valley Groundwater Basin, the northern portion of which drains toward the Delta by the San Joaquin River and its tributaries, the Fresno, Merced, Tuolumne, and Stanislaus Rivers. The southern portion of the valley is internally drained by the Kings, Kaweah, Tule, and Kern Rivers that flow into the Tulare drainage basin.

The Kern County Groundwater subbasin is bound on the north by the Kern County line and the Tule Groundwater subbasin, on the east and southeast by granitic bedrock of the Sierra Nevada foothills and Tehachapi Mountains, and on the southwest and west by the marine sediments of the San Emigdio Mountains and Coast Ranges. Major hydrologic features include Kern River and Poso Creek.

Natural recharge is primarily from stream seepage along the eastern subbasin and the Kern River. The largest contributor is recharge of applied irrigation water. Inflows to the subbasin include natural recharge, artificial recharge, applied water recharge, and subsurface inflow. Although there was some annual variability, the average subbasin water level was essentially unchanged from 1970 through 2000, with variable net water level changes in different portions of the subbasin (California Department of Water Resources 2006). Native groundwater in the study area is approximately 350 feet below ground surface (Dudek 2014).

3.7.2 Environmental Consequences

Approach and Methods

Potential impacts related to water quality and hydrology that could occur as a result of implementing the alternatives were assessed based on the analysis of impacts of oil and gas projects presented in Sections 4.9-4, and 4.9-5 of the Oil and Gas EIR and the Draft IS/MND prepared for the T11-Block 12 Development Project (Dudek 2014), which are incorporated by reference.

Significance Criteria

An alternative would have a significant impact on hydrology or water quality in the study area if it would substantially increase erosion or siltation within existing drainage patterns, degrade water quality by increasing the rate or amount of surface water runoff within the study area, deplete the groundwater supply, cause prolonged alterations to the historical baseline or desired water quality conditions, or create flood hazards.

Effects

No Action Alternative

Under the No Action Alternative, the proposed action would not be implemented and the project site and mitigation properties would continue to be unused vacant land. No impacts related to

hydrology, seasonal drainages, or water quality would occur in the study area beyond those related to current land uses and there would be no effects on groundwater resources or flood risk.

Proposed Action Alternative

Construction-Related Impacts

Project construction would disturb approximately 55 acres. All disturbance areas will remain unpaved. The proposed well pad disturbance areas will be grubbed and graded or compacted, and will disturb a total of approximately 33 acres. The unpaved access roads and pipeway corridors will disturb an additional 2 acres and 13 acres, respectively. Disturbed soil areas, including staging and storage areas, grading, and construction activities, could temporarily increase suspended particulates and turbidity or result in eroded soil and other nonpoint source pollutants that could drain to offsite areas and degrade local water quality during storm events. In addition, grading of the project site could create minor modifications to existing drainage paths. However, changes in flow paths including sheet flow of stormwater within the project site and offsite would be temporary and would be returned to existing conditions upon completion of construction activities. Furthermore, the site is relatively flat, therefore grading is not expected to result in excess soil. Grading would be designed to slow runoff velocities and reduce the potential for erosion and sedimentation once construction is complete. Roads and other work areas would be periodically sprayed with water for dust suppression during construction; however, no dust suppressants other than water will be used. Approximately 2.5 acre-feet of water would be needed for site preparation, primarily for dust control, and would be supplied from the Belridge Water Storage District (Dudek 2014), and would therefore not deplete groundwater supply.

Construction of the proposed project would involve front loaders, graders, backhoes, and trucks. Small quantities of fuels, oils, lubricants, hydraulic fluids, and solvents could be accidentally released and could increase the pollutant load in runoff being transported to receiving waters. Oil and Gas EIR mitigation measures noted below which will be required of the project by Kern County will address these potential impacts. A spill contingency plan (CCR Section 1722) will be prepared for the project and implementation of Oil and Gas EIR Mitigation Measures MM 4.9-1 and MM 4.9-2 would reduce potential water quality impacts. The potential for surface or subsurface discharges from well-construction and reworking activity could be significant without the implementation of mitigations, specifically Oil and Gas EIR Mitigation Measures MM 4.9-1, MM 4.9-2, and MM 4.9-3. In addition, the project will install and cement surface casing to prevent blowouts and contamination of freshwater aquifers in compliance with DOGGR regulations, CCR Title 14, Articles 1941–1942. Fluid disposal will follow Regional Water Quality Control Board regulations (CCR Title 23, Waters). The use and closure of any reserve pits will be handled in accordance with 27 CCR 20090(g) and the Statewide General Waste Discharge Requirements for Discharges to Land with a Low Threat to Water Quality (General Order 2003-0003-DWQ).

The Proposed Action Alternative includes preparation of a SWPPP and identification of project-specific BMPs consistent with the Construction General Permit to reduce construction-related impacts on water quality. Implementation of the SWPPP would reduce construction-related impacts on hydrology and water quality under the Proposed Action Alternative. Implementation of Oil and Gas EIR Mitigation Measures MM 4.9-1, MM 4.9-2, and MM 4.9-3 would also ensure that there would not be adverse effects related to hydrology and water quality through the transport, use, or disposal of hazardous materials.

Operational Impacts

Historic agricultural uses including dry-land farming and grazing on the project site and offsite mitigation lands have maintained permeable surfaces that allow for infiltration, lower runoff velocities, and limit channelization. The discontinuation of agricultural uses could allow surface water runoff to concentrate and form more well-defined drainage paths, which could increase drainage and peak runoff rates. However, the site is relatively flat, so stormwater runoff is not expected to result in excess runoff volumes or flow. The magnitude of this increase would be minor, if it increases at all. Grading would be designed to reduce slopes which would slow runoff velocities, and runoff would ultimately infiltrate into the ground.

During operation, 2.5 acre-feet of water would be required for drilling operations, primarily for drilling fluid and mud. Water would be supplied by Aera's 8,600-acre-foot annual allocation of water from the Belridge Water Storage District and not from a local groundwater source in the San Joaquin Valley. Water used in facility operations is derived from produced and treated water drawn from oil and gas production wells. The Belridge Water Storage District is supplied to the Belridge Producing Complex through a series of canals and pipelines and delivered by tap to trucks (Dudek 2014). Therefore, the proposed action would not deplete groundwater supply.

Operation and maintenance activities on the project site including use and closure of any reserve pits will be in compliance with the Statewide General Waste Discharge Requirements for Discharges to Land with a Low Threat to Water Quality (General Order 2003-0003-DWQ) and in accordance with 27 CCR Section 20090(g). Runoff pollution originating from any pesticides or fertilizers used in former farming practices on the project site would be discontinued, decreasing associated contaminants, and opportunities for filtration into the ground would continue to exist.

In summary, long-term operation of the Proposed Action Alternative would not adversely affect water quality or lead to a violation of water quality standards. Water used in operation and maintenance activities would infiltrate into the ground, and not cause sedimentation or other water quality concerns. Therefore, the Proposed Action Alternative would not contribute surface water runoff that would increase erosion or siltation, increase surface water runoff, or cause prolonged water quality conditions.

3.8 Socioeconomics and Environmental Justice

3.8.1 Affected Environment

Regulatory Setting

Executive Order 12898

Executive Order (EO) 12898, Federal Action to Address Environmental Justice in Minority Populations (1994), requires that all federal agencies consider environmental justice concerns when evaluating the potential effects of a proposed action. In general, EO 12898 seeks to ensure that environmental effects potentially associated with a federal action will not disproportionately generate high and/or adverse human health or environmental effects on minority and low-income populations and communities. The summary of EO 12898 is found on the EPA website:

<https://www.epa.gov/laws-regulations/summary-executive-order-12898-federal-actions-address-environmental-justice>.

Environmental Setting

Population

The study area is in a rural, largely undeveloped area of western Kern County dominated by oil fields and agricultural uses. The nearest communities are McKittrick, approximately 8 miles to the south, and Buttonwillow, approximately 12 miles to the east. The nearest residence to the project site is approximately 7.5 miles to the south.

Demographics

Race and Hispanic Origin

Table 3.8-1 lists the race and Hispanic origin for Census Designated Places (CDPs) near the study area, as well as Kern County and California as a whole (California Department of Finance 2011).

Table 3.8-1. Race and Hispanic/Latino Origin by Percentage

Jurisdiction	Total 2010 Population	White (%)	Black or African American (%)	American Indian and Alaska Native (%)	Asian (%)	Native Hawaiian and Other Pacific Islander (%)	Some Other Race (%)	Two or More Races (%)	Hispanic or Latino Origin (%)
California	37,253,956	57.6	6.2	1.0	13.0	0.4	17.0	4.8	37.6
Kern County	839,631	59.5	5.8	1.5	4.2	0.1	24.3	4.5	49.2
McKittrick CDP	115	86.9	0.8	0.8	3.2	0.4	6.1	4.3	7.8

Source: California Department of Finance 2010, 2011.

Labor Force and Unemployment Rates

The number of people considered to be in the labor force (i.e., actively working or seeking work) and the unemployment rates for California, Kern County, and McKittrick CDP are shown in Table 3.8-2.

Table 3.8-2. Labor Force and Unemployment Rates

	California	Kern County	McKittrick CDP
2017 Labor Force	19,159,000	389,300	100
2017 Unemployment Rate	4.9%	7.5%	20.7%

Source: California Employment Development Department 2017.

Income and Poverty Levels

The median family income and poverty levels collected during the 2012–2016 American Community Survey are shown in Table 3.8-3 (U.S. Census Bureau 2016).

Table 3.8-3. Family and Individual Income and Poverty Levels

Jurisdiction	Median Family Income	Families below Poverty Level (%)	Individuals below Poverty Level (%)
California	\$63,783	11.8	15.8
Kern County	\$48,574	19.2	23.1
McKittrick CDP	\$43,333	6.3	6.6

Source: U.S. Census Bureau 2016.

3.8.2 Environmental Consequences

Approach and Methodology

Demographic data from the U.S. Census Bureau and California Employment Development Department (2017) were used to assess potential effects on population and employment in the study area, including potential effects on environmental justice communities.

There would be no construction at the mitigation areas. These lands would be maintained as vacant and undeveloped. Therefore, potential impacts on socioeconomics and environmental justice as they relate to the offsite mitigation lands are not discussed further.

Significance Criteria

An action would be considered to have an adverse effect if it would adversely affect socioeconomic conditions, or disproportionately affect a minority or low income population.

Effects

No Action Alternative

Under the No Action Alternative, the proposed action would be not implemented and there would be no effect on socioeconomic conditions or environmental justice populations.

Proposed Action Alternative

Implementation of the Proposed Action Alternative would result in the construction and operation of oil field production facilities on the project site. Current Aera employees would be employed for construction. These employees reside in the project vicinity, most from Bakersfield. As a result, the proposed action would not have an effect on unemployment rates or income and poverty levels in the study area or vicinity. Similarly, it is unlikely that the population in the study area would be affected by implementation of the proposed action.

Table 3.8-1 summarizes the population composition in the study area by race and Hispanic origin. For the purposes of this analysis, minority populations include all ethnic groups that identify as anything other than *White*. Minority populations in Kern County represent 40.5% of the population,

a percent comparable to the state of California (42.4%) but far higher than the CDP of McKittrick (13.1%). Populations of Hispanic origin in the local area are lower than the statewide and county-wide averages.

Although income levels in the vicinity of the study area are lower than the statewide average, it is unlikely that the proposed project, utilizing current employees, would have a different or disproportionate effect on low income or minority populations. None of the potential effects identified in this EA (e.g., temporary increases in traffic and air emissions during construction) would exclusively affect a minority or low income population, or in a way that would result in a disproportionate effect on a minority or low income community, either as a result of the nature or the location of the specific impact. The proposed action would not bisect any communities, and would not result in the displacement of any residential homes or structures. As a result, impacts on socioeconomic conditions would not be significant, and disproportionate impacts on environmental justice communities would not be anticipated. Effects would be similar to those of the No Action Alternative.

Chapter 4

Additional Topics Required by NEPA

CEQ's NEPA regulations require that an environmental analysis include a discussion of "... any adverse environmental effects which cannot be avoided should the proposal be implemented, the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and any irreversible or irretrievable commitments of resources which would be involved in the proposal should it be implemented" (40 CFR 1502.6). This chapter addresses those additional required NEPA analyses.

4.1 Unavoidable Adverse Effects

As described in Chapter 3, the design criteria, avoidance, minimization and mitigation measures, conservation strategy, and measures included in the HCP associated with the proposed action, as well as the Oil and Gas EIR mitigation measures specifically noted which will be required of the project by Kern County, would ensure that there would be no unavoidable adverse effects from the covered activities. Unavoidable adverse impacts on the human environment are not anticipated.

4.2 Short-Term vs. Long-Term Productivity

Implementation of the proposed action would result in the permanent conversion of 46 acres of undeveloped land to a developed use producing oil over the anticipated 35-year life of the project. In addition, short-term uses related to construction activities have the potential to temporarily degrade 9 acres of habitat and disturb species known to occur at the project site.

Short-term uses related to construction activities are not expected to result in substantial adverse effects due to the design criteria, avoidance, minimization and mitigation measures, conservation strategy, and measures included in the HCP associated with the Proposed Action Alternative (see Chapter 2, *Proposed Action and Alternatives*), as well as the mitigation measures incorporated into

the project through the IS/MND adopted by CDFW. Moreover, the applicant will preserve habitat for the covered species in western Kern County to offset the effects of the taking that would result from project implementation. The applicant will conserve a total of 214.2 acres for compensatory mitigation of the estimated 46 acres of permanent habitat loss and degradation and 9 acres of temporary habitat disturbance resulting from the project. All land that is protected for the purpose of mitigation will be placed under a permanent conservation easement and managed in perpetuity to support and, if feasible, enhance the covered species.

4.3 Irreversible and Irretrievable Commitment of Resources

Implementation of the Proposed Action Alternative would result in an irretrievable commitment of resources necessary to construct the oil-producing wells, steam injection wells, pipelines, access roads, and overhead electric lines. This irretrievable commitment of resources would occur over a relatively small area (55 acres) adjacent to an existing oil and gas extraction field and impacts would not be significant. Energy resources would also be expended during construction; however, because the proposed action would involve development of energy resources, this expenditure would be offset by operation of the facilities once operational.

Chapter 5 Cumulative Effects

CEQ's NEPA regulations (40 CFR 1580.25, 1508.7) require federal agencies to consider the cumulative impacts of a proposed action. A cumulative impact is defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such actions..." (40 CFR 1508.7).

The assessment of cumulative effects in this EA considers ongoing land management activities and other future land use planning efforts or large-scale projects in the vicinity of the proposed action that could contribute to the cumulative effects of the proposed action. Such activities are anticipated to primarily consist of other oil and gas operations, as detailed in the Project Description for the Oil and Gas EIR, Sections 3.4 and 3.5. For the purposes of this document, the potential cumulative effects were taken to be the impacts of the whole of the proposed project analyzed by the Oil and Gas EIR, which assessed a future oil and gas development scenario in Section 3.5 of that document, which is incorporated by reference. Under the future oil and gas development scenario, over a 25-year period, the Oil and Gas EIR conservatively assumes that an average of 2,697 new producing wells per year could be drilled in the EIR project area as part of the potential future oil and gas development scenario. The project area considered in the Oil and Gas EIR consists of thousands of square miles. Cumulative projects would include other oil and gas extraction projects occurring within the Belridge Producing Complex, or operations in existing oil fields in the region such as Lost Hills, Cymric, and McKittrick Oil Fields.

The project is located within the existing Belridge Producing Complex and would add an additional 131 wells, including 98 oil producers and 33 steam injectors, to the thousands of wells currently operating in the Belridge Oil Field.

The Oil and Gas EIR concluded that impacts of all of the projected oil and gas operations, including the proposed project and cumulative projects as described above, would result in significant unavoidable effects in the areas of aesthetics, light and glare, odors, biological resources, GHG, groundwater levels and aquifer volumes, and water quality.

Table 5-1 summarizes the potential for the proposed project to contribute to cumulative impacts, based on the information presented elsewhere in this EA.

Table 5-1. Cumulative Impacts

EA Impact/ (Oil and Gas EIR Topic Name)	Oil and Gas EIR Impact (Cumulative Impact)	Project Impact	Project Contribution to Impact
Aesthetics (Aesthetics and Visual Resources)	Oil and gas operations would have aesthetic and light and glare impacts on sensitive receptors. <i>Oil and Gas EIR Section 4.1.4</i>	The project would have no effects related to aesthetics light and glare.	None.
Air Quality	The County concluded that odors would continue to be generated but would not affect sensitive receptors and that “oil and gas production and processing facilities were not likely to have potentially significant odor emissions”. <i>Oil and Gas EIR Section 4.3.4</i>	The project would not be likely to generate odors.	None.
Biological Resources	The County determined that cumulative impacts to biological resources in general, over the entire 3,110 square mile EIR study area, would be significant and unavoidable. <i>Oil and Gas EIR Section 4.4.5</i>	The project would cause 46 acres of permanently removed habitat ,	The project will not appreciably contribute to cumulative impacts to biological resources given the impacts are relatively small (only 46 acres), the project incorporated avoidance and minimization measures to protect various species, and there will be preservation of hundreds of acres of offsite conservation lands that far exceed the total number of

			habitat acres disturbed or removed.
Climate Change (Greenhouse Gases)	The County found that it did not have control over achievement of plans of state and federal agencies, and other local agencies, and so concluded that there could be a significant impact related to achievement of plans to reduce GHG emissions. <i>Oil and Gas EIR Section 4.7.4</i>	The project will be required to achieve no net increase in GHG emission and therefore will not have an effect related to GHG emissions.	GHG emissions are inherently cumulative. The project's emissions will be restricted to no net increase and therefore the project will not contribute to a cumulative impact.
Cultural and Paleontological Resources	None. <i>Oil and Gas EIR Section 4.5.4</i>	The project would have no adverse effects related to cultural and paleontological resources.	No cumulative impact
Geology, Seismicity, Soils and Mineral Resources (Geology and Soils; Mineral Resources)	None. <i>Oil and Gas EIR Sections 4.6.4 and 4.11.4</i>	The project would have no adverse effects related to geology, seismicity, soils and mineral resources.	No cumulative impact
Hazards and Hazardous Materials	None. <i>Oil and Gas EIR Section 4.8.4</i>	The project would have no adverse effects related to hazards and hazardous materials.	
Hydrology and Water Quality	Cumulative impacts on groundwater levels and aquifer volumes, and water quality <i>Oil and Gas EIR Section 4.9.4 and 4.17.4</i>	No effects on groundwater or water quality – project will not use groundwater for operational supply and has access to sufficient surface water supply.	No contribution
Socioeconomics and Environmental Justice (Population and Housing)	None. <i>Oil and Gas EIR Section 4.13.4</i>	The project would have no adverse effects related to socioeconomics and environmental justice.	No cumulative impact

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