

5. Cumulative Impacts

5.1 Introduction

The Council on Environmental Quality (CEQ) defines cumulative effects 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 other actions” (40 CFR 1508.7). The CEQ suggests cumulative impact analyses should focus on meaningful impacts, and not exhaustively analyze all possible cumulative impacts (CEQ, 1997). Therefore, the analysis in this RMPA and EIS focuses on past, present, and future actions that are anticipated to have environmental impacts similar to or impacting the same resources as, the direct and indirect impacts identified for each of the alternatives. Cumulative projects include those actions that result in meaningful impacts to historically important resources, those with a potential for violating legal standards or laws, or other identified projects or actions in the geographic scope that relate to the identified issues. Cumulative impacts will be analyzed only for those resources that have identified direct or indirect impacts.

5.1.1 Geographic Scope

The geographic scope for which the list of cumulative projects was determined includes the 12 counties within the boundary of the CCFO Planning Area. However, the specific geographic scope for each resource area will vary due to the different nature and extent of that resource. Each issue area analysis will consider the appropriate geographic scope due to the different nature and extent of the impacted resource area. The appropriate boundary depends on the accumulation characteristics of the effects being assessed (CEQ, 1997).

5.1.2 Timeframe

The timeframe of past, present, and probable future projects was determined as follows:

- **Past and Present Oil and Gas Development.** Existing oil and gas exploration and development as defined in the CCFO Reasonably Foreseeable Development (RFD) Scenario (see Appendix B), which reflects the cumulative baseline or existing conditions; projects other than oil and gas are reflected in the existing environment in Chapter 3;
- **Reasonably Foreseeable Development Scenario.** An estimate of the level and type of future oil and gas activity in the CCFO Planning Area (see Appendix B);
- **Reasonably Foreseeable Future Action.** Includes oil, gas, and other relevant projects that have either: submitted permit applications, begun the environmental review process, been approved, or are under construction within the geographic scope. These projects were identified from a review of the 2015 RFD Scenario, the 2007 HFO RMP and Final EIS (BLM, 2007), and the California Department of Conservation’s (DOC) Division of Oil, Gas, and Geothermal Resources (DOGGR) Analysis of Oil and Gas Well Stimulation Treatments (DOC, 2015).

5.2 Past, Present, and Reasonably Foreseeable Future Actions

5.2.1 Past and Present Oil and Gas Exploration and Development

As of mid-2014, there are 127 authorized oil and gas leases on Federal mineral estate within the CCFO Planning Area covering an estimated 41,360 acres. Eighty (80) producing/active oil and gas wells are located on Federal mineral estate within the CCFO Planning Area (CCST, 2015).

As described in the 2015 RFD Scenario, recent well drilling activity has not been evenly distributed across the CCFO Planning Area. Of the 12 counties in the CCFO Planning Area, five have had some recent levels of new well activity. However, existing wells are located on BLM-administered land only in the following counties: Contra Costa, Fresno, Monterey, San Benito, and Santa Cruz. No wells are located on BLM-administered land in Alameda, Merced, San Francisco, San Joaquin, San Mateo, Santa Clara, or Stanislaus Counties. In general, most of the new well activity in the counties covered by CCFO Planning Area occurs in Fresno County and in Monterey County (CCST, 2015).

The history of activity for oil and gas exploration and development on Federal lands within the planning area is minimal compared to private minerals. The most productive oil and gas fields in the CCFO Planning Area, in order of cumulative past production, include the following:

- Coalinga and Coalinga East Extension (Fresno County);
- San Ardo (Monterey);
- Lynch Canyon (Monterey);
- Jacalitos (Fresno);
- Kettleman North Dome (Fresno); and
- Hollister-Sargent (San Benito/Santa Clara).

In the last decade, nearly all well development occurred in the Coalinga, San Ardo, Lynch Canyon, and Jacalitos fields. Recent activity indicates that an annual average rate of between 140 and 210 wells per year have had first production or injection since 2002 in the region. Assuming that the development trend in this region is likely to continue for the next 15 to 20 years, up to 3,150 wells could be initiated over 15 years with over 99 percent of these wells located within the Coalinga, San Ardo, Lynch Canyon, and Jacalitos fields.

New oil and gas activity in the CCFO Planning Area has involved only limited levels of well stimulation by hydraulic fracturing, and for counties within the CCFO Planning Area. In the Fresno County portion of the CCFO Planning Area, which has the highest level of well stimulation, 4 percent of recently producing wells indicate any record of previous hydraulic fracturing (see Appendix B, RFD Scenario).

5.2.2 Reasonably Foreseeable Development Scenarios

The 2015 RFD Scenario was developed to estimate the level and type of future oil and gas activity in the CCFO Planning Area, and to provide a basis for assessing cumulative impacts. This 2015 RFD Scenario is applicable to all alternative scenarios, because the alternatives considered in the RMPA/EIS consider which BLM-administered lands to open or close to leasing, which would not impact the assumptions.

Furthermore, the RFD Scenario identifies areas within the CCFO Planning Area that have been categorized as high, moderate, and low to no occurrence potential, as summarized below and shown in Figure 5-1. Based on further analysis of the geology of the area and updated information, the areas of oil and gas occurrence potential have been modified from the 2007 HFO RFD Scenario for Oil and Gas. For a more detailed discussion of the oil and gas occurrence potential and the differences from the 2007 HFO RFD Scenario for Oil and Gas, see Appendix B.

High Oil and Gas Occurrence Potential

As illustrated in Figure 5-1, high oil and gas occurrence potential is located in southern San Benito County, southeastern Monterey County and western Fresno County. This area is part of the San Joaquin Basin and the Salinas Basin. The San Joaquin Basin has 8 oil fields that produce from Miocene and Pliocene marine sedimentary rocks. The Coalinga Field, located in western Fresno County, is the most productive field in the CCFO Planning Area and is currently the eighth largest oil and gas field in California. The entire San Joaquin Basin in the CCFO Planning Area is underlain by oil and gas plays, except for a 9-by-4-mile strip in the far northwest corner of the basin, just west of Westley.

Moderate Oil and Gas Occurrence Potential

The Sacramento Basin in the northeastern portion of the Planning Area has moderate oil and gas occurrence potential. There are 12 productive oil and gas fields and three abandoned fields in this area.

The La Honda Play is located within the northwestern area of the CCFO Planning Area. Four oil fields have been developed within this play. In 1983, there were estimated reserves of 1.7 million barrels of oil equivalents (MMBOE).

Low to No Oil and Gas Occurrence Potential

Within the CCFO Planning Area, the areas of low or no oil and gas occurrence potential are areas that are underlain dominantly by granitic, volcanic, metamorphic, and ophiolitic series rocks, as well as rocks of the Franciscan Formation. These areas of low or no oil and gas occurrence potential are shown on Figure 5-1.

5.2.3 Reasonably Foreseeable Future Actions

Oil and Gas Projects

Table 5-1 lists future oil and gas exploration and development projects that have been identified within the geographic scope.

Table 5-1. Cumulative Oil and Gas Projects

Project Name	Description	Location	Status
Phillips 66 Propane Recovery Project	Modification of 495-acre refinery to recover butane and propane from refinery fuel gas	Rodeo area, Contra Costa County	Operational, modification in environmental review

Sources: DOC, 2015.

Other Applicable Cumulative Projects

Other major projects producing related or cumulative effects, including large surface area disturbance, noise, air pollution, greenhouse gas emissions, water pollution, the use of hazardous materials, and/or high water usage, are included in this section. These projects include development projects, resource extraction activities, power generating facilities, renewable and non-renewable energy projects, large-scale infrastructure, flood control, and road improvement projects. The estimated average annual water use for irrigated cropland in California from 1998 to 2005 is summarized in Table 5-3. The estimates are provided for each hydrologic region within the CCFO Planning Area, as defined by the California Department of Water Resources (DWR) and the State Water Resources Control Board (SWRCB). The time frame considered in the EIS is a 10- to 15-year horizon. The cumulative analysis conservatively considers that future agricultural water use within this time frame will not vary substantially from that revealed in the data in the table below.

Table 5-2. Other Applicable Cumulative Projects

Project Name	Description	Location	Status
Alameda County			
Next Era Wind Repowering Project	135.7 MW; 8,950-acre wind repowering project	North and south of I-580, southeastern Contra Costa county and northeastern Alameda County	Environmental Review
SMP 30 Sunol Quarry Project (Expansion)	Quarry expansion project	Sunol, Alameda County	Environmental Review
Summit Wind Project (Altamont Winds)	95 MW; 7,650-acre wind project	South of I-580, northeastern Alameda County	Environmental Review

Table 5-2. Other Applicable Cumulative Projects

Project Name	Description	Location	Status
Contra Costa County			
No applicable cumulative projects have been identified in Contra Costa County.			
Fresno County			
Austin Quarry	671-acre aggregate mining project	8 miles north of Fresno, Fresno County	Environmental Review
Carmelita Aggregate Mine	900-acre aggregate mine	East of Sanger, Fresno County	Approved
Jesse Morrow Mountain Mine and Reclamation Project	824-acre aggregate mining, processing, and distribution facility	East of Sanger, Fresno County	Environmental review
Riverbend Sand and Gravel Project	619-acre aggregate mine	Southeast of Sanger, Fresno County	Environmental review
Tranquility Solar Generating Station	3,800-acre; 400 MW solar generating facility	Southwest of Tranquility, Fresno County	Approved
Merced County			
Don Chapin Concrete Batch Plant Project	26.9-acre project for the delivery and storage of materials, concrete mixing	Volta, west-central Merced County	Environmental Review
Leo/Vega Solar Project	1,009-acre; 150 MW solar PV power plant	Southwestern Merced County adjacent to I-5	Approved
Snellings Tailings Project	409-acre, dredge tailings removal project	Snelling, northeastern Merced County	Approved
Sumpter Project Mine and Reclamation Project	28-acre sand removal project	West of Atwater, Merced County	Approved
Wright Solar Park	1,600-acre; 200 MW solar PV power plant	Western Merced County	Environmental Review
Monterey County			
Stonewall Quarry	33-year extension of permit for 53-acre surface mine	2 miles northeast of Soledad, Monterey County	Active, Environmental review for extension
California Flats Solar	280 MW PV solar project	4 miles southeast of Parkfield, Monterey County	Environmental review
San Benito County			
Solargen Panoche Valley Solar Project	10,000+ acres; 1,000 MW solar facility	East-central San Benito County	Approved by County; NEPA environmental review ongoing
San Joaquin County			
Hendrick Pit	Aggregate mine	San Joaquin County	Approved
KRC Aggregates Mine Expansion Project	1,059-acre expansion to existing 1,048-acre quarry	Between Clements and Wallace, San Joaquin County	Approved
Tracy Lakes Quarry Excavation Project	Aggregate mine	6.5 miles northwest of Lodi, San Joaquin County	Approved
East and West Vernalis	Aggregate mines	Vernalis, San Joaquin County	Approved
Vernalis	Aggregate mine	Vernalis, San Joaquin County	Approved
Stanislaus County			
Riddle Surface Mine	436-acre aggregate mine	3 miles northwest of Newman, Stanislaus County	Environmental Review

Source: DOC, 2015.

Table 5-3. Average Annual Water Use for Irrigated Cropland 1998-2005

Hydrologic Region	Irrigated Crop Area ¹ (thousands of acres)	Quantity of Applied Water ² (million acre-feet)
San Francisco Bay	81	0.1
Central Coast	430	1.0
San Joaquin River	1,900	7.0
Tulare Lake	3,000	10.0

1 - The total amount of land irrigated for the purpose of growing a crop. Some land is cropped more than once during the year, so irrigated crop acreage exceeds irrigated land area

2 - Gross water use, includes water available for reuse

Source: DOC, 2015.

Reasonably Foreseeable Proposed ACEC Expansion

The CCFO is currently analyzing the potential expansion of the Panoche-Coalinga ACEC in southern San Benito and western Fresno Counties. The proposal is considering expanding existing ACEC and RNA designations to existing and acquired public lands, emphasizing recovery of special status species. The decisions related to oil and gas leasing within the potentially expanded ACEC would be made through this oil and gas leasing and development RMPA. Under the current range of alternatives in this EIS, the acreage within the potential expansion fall within a range of areas open to leasing with CSU stipulations, open to leasing with NSO stipulations, and closed to leasing.

5.3 Cumulative Impacts

5.3.1 Energy and Minerals

Cumulative impacts to energy and minerals would occur if impacts of the oil and gas development under the RFD Scenario combine with other projects or actions within the Planning Area to reduce access to or the development of energy or mineral resources. The geographic scope would be the Planning Area because decisions or development within the Planning Area are unlikely to impact developers outside of the Planning Area.

The BLM management decisions regarding energy are unlikely to combine with the list of cumulative projects to reduce the development of oil or gas in the CCFO Planning Area. This is because Counties take into consideration the need for energy during their General Plan and set aside areas for such development. Prior to approval of any of the projects listed in Table 5-2, the Counties would analyze whether the projects would restrict use of other resources such as energy and would reduce any loss of access if feasible and applicable. Alternatives A, C, D, and E are all expected to have minimal contributions to cumulative effects. Alternative B would place the most restrictions on where energy could be developed in the CCFO Planning Area on Federal mineral estate. This would result in a minor contribution to cumulative restrictions to energy development reducing the future energy development potential in this area.

As noted in Section 4.2, development of up to 37 wells in the CCFO Planning Area on up to 206 acres of land would result in only a minor loss of access to mineral resources. The majority of projects listed in Table 5-2 are mines and would not result in a cumulative loss of mineral resources when combined with the RMPA/EIS alternatives. While the renewable projects listed in Table 5-2 would require use of a large amount of acreage, each County would analyze whether the renewable projects would restrict other uses of the lands and mitigate for such loss. Consequently, cumulative impacts to minerals would be minor.

5.3.2 Geology

The geographic area considered for cumulative effects related to geologic hazards is within a 0.5-mile radius of open areas for all alternatives for seismic events. This is because impacts resulting from seismic events are localized in nature and are unlikely to extend beyond the actual oil and gas occurrence boundaries.

An oil and gas development would expose people and/or structures to geologic hazards, and a cumulative effect could occur if another project within a 0.5-mile radius would also expose people and/or structures to geologic hazards. The majority of the Federal mineral estate lands where the RFD Scenario would occur for Alternatives A, C, D, and E are not within 0.5-miles of other cumulative projects or existing infrastructure except within existing oil and gas fields. Cumulative effects due to ground shaking and other seismic events would therefore be limited in nature. Alternative B would limit the locations of the 37 wells to existing oil and gas fields and a buffer, but even in this instance, cumulative geologic effects are limited because each oil field development is required to provide civil engineering studies or geotechnical studies prior to developing the wells. Oil and gas development workers would be most at risk should a cumulative effect occur.

The potential for cumulative induced seismicity due to the combination of the RFD Scenario and the reasonably foreseeable future actions is low as there are only three cumulative oil and gas projects presented in Table 5-1 and it is unknown if they would undergo well stimulation activities. In addition, the current use of well stimulation technologies (including hydraulic fracturing) in California is not considered to pose a significant seismic hazard (CCST, 2014). Induced seismicity has been linked to the injection of large volumes of wastewater into deep disposal wells in the eastern and central United States (CCST, 2014). Currently, the volume of wastewater injected underground in California is small compared to other states, and the depth of the injection wells is comparatively shallow (CCST, 2014). The current risk of induced seismicity from wastewater disposal in California is small; however, with an increase in well stimulation treatments and an increase in wastewater injection (including from future cumulative projects), the risk of induced seismicity may increase (CCST, 2014). Further studies of the relationship, if any, between wastewater injection, seismicity and faulting in California will be needed to establish this with confidence and to provide a better idea of incremental hazard levels due to induced seismicity (CCST, 2015). The probability of inducing larger, hazardous earthquakes by wastewater disposal could likely be reduced by following protocols similar to those that have been developed for other types of injection operations, such as enhanced geothermal (CCST, 2015). Even though hydraulic fracturing itself rarely induces felt earthquakes, application of similar protocols could protect against potential worst-case outcomes resulting from wastewater injection activities (CCST, 2015).

5.3.3 Hazardous Materials and Public Safety

The geographic scope for cumulative analysis for hazardous materials and public safety is generally within the oil and gas project boundaries and along the access routes or pipeline routes. This is where hazardous materials and public safety effects are generally localized. Because oil and gas projects could be built anywhere within the open areas, the geographic scope for cumulative impact analysis is anywhere within the open areas and access routes for the entire CCFO Planning Area and along the pipelines.

Many of the effects of oil and gas development analyzed in Section 4.4 would only have the potential to contribute to a cumulative effect with the oil and gas development listed in Table 5-1. These include impacts such as public exposure to hazards of oil and gas operations, well blowouts, subsurface contamination, irrigation with produced water, pressurized gas releases, and transportation of crude oil and gas by pipeline. The cumulative effects of the oil and gas development listed in Table 5-1 and the development anticipated in the 2015 RFD Scenario would slightly increase the risk of these effects but due to the low number of oil and gas wells, the risk would be similar to that discussed in Section 4.4, Hazardous Materials and Public Safety.

All phases of oil and gas development would involve the transport, use, storage, and disposal of hazardous materials. The projects listed in Tables 5-1 and 5-2 use similar hazardous materials such as fuels, lubricating oils, hydraulic fluids, glycol-based coolants, lead-acid batteries, solvents, paints, cleaning agents, coatings, and herbicides. Solar facilities could also involve the use of the toxic elemental metal cadmium and dielectric fluids.

Construction, operations, and decommission activities of the solar projects listed in Table 5-2 would involve movement of large amounts of soil materials. Valley Fever is spread through the air and if soil containing the Valley Fever fungus is disturbed by construction, natural disasters, or wind, the fungal spores can be released into the air.

Renewable energy sites may have existing contamination that could pose a risk to workers and the environment during site characterization, construction, operations, and decommissioning. Potential hazardous material impacts from renewable projects listed in Table 5-2 are increased risks of fires, human health impacts, and environmental contamination. This could lead to environmental impacts related to biological resources, surface water, groundwater, air quality, agriculture and grazing, and recreation.

Cumulative impacts resulting from hazardous materials would occur only if oil and gas development anticipated by the 2015 RFD Scenario occurred in the near vicinity to the projects listed in Tables 5-1 and 5-2 and if the projects were under construction at the same time. This includes cumulative impacts due to Valley Fever. Ground disturbance is stabilized after construction, reducing the risk of airborne fungal spores. Assuming some of the oil and gas development anticipated in the 2015 RFD Scenario were drilled in the next 5 years, it would overlap with the projects listed in Tables 5-1 and 5-2 and result in cumulative effects. The effects would be reduced by the BMPs, SOPs, and regulations required for oil and gas drilling on BLM land. These effects would be similar for all alternatives, except Alternative B because the open areas in Alternative B are not sufficiently near the solar projects listed in Tables 5-2 to result in cumulative effects.

5.3.4 Air Quality and Atmospheric Conditions

Cumulative impacts to air quality would result from impacts of the oil and gas development under the 2015 RFD Scenario that combine with impacts of other projects or actions within the CCFO Planning Area. The geographic scope would include the areas of most likely development, which are either in the North Central Coast air basin or in the San Joaquin Valley air basin, including areas impacted by cumulative projects within or near the portions of these air basins that are in the CCFO Planning Area.

As discussed in Section 4.5, new sources of air pollution, including those associated with oil and gas development and other cumulative projects, would require further project- and site-specific analysis by the local air quality management district and for activity on public land, by the BLM. Applicable BMPs, stipulations, and other COAs would be identified and imposed as necessary. Each application for new oil and gas activity would require an assessment of ambient air quality conditions (baseline or existing), National Ambient Air Quality Standards, criteria pollutant nonattainment conditions, and potential air quality impacts of the activity (including cumulative and indirect impacts). This would disclose the potential impacts from temporary or cumulative degradation of air quality to the affected air basin. All cumulative projects would be expected to undergo environmental permitting and would be likely to incorporate mitigation to reduce short-term emissions during construction and long-term emissions for ongoing operations and maintenance. Cumulative project mitigation would likely be similar to mitigation identified in Section 4.5 for oil and gas activity, including measures to control dust, control emissions from equipment, use best available emissions controls on stationary sources, and possibly to offset emission sources.

With BLM's discretionary review of oil and gas development within its administrative area, potential conflicts with other cumulative projects or actions within the Planning Area would be avoided. Cumulative impacts to air quality would be minor.

5.3.5 Climate Change/Greenhouse Gas Emissions

Globally, greenhouse gas (GHG) emissions contribute, by their nature, on a cumulative basis to the adverse environmental impacts of global climate change. Because the primary environmental effect of GHG emissions would be to exacerbate global climate change and the numerous side-effects on the environment and humans, the area of influence for GHG impacts is global. As noted in Section 4.6, the alternatives would result in directly emitted GHG and indirect emissions from end-users of the fuels. Tables 4.6-1 and 4.6-2 in Section 4.6.2 estimate that development and production phase GHG emissions for a full buildout of the 2015 RFD scenario on Federal mineral estate would result in 19,084 metric tons of carbon dioxide equivalent (MTCO_{2e}) annually, which is 0.004 percent of the approximately 459 million metric tons of CO₂ equivalent (MMTCO_{2e}) that California emitted in 2013 (ARB, 2015). Table 4.6-3 in Section 4.6.2 provides a rough estimate of potential indirect emissions as 141,062 MTCO_{2e}, 0.03 percent of the approximately 459 MMTCO_{2e}. The GHG emissions and the associated direct and indirect impacts of the project would be minor.

All projects listed in Tables 5-1 and 5-2 would result in direct emissions of GHG over the lifetime of the projects. Some projects, such as the wind and solar projects, would also produce electricity in a manner that avoids the GHG emissions normally associated with power plants over the lifetime of the projects. While each project's GHG emissions would be subject to State climate change programs including California's Cap-and-Trade Program and/or local air quality regulations, any increases in GHG emissions that occur in the CCFO Planning Area would contribute to cumulative increases in global GHG emissions. As noted in Section 3.6, how climate change may impact California is described in the 2009 Biennial Report of the California Climate Action Team (CAT, 2009) and Our Changing Climate 2012 from the California Climate Change Center (CEC, 2012). The effects anticipated in the Central Valley provide an illustration of the potential changes: the number of days conducive to ozone formation in the San Joaquin Valley may rise by 75 to 85 percent by the end of the century; and sea-level rise may place additional pressure on the levee systems and increase the intensity of saltwater intrusion into coastal groundwater resources, leading to increased flooding and decreased freshwater availability (CAT, 2006; CAT, 2009). The California Climate Change Center notes that the agricultural resources of the Salinas Valley are particularly vulnerable (CEC, 2012). Cumulative emissions would contribute to these effects.

5.3.6 Groundwater Resources

The cumulative impact analysis for groundwater resources considers the estimation of future oil and gas well development on Federal mineral estate in the 2015 RFD Scenario, the future oil and gas projects summarized in Table 5-1, and the other applicable cumulative projects summarized in Table 5-2.

If the current development trend continues, 3,150 wells could be initiated in the next 15 years within the CCFO Planning Area and over 99 percent of these would be within the Coalinga, San Ardo, Lynch Canyon, and Jacalitos oil and gas fields (Section 5.2.1). The RFD Scenario assumes that 32 to 37 wells will be developed in the next 15 to 20 years on Federal mineral estate within the CCFO Planning Area, regardless of the chosen alternative. Therefore, only 1 percent of the wells projected for the CCFO Planning Area in the next 15 years might be on Federal mineral estate. As stated in Section 5.2.1, nearly all well development in the last decade occurred in four oil and gas fields: Coalinga, San Ardo, Lynch Canyon, and Jacalitos. If the 32 wells expected to be drilled within existing oil and gas fields are within these four oil and gas fields, then two groundwater subbasins — Westside subbasin (CDWR basin number 5-22.09), which intersects a small portion of the Coalinga field, and Paso Robles Area subbasin (3-4.06), which intersects a portion of the San Ardo field — may be particularly vulnerable to impacts

(see Figure 7.3-3). Both of these subbasins are critically overdrafted basins (DCWR, 2015b) and have been assigned a CASGEM high-priority ranking for the CASGEM basin prioritization program (CDWR, 2014a). However, as stated in Section 4.7.2, BLM regulations, the DOGGR regulations, mitigation measures provided in the Final EIR, and the BLM final rule collectively serve to reduce any potential impacts to the quantity or quality of usable groundwater.

In addition to the well development projected in the RFD Scenario, there are other future projects in the CCFO Planning Area. There is one cumulative future oil and gas exploration and development projects within the CCFO Planning Area (Table 5-1). The Phillips 66 Propane Recovery Project in Contra Costa County involves a modification to the existing refinery to recover butane and propane from refinery fuel gas. The Phillips 66 Refinery, however, is in northwestern Contra Costa County and is not located on Federal mineral estate. Other applicable cumulative projects in the CCFO Planning Area include mostly mining projects, with some alternative energy projects (solar and wind), quarry projects, a dredge tailings removal project, and a concrete plant (Table 5-2). Based on the nature of the cumulative projects, a cumulative impact on groundwater quality is not expected. But, because the amount of water necessary for each of the cumulative projects is not known, there is the potential that these projects could have a cumulative impact on groundwater quantity. In addition to these cumulative projects, future municipal and industrial growth, along with the ongoing water demands of existing agriculture, will add additional pressure to the increasing water demand.

As stated in Section 4.7, water quantity impacts depend on local conditions, and therefore, require a site-specific analysis (CCST, 2014). The volumes of water are often less important than the rates and timing of the withdrawals (CCA, 2014). There is uncertainty associated with the amount of water needed for future well stimulation treatments, the amount of water needed for future cumulative projects, and the amount of water available due to the recent extreme drought in California. The average water use for hydraulic fracturing in California is small (140,000 gallons per well or 0.4 AF/well) when compared to the overall water use in most of the California basins. In addition, the average water use per well is similar to the average annual water use of one household in California (153,000 gallons) (CCST, 2015a). Nonetheless, recognizing the pressure placed on scarce water resources during the ongoing California drought, it is reasonable to assume that any increase in groundwater use could result in a cumulative adverse effect on groundwater quantity, especially in a basin already subject to overdraft.

5.3.7 Surface Water Resources

The cumulative geographic scope for surface water resources is the entire CCFO Planning Area.

Cumulative effects to surface water quality could occur if disturbed soils or spills or disposal of potentially harmful materials used during construction occurred during oil and gas drilling and combined with disturbed soils or spills from the cumulative projects listed in Tables 5-1 and 5-2. Most projects listed in Tables 5-1 and 5-2 are sufficiently far from the open areas for all alternatives that it is unlikely that any simultaneous spill would impact the same water feature and any cumulative effects would be expected to be minor and short-term.

Cumulative effects to flooding are expected to be minimal because all of the projects listed in Tables 5-1 and 5-2 are expected to have few new permanent structures or impervious surfaces. This combined with the effects of the oil and gas development would result in minor cumulative effects to flooding.

As noted in Section 5.3.6, Groundwater Resources, cumulative effects to water use and supply depends on local conditions, and therefore, require a site-specific analysis (CCST, 2014). There is uncertainty associated with the amount of water needed for future well stimulation treatments, the amount of water needed for future cumulative projects, and the amount of water available due to the recent extreme drought in California. Recognizing the pressure placed on scarce water resources during the ongoing California drought, it is reasonable to assume that any increase in water use could result in a cumulative adverse effect on water use and supply.

5.3.8 Soil Resources

The geographic area considered for cumulative effects related to soils is within a 0.5-mile radius of the open areas within each alternative. This is because impacts resulting from erosion are localized in nature and are unlikely to extend beyond the actual project boundaries unless an extreme event results in substantial downstream erosion.

The only cumulative project that is close enough to potential development in the open areas for each alternative is the Stonewall Quarry. While any disturbance to surface soils could expose soils to the effects of wind and water and result in erosion, the anticipated ground disturbance for the up to 37 wells, 206 acres, combined with the 53 acres of potential ground disturbance from the Quarry would have only a minor potential to result in a cumulative effect. Standard BMPs required for both the oil and gas development as well as standard BMPs required for mining activities would reduce the effects of any potential cumulative soil erosion such that the overall cumulative impact would be minor.

5.3.9 Biological Resources – Vegetation

The cumulative impact analysis for biological resources is bounded by the timeframe, geographic scope, and analytical assumptions. The timeframe is discussed in Section 5.1.2. The geographic scope for analysis of cumulative effects on biological resources is the Planning Area. The analytic assumptions are that other Federal and State agencies with a stake in the Planning Area will continue to implement their current plans as written. It is further assumed that private lands within the Planning Area would continue to exhibit the same overall spatial pattern and trends of vegetation, habitat, and disturbance over time as presently exists.

Biological resources are primarily subject to degradation from human activities, including surface disturbance. Historically, the CCFO Planning Area has been subject to human disturbances that have resulted from agriculture, grazing, development, and recreational use. These trends in disturbance are expected to continue accumulating a net loss of these resources.

Cumulatively, these historic trends of adverse impacts result from private, local, State, and Federal actions within the Planning Area. To counter these adverse impacts, agencies with a preservation or protection mandate, such as BLM, plan for and implement actions to mitigate these trends (e.g., habitat conservation plans and species recovery plans). The actions provided for by the BLM through this RMPA add to the protections of biological resources through the support, compliance with, and enhancement of these efforts. However, there is a limited amount of land within the CCFO Planning Area under BLM management.

Cumulative impacts directly relate to the management of the biological resources in the Planning Area. The RMP FEIS (BLM, 2006) discusses BLM management of livestock grazing, wildland fire and fuels management, recreation, and other activities, and provides an analysis of cumulative impacts of management actions. The RMP FEIS concludes that the RMP would result in generally moderate levels of cumulative impacts and localized, high-impact activities occurring as a result of BLM management actions are expected to be relatively minimal. Therefore, cumulative impacts are not expected to be extensive under the RMP (BLM, 2006). As discussed below, the additional cumulative impact of oil and gas leasing under the RMPA would be minor.

Vegetation and Habitat Impacts

Section 4.10 describes potential impacts to native vegetation and habitat from oil and gas development in the Planning Area. Oil and gas development, as well as other current and probable future projects in the Planning Area (Section 5.2), would contribute to cumulative direct and indirect impacts to vegetation and habitat.

Oil and gas development in the Planning Area has the potential to result in short-term and temporary and long-term and permanent adverse impacts on biological resources that could range from negligible to major depending on the extent and locations of surface disturbance for exploration and development. Site-specific analysis would be required to determine actual impacts.

Oil and gas development on BLM land and split estate would be mainly in existing well fields. New development in common vegetation communities that do not support special status species would result in minor impacts to vegetation and habitat. However, valuable native habitat is found within some existing oil and gas fields, where future effects of oil and gas development could contribute to cumulatively considerable impacts.

Site-specific analysis and implementation of lease stipulations, BMPs, SOPs, and additional mitigation as presented in Section 4.10 would reduce impacts and minimize the incremental contribution to cumulative effects from each oil and gas development lease.

Generally, the context and intensity of non-BLM activities are not anticipated to vary by alternative because these activities do not directly depend on BLM management actions and allowable uses set forth in the RMPA alternatives; however, oil and gas development will somewhat depend upon BLM management.

As discussed in the RMP FEIS (BLM, 2006), much of the BLM management in these alternatives is designed to protect and preserve biological resources. However, there is a very limited amount of land within the Planning Area under BLM management. Therefore, BLM management makes a relatively small contribution to cumulative effects, both adverse and beneficial, throughout the Planning Area.

Alternative A is the No Action Alternative. The No Action Alternative would continue the current management goals, objectives, and direction as specified in the 2007 Hollister Field Office RMP. See Section 4.10.3. The impacts and cumulative effects of Alternative A on biological resources would be identical to existing conditions.

Under Alternative B, lands within oil and gas fields and a 0.5-mile buffer area would be open and all other areas would be closed. All lands open to leasing would have a Controlled Surface Use (CSU) stipulation. See Section 4.10.4. The impacts and cumulative effects of Alternative B on biological resources are likely to be substantially reduced from existing conditions (i.e., the No Action Alternative) due to limitations on the locations of future wells.

Depending on where new oil and gas leases are located, the impacts and cumulative effects of Alternative C on biological resources are likely to be reduced from existing conditions (i.e., the No Action Alternative) but greater than Alternative B. Cumulative effects of Alternative D on biological resources are likely to be considerably reduced from existing conditions (i.e., the No Action Alternative), and somewhat reduced from Alternative C, but greater than Alternative B. Cumulative effects of Alternative E on biological resources are likely to be reduced from existing conditions (i.e., the No Action Alternative), but may be similar to or greater than Alternatives B, C, and D.

Overall, each alternative would contribute incrementally to cumulative impacts. Most impacts would be avoided and minimized through implementation of lease stipulations, BMPs, and SOPs, and additional mitigation as described in Section 4.10, and the net cumulative effect of oil and gas leasing on BLM-managed lands would be minor.

5.3.10 Biological Resources – Wildlife Habitat

Introductory information in Section 5.3.9 would also apply to Wildlife Habitat.

Section 4.11 describes potential impacts to wildlife and habitat from oil and gas development in the Planning Area. Oil and gas development, as well as other current and probable future projects in the Planning Area (Section 5.2), would contribute to cumulative direct and indirect impacts to wildlife and habitat.

Oil and gas development in the Planning Area has the potential to result in short-term and temporary and long-term and permanent adverse impacts on biological resources that could range from negligible to major depending on the extent and locations of surface disturbance for exploration and development. Site-specific analysis would be required to determine actual impacts.

Oil and gas development on BLM land and split estate would be mainly in existing well fields. New development in common vegetation communities that do not support special-status species would result in minor impacts to wildlife and habitat. However, valuable native habitat is found within some existing oil and gas fields, where future effects of oil and gas development could contribute to cumulatively considerable impacts.

Site-specific analysis and implementation of lease stipulations, BMPs, SOPs, and additional mitigation as presented in Section 4.11 would reduce impacts and minimize the incremental contribution to cumulative effects from each oil and gas development lease.

The alternatives analysis in Section 5.3.9 would also apply to Wildlife Habitat. Overall, each alternative would contribute incrementally to cumulative impacts. Most impacts would be avoided and minimized through implementation of lease stipulations, BMPs, and SOPs, and additional mitigation as described in Section 4.11, and the net cumulative effect of oil and gas leasing on BLM-managed lands would be minor.

5.3.11 Biological Resources – Special Status Species

Introductory information in Section 5.3.9 would also apply to Special Status Species.

Section 4.12 describes potential impacts to special status species from oil and gas development in the Planning Area. Oil and gas development, as well as other current and probable future projects in the Planning Area (Section 5.2), would contribute to cumulative direct and indirect impacts to special status species.

Oil and gas development in the Planning Area has the potential to result in short-term and temporary and long-term and permanent adverse impacts on biological resources that could range from negligible to major depending on the extent and locations of surface disturbance for exploration and development. Site-specific analysis would be required to determine actual impacts.

Oil and gas development on BLM land and split estate would be mainly in existing well fields. New development in common vegetation communities that generally do not support special status species would result in negligible or no impacts to special status species. However, valuable native habitat that may support special status species is found within some existing oil and gas fields, where future effects of oil and gas development could contribute to cumulatively considerable impacts.

Site-specific analysis and implementation of lease stipulations, BMPs, SOPs, and additional mitigation as presented in Section 4.12 would reduce impacts and minimize the incremental contribution to cumulative effects from each oil and gas development lease.

The alternatives analysis in Section 5.3.9 would also apply to Special Status Species. Overall, each alternative would contribute incrementally to cumulative impacts. Most impacts would be avoided and minimized through implementation of lease stipulations, BMPs, and SOPs, and additional mitigation as described in Section 4.12, and the net cumulative effect of oil and gas leasing on BLM-managed lands would be minor.

5.3.12 Visual Resource Management

The geographic scope for cumulative visual impacts is limited to land areas within the viewshed of potential CCFO Planning Area oil and gas lease lands designated VRM Class I, II, and/or III. Lands visible from potential CCFO Planning Area oil and gas lease lands designated VRM Class IV need not be considered because the VRM Class IV management objective allows for a high level of visual change. As a

result, cumulative actions in combination with potential CCFO Planning Area oil and gas leasing would not be expected to result in inconsistencies with the VRM Class IV management objective.

Because the cumulative analysis is limited to VRM Class I through III viewsheds, only the potential CCFO Planning Area oil and gas lease lands in the southern half of the Planning Area are analyzed. The very few BLM-managed public lands in the northern area (north of Hollister) are not analyzed because they are designated VRM Class IV. Furthermore, cumulative actions located outside the Planning Area are also not analyzed because they are at least 15 miles from the eastern boundary of the Planning Area (i.e., where VRM Class I, II, and/or III areas are located) and would not be visibly discernible.

Consequently, there are only five projects, along with potential CCFO Planning Area oil and gas lease lands, within the effective geographic scope for cumulative visual impacts, which is the southern half of the CCFO Planning Area. One of these projects (Stonewall Quarry), however, is also eliminated from analysis because it would be screened from view by intervening terrain. Therefore, four projects remain and are analyzed below including two oil and gas projects in Coalinga, Fresno County (Table 5-1), the California Flats Solar Project in Monterey County, and the Solargen Panoche Valley Solar Project in San Benito County (Table 5-2).

Cumulative impacts on visual resources from the projects considered in this analysis could occur from surface disturbance, combustion emissions and fugitive dust that alter visibility, and the introduction of man-made elements that change the landscape character. These changes could alter visible landscape form, line, color, and texture, and cause visual contrast. The cumulative effects of these changes on BLM-managed lands could degrade the visual quality of the overall landscape in the Planning Area and could be inconsistent with the objectives of VRM classes designated in the Planning Area. The degree of impact depends on the visibility of the projects and the VRM classes of the particular BLM-managed areas affected by the projects.

Under Alternatives A, C, D, and E of this Draft RMPA/EIS, all four of the cumulative projects could potentially be located in the same field of view as the oil and gas leases depending on where the leasing and development occurs.

Under Alternative B, only the two oil and gas projects in Coalinga, Fresno County could be located in the same field of view as potential Alternative B oil and gas leases depending on where that leasing and development occurs. Under Alternative B, areas in the potential field of view of the California Flats Solar Project and Solargen Panoche Valley Solar Project would be closed to oil and gas leasing.

The two oil and gas leases in Fresno County occur on BLM-managed lands located in areas designated as VRM Class IV. Since the Class IV objective allows for major modification to the existing character of the landscape, these leases, in conjunction with any leases associated with any of the Alternatives A through E would likely be consistent with the Class IV objective.

The remaining two cumulative projects (California Flats Solar and Panoche Valley Solar) would occur on private lands not managed by the BLM; these projects would contribute to landscape changes in the Planning Area that may adversely affect the visual quality of nearby BLM-managed public lands.

The **California Flats Solar Project**, however, and any leases associated with Alternatives A, C, D, and E, would only be located in the field of view of BLM-managed lands designated as VRM Class IV (areas near this solar project would be closed to leasing under Alternative B). Since the Class IV objective allows for major modification to the landscape that can dominate the view and be the major focus of viewers' attention, this solar project, in conjunction with any leases associated with Alternatives A, C, D and E, would likely be consistent with the VRM Class IV objective.

The **Solargen Panoche Valley Solar Project** would occur on private land in a valley between the Panoche Hills and Griswold-Tumey Hills areas that are BLM-managed lands designated as VRM Class III. The

VRM Class III objective is to partially retain the existing character of the landscape and allow for a moderate (or lower) level of change. The change may attract the attention of the casual observer but should not dominate the view. This solar project, in conjunction with any leases associated with Alternatives A, C, D, and E and their close proximity to these VRM Class III areas, could attract attention and/or dominate the views of some observers on or near the hills and slopes closest to the valley resulting in an adverse, cumulative visual impact that could be inconsistent with the VRM Class III objective. Under Alternative B, areas in proximity to the Solargen Panoche Valley Solar Project would be closed to oil and gas leasing, so Alternative B would not contribute to cumulative visual impacts in this field of view.

The Panoche Hills area also contains the Panoche Hills Wilderness Study Area (WSA) designated as VRM Class I. The VRM Class I objective is to preserve the existing character of the landscape and allow only a very low level of change that must not attract attention. The Solargen Panoche Valley Solar Project, itself, would barely be discernible from the WSA due to very limited visibility and brief viewing opportunities. A limited number of power blocks could briefly be visible; they would appear as a sliver of darker shading against the lighter valley floor and would not be substantially noticeable given the viewing distance and screening by intervening landforms (Aspen Environmental Group, 2010). The Solargen Panoche Valley Solar Project, in conjunction with any leases associated with Alternatives A, C, D, and E, however, has the potential to result in a cumulative level of change to the landscape that is greater than that allowed under VRM Class I, which could result in an adverse, cumulative visual impact that would likely be inconsistent with the VRM Class I objective. Under Alternative B, areas in proximity to the Solargen Panoche Valley Solar Project would be closed to oil and gas leasing, so Alternative B would not contribute to cumulative visual impacts in this field of view.

In summary, Alternatives A, C, D, and E, in conjunction with the Solargen Panoche Valley Solar Project, may have cumulatively adverse visual impacts that could be inconsistent with VRM Class I and III objectives. The types of mitigation that could be implemented to lessen the degree of these impacts are presented at the end of Section 4.13.3. Under Alternative B, lease areas within or near the cumulative projects would be closed to oil and gas leasing; therefore, Alternative B would not contribute to cumulative visual impacts in the respective fields of view.

5.3.13 Special Management Areas

Cumulative impacts to SMAs would occur when impacts of the Proposed RMPA are combined with impacts from other projects or actions within the Planning Area. The special designation Planning Area for this RMPA/EIS is defined as the SMAs within the CCFO administrative boundary that are managed by the BLM.

Oil and gas development and its associated demand for land use authorizations within the Planning Area would continue to be limited by the protected status of Wilderness Areas, WSAs, national monuments, ACECs and RNAs, and other areas that contain management prescriptions (see Section 3.14). For special designation areas that would be open to leasing under the Proposed RMPA, lease stipulations (i.e., NSO, CSU, or Timing Limitations) are recommended to avoid or reduce impacts to SMAs (see Sections 4.14.3 through 4.14.7). With implementation of these stipulations on future oil and gas development, the Proposed RMPA would have negligible impacts on SMAs, and would not combine with present or future projects to create a cumulative effect.

5.3.14 Cultural and Heritage Resources

Cumulative effects on archaeological sites, traditional cultural properties, and historic resources are caused by impacts (both mitigated and non-mitigated) that can occur over a long period of time, resulting in the gradual but permanent loss of archaeological data as well as the diverse cultural history represented by those properties. In this sense, cumulative losses of cultural resources within the CCFO Planning Area also have the potential to indirectly affect Native American groups and various other populations with a

history of settlement and land use in the region. Specific site types that embody this culture history are prehistoric habitation and resource procurement sites, rock art, sacred sites, mission-related sites, and historic ranching, mining, and agricultural sites. While impacts on historic properties may be considered “mitigated” by the retrieval of scientific data from archaeological sites or by the recovery of historical data present in built resources (e.g., buildings, structures, landscapes), the cultural heritage represented by these sites is a non-renewable resource whose loss cannot be mitigated and thus constitutes a major and unavoidable cumulative impact. Cumulative losses to the cultural heritage of specific groups or populations may also be considered an off-site effect.

While cumulative effects on cultural resources are difficult to predict given the limited data currently available concerning cultural resources in the Planning Area, increased or strengthened management programs for the protection and long-term preservation of historic properties will ultimately prevent major cumulative effects from occurring. For all of the alternatives, there are possible cumulative effects to prehistoric and historic resources in areas that receive increased use from potential ground-disturbing activities such as those listed in Tables 5-1 and 5-2. Some projects listed in Tables 5-1 and 5-2 would require many acres of ground disturbance such as the solar PV projects. Cumulative adverse effects include the physical destruction of all or part of the resource; these resource types and areas will require more intensive management and mitigation measures by BLM as land use demands rise. These demands could be potential uses for energy and mineral, grazing, transportation, recreation, and other approved land use authorizations through time. Additionally, potential cumulative effects from increased public awareness of cultural resources increase the risk of vandalism or theft. These cumulative impacts cannot easily be measured; but over time, these activities could permanently impact resources, resulting in an irretrievable loss of non-renewable resources and information.

5.3.15 Paleontological Resources

The geographic extent of cumulative analysis for paleontological resources encompasses the 12 counties within the boundary of the CCFO Planning Area. This wide geographic scope is appropriate because it is likely that paleontological resources similar to those described under each alternative are present throughout this area and unknown, previously unrecorded paleontological resources could be uncovered within sensitive geologic units within the geographic area of cumulative effect. Cumulative impacts to paleontological resources will persist as long as ground-disturbing activities occur within the geographic extent of cumulative analysis for paleontological resources. Should paleontological resources be discovered during construction-related activities associated with the current and future projects, they would be subject to the applicable laws and regulations discussed in Section 3.16.2, which afford specific protections to discovered paleontological resources.

With regard to paleontological resources, those cumulative projects that directly result in ground disturbances are most likely to adversely affect paleontological resources. Power transmission and energy development projects, utility improvements, transportation projects, landfill projects, and commercial and residential projects have previously affected paleontological resources in San Mateo, San Francisco, Santa Cruz, Santa Clara, Stanislaus, Alameda, Contra Costa, San Joaquin, Monterey, San Benito, Merced, and Fresno Counties. The destruction of non-renewable paleontological resources as a result of project-related ground disturbances have the potential to cause the permanent loss of scientific information, thus resulting in an adverse cumulative impact over time. The implementation of management actions and mitigation measures during construction has resulted in the recovery and curation of fossil remains that may otherwise have been destroyed. Many of the recovered specimens have been made available for academic or institutional research, thereby aiding in scientific discovery.

As described in Table 5-1 and Table 5-2, there are numerous projects considered in this cumulative impact analysis. The actual number and type of paleontological resources that might be adversely affected by these projects cannot be determined without a comprehensive inventory and assessment of the paleontological resource potential for each oil and gas lease in the CCFO Planning Area, which is beyond the reasonable

scope of this EIS. Typically, the paleontological resource potential of a given project area is identified as part of the permitting process for individual undertakings, and paleontological resources are discovered during ground-disturbing activities related to project development.

Unknown, previously unrecorded paleontological resources could be found at nearly any development site within the CCFO Planning Area. As described above, projects that directly result in ground disturbances are most likely to adversely affect paleontological resources. In the CCFO Planning Area, those projects would include wind and solar farm developments, mining and quarry expansions, and conventional energy generation projects. In addition, according to the 2015 RFD Scenario, future oil and gas activity in the CCFO Planning Area is most likely to occur within geologic units with moderate to high paleontological sensitivity, which would have the potential to cause an adverse effect to fossil resources. Should paleontological resources be discovered on BLM-administered public lands during construction-related activities associated with the current and future projects, they would be subject to legal requirements designed to protect them similar to the BLM Mitigation and Management Actions described in Section 4.16, thereby reducing the effects of impacts. Therefore, the potential impacts of the CCFO Planning Area RMPA/EIS, when combined with impacts from past, present, and reasonably foreseeable projects would be reduced to an acceptable level with mitigation incorporated.

5.3.16 Social and Economic Conditions

The geographic scope for cumulative impacts would be the entire CCFO Planning Area. Effects would likely be county specific because local jurisdictions or districts provide public services and utilities, and the regional labor force would be expected to come primarily from counties within the Planning Area and from neighboring counties.

Construction of cumulative projects listed in Tables 5-1 and 5-2 may bring workers to the communities proximate to and serving individual project locations. This type of temporary growth should be expected for construction of large utility-scale projects that typically require large numbers of workers, many of whom have specialized skills. However, given the existing vacancy rates and projected population growth within the regional study area (refer to Table 3.17-1), any increases to housing demand and population from the 2015 RFD Scenario is expected to have a minor cumulative contribution to the available supply and projected growth.

While some degree of social disruption is likely to accompany cumulative short-term construction worker in-migration (particularly if a number of large-scale projects are built simultaneously within the same localized area), it is difficult to predict the extent to which specific communities are likely to be affected, which population groups within each community are likely to be most affected, and the extent to which social disruption is likely to persist beyond facility construction. This is because such a cumulative impact would be highly dependent on projects having overlapping construction time frames. Should cumulative project development result in a recognizable scale of temporary construction worker relocations to local communities, regardless of the amount the 2015 RFD Scenario well development contributes within these localized communities, some social change is expected to occur cumulatively but is considered to be minor.

Beneficial economic impacts would occur from the development of cumulative projects identified in Tables 5-1 and 5-2. Workforce wages and spending during the construction and operation of cumulative projects would be an economic stimulator to regional and local governments. Other important public benefits include both short-term and long-term increases in local expenditures, payrolls, and sales tax revenues. These would positively affect the economy at regional and local levels. The development of cumulative industrial projects may adversely affect environmental amenities including environmental quality, stable rural community values, and cultural values. The development of cumulative mineral extraction projects could reduce a community's ability to attract some new types of businesses. However, other economic and demographic factors would play a role in the economic development potential of any particular location.

With respect to environmental justice, the communities of King City, San Ardo, and San Lucas contain exceptionally high concentrations of minority population, with San Lucas also containing a very high percentage of low-income population. However, when reviewing the locations of cumulative projects identified in Tables 5-1 and 5-1, these areas do not show a disproportionate amount of cumulative projects occurring. Because some of the cumulative projects listed in Table 5-1 would be located in the same local areas containing a disproportionate amount of minority and low-income populations, these projects could contribute toward impacts disproportionately borne by minority or low-income populations. However, as discussed in Section 4.17, given the small number of new wells (up to 37) and land disturbed (up to 206 acres), the 2015 RFD Scenario would have a negligible contribution toward cumulative disproportionate adverse environmental impacts within the communities of King City, San Ardo, and San Lucas.

5.3.17 Transportation and Access

Construction of cumulative projects listed in Tables 5-1 and 5-2 would generate traffic on roadways and within communities proximate to and serving individual project locations. The greatest number of trips would be expected during construction of large utility-scale projects that typically require large numbers of workers and daily truck trips. Any adverse cumulative impact from increased daily trips may be most noticeable on rural roadways with low baseline traffic volumes. However, because these roadways have low existing traffic volumes, an increase in traffic volumes may not have adverse effects in the performance of the circulation system. The trips generated due to 2015 RFD Scenario activities would be negligible in terms of traffic volumes on the roadways serving the development of 37 wells over the next 15-20 years. Moreover, most of these trips would be temporary in nature. Therefore, vehicle trips from 2015 RFD Scenario activities would have a minor to negligible cumulative contribution to the performance of the circulation system.

When reviewing the cumulative projects that may affect the area where 2015 RFD Scenario activities are expected to occur (BLM-administered lands in Fresno, Monterey, and San Benito Counties within the area of high oil and gas occurrence potential, shown in Figure 5-1); only the projects identified in Table 5-1 could result in cumulative access impacts. As discussed in Section 4.18 (Transportation and Access), all future projects on BLM-administered lands would require further project- and site-specific environmental analysis, during which time applicable BMPs, stipulations, and other measures would be identified and imposed to reduce adverse effects to existing BLM transportation routes or access points. Furthermore, Mitigation Measure TR-1 is proposed to directly mitigate any adverse disruption effects to existing BLM travel routes or access points within the CCFO Planning Area from oil and gas development under the 2015 RFD Scenario for Alternatives B through E. With BLM's discretionary review of oil and gas development on Federal mineral estate, conflicts between the 2015 RFD Scenario activities, other projects or actions within BLM lands, and the management of existing transportation routes and access to BLM lands would be avoided. Cumulative access impacts would be negligible.

5.3.18 Lands and Realty

Cumulative impacts to the BLM's lands and realty program would result from other projects or activities that combine with the impacts of the Proposed RMPA to affect the BLM's ability to authorize land uses in the Planning Area. The Planning Area for lands and realty is defined as the BLM-administered surface land within the CCFO Planning Area administrative boundary, as well as the BLM-administered subsurface mineral estate underlying privately owned lands within the CCFO Planning Area (i.e., split estate).

Cumulative projects that may affect the Planning Area have been identified in Tables 5-1 and 5-2. As discussed in Section 4.19 (Lands and Realty), all Applications for Permits to Drill subject to BLM approval would require further future project- and site-specific analysis, during which time applicable BMPs, stipulations, and other COAs would be identified and imposed on the proposed leases. With BLM's discretionary review of oil and gas development on Federal mineral estate, conflicts between energy-related actions and other projects or actions within the Planning Area would be avoided. Cumulative impacts to existing land uses and future land use authorizations would not occur.

5.3.19 Utility Corridors and Communication Sites

Cumulative impacts to utility corridors and communication sites would result from impacts of the Proposed RMPA that combine with impacts of other projects or actions within the Planning Area. The utility corridor Planning Area for this RMPA/EIS is defined as oil and gas pipelines, transmission lines, and communication sites within the CCFO Planning Area.

The collective effects on utility corridors and communication sites are interrelated with various energy-related growth activities in the Planning Area. Increased demand for oil and gas development would increase the use of existing ROW corridors, as well as require the construction of new ancillary facilities such as pipelines and connectors, compressor stations, or transmission tie-ins. As discussed in Sections 4.20.3 through 4.20.7, new utility facilities associated with oil and gas development would require further project- and site-specific analysis by the BLM, during which time applicable BMPs, stipulations, and other COAs would be identified and imposed as necessary. With BLM's discretionary review of oil and gas development within its administrative area, potential conflicts with other cumulative projects or actions within the Planning Area would be avoided. Cumulative impacts associated with utility corridors and communication sites would not occur.

5.3.20 Wild and Scenic Rivers

Cumulative impacts to National Wild and Scenic Rivers (NWSRs) would result from impacts of the Proposed RMPA that combine with impacts of other projects or actions within the Planning Area. The NWSR Planning Area for this RMPA/EIS is defined as eligible river segments within the CCFO Planning Area. Designated NWSRs would not cross or be located in the vicinity of Federal mineral estate, and as such would not be affected by the Proposed RMPA.

Oil and gas development and its associated demand for land use authorizations within the Planning Area would continue to be limited by the protected status and management prescriptions required for eligible and NWSRs (see Section 3.21). For eligible river segments that would be open to leasing under the Proposed RMPA, lease stipulations (i.e., NSO or CSU) are recommended to avoid or reduce impacts to NWSRs (see Sections 4.21.3 through 4.21.7). With implementation of these stipulations on future oil and gas development, the Proposed RMPA would have negligible impacts on NWSRs. The BLM would also implement management direction through project-level decisionmaking to avoid impacts to river values from other proposed or future projects, as required by BLM Manual 6400. With BLM's discretionary review and approval of future proposed actions near eligible NWSRs, the Proposed RMPA would not combine with other existing or future projects to create a cumulative effect.