

practitioner to ‘count what counts.’” In this way, the cumulative analysis is focused on those cumulative impacts to which the Central Valley Wye alternatives would contribute.

National Historic Preservation Act (36 C.F.R. § 800)

The regulations implementing Section 106 of the National Historic Preservation Act acknowledge that a project’s adverse effects include any that are reasonably foreseeable, even if they may occur later in time, are farther removed in distance, or are cumulative.

Clean Water Act (33 U.S.C. § 1251 et seq.)

Section 404 of the Clean Water Act requires the assessment of potential cumulative impacts on jurisdictional waters of the U.S., including special aquatic sites protected by Section 404, which are under the jurisdiction of the U.S. Army Corps of Engineers (USACE) and the U.S. Environmental Protection Agency (USEPA).

Federal Endangered Species Act (15 U.S.C. § 1531 et seq.)

The implementing regulations for the federal Endangered Species Act, Section 7 (50 C.F.R. § 402.02) define cumulative impacts as those effects of future state or private activities not involving federal activities that are reasonably certain to occur within the action area that is subject to consultation with the U.S. Fish and Wildlife Service or National Marine Fisheries Service, or both. This definition is narrower than the definition of cumulative effects under NEPA and is only used for Section 7 consultation and not for the analysis conducted under NEPA.

3.19.2.2 State

California Environmental Quality Act (Cal. Code Regs., tit. 14, § 15000 et seq.)

The California Environmental Quality Act (CEQA) defines cumulative impacts as two or more individual impacts that, when evaluated together, are considerable or compound or increase other environmental impacts (CEQA Guidelines § 15355). Under CEQA, when a project would contribute to a cumulatively significant impact, an EIR must discuss whether the project’s incremental effect is cumulatively considerable. *Cumulatively considerable* means that the project’s incremental effect is significant when viewed in the context of past, present, and reasonably probable future projects.

The CEQA Guidelines provide that cumulative impact analyses should focus on *significant* cumulative impacts to which a project would contribute and the magnitude of the project’s contribution.

When the combined cumulative impact associated with the project’s incremental effect and the effects of other projects is not significant, the EIR will briefly indicate why the cumulative impact is not significant and is not discussed in further detail in the EIR. A lead agency shall identify facts and analysis supporting the lead agency’s conclusion that the cumulative impact is less than significant (CEQA Guidelines § 15130(a)(2)).

3.19.3 Methods for Evaluating Impacts

For each resource topic, the Authority followed the following steps to determine whether any of the Central Valley Wye alternatives would contribute to cumulative impacts:

- Compiled a list and description of, as well as environmental impact information for, planned projects and relevant plans for consideration of cumulative impacts. Checked for such projects in adopted plans such as regional transportation plans (RTP), regional transportation improvement plans, local long-range transportation plans, local land use general and specific plans; interviews with local and regional planning agencies; and recent environmental documents for other large-scale projects near HSR alternatives.
 - Planned projects in this analysis are those that are likely to occur and will add to the cumulative impacts on a particular resource. Generally, projects are considered in the analysis if they are part of an adopted plan as described in this section or fall under any of the following conditions:

- Applications for project entitlements or construction are pending with a government agency.
- The project is included in an agency’s budget or capital improvement program.
 - The project is a foreseeable future phase of an existing project.
 - The project would likely occur within the 2040 planning horizon for the HSR system.
- Defined the resource study area (RSA) for the cumulative impacts for each resource area.
- Identified and evaluated the cumulative impacts of the planned projects, including the Central Valley Wye alternatives, that make up the cumulative condition for each resource area. Determined as part of this evaluation whether there is a cumulative impact.
- Determined whether the incremental contribution of the Central Valley Wye alternatives to the cumulative impacts for each resource area is cumulatively considerable under CEQA. “Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.” (CEQA Guidelines § 15355)
- Identified reasonable, feasible options for avoiding or mitigating the Central Valley Wye alternatives’ contribution to cumulative impacts.

The specific resource evaluations in Chapter 3, Affected Environment, Environmental Consequences, and Mitigation Measures, form the basis for analyzing the cumulative impacts of each resource. The cumulative analysis includes all resources considered in Chapter 3 (i.e., Sections 3.2 through 3.17).¹

3.19.4 Cumulative Projects and Growth Forecasts

This section discusses the historical context of the San Joaquin Valley and how development trends in the past have influenced the environmental character of the area. This section also discusses projected development trends and describes how future urbanization is projected to change the character of the San Joaquin Valley.

3.19.4.1 Historical Context of San Joaquin Valley

The historical context of the San Joaquin Valley is the same as that described in Section 3.19.2.1 of the Merced to Fresno Final EIR/EIS, which is incorporated by reference (Authority and FRA 2012: pages 3.19-2 through 3.19-3). The conversion of the San Joaquin Valley from a natural state in the late 1700s and early 1800s to current agricultural, urban, and transportation uses has resulted in a general deterioration of the natural environment. This has manifested in widespread impacts such as groundwater overdraft and related land subsidence, loss of biological diversity and habitat, traffic congestion, air quality below state and federal standards, conversion of important farmland to urban uses, and pollution of surface waters. The San Joaquin Valley was flood-prone before development began on a large scale in the 1800s; the physical risk of flooding has increased when viewed in the context of its potential to disrupt human activities.

3.19.4.2 Projected Growth Trends

As discussed in Chapter 2, Alternatives, projections show that the San Joaquin Valley is expected to grow at a faster rate than any other region in California. General plans and other planning documents for cities and counties in the region project the locations and types of growth likely to occur under build-out of the plans. Population growth in Merced and Madera Counties is projected to continue at the rate of 1.7 percent and 1.9 percent per year, respectively, with an estimated population increase for both counties totaling approximately 222,000 people by 2040 (CDOF 2014). This growth in population will translate into continued conversion of currently

¹ Section 3.18, Regional Growth, describes induced growth and indirect effects from growth; that section also identifies cumulative impacts associated with regional growth and future projects and this analysis is not repeated in this section.

undeveloped or agricultural lands to residential, small business, and light industrial uses, plus the transportation infrastructure needed to support added development.

The relevant adopted general plans for the counties and incorporated areas promote relatively dense urban development, concentrated near existing urban areas, with the exception of the specific plans included on the project list. The *2030 Merced County General Plan* calls for concentrating new residential development in areas designated as urban communities (Merced County 2013). The *Madera County General Plan* calls for accommodating growth in cluster housing or planned communities (Madera County 1995). Growth is also anticipated in the cities of Chowchilla, as identified in the *City of Chowchilla 2040 General Plan* (City of Chowchilla 2011) and Madera, as identified in the City of Madera's *General Plan* (City of Madera 2009), and in the community of Fairmead, as identified in the draft Fairmead Colony Area Plan (Madera County Planning Department 2012). As such, some population growth would occur based on urban infill, and the remainder would occur on undeveloped lands outside existing urban areas. Land and the construction of new residential areas, roadways, electric power generation facilities, utilities, schools, hospitals, and commercial and industrial facilities would be required to accommodate the new population.

The electrical network upgrade work (including reconductoring), proposed to be constructed in the 2031 to 2033 timeframe in Stanislaus, Merced, Madera, and Fresno Counties as well as the cities of Merced and Waterford are required to ensure the availability of reliable electric service to meet the Central Valley Wye alternatives electrical demand. Proposed modifications to existing Pacific Gas & Electric (PG&E) facilities (i.e., replacing existing conductor with more efficient conductor of the same voltage) are specifically designed to accommodate the existing and planned electrical load growth produced by the HSR, rather than to induce growth. Consideration of potential impacts under the No Project Alternative in terms of projected population growth is not applicable to network upgrades. However, consideration of the cumulative condition from build-out as disclosed in the applicable general plan and regional transportation plan (RTP) final EIRs for which construction activities associated with the network upgrades could contribute is considered in Section 3.19.5, Organization of Cumulative Impacts Analysis. Specifically, reconductoring could contribute to the following impacts: air quality (construction emissions), biological resources, greenhouse gas (GHG) emissions (short-term); hydrology and water quality (groundwater depletion), aesthetics and visual resources as well as energy consumption (Merced County 2012; Madera County 1995; Stanislaus County 2016; Fresno County 2000; City of Merced 2011; Merced County Association of Governments 2014; Madera County Transportation Commission 2014b; Stanislaus Council of Governments 2014; Fresno Council of Governments 2014). There are no other identified cumulative conditions to which construction of the network upgrades could contribute, including those in Waterford. Therefore, no cumulative impacts would occur from construction and operations of these network upgrades (City of Waterford 2006).

Regarding operation and maintenance, for PG&E components there would be no change in baseline conditions; therefore, no contribution to a cumulative condition could occur.

3.19.4.3 Cumulative Project Lists and Regional Projections

In addition to considering general plan projections identified for Merced and Madera Counties and the cities of Madera and Chowchilla, the cumulative impacts analysis also considers a list of planned transportation and utility projects listed in Appendix 3.19-A, Cumulative Plans and Non-Transportation Projects List, and Appendix 3.19-B, Cumulative Transportation Projects List. Appendix 3.19-A provides detailed information about planned development projects and plans, and Appendix 3.19-B provides similarly detailed information about transportation projects considered in this cumulative impact analysis. These cumulative project lists are based on the cumulative projects lists from the Merced to Fresno Final EIR/EIS but have been updated with projects newly planned since 2012.

Appendix 3.19-A includes a series of tables that list major capital or new development projects by jurisdiction for the counties and cities in the cumulative RSAs, including large-scale planning efforts through the region, county and city general plan updates to accommodate long-term development and urbanization, and smaller-scale mixed-use, residential, agricultural-industrial,

and commercial developments planned through 2040. Analysts identified 242 projects and plans for Merced, Madera, Stanislaus and Fresno Counties, the community of Fairmead, and the cities of Madera, Merced and Chowchilla. While there are no additional or markedly different projects other than those previously identified in the Merced to Fresno Final EIR/EIS for Fresno County; there is an additional road project disclosed in the *Merced Vision 2030 General Plan* (City of Merced 2015). There were no projects proposed for construction in the 2031 to 2033 timeframe identified in Waterford. With the exception of the portion of the Site 7—Le Grand Junction/Sandy Mush Road, Warnerville – Wilson 230 kilovolt (kV) Transmission Line located in the city of Merced, there are no planned projects within 1.5 miles of the network upgrade facilities for which localized construction impacts could combine.

Projects listed in Appendix 3.19-B reflect consideration of relevant adjacent HSR sections and applicable state and local projects and plans, listed primarily within RTPs and general plan transportation elements. Analysts reviewed these plans to identify planned and programmed transportation improvements considered in the cumulative setting and relevant impact analyses. Assumptions about what constitutes a funded or programmed improvements on the intercity highway network are based on financially constrained RTPs² developed by regional transportation planning agencies and include more than 100 transportation improvements in Merced and Madera Counties.

3.19.5 Organization of Cumulative Impacts Analysis

The analysis includes potential short-term, long-term, and indirect impacts from adopted plans, concurrent construction activities, and planned and projected development and transportation projects listed in Appendices 3.19-A and 3.19-B, including the adjacent HSR sections to the Central Valley Wye (i.e., the entire Merced to Fresno Section and the adjacent San Jose to Merced Section).

3.19.5.1 Cumulative Condition

The combined environmental influence of the past, present, and future changes described in Section 3.19.4, Cumulative Projects and Growth Forecasts, and Appendices 3.19-A and 3.19-B in conjunction with the Central Valley Wye alternatives is referred to as the “cumulative condition” through 2040. Projected growth and conversion of land to urban and transportation uses associated with the cumulative condition, as reflective of adopted city and county general plans, regional transportation plans/sustainable communities strategies, as well as the cumulative project list, is anticipated to have an environmental effect in the area crossed by the Central Valley Wye alternatives through 2040. Population growth in Merced and Madera Counties is projected to continue at the rate of 1.7 percent and 1.9 percent per year, respectively, with an estimated population increase for both counties totaling approximately 222,000 people by 2040 (CDOF 2014). This growth in population will translate into continued conversion of currently undeveloped or agricultural lands to residential, small business, and light industrial uses, plus the transportation infrastructure needed to support added development. The relevant adopted general plans for the counties and incorporated areas promote relatively dense urban development. Nevertheless, urban development would continue to result in the conversion of natural and agricultural land, especially for future housing and associated development consistent with the general plans of the area. Under the cumulative condition, traffic would increase; ambient noise levels would increase; the demand for energy and water would increase; habitat for wildlife would become less available; the amount of impervious surfaces would increase and affect the quality and amount of stormwater runoff; demand for public facilities and parks would increase; the land available for agricultural production would decrease; and the visual character of many locations in the cumulative RSA would change from rural to urban.

² “Financially constrained RTPs” means transportation plans that conform to funding an agency has secured. Transportation agencies may also have financially unconstrained plans, representing aspirational projects for which funding has yet to be obtained.

Moreover, under the cumulative condition in the 2031 to 2033 timeframe, for which construction activities associated with the network upgrades could contribute, it is anticipated that the following impacts as reflected by adopted city and county general plans, regional transportation plans/sustainable communities strategies, as well as the cumulative project list would continue to occur: conversion of agricultural land, construction air emissions, loss of biological habitat and species, short-term GHG emissions, groundwater depletion, change in visual character and energy consumption. Therefore, with respect to the potential contribution to the cumulative condition from the network upgrades, the cumulative RSA is expanded for these resource areas.

3.19.5.2 Contribution of the Central Valley Wye Alternatives

This analysis first considers the impacts of the Central Valley Wye alternatives in combination with the other cumulative projects (listed in Appendices 3.19-A and 3.19-B) to determine if there would be a cumulative impact on the resource. If a cumulative impact was identified for a resource, then analysts determined whether the Central Valley Wye alternatives' incremental contribution would be cumulatively considerable.

The Central Valley Wye alternatives' contribution to cumulative impacts is considered assuming incorporation of the Authority's relevant impact avoidance and minimization features (IAMF) (Chapter 2 and Appendix 2-B, California High-Speed Rail: Impact Avoidance and Minimization Features), and with application of mitigation measures identified for the Central Valley Wye alternatives in the individual resource analyses in Chapter 3 (i.e., Sections 3.2 through 3.17). In addition to including IAMFs and mitigation, the Central Valley Wye alternatives design and project footprints have been refined during the environmental planning process to avoid or minimize impacts while meeting the project purpose and objectives. Where appropriate, additional feasible mitigation measures are proposed that could reduce the Central Valley Wye alternatives' cumulatively considerable contribution.

Through the planning horizon of 2040, the Central Valley Wye alternatives could have environmental impacts that are cumulatively considerable in some areas and would reduce a potential cumulative impact in other areas, as described in the resource specific sections.

3.19.5.3 CEQA Conclusion

The cumulative impacts analysis of the Central Valley Wye alternatives considers whether the cumulative condition could result in a *cumulative impact* within a specific resource area (e.g., biological resources, noise and vibration). If it is determined that there could be cumulative impacts, the analysis then proceeds to determine whether the incremental contributions of the Central Valley Wye alternatives to the identified cumulative impacts would be *cumulatively considerable*. If the incremental effect of the Central Valley Wye alternatives would be cumulatively considerable, the discussion then identifies notable differences between alternatives, if any. The analysis then describes additional feasible mitigation measures beyond those already identified, if available, to address the contribution of the Central Valley Wye alternatives to a cumulative impact.³ The analysis concludes with a determination of CEQA significance for each resource topic where it is applicable. This conclusion specifically identifies whether there would be significant cumulative impacts under CEQA and whether the contribution of the Central Valley Wye alternatives, after any applicable mitigation, would be cumulatively considerable.

3.19.6 Cumulative Impacts Analysis

3.19.6.1 Transportation

RSA

The cumulative RSA for transportation is the area encompassing Merced and Madera Counties, which is larger than the RSA described in Section 3.2, Transportation (defined as the major and

³ This analysis is included to comply with CEQA, which requires a determination as to whether cumulative impacts are "cumulatively considerable." Refer to Section 3.19.2.2, State, for further information.

minor roadways within 0.25 mile of the project footprints; airports within 1.0 mile of the project footprints; and, pedestrian and bicycle access within 500 feet of the project footprints). This cumulative RSA was selected to develop a broad, regional consideration of cumulative transportation impacts, and because it captures impacts on transportation associated with the construction and operations of the Central Valley Wye alternatives and regional impacts on transportation associated with anticipated development projects affecting the same transportation infrastructure and conditions.

Cumulative Condition and Contribution of the Central Valley Wye Alternatives

The cumulative condition relevant to transportation includes not only the Central Valley Wye alternative as part of the Merced to Fresno Project Section, but also development planned under the general plans of Merced and Madera Counties and the cities of Chowchilla and Madera, as well as adjacent HSR sections and relevant planned and future residential, commercial, industrial, recreational, transportation, and agricultural projects identified in Appendices 3.19-A and 3.19-B. Under the cumulative condition, ongoing urban development is expected to continue within the cumulative RSA. Urban development stemming from the population increase through 2040 would result in the conversion of large areas of land that is presently used for agriculture or is undeveloped to accommodate housing, commercial, office, transportation, parks, and schools within Merced and Madera Counties as well as the city of Merced. Traffic volumes on roadways in the cumulative RSA are expected to increase because of planned and future development activity, thereby affecting existing roadways, highways, utilities, airports, and railways. Cumulative impacts relevant to transportation would occur if the effects of these projects and planned development were to combine to cause substantial increases in vehicle miles traveled or substantial deterioration of safety during or after construction. Cumulative impacts also could occur if any individual transportation impacts combined to diminish emergency access, reduce bicycle or pedestrian access, or reduce the level of transit service provided within the cumulative RSA.

Local and regionally planned transportation projects such as the widening of State Route (SR) 99, reconstruction of the SR 99/SR 233 interchange, construction of the SR 152 Los Banos bypass, as well as Upgrading Arterial G Street from Yosemite to the north end of the city of Merced's Specific Urban Development Plan and Sphere of Influence boundary are intended to accommodate the expected increase in traffic related to development in the region. However, if work on multiple projects were to overlap with the construction of the Central Valley Wye alternatives and adjacent HSR sections, cumulative impacts related to traffic delays and detours for travel in the region could occur. Planned and future development such as the Yosemite Ranch Estates 2,500-lot development in Merced County and the 2,062-acre Gateway Village and Gunner Ranch Specific Plans in Madera County would likely require temporary construction easements and may result in the temporary closure of parking areas and roadway travel lanes. Planned highway projects, or other developments directly adjacent to highways, could require temporary reductions in lane widths and reductions in speed limits, which could contribute to cumulative impacts on traffic circulation and congestion in construction zones. Construction activities associated with planned and future transportation projects would also potentially result in temporary detours and temporary and permanent road closures and contribute to cumulative impacts on traffic circulation and roadway level of service (LOS). Indirect cumulative impacts would result if these direct cumulative impacts combined and temporarily limited or detoured pedestrian and bicycle access, or limited or slowed access of emergency responders.

During and after construction, cumulative development in Merced and Madera Counties could also directly affect transit conditions by requiring the rerouting of public transit routes caused by the closure of roadways. Similar cumulative impacts could also occur on school bus operations in the cumulative RSA. Proposed development and transportation projects would be required by law to put in place measures to reduce transportation safety impacts, to avoid disrupting public transit and bus travel, and would likely include measures to mitigate roadway LOS impacts during and after construction.

As discussed in Section 3.2, impacts on the transportation network are expected under all of the Central Valley Wye alternatives, generally related to temporary and permanent road closures and relocations. These would include changes in traffic circulation on major roadways, changes in emergency and property access, and disruptions or delays of road, rail, and agricultural vehicles during construction. These impacts would be greatest under the three SR 152 (North) Wye alternatives because of a larger number of permanent road closures and disruptions to SR 152 itself. However, grade separations proposed under the three SR 152 (North) Wye alternatives would also provide traffic safety benefits by reducing the number of existing at-grade crossings and potential conflicts between vehicles along the portion of SR 152 that parallels the three SR 152 (North) Wye alternatives. The design of the Central Valley Wye alternatives incorporates features such as TR-IAMF#2, Construction Transportation Plan, which would allow traffic flow to continue during construction and would include coordination between the construction contractor and local jurisdictions to minimize conflicts with other concurrent construction projects. TR-IAMF#3, Off-Street Parking for Construction-Related Vehicles, would avoid conflicts with passing traffic. TR-IAMF#4, Maintenance of Pedestrian Access, would allow passage of pedestrians during construction. TR-IAMF#5, Maintenance of Bicycle Access, would allow passage of bicyclists during construction. TR-IAMF#6, Restriction on Construction Hours, would minimize construction traffic on roads during peak travel hours. TR-IAMF#9, Protection of Freight and Passenger Rail during Construction, would avoid interruption of rail traffic. Finally, TR-IAMF#10, Maintenance of Transit Access, would minimize conflicts over bus access. In addition, the Central Valley Wye alternatives would include overcrossings or undercrossings approximately every 2 miles, reducing circulation impacts that could result from the closure of rural roads.

Taken together, the features of the Central Valley Wye alternatives, along with the transportation safety measures of other proposed development projects would minimize temporary construction impacts on traffic circulation such that roadway LOS would remain within acceptable levels. While some level of disruption in traffic would be expected if construction schedules of planned development and transportation improvements were to occur simultaneously, this disruption would be temporary and individual projects would contain measures to avoid major traffic delays, likely similar to the IAMFs that are part of the Central Valley Wye alternatives. Therefore, it is not anticipated that temporary impacts of construction of multiple projects would combine to result in cumulative impacts.

In the long term, planned transportation improvements of major roadways in the cumulative transportation RSA are anticipated to improve the existing highway network by widening existing highways, improving safety, and reducing congestion. Future projects involving new and improved bridge crossings, such as the SR 99 bridge over the Merced River, the Schnoor and Cleveland Avenue Bridges over the Fresno River in the city of Madera, and projects involving lane widening and interchange improvements, such as the widening of Highway 99 south of Madera and the reconstruction of the SR 99/SR 233 interchange, would accommodate increased traffic, reduce congestion, and enhance safety for motorists in the long term. HSR operations would provide transportation alternatives for regional travel, potentially reducing the number of automobiles traveling across the RSA. Taken together, these transportation projects would provide a cumulative regional improvement to transportation circulation and access in the region. Therefore, there would not be a cumulative impact on transportation.

CEQA Conclusion

No cumulatively significant impacts for transportation would occur in the RSA because planned development and transportation projects are geographically dispersed, and it is assumed that each would have in place measures to maintain traffic access and LOS during construction. After construction, these planned transportation system improvements would accommodate the traffic associated with planned development and regional growth such that there would not be a deterioration of roadway LOS or safety. Cumulatively significant impacts also are not anticipated for emergency access, reduce bicycle or pedestrian access, or transit service within the cumulative RSA. Therefore, CEQA does not require any mitigation.

3.19.6.2 Air Quality and Global Climate Change

RSA

To develop a broad, regional consideration of cumulative impacts for air quality, the entire San Joaquin Valley Air Basin (SJVAB) and San Francisco Bay Area Air Basin (SFBAAB) were identified as the cumulative RSA. The cumulative RSA for air quality goes beyond the local RSA described in Section 3.3, Air Quality and Global Climate Change, to encompass the regional RSA (the SJVAB for primary Central Valley Wye alternatives construction and operations and the SFBAAB for potential hauling activity during construction).

The air quality analysis differs in format from other cumulative discussions in this section. The analysis utilizes a projection approach that is generated by the San Joaquin Valley Air Pollution Control District (SJVAPCD) and the Bay Area Air Quality Management District (BAAQMD), which use models for air quality based on projections of future development compared to existing conditions. Those criteria pollutants that exceed air quality standards under modeled conditions are considered to reflect the cumulative impacts resulting from contributors within the air basins. Therefore, the air quality analysis provided in Section 3.3 is inherently a cumulative analysis and already inclusive of the cumulative condition. Accordingly, in this discussion, the cumulative condition and the Central Valley Wye alternatives' contribution to any impacts are discussed jointly. The analysis utilizes the outcomes of these models to determine whether the Central Valley Wye alternatives' emissions of criteria pollutants and dust would exceed the SJVAPCD's and BAAQMD's air quality thresholds. If thresholds are exceeded, it indicates both that there would be a cumulative impact, and that the Central Valley Wye alternatives' contribution would be cumulatively considerable.

This cumulative analysis for global climate change identifies the same cumulative RSA described in Section 3.3, which includes the entire state of California. Because climate change is the result of cumulative contributions worldwide, it is also examined using a projection approach. Similarly, if applicable thresholds for GHG emissions are exceeded⁴, it indicates that there would be a cumulative impact, and that the Central Valley Wye alternatives' contribution would be cumulatively considerable.

Cumulative Condition and Contribution of the Central Valley Wye Alternatives

Under the cumulative condition, ongoing urban development, agricultural practices, and construction activities are expected to continue within the cumulative RSAs and planned development and regional growth would contribute to emissions of air pollutants. Construction of planned transportation improvements, including the HSR Merced to Fresno, Fresno to Bakersfield, and San Jose to Merced Sections and the planned expansion of SR 99 through several locations in Stanislaus, Merced, Madera, and Fresno Counties, would likely result in impacts on air quality from construction emissions. Together, the Central Valley Wye alternatives, development planned under the general plans of Merced and Madera Counties and the cities of Chowchilla and Madera, adjacent HSR sections, planned projects identified in the RTPs prepared by metropolitan planning organizations within the SJVAB and SFBAAB, and relevant planned and future residential, commercial, industrial, recreational, transportation, and agricultural projects identified in Appendices 3.19-A and 3.19-B constitute the cumulative condition relevant to air quality and global climate change.

The SJVAPCD, which has jurisdiction over the SJVAB, has identified project-level thresholds to evaluate air quality impacts from projects in the SJVAB and, in developing these thresholds, has identified levels at which project emissions would be cumulatively considerable. The air district thresholds have been adopted based on federal requirements to meet air quality standards, and to prevent deterioration of ambient air quality. The project-level thresholds therefore are based on models that consider planned future projects within the SJVAB. As stated under the air quality analysis prepared for the Central Valley Wye alternatives, emissions modeling conducted for the

⁴ Refer to Section 3.3.4.5.

Central Valley Wye alternatives indicates that all four alternatives would result in cumulative impacts on air quality in the SJVAB prior to mitigation. As discussed in Section 3.3.6.3, Central Valley Wye Alternatives, emissions would be largely similar between the four alternatives, and operation of construction equipment and trucks during the 2019 to 2022 construction period could result in fugitive dust emissions (particulate matter 10 micrometers or less in diameter [PM₁₀] and particulate matter 2.5 micrometers or less in diameter [PM_{2.5}]), earthmoving and disturbed earth surfaces, and combustion pollutants, particularly ozone precursors (nitrogen oxides [NO_x]), affecting air quality through the release of emissions into the atmosphere that exceed the applicable SJVAPCD thresholds. All four Central Valley Wye alternatives would exceed the annual PM₁₀ threshold in three disparate years of construction. The highest exceedances of PM₁₀ would occur in 2020 as well and would be a maximum of 10.77 tons per year over the threshold for the Avenue 21 to Road 13 Wye Alternative and a minimum of 10.50 tons per year over the threshold for the SR 152 (North) to Road 11 Wye Alternative. All four Central Valley Wye alternatives would exceed the annual NO_x threshold in four disparate years of construction. The highest exceedances of NO_x would occur in 2020, and would be a maximum of 134.40 tons per year over the threshold for the Avenue 21 to Road 13 Wye Alternative and a minimum of 123.86 tons per year over the threshold for the SR 152 (North) to Road 19 Wye Alternative in 2020.

The Central Valley Wye alternatives would also contribute to cumulative impacts with respect to NO_x in the SFBAAB during the 2019 to 2022 construction period because emissions during material hauling activities associated with the HSR alignment would exceed the BAAQMD threshold. The SR 152 (North) to Road 19 Wye Alternative would require the maximum amount of ballast and subballast to be hauled, while the SR 152 (North) to Road 11 Wye Alternative would result in the minimum amount of ballast and subballast to be hauled. Emissions of all other pollutants would not exceed any other BAAQMD threshold. Without mitigation, these emissions would be considered a cumulatively considerable impact on air quality. The Central Valley Wye alternatives would incorporate IAMFs to protect air quality. AQ-IAMF#1, Fugitive Dust Emissions, would include measures to avoid or minimize fugitive dust emissions, and AQ-IAMF#2, Selection of Coatings, would avoid the potential for air pollutant creation from off-gassing of volatile organic chemicals). However, even with these IAMFs taken into account, these pollutants could combine with emissions from other construction projects and create cumulative impacts on air quality.

For the Central Valley Wye alternatives, mitigation measures would offset construction and off-site emissions; reduce criteria exhaust emissions from construction equipment, on-road vehicles, and concrete batch plants; and offset construction emissions through a voluntary emissions reduction agreement (see Section 3.3.7, Mitigation Measures, for information on the mitigation measures). These mitigation measures would avoid impacts on regional air quality from criteria pollutants. Therefore, considering these mitigation measures, the Central Valley Wye alternatives would not result in or contribute to cumulative air quality impacts from criteria pollutants during construction.

As shown in Section 3.3.6.3, during operations, net reduction in overall emissions would occur through reductions in regional aircraft and roadway emissions. The historical trend has been for regulatory agencies to adopt more stringent criteria pollutant emission standards with the goal of reducing the amount of pollutant emissions in the atmosphere. Many of these regulations are not yet implemented but would be prior to the planning horizon of 2040 for the Central Valley Wye alternatives. Overall, air quality in the SJVAB and statewide has improved and improvements are anticipated to continue as a result of implementing of these regulations. Operations of the Central Valley Wye alternatives would not result in direct pollutant emissions from the trains, with the exception of wind-induced dust (i.e., PM₁₀ and PM_{2.5}) from train movement. Wind-induced dust emissions would not exceed the SJVAPCD thresholds (see Table 3.3-19). Emissions at power plants may increase, because the HSR trains would use electricity, but the increases would likely be much smaller than the decreases from on-road vehicles and aircraft. Therefore, from an operational perspective, the Central Valley Wye alternatives could result in a net reduction in criteria pollutant emissions (see Table 3.3-19 in Section 3.3 for a presentation of operations emissions associated with the Central Valley Wye alternatives). Thus, the Central Valley Wye alternatives would not result in or contribute to cumulative air quality impacts during operations,

and the HSR system as a whole may provide cumulative reductions in air emissions after construction.

Health Risk Assessment and Other Localized Construction Impacts

Emissions analysis at the local level includes evaluating whether there would be concentrations of certain criteria pollutants and toxic air contaminants that could affect sensitive receptors within 1,000 feet of construction areas. The principal sources of project emissions that could cause health risks are diesel particulate emissions associated with construction equipment. For projects to combine to form a cumulative cancer risk and chronic and acute health hazard, the emissions of these pollutants and contaminants from construction or operation of multiple projects would have to occur in close proximity to nearby sensitive receptors and emissions of multiple projects would have to overlap in time. It is unknown if any other construction projects scheduled would occur in the immediate vicinity of the Central Valley Wye alternatives project footprints. However, based on a review of the planned projects disclosed in Appendix 3.19-A and 3.19-B, it is not anticipated that any potential construction activities associated with these projects would occur within 1,000 feet of any given sensitive receptor concurrent with Central Valley Wye alternatives construction activities within this distance. Therefore, the Central Valley Wye alternatives would not result in or contribute to a cumulative impact during construction that would result in an increase in health risks.

Global Climate Change

Note that climate change is a global problem and GHGs are global pollutants, unlike criteria air pollutants (such as ozone precursors), which are primarily pollutants of regional and local concern. Given their long atmospheric lifetimes, GHGs emitted by countless sources worldwide accumulate in the atmosphere. No single emitter of GHGs is large enough to trigger global climate change on its own. Rather, climate change is the result of the individual contributions of countless past, present, and future sources. Therefore, GHG impacts are inherently cumulative.

Growth and proposed developments are projected to result in thousands of new homes and millions of square feet of new retail, commercial, and industrial uses that would cumulatively contribute GHG emissions from initial construction as well as operations (e.g., vehicle miles traveled, electricity, etc.) of these developments. However, as shown in Table 3.3-12, GHG emissions statewide are anticipated to decrease between 2015 and 2040 because of improvements in vehicle emission technology in future years that would result in lower levels of GHG emissions toward meeting statewide targets to reduce GHG emissions. Therefore, there would not be a cumulative GHG emissions impact related to this cumulative development.

Construction of the Central Valley Wye alternatives would require the use of heavy equipment and trucks. The use of construction equipment and trucks could result in GHG emissions that would affect global climate change through the release of emissions into the atmosphere. As shown in Table 3.3-17, the Central Valley Wye alternatives would result in temporary GHG emissions that would be less than 3,700 metric tons of carbon dioxide equivalent per year. Although there are no explicit thresholds for GHG emissions, construction GHGs would not result in a cumulatively considerable impact on global climate change because the HSR would not conflict with an applicable plan, policy, or regulation adopted for reducing the emissions of GHG. The HSR is consistent with the State of California's 2020 goal to reduce GHG emissions and with Measure T#9 in the Assembly Bill (AB) 32 scoping plan.

Statewide, the operation of the Central Valley Wye alternatives would result in a net reduction in GHG emissions and global climate change (as shown in Table 3.3-25). During the operational phase of the Central Valley Wye alternatives, it is anticipated that emissions from roadways and aircraft would decrease as people shift from using these forms of transportation to the HSR, which has a lower emissions intensity. Emissions at power plants, switching stations, and substations would increase because the HSR trains operating as part of the Central Valley Wye alternatives would use electricity, but the increases are anticipated to be much smaller than the decreases from on-road vehicles and aircraft (see Table 3.3-27 and Table 3.3-29). Additionally, the net reduction in GHG emissions during operations would offset the emissions produced

during construction. Thus, during the operational phase, the Central Valley Wye alternatives would not result in net increases of direct or indirect GHG emissions and would not conflict with any applicable plans to reduce GHGs. In conclusion, statewide contributions to GHG emissions would decrease between 2015 and 2040 (Table 3.2-25). Therefore, there would not be a cumulative impact with or without the contribution of the Central Valley Wye alternatives and the HSR system as a whole may result in a net cumulative GHG reduction after construction.

CEQA Conclusion

The Central Valley Wye alternatives would include IAMFs to minimize the potential for the violation of air quality standards or contribution to an existing or projected air quality standard violation in the SJVAB and the SFBAAB. Construction activities during the 2019 to 2022 construction period of the Central Valley Wye alternatives would contribute to cumulative air quality impacts because they would contribute to a violation of air quality standards (i.e., exceedances of the NO_x, and PM₁₀ SJVAPCD thresholds). Material hauling in the SFBAAB would also result in emissions of NO_x that exceed the BAAQMD NO_x threshold. Emissions that exceed the applicable thresholds would be reduced or offset through the application of mitigation measures, such as through the purchase of emissions offsets. Therefore, impacts would be reduced to the point that there would not be a cumulatively considerable contribution to significant cumulative air quality impacts during construction under CEQA.

Statewide efforts are underway to reduce GHG emissions. As a state agency, the Authority is required to comply with such adopted plans and goals. Such adopted plans and goals are also generally applicable to other development projects. Additionally, because construction projects are not anticipated to overlap spatially or temporally near sensitive receptors, no cumulative health risks impacts are anticipated to which the Central Valley Wye alternatives would contribute. The operational phase of the Central Valley Wye alternatives in combination with other planned projects would not result in any emissions exceedances or cumulative air quality impacts. Therefore, CEQA does not require any mitigation.

3.19.6.3 Noise and Vibration

RSA

This cumulative analysis utilizes the same RSAs for noise and vibration as those described in Section 3.4, Noise and Vibration, because it is sufficiently broad to cover the area in which the potential noise and vibration impacts of the Central Valley Wye alternatives, in combination with other projects, could result in cumulative impacts. The noise RSA for construction and operations is defined as 2,500 feet from the Central Valley Wye alternatives' centerlines and from the footprint of work associated with electrical interconnections and network upgrades and includes all sensitive receptors that could be exposed to noise impacts. The vibration RSA for construction and operations includes a range of screening distances up to 275 feet from the Central Valley Wye alternatives' centerlines, which is sufficient to encompass vibration-sensitive receptors that could be affected by vibration impacts.

Cumulative Condition and Contribution of the Central Valley Wye Alternatives

Under the cumulative condition, ongoing urban development and the expansion of some agricultural operations are expected to continue within the cumulative RSAs. Together, the Central Valley Wye alternatives, development planned under the general plans of Merced and Madera Counties and the cities of Chowchilla and Madera, as well as adjacent HSR sections and relevant planned and future residential, commercial, industrial, transportation, and agricultural projects identified in Appendix 3.19-A and Appendix 3.19-B, constitute the cumulative condition relevant to noise and vibration.

Noise

A cumulative noise effect would occur if activities related to the Central Valley Wye alternatives combined with the noise generated by other planned development, agricultural, and transportation projects to expose people to harmful noise levels. Cumulative noise impacts could occur from both temporary and permanent increases in ambient noise levels within the RSA and

result from noise-generating activities combining during construction or operation of any of these projects. These impacts would be considered a cumulative impact if the noise levels from train operations combined with noise emissions from other projects to exceed standards for severe impacts as established by the FRA for high-speed ground transportation or traffic noise emissions to exceed Federal Highway Administration standards, as established in the California Department of Transportation Traffic Noise Analysis Protocol. Additionally, construction noise emissions from multiple projects could combine to form a cumulative impact if these combined emissions exceed FRA construction noise assessment criteria.

Present activities that contribute to the baseline ambient noise environment of the cumulative RSA include traffic on SR 152 and SR 99, trains from the Union Pacific Railroad (UPRR), small aircraft, and agricultural activities. Future population growth within Merced and Madera Counties will cause increased traffic on SR 152 and SR 99 and increased operations at nearby airports, resulting in increased noise. Construction of planned development within urbanizing areas of Chowchilla and expansions of agricultural facilities such as processing plants and dairies could also contribute noise within the cumulative RSA. The only future planned transportation project that falls within the Central Valley Wye alternatives' cumulative noise and vibration RSA is the HSR Merced to Fresno Section.

While construction activities would generate noise levels that could result in individual impacts that would require project-specific mitigation, it is not considered likely that these would combine with the noise-generating activities of other projects to result in cumulative noise impacts. For this to occur, construction of multiple projects generating high noise levels would have to occur simultaneously and in very close proximity to sensitive receptors such that they combined to create noise levels that exceeded federal (FRA and Federal Highway Administration) standards. This scenario is unlikely to occur because the construction of planned projects would be temporary, and the projects do not generally have overlapping or adjacent construction footprints. Therefore, there would not be a cumulative noise impact in the RSA.

As described in Section 3.4, construction of the Central Valley Wye alternatives would require demolishing existing structures; handling, storing, hauling, and placing fill; and construction of aerial structures, bridges, road modifications, utility upgrades and relocations, HSR electrical systems, and rail beds. All of these activities would introduce new temporary sources of noise from construction equipment and these noise emissions are anticipated to affect sensitive receptors under all four Central Valley Wye alternatives. For daytime and nighttime impacts, the SR 152 (North) to Road 19 Wye Alternative would result in many more impacts on sensitive receptors than the other alternatives. For daytime impacts, the SR 152 (North) to Road 13 Wye Alternative would have the fewest impacts (65 impacts), closely followed by the SR 152 (North) to Road 11 Wye Alternative (66 impacts). The Avenue 21 to Road 13 Wye Alternative would have the fewest nighttime construction impacts. The Central Valley Wye alternatives would include a measure to minimize noise levels, NV-IAMF#1, Noise and Vibration, which would require the construction contractor to comply with FRA guidelines for noise and vibration (FRA 2012). Implementation of FRA guidelines would partially minimize noise and vibration impacts on sensitive receptors; however, noise and vibration generated by construction activities could still exceed thresholds at nearby sensitive receptors during construction of the Central Valley Wye alternatives. Therefore, the Central Valley Wye alternatives would implement mitigation measure NV-MM#1, Construction Noise Mitigation, which requires the contractor to maintain noise levels below FRA construction noise criteria at sensitive receptors. With incorporation of this mitigation measures, the Central Valley Wye alternatives would not cause or contribute to a cumulative noise impact during construction.

None of the projects identified within the cumulative RSA are anticipated to generate operations noise levels above federal and state standards because the nature of these projects is such that they either do not generate high levels of noise (residential and commercial development) or that they are transportation and agricultural expansions that are distant from sensitive receptors (dairy expansions, additional freight rail operations). Therefore, no cumulative noise impacts are anticipated during operations of these projects at sensitive receptors. However, the Central Valley Wye alternatives would generate new and permanent sources of noise during operations in the

form of train passbys, which would result in noise levels that exceed standards set by FRA. While mitigation measures are proposed to reduce these impacts, there would still be intermittent permanent noise impacts at 23 (SR 152 (North) to Road 19 Wye Alternative) to 39 (Avenue 21 to Road 13 Wye Alternative) single-family homes. While this would be a project-specific impact, it is not anticipated that these brief intermittent passbys would combine with other operations noise sources to further exceed FRA criteria such that there would be a new cumulative noise impact because of the localized nature of noise, relatively few other new operations noise sources, and the distance to these other potential noise-generating sources.

Vibration

Similar to noise impacts, ground-borne vibration generated by construction of the Central Valley Wye alternatives and other HSR sections could combine with vibration from other development, agricultural, and transportation projects to affect nearby sensitive receptors. If these vibration levels exceeded standards for nearby sensitive receptors, it could cause damage to structures and would be considered a cumulative impact. The construction of planned transportation projects could cause cumulative vibration impacts on sensitive receptors if construction schedules for these projects overlap and if work that generated high levels of vibration was taking place simultaneously on multiple sites near sensitive receptors. While there are few construction activities that generate high levels of vibration (see discussion in Section 3.4), impact pile driving in particular can result in damaging and annoying ground-borne vibration.

Ground-borne vibration generally only travels short distances from the vibration source and does not readily combine with other sources of vibration to increase in magnitude because of differing frequencies. Therefore, even if construction activities were taking place on adjacent projects, it is unlikely that there would be multiple vibration sources (such as impact pile drivers) in close proximity generating high levels of vibration at the same frequency and at the same time during construction near sensitive receptors. As discussed in Section 3.4, vibration impacts are anticipated to be similar for the four Central Valley Wye alternatives. As construction of the Central Valley Wye alternatives and other sections of the HSR project is not expected to include impact pile driving during construction near sensitive receptors or buildings (see Section 3.4), there is even less likelihood of multiple high-vibration activities occurring in proximity to each other or to sensitive receptors.

For operations vibration, existing vibration sources consist primarily of train operations between the cities of Fresno and Merced. Anticipated additional freight train traffic on the UPRR will result in increased vibration levels. Operations of the Central Valley Wye alternatives would also increase vibration levels along the selected alternative alignment. These freight and HSR operations are separated for rail safety reasons and do not overlap in a way such that ground-borne vibration would readily combine. Therefore, there would not be a cumulative vibration impact.

CEQA Conclusion

No cumulative noise impacts are anticipated during construction of cumulative projects. The Central Valley Wye alternatives would include IAMFs to minimize construction noise emissions and mitigation measures that require that the contractor stay within FRA construction noise criteria. Therefore, there would not be a significant cumulative construction noise impact under CEQA caused by or to which the Central Valley Wye alternatives would contribute. During operations, any of the Central Valley Wye alternatives could result in intermittent noise impacts on single-family homes from passing trains. While this would be a project-specific impact, it is not anticipated that these noise emissions would combine with the noise emissions of other planned projects to result in cumulative operations noise impacts. Because of the nature of vibration transmission, no cumulative impacts are anticipated during construction or operations. Therefore, CEQA does not require any additional mitigation.

3.19.6.4 Electromagnetic Fields and Electromagnetic Interference

RSA

This cumulative analysis identifies the same RSA for electromagnetic fields (EMF) and electromagnetic interference (EMI) as the RSA described in Section 3.5, Electromagnetic Fields and Electromagnetic Interference, because it is sufficiently broad to cover the area in which the potential impacts of the Central Valley Wye alternatives, in combination with other projects, could result in cumulative impacts. The EMF and EMI RSA is defined as the project footprint for each of the Central Valley Wye alternatives plus 500 feet from the proposed track centerline and 500 feet on both sides of the proposed HSR right-of-way centerline (a 1,000-foot-wide strip) from the traction power substations.

Cumulative Condition and Contribution of the Central Valley Wye Alternatives

Under the cumulative condition, ongoing urban development and agricultural operations are expected to continue within the cumulative RSAs. Together, the Central Valley Wye alternatives, development planned under the general plans of Merced and Madera Counties and the cities of Chowchilla and Madera, as well as adjacent HSR sections and relevant planned and future residential, commercial, industrial, recreational, transportation, and agricultural projects identified in Appendices 3.19-A and 3.19-B constitute the cumulative condition relevant to EMF and EMI.

As discussed in Section 3.5, EMF and EMI emissions are anticipated to be similar for all of the four Central Valley Wye alternatives. Planned and future projects, in combination with the Central Valley Wye alternatives and the HSR Merced to Fresno Section, could generate EMF by increasing the intentional use of the electromagnetic spectrum and unintentional generation of EMI. In addition, residential and service commercial uses planned for Robertson Boulevard between SR 152 and the existing city development under the *City of Chowchilla 2040 General Plan* (City of Chowchilla 2011), as well as increases in population from planned development, would also slightly increase demand for electromagnetic spectrum. Electrical power equipment that emits EMF and EMI, including high-voltage electric power lines, would continue to be used in the cumulative RSA. Directional and non-directional (cellular and broadcast) antennas and radio frequency communication equipment would be used and expanded through the development and transportation projects. Cumulative EMI impacts could occur if the combined impacts of these projects and anticipated growth combined to expose people to a documented EMF health risk, including a field intensity over the limit of an applicable standard, or if these EMFs interfered with unshielded sensitive equipment such as a medical equipment or devices.

As described in Section 3.5, future EMF levels in the cumulative RSA are not expected to increase to levels that would expose people to EMF health risks, interfere with the operation of an electrical, magnetic, or electromagnetic device, or increase the corrosion of nearby metal objects. Aside from the electricity required to operate HSR trains, there are no other large or continuous sources of EMF within the cumulative RSA. Therefore, there are no known existing or future locales within the RSA that would have excessive levels of EMF or EMI because of two or more existing or future projects, including the addition of EMF from the Central Valley Wye alternatives. Therefore, there would not be a cumulative impact associated with EMF and EMI.

CEQA Conclusion

There are no anticipated significant cumulative impacts under CEQA related to EMI and EMF to which the Central Valley Wye alternatives would contribute. Therefore, CEQA does not require any mitigation.

3.19.6.5 Public Utilities and Energy

RSA

The cumulative RSA for public utilities (excluding electricity) is Merced and Madera Counties, which is larger than the RSA described in Section 3.6, Public Utilities and Energy (defined as affected service areas of utilities and utility-owned properties within and beyond the project footprints). This RSA was chosen to develop a broad, regional consideration of cumulative

impacts, and because it captures impacts on public utilities associated with the construction and operation of the Central Valley Wye alternatives and regional impacts on public utilities associated with planned development. Specifically, the cumulative RSA allows for the analysis of additional projects that could affect stormwater and water supply line, electricity transmission facilities, fiber optics, and communication facilities in Merced and Madera Counties.

The cumulative RSA for energy (including electricity) identifies the same RSA for energy as the RSA described in Section 3.6, because the entire electricity grid of the state of California and other western states that produce energy and export to California is sufficiently broad to cover the area in which the potential impacts of the Central Valley Wye alternatives, in combination with other projects, could result in impacts. Electricity is examined using projections, rather than a list of other projects, given its large RSA.

Cumulative Condition and Contribution of the Central Valley Wye Alternatives

Under the cumulative condition, ongoing urban development and agricultural practices are expected to continue within the cumulative RSA. Urban development stemming from population increases through 2040 would result in the conversion of a large area of land that is presently used for agriculture or is undeveloped to accommodate housing, commercial, office, transportation, parks, and schools. Additionally, planned agricultural and industrial expansions, such as the expansion of dairies and processing plants, is expected to occur within the RSA. Together, the Central Valley Wye alternatives, development planned under the general plans of Merced and Madera Counties and the cities of Chowchilla, and Madera, as well as adjacent HSR sections and relevant additional future projects identified in Appendix 3.19-A and Appendix 3.19-B constitute the cumulative condition relevant to public utilities and energy.

This development and continued population growth anticipated in the cumulative RSA would result in corresponding increases in demand for utility services, storm drain facilities, water use (including irrigation), communications, and gas services. This planned development and growth would also contribute to cumulative increases in demands on the existing utility and electricity infrastructure within the cumulative RSA, including increased peak and base period electricity demand. For example, there are a large number of development projects planned and proposed within Madera County that would increase population in the county and greatly increase demand for more urban services, such as through requiring new electrical transmission lines, natural gas, water supply (including irrigation), wastewater treatment, communications, and stormwater facilities. For the purposes of this analysis, a cumulative impact on public utilities or energy would occur if this development and growth occurred faster than the local community utility, landfill and waste handling, and energy providers could accommodate and demand levels exceeded the capacity of existing infrastructure, or if the construction of new utility or energy services, facilities, and systems to accommodate the increased demand resulted in other direct or indirect impacts on the environment.

Public Utilities and Landfills

Because the general plans of Merced, Madera, Stanislaus and Fresno Counties and the cities of Chowchilla and Madera anticipate planned growth and coordinate this with utility providers, future public utility capacity in the cumulative RSA is generally anticipated to keep pace with growth in the region and meet future demand. However, planned and future development would require new facilities or the expansion of existing facilities in the cumulative RSA (such as the construction of new stormwater facilities to accommodate increased runoff resulting from new impervious surfaces). Dairies and processing plants are approved through local permitting processes that include evaluations of impacts on public utilities, especially water and wastewater supply and treatment. While these facilities can be heavily reliant on these utilities, they generally address water needs and waste issues on-site. Conversely, new residential and commercial developments rely on public utilities and the local permitting process includes evaluation of the capacity of utility providers to accommodate this development.

In addition to the planned growth anticipated in the general plans, the Merced County Regional Waste Management Authority is planning the Planada Wastewater Treatment Plant Improvement

Project and the Highway 59 Landfill Valley Fill Project. New utility infrastructure systems that would be required to support new residential, commercial, and industrial development and agricultural expansions are not anticipated to exceed the capacity of utility and energy service providers because the planned growth is already taking into consideration whether there is a need to upgrade any of these systems. For example, the Utilities and Service Systems analysis in the *2030 Merced County General Plan Draft Program Environmental Impact Report* (Merced County 2012) documents that there is adequate water, wastewater, and solid waste processing capacity in the county such that new facilities would not be required.⁵

As documented in Section 3.6, the four Central Valley Wye alternatives are expected to have similar public utility impacts with slightly higher water use for the construction of the SR 152 (North) to Road 19 Wye Alternative. The Central Valley Wye alternatives would include HYD-IAMF#1, Stormwater Management, under which the Authority, during the detailed design phase, would evaluate each receiving stormwater system's capacity to accommodate runoff from the HSR system for the design storm event. Also, for the Central Valley Wye alternatives, PUE-IAMF#4, Utilities and Energy, requires the contractor to coordinate with service providers to minimize or avoid utility interruptions during construction. Taken as a whole, under the cumulative condition, new systems and facilities would come on-line in conjunction with new development, including HSR, and would include measures to reduce impacts. It is not anticipated that any remaining impacts would combine to require new unplanned utility systems that could cause environmental impacts or would overwhelm existing systems. There would therefore not be a cumulative impact related to utility systems.

Construction activities associated with the planned and future projects in the cumulative RSAs would result in construction wastes, including concrete from demolished structures and asphalt from removed roadways. Although some construction and demolition wastes may be reused to the degree feasible, particularly for transportation projects including SR 99 south of Madera, reconstruction of the SR 99/SR 233 interchange, and construction of the SR 152 Los Banos bypass, and the HSR Merced to Fresno and Fresno to Bakersfield Sections, these projects would still result in construction wastes and would contribute cumulative impacts on the waste stream. For the construction of the Central Valley Wye alternatives, the SR 152 (North) to Road 13 Wye Alternative would generate the most estimated solid and hazardous waste (77,752 cubic yards) and the Avenue 21 to Road 13 Wye Alternative would generate the least (40,531 cubic yards). New residential, commercial, and industrial development projects would also contribute cumulative impacts on the waste stream in the cumulative utilities RSA. However, because there are adequate existing landfill capacities to receive solid wastes, and because county planning documents account for the increased need for solid waste facilities, there would not be a cumulative impact.

Energy Systems

The cumulative condition for energy involves the electricity grid and is reflected in planning documents of the California Energy Commission. Electricity providers perform regular demand projections that include the demand created by planned development. New and existing transmission, power, and distribution lines would need to be built or upgraded to serve the increased demand or to meet grid reliability requirements, respectively. Currently, there are two upgrades to existing electrical transmission/power lines (i.e., Wilson - Le Grand 115 kV Reconductoring Project and Warnerville - Bellota 230 kV Reconductoring Project) identified on the list in Appendix 3.19-A and 3.19-B. Planned utility-scale projects such as the Quinto Solar Photovoltaic Project, the Wright Solar Park Project, and the Fairmead Landfill Expansion Gas to Energy System located within the cumulative public utilities and energy RSA could contribute to the electricity supply. These developments are expected to help accommodate the additional electrical demand associated with the planned and future development projects and regional

⁵ Due to the drought and the use of water outside of county control, the Merced General Plan EIR does identify a cumulative impact related to surface water supply for future development. This cumulative water supply impact is not mitigated and would not require new facilities.

growth within the cumulative RSA. As a result, the energy used for project construction of planned and future development would not require additional energy capacity beyond that which is already planned and would not greatly increase peak or base period demands for electricity and other forms of energy. Because the construction and operation of planned and future projects within the cumulative RSA would include new/upgraded transmission/power lines and would not require a new unplanned energy supply or unplanned additional capacity, there would not be a cumulative impact.

CEQA Conclusion

There are no anticipated significant cumulative impacts under CEQA related to public utilities and landfills or to energy systems to which the Central Valley Wye alternatives would contribute. Therefore, CEQA does not require any mitigation.

3.19.6.6 Biological Resources and Wetlands

Several resource subtopics are discussed in this subsection and the organization of the discussion has been modified from the format of other resource discussions for clarity and readability. This subsection presents individual discussions of the cumulative condition, the contribution of the Central Valley Wye alternatives, and a CEQA conclusion for six different subtopics: special-status plants and wildlife, special-status plant communities, jurisdictional aquatic resources, critical habitat, essential fish habitat, and wildlife movement corridors.

RSA

The cumulative RSA for habitat, special-status species, and wildlife movement is the San Joaquin Valley, which is larger than the RSAs described in Section 3.7, Biological Resources and Wetlands (see Table 3.7-2).

The cumulative RSA for wetlands comprises the following subbasins of the San Joaquin River Basin—Middle San Joaquin-Lower Chowchilla, Fresno River, Lower San Joaquin River, Upper Merced and Upper Tuolumne watersheds (U.S. Geologic Survey 8-digit Hydrologic Unit Codes 18040001, 18040002, 18040007, 18040008, and 18040009, respectively)—which is also larger than the RSA described in Section 3.7 (defined for direct impacts as the project footprints, and defined for indirect impacts as the project footprints plus a 250-foot buffer and the entirety of vernal pool coverage).

These cumulative RSAs were selected to develop a broad, regional consideration of cumulative impacts, and because they capture impacts on biological resources associated with construction and operations of the Central Valley Wye alternatives and regional impacts on biological resources associated with development projects affecting similar habitat types and occurring within neighboring watersheds.

Special-Status Plants and Wildlife

Cumulative Condition

As discussed in Section 3.7, large areas of valley grasslands, saltbush scrub, palustrine wetlands, valley foothill hardwoods, and extensive riparian woodlands have been either lost to development or have been converted to agricultural production. The historical trend of converting or altering these natural communities has compromised the biological complexity of the region and has been a factor in the listing by federal and state agencies of special-status species. Within the cumulative RSA, the majority of land is actively used for agriculture, and urban areas are the second most common type of land use. Native vegetation in these areas is absent or highly disturbed. As a result, any occurrences of special-status plant or wildlife species are considered sensitive resources under the existing, altered conditions of the cumulative RSAs. Under the cumulative condition, ongoing urban development and agricultural practices are expected to continue within the cumulative RSAs. Urban development stemming from the population increase through 2040 would result in the conversion of large areas of land that is presently used for agriculture or is undeveloped to accommodate housing, commercial, office, transportation, parks, and schools. Several large planned development projects such as Yosemite Ranch Estates'

2,500-lot development in Merced County and the 2,062-acre Gateway Village and Gunner Ranch Specific Plans in Madera County would contribute to development in the RSA. Planned transportation projects such as the widening of SR 99 south of Madera, reconstruction of the SR 99/SR 233 interchange, construction of the SR 152 Los Banos bypass, the Central Valley Wye alternatives, and the HSR Merced to Fresno and Fresno to Bakersfield Sections are located within the RSA. Together, the Central Valley Wye alternatives, development planned under land use plans, planned transportation improvements, agricultural and dairy farm expansions, adjacent HSR sections and relevant additional future projects identified in Appendix 3.19-A and 3.19-B constitute the cumulative condition relevant to special-status plants and wildlife.

The permanent conversion of existing land uses to residential, commercial, agricultural, and transportation uses would result in cumulative impacts on special-status plant and wildlife species within the cumulative RSA for these resources. These cumulative impacts would be mostly likely to occur for 46 plant species determined to have a moderate to high potential to occur in the special-status plant RSA (see Table 3.7-6). Additionally, construction of these projects could result in land disturbance, increased vehicle traffic, and topography alteration, which could lead to disturbance, injury, or mortality of various special-status wildlife species and their respective habitats.

Operation of these planned projects could result in additional cumulative impacts. For example, operation of transportation projects could result in the loss of individual members of special-status species through maintenance and mowing of roadside embankments, or from the death of animals trying to cross transportation facilities. Indirect habitat degradation could occur near developed sites such as through as nighttime lighting that illuminates sensitive habitat areas, or from trash blown from nearby residential and commercial areas. Taken together, these cumulative operations impacts would be considered a cumulative impact on special-status species and habitat.

These species are protected by law and any planned development or transportation projects would be required to incorporate measures to minimize disturbance of special-status species, such as by conducting protocol-level surveys; salvaging, relocating, and propagating identified species; and restoring potential habitat areas after construction. Additionally, the Central Valley Wye alternatives include requirements that would avoid or minimize many of the direct and indirect impacts associated with construction of the HSR system. For example, the IAMFs identified in Section 3.7 include measures to delineate environmentally sensitive and restrictive areas to avoid and minimize the potential direct disturbance of special-status species during construction, and would minimize the indirect impact on special-status plants and other native vegetation occurring outside of the project footprints by requiring the cleaning of construction equipment and incorporating a weed control plan to minimize the spread of invasive species. Other planned development and transportation projects would have in place similar measures to minimize impacts. While these measures would minimize project-specific impacts, they would not completely avoid destruction of habitat or loss of individual members of the species and these effects would combine within the RSA to result in a cumulative impact.

Contribution of the Central Valley Wye Alternatives

As described in Section 3.7, construction of the Central Valley Wye alternatives would result in the removal of vegetation for the placement of permanent infrastructure during construction, and the removal of vegetation within temporary impact areas and from construction vehicles, and disturbance of vegetation from personnel (i.e., trampling, covering, and crushing individual plants, plant populations, or suitable potential habitat for special-status species). The contribution of the Central Valley Wye alternatives to this cumulative impact would vary depending on the alternative and the type of habit affected by each alternative. For example, the SR 152 (North) to Road 19 Wye Alternative would have the greatest potential to contribute to impacts on 16 special-status plant species associated with California annual grassland while the Avenue 21 to Road 13 Wye Alternative would have the greatest potential to contribute to cumulative impacts on 12 special-status plant species associated with aquatic and wetland vegetation (see Section 3.7.7, Environmental Consequences). Mitigation measures would require protocol-level surveys to identify individual members of a species that could be avoided, relocated, or propagated. They would also

involve the preparation and implementation of a habitat mitigation plan to offset impacts on habitat for special-status species by creating, restoring, enhancing, and/or preserving habitat that provides the same functions and values as habitat permanently affected by construction. With the implementation of this mitigation, the Central Valley Wye alternatives' incremental contribution from construction to this cumulative impact is not cumulatively considerable.

Operations of the Central Valley Wye alternatives would avoid or minimize the potential for impacts from maintenance activities that have the potential to trample or crush plant communities and wildlife. These impacts would be avoided through the IAMFs identified in Section 3.7, which would require that maintenance personnel attend a worker environmental awareness program (WEAP) training to understand and identify sensitive biological resources and associated regulatory requirements. Additionally, the Central Valley Wye alternatives would provide wildlife crossings and would not include nighttime lighting. These measures would avoid and/or minimize the potential for trampling or other destruction of special-status plant species or habitat and minimize the potential for impacts on special-status wildlife species by training maintenance personnel to understand environmental compliance issues. Therefore, it is not anticipated that the Central Valley Wye alternatives would contribute to a cumulative operations impact.

CEQA Conclusion

The historical trend of land use changes in the RSA has led to large-scale alteration and removal of the habitat of numerous special-status plant and wildlife species, and ongoing development continues to degrade remaining habitat. All four of the Central Valley Wye alternatives would result in the removal of vegetation for the placement of permanent infrastructure during construction, and the removal of vegetation within temporary impact areas and from construction activities. The mitigation proposed to address impacts to species habitat includes habitat preservation in combination with restoration and enhancement, would maintain or result in an improvement over existing conditions within the RSA. With implementation of the mitigation measures identified in Section 3.7.8, Mitigation Measures, the Central Valley Wye alternatives would not result in a cumulatively considerable contribution to significant cumulative impacts during construction. Operations of the Central Valley Wye alternatives would not result in cumulatively considerable contributions to significant cumulative impacts because IAMFs incorporated into the Central Valley Wye alternatives would avoid or minimize the potential for trampling or other destruction of special-status plant and wildlife species and their habitats.

Special-Status Plant Communities

Cumulative Condition

Construction of development and transportation projects within the cumulative RSA would result in removal or disruption of plants and vegetation, which could lead to direct and indirect impacts on special-status plant communities from trampling and crushing of plants. Construction activities that directly affect vernal pools, riparian plant communities, seasonal wetlands, and palustrine forested special-status plant communities would result in the removal or disruption of special-status plant communities by construction vehicles and personnel. See the previous discussion under Special-Status Plants and Wildlife for a description of the cumulative condition and the planned development and transportation projects that would contribute to these cumulative impacts.

Many of these habitat areas and species are protected by law and any development or transportation projects would be required to incorporate measures to minimize disturbance of special-status species, such as by conducting protocol-level surveys, avoiding identified areas found to contain special-status plant communities, and restoring potential habitat areas after construction. Furthermore, these projects may be required to provide mitigation, including compensatory mitigation, for impacts on special-status plants, as required by state and federal law (e.g., CEQA, the federal Endangered Species Act, the California Endangered Species Act, and indirectly through the Clean Water Act). For the Central Valley Wye alternatives, IAMFs included in the project design (identified in Section 3.7) would require various controls during construction, such as identifying and delineating habitat features and other environmentally sensitive areas on final construction plans and in the field; controlling weeds, monitoring

measures, cleaning construction equipment to prevent the spread of weeds; and limiting vehicle traffic and construction site speeds to avoid and minimize the potential direct disturbance of special-status plant communities during construction. While these measures would reduce individual impacts, they would not completely avoid degradation of special-status plant communities during construction and these impacts would combine within the RSA to result in a cumulative impact. Operation of these planned projects could result in additional cumulative impacts on plant communities. For example, operation of development projects could result in the degradation of plant communities through the spread of non-native and invasive plant species.

Contribution of the Central Valley Wye Alternatives

IAMFs and mitigation measures identified in Section 3.7.8 would minimize disturbance of special-status plant communities by conducting protocol-level surveys to identify special-status plants in areas where permission was not previously granted to allow for removal prior to disturbance; salvaging, relocating, and propagating; incorporating a habitat management plan; and restoring and preserving (on-site and off-site) of special-status plant species. The incorporation of these measures would avoid some direct and indirect impacts on special-status plant communities; however, some impacts on special-status plant communities would still occur and could combine with the individual impacts of other projects. The contribution to this cumulative impact would vary depending on the alternative selected and the type of habit affected by each alternative. For example, the SR 152 (North) to Road 19 Wye Alternative would have the most impacts on mixed riparian plant communities (1.06 acres) compared to the SR 152 (North) to Road 13 Wye Alternative (0.36 acre). In contrast, the greatest extent of direct impact (0.19 acre) on vernal pools would result from construction of the SR 152 (North) to Road 19 Wye Alternative or the SR 152 (North) to Road 11 Wye Alternative. Construction of the SR 152 (North) to Road 13 Wye Alternative would result in a nearly equal extent of direct impact (0.18 acre) on vernal pools. Construction of the Avenue 21 to Road 13 Wye Alternative would result in the least direct impacts (0.10 acre) on the vernal pool plant community (see Table 3.7-14 in Section 3.7.7). Mitigation measures would require protocol-level surveys to identify individual members of a species that could be avoided, relocated, or propagated. They would also involve the preparation and implementation of a habitat mitigation plan to offset impacts on habitat for special-status species by creating, restoring, enhancing, and/or preserving habitat that provides the same functions and values as habitat permanently affected by construction. With the implementation of this mitigation, the Central Valley Wye alternatives' incremental contribution from construction to this cumulative impact is not cumulatively considerable.

Operations of the Central Valley Wye alternatives would require periodic removal of vegetation and disturbance of plants caused by an increase of maintenance activity. The IAMFs identified in Section 3.7 would require maintenance personnel to attend a WEAP training to understand and identify sensitive biological resources and associated regulatory requirements. Therefore, it is not anticipated that the Central Valley Wye alternatives would contribute to cumulative impacts during operations.

CEQA Conclusion

The historical trend of land use changes in the RSA has led to large-scale alteration and removal of special-status plant communities, and ongoing development continues to degrade remaining habitat. All four of the Central Valley Wye alternatives would result in the disturbance or removal of vegetation within special-status plant communities for the placement of permanent infrastructure during construction, and the removal of vegetation within temporary impact areas and from construction activities. The mitigation proposed to address impacts to special-status plant communities includes habitat preservation in combination with restoration and enhancement, which would maintain or result in an improvement over existing conditions within the RSA. With implementation of the mitigation measures identified in Section 3.7.8, the Central Valley Wye alternatives would not result in a cumulatively considerable contribution to significant cumulative impacts during construction. Operations of the Central Valley Wye alternatives would not result in cumulatively considerable contributions to significant cumulative impacts because IAMFs incorporated into the Central Valley Wye alternatives would avoid or minimize the potential for trampling or other destruction of special-status plant communities.

Jurisdictional Aquatic Resources

Cumulative Condition

Construction of development and transportation projects within the cumulative RSA for aquatic resources would result in the discharge of fill into federal and state jurisdictional wetlands and other waters under Section 404 of the Clean Water Act, and under Section 1600 et seq. of the California Fish and Game Code (including seasonal wetlands, vernal pools, canals, ditches, lacustrine wetlands, retention and detention basins, riparian, and seasonal riverine areas), which could lead to impacts on jurisdictional aquatic resources, including through the removal or modification of local hydrology, and redirection of flow. Areas potentially affected include seasonal wetlands, canals, ditches, lacustrine wetlands, retention and detention basins, riparian, and seasonal riverine complexes. The discharge of fill material into waters is regulated by state and federal agencies, and such discharges may be authorized under certain circumstances.

Under the cumulative condition, ongoing urban development would result in the conversion of large areas of agricultural or undeveloped land to accommodate housing, commercial, office, transportation, parks, and schools. Several large planned development projects such as Yosemite Ranch Estates' 2,500-lot development in Merced County and the 2,062-acre Gateway Village and Gunner Ranch Specific Plans in Madera County would contribute to development in the RSA and could result in some fill of wetlands or other impacts on jurisdictional aquatic resources. Linear transportation projects, such as the widening of SR 99, construction of the SR 152 Los Banos bypass, the Central Valley Wye alternatives, and the HSR Merced to Fresno and Fresno to Bakersfield Sections, are likely to contribute to cumulative impacts on jurisdictional aquatic resources because their linear footprints would result in crossing multiple waterways. Over time, fill activities related to these individual projects can result in a cumulative reduction in jurisdictional aquatic resources and these would be considered cumulative impacts. Operation of these planned projects could result in additional cumulative impacts on jurisdictional aquatic resources. For example, operation of development and transportation projects could result in changes in local hydrology and drainage that could degrade nearby waters or introduce non-native and invasive species.

Contribution of the Central Valley Wye Alternatives

Construction activities associated with all four of the Central Valley Wye alternatives would contribute to these cumulative impacts. As presented in Table 3.7-15 and Table 3.7-16, the greatest extent of direct impact (2.34 acres) on all types of jurisdictional wetlands combined would result from construction of the Avenue 21 to Road 13 Wye Alternative, whereas the least direct impact (0.72 acres) on jurisdictional wetlands would result from construction of the SR 152 (North) to Road 11 Wye Alternative. The greatest extent of direct impact (43.34 acres) on all types of jurisdictional other waters combined would result from construction of the Avenue 21 to Road 13 Wye Alternative, whereas the least direct impact (29.26 acres) on jurisdictional other waters would result from construction of the SR 152 (North) to Road 11 Wye Alternative. As presented in Table 3.7-16, the greatest extent of direct impact (2.97 acres) on all types of riparian habitats considered jurisdictional under Section 1600 et seq. of the California Fish and Game Code combined would result from construction of the Avenue 21 to Road 13 Wye Alternative, whereas the least direct impact (1.53 acres) on jurisdictional riparian habitats would result from construction of the SR 152 (North) to Road 11 Wye Alternative. The greatest extent of direct impact (41.36 acres) on all types of streams and riparian areas considered jurisdictional under Section 1600 et seq. of the California Fish and Game Code would result from construction of the Avenue 21 to Road 13 Wye Alternative, whereas the least direct impact (23.68 acres) on all types of jurisdictional streams and riparian areas would result from construction of the SR 152 (North) to Road 11 Wye Alternative. Mitigation measures identified in Section 3.7.8 would compensate for permanent and temporary impacts on jurisdictional waters through creation, restoration, enhancement, and preservation of wetlands, which would prevent reduction of or degradation of jurisdictional wetlands. Through the implementation of compensatory wetland mitigation, this action would be consistent with the USACE "no net loss of wetlands" policy, which provides that the total area of wetlands must not be reduced. These features would also minimize turbidity and

siltation and ground disturbing activities by incorporating a dewatering plan and construction site best management practices (BMP).

Operations of the Central Valley Wye alternatives would require maintenance and vehicular activity near jurisdictional aquatic resources. The IAMFs identified in Section 3.7 would require maintenance personnel to attend a worker environmental awareness program (known as WEAP) training to understand and identify sensitive biological resources and associated regulatory requirements. With these measures in place, the likelihood of accidental spills, introduction of contaminants/pollutants, and degradation of jurisdictional waters would be minimized and, therefore, it is not anticipated that the Central Valley Wye alternatives would contribute to this cumulative impact during operations.

Mitigation measures identified in Section 3.7.8 would compensate for these cumulative impacts on jurisdictional waters by providing for on-site and off-site mitigation by creating, restoring, enhancing, and preserving wetlands or other waters that provide the same or greater functions and values as those permanently affected by construction and implementing a habitat management plan. The implementation of these measures would compensate for direct and indirect impacts on jurisdictional aquatic resources. Other projects would also likely be required to compensate for loss of jurisdictional aquatic resources, particularly wetlands, pursuant to the requirements of Section 404 of the Clean Water Act. The mitigation measures proposed for the Central Valley Wye alternatives and compliance with the USACE “no net loss of wetlands” policy would avoid a contribution to this cumulative impact.

CEQA Conclusion

The historical trend of land use changes in the RSA has led to large-scale removal and degradation of aquatic resources, and ongoing development continues to degrade remaining aquatic resources. All four of the Central Valley Wye alternatives would result in impacts to jurisdictional aquatic resources. With implementation of mitigation measures identified in Section 3.7.8, the Central Valley Wye alternatives would result in no net loss of jurisdictional aquatic resources; therefore, there would not be cumulatively considerable contribution to significant cumulative impacts during construction. Operations of the Central Valley Wye alternatives would not result in cumulatively considerable contributions to significant cumulative impacts because IAMFs incorporated into the Central Valley Wye alternatives would avoid the degradation or removal of remaining aquatic resources.

Critical Habitat

Cumulative Condition

Construction of transportation and development projects within the cumulative RSA could result in the destruction or degradation of federally designated critical habitat. Critical habitat areas have been designated within the cumulative RSA for eight species, including plant and aquatic species. Although some of these upland critical habitat areas are largely protected from development, some loss or degradation of critical habitat areas, such as of vernal pools, are anticipated under the cumulative condition and would be considered cumulative impacts. Additionally, indirect impacts of planned development and transportation projects could also combine to contribute to these impacts, such as through the spread of invasive species that could compromise the habitat value of these critical habitat areas. See the previous discussion under Special-Status Plants and Wildlife for a description of the cumulative condition and the planned development and transportation projects that would contribute to these cumulative impacts. Operation of these planned projects could result in additional cumulative impacts on critical habitat areas. For example, operation of development and transportation projects could result in changes in local hydrology and drainage that could degrade nearby vernal pools or introduce non-native and invasive species.

Contribution of the Central Valley Wye Alternatives

Critical habitat areas for eight species (San Joaquin Orcutt grass, vernal pool fairy shrimp, vernal pool tadpole shrimp, Conservancy fairy shrimp, Central Valley steelhead, Colusa grass, fleshy

owl's-clover, and Greene's tuctoria) exists within the vicinity of the Central Valley Wye alternatives. As discussed in Section 3.7, there would be impacts critical habitat associated with vernal pool species from construction of two of the Central Valley Wye alternatives, SR 152 (North) to Road 19 Wye Alternative (4.72 acres), and the SR 152 (North) to Road 11 Wye Alternative (0.21 acre). The Site 7—Le Grand Junction/Sandy Mush Road, Warnerville – Wilson 230 kV Transmission Line associated with the SR 152 (North) to Road 19 Wyes Alternative would also have indirect impacts to Central Valley steelhead critical habitat. As shown in Table 3.7-10, the SR 152 (North) to Road 13 Wye Alternative and the Avenue 21 to Road 13 Wye Alternative would have no impacts on critical habitat.

The IAMFs identified in Section 3.7 would identify critical habitat and minimize, although not avoid, direct impacts on special-status plant communities from construction. While these critical habitat areas are protected by law to reduce impacts from HSR and other projects, this designation does not forbid development or construction, and these two alternatives would contribute to this cumulative impact during construction.

Operations of the Central Valley Wye alternatives would require maintenance and increased vehicular activity near critical habitats. The IAMFs identified in Section 3.7 would require maintenance personnel to attend a WEAP training to understand and identify sensitive biological resources and associated regulatory requirements. With these measures in place, the likelihood accidental spills, introduction of contaminants/pollutants, and degradation of, or direct impacts on, critical habitat would be minimized. Therefore, it is not anticipated that any of the Central Valley Wye alternatives would contribute to this cumulative impact during operations. Mitigation measures identified in Section 3.7.8 would require on-site and off-site restoration and preservation of critical habitat by creating, restoring, enhancing, and preserving habitat that provides the same functions and values as those permanently affected by construction. With these measures and the delineation of habitat features as environmental site assessments during final construction plans and in the field, the likelihood of direct removal or effect on the long-term viability of critical habitat would be minimized. Therefore, the incremental contribution related to the construction of the SR 152 (North) to Road 19 Wye and SR 152 (North) to Road 11 Wye Alternatives to this cumulative impact is not cumulatively considerable.

CEQA Conclusion

The historical trend of land use changes in the RSA has led to large-scale alteration and removal of critical habitat, and ongoing development continues to degrade remaining habitat. Two of the Central Valley Wye alternatives would contribute to significant cumulative impacts on critical habitat areas for vernal pool associated species, and one of the two would also contribute to significant cumulative impacts on critical habitat for Central Valley steelhead. With implementation of mitigation measures identified in Section 3.7.8, these impacts would be reduced and there would not be cumulatively considerable contributions to significant cumulative impacts during construction. Operations of the Central Valley Wye alternatives would not result in cumulatively considerable contributions to significant cumulative impacts because IAMFs incorporated into the Central Valley Wye alternatives would minimize the potential for direct and indirect impacts to critical habitat. Therefore, CEQA does not require additional mitigation.

Essential Fish Habitat

Cumulative Condition

Essential fish habitat (EFH) occurs in the San Joaquin River, which flows south to north across the cumulative RSA to the east of Los Banos. A segment of the river within the RSA is designated as EFH for the recovery of Pacific (Chinook) Salmon by the National Oceanic and Atmospheric Administration. Since 2009, the San Joaquin River Restoration Program has been initiating the restoration of flows conducive to Chinook salmon through a series of restoration programs and projects, including the Mendota Pool Bypass and Reach 2B Improvements, Reach 4B and Eastside Bypass, Arroyo Canal, and Sack Dam, which are resulting in beneficial effects on quality of the EFH. Construction of bridges and aerial structures over the San Joaquin River from projects such as the Central Valley Wye alternatives, widening of SR 99 south of Madera, and

proposed improvements to SR 152 could result in direct and indirect impacts on EFH in the San Joaquin River through construction along riverbanks and through increased turbidity and siltation. Existing permitting requirements for in-water work and stormwater pollution prevention regulations would reduce potential impacts but there could still be cumulative impacts related to increased turbidity and siltation resulting from construction. These cumulative impacts are limited to construction activity along the riverbanks and no impacts associated with operations or maintenance activities are anticipated under the cumulative condition.

Contribution of the Central Valley Wye Alternatives

For the Central Valley Wye alternatives, construction over the San Joaquin River would increase turbidity and siltation and would contribute to cumulative impacts on EFH. The IAMFs identified in Section 3.7 would require that the project biologist consult with the U.S. Fish and Wildlife Service and California Department of Fish and Wildlife to identify appropriate work windows for federally listed species, including federally listed fish in the San Joaquin River. If work cannot be conducted when the channel lacks flowing and/or standing water, a dewatering plan would be required in consultation with the U.S. Fish and Wildlife Service and California Department of Fish and Wildlife. Prior to construction, a dewatering plan would be required for review and approval by the resource agencies. The plan would include appropriate measures to minimize turbidity and siltation. The implementation of these measures would minimize some direct impacts on EFH; however, the degradation of EFH by the Central Valley Wye alternatives during construction would be unavoidable and there would be a cumulatively considerable contribution to these cumulative impacts. The extent of direct impacts on EFH for each alternative would depend upon the final design to determine the exact distance of each aquatic crossing, the shading potential and the number of piers installed within or over EFH.

Operations of the Central Valley Wye alternatives could require periodic maintenance and increased vehicular activity near streams or rivers with EFH which could result in increased turbidity and siltation. The IAMFs identified in Section 3.7 would require that maintenance personnel attend a WEAP training to understand and identify sensitive biological resources and associated regulatory requirements. With these measures in place, the likelihood for accidental spills, introduction of contaminants/pollutants, and degradation of, or direct impacts on, EFH would be minimized. They would also minimize the impacts on water quality from increased erosion, sedimentation, siltation, and runoff caused by alterations in hydrology during operations-related maintenance such as vegetation removal, drain cleaning, and litter removal; wind erosion impacts (including from unvegetated rights-of-way and passing high-speed trains); increased risk of fire in adjacent open spaces because of increased human activity; and the introduction of noxious plant species from increased human activity/disturbance. These IAMFs would minimize impacts and there would not be cumulative impacts during operations.

Mitigation measures identified in Section 3.7.8 would require on-site and off-site restoration and preservation of fish habitat and a plan for fish rescue. With these mitigation measures, the Central Valley Wye alternatives' incremental contribution from construction to this cumulative impact is not cumulatively considerable.

CEQA Conclusion

Cumulative projects in the RSA could increase the turbidity and siltation in the San Joaquin River, degrading EFH. All four of the Central Valley Wye alternatives would result in cumulatively considerable contributions to significant cumulative impacts on EFH. With implementation of mitigation measures identified in Section 3.7.8, these impacts would be reduced and there would not be cumulatively considerable contributions to significant cumulative impacts during construction. Therefore, CEQA does not require additional mitigation. Operations of the Central Valley Wye alternatives would not result in cumulatively considerable contributions to significant cumulative impacts because IAMFs incorporated into the Central Valley Wye alternatives would minimize the potential for accidental discharge of pollutants to the San Joaquin River, therefore avoiding impacts to EFH.

Wildlife Movement Corridors

Cumulative Condition

As described in Section 3.7.6.5, several major known habitat linkages provide wildlife movement within the cumulative RSA, including the Eastman Lake–Bear Creek essential connectivity areas (ECA), Ash Slough–Merced National Wildlife Refuge ECA, San Luis Canal–Kesterson National Wildlife Refuge ECA, Sandy Mush Road Area, and other modeled wildlife corridors. Construction of development and transportation improvement projects could create barriers within natural lands such that they would interfere with the movement of wildlife species. These mapped wildlife movement corridors cover large areas that are currently divided by roads and influenced by agricultural activities and nearby development. Proposed improvements to roadways and development along major arterials, such as for Highway 152, would introduce new features into the landscape that could degrade these wildlife movement corridors during construction and operations.

The Central Valley Wye alternatives include IAMFs that would require the creation of wildlife-crossing features at frequent intervals and along sensitive areas to facilitate wildlife movement and minimize or avoid impacts on wildlife corridors. The incorporation of these measures would minimize the impacts of interfering with established wildlife movement corridors and other impacts relating to the potential for isolation of populations. In areas where the Central Valley Wye alternatives would cross existing barriers to wildlife movements, such as roads and the UPRR right-of-way, there would be an opportunity to improve existing wildlife movement opportunities. While these design features could improve wildlife movement in some areas, overall opportunities for wildlife movement within the cumulative RSA would be diminished. Therefore, there would be a cumulative impact on known and modeled wildlife corridors.

Contribution of the Central Valley Wye Alternatives

As discussed in Section 3.7, the Central Valley Wye alternatives would affect known and modeled wildlife corridors from construction. The SR 152 (North) to Road 19 Wye Alternative would have the greatest potential impact on wildlife movement corridors because it would affect the greatest area of land compared to the other three alternatives, especially within the Eastman Lake–Bear Creek ECA. The SR 152 (North) to Road 11 Wye Alternative would have the least potential impact on wildlife movement corridors. By including wildlife-crossing features in the project design, the Central Valley Wye alternatives are expected to maintain existing wildlife movement corridors within the project footprints. Impacts would still occur and would be temporary, lasting from 1 to 2 months, up to 3 years during construction, and there could be permanent impacts from the introduction of the new linear infrastructure. These impacts could combine with those from other construction projects and disrupt seasonal migrations and animal foraging and mating opportunities. Therefore, any of the Central Valley Wye alternatives' contributions to these cumulative impacts would be considerable. Feasible mitigation measures have been identified in Section 3.7.8, and no additional mitigation is proposed. There would still be cumulative impacts from construction after mitigation.

During operations, maintenance activities are not expected to affect wildlife movement corridors because activities would be dispersed over time and location, diluting potential impacts. Impacts on wildlife movement corridors from operations would include disturbance from the passage of trains (noise, motion, and startle effects). As discussed in Section 3.7.7.5 in Impact BIO#45, Indirect Impacts on Wildlife Movement Corridors, the level of impact caused by a particular alternative would be dependent on the number, type, and length of wildlife corridor crossed by an alternative, as well as the frequency of passing trains. In general, for the Central Valley Wye alternatives, these potential effects would be limited as a result of the short duration of train passes and the infrequent use of the wildlife crossings by wildlife. Therefore, while disturbance to wildlife corridors from operations could combine with other regional projects' impacts to disrupt normal movement within wildlife corridors, the Central Valley Wye alternatives' contributions to these cumulative impacts would not be cumulatively considerable.

CEQA Conclusion

Existing linear features and development divide wildlife movement corridors in the RSA, and cumulative projects. Existing and planned linear transportation projects and other development within the RSA could degrade wildlife movement features through the introduction of new barriers into the landscape and thereby further limiting wildlife movement, resulting in significant cumulative impacts on known and modeled wildlife corridors. The Central Valley Wye alternatives would include IAMFs and mitigation measures that would maintain wildlife-crossing opportunities by requiring the creation of wildlife-crossing features at frequent intervals and along sensitive areas to facilitate wildlife movement and minimize or avoid impacts on wildlife corridors. With implementation of mitigation measures identified in Section 3.7.8, there would not be cumulatively considerable contributions to significant cumulative impacts during construction. Operations of the Central Valley Wye alternatives would not result in cumulatively considerable contributions to significant cumulative impacts because operations and maintenance activities would be dispersed over time and place and the potential disturbance to wildlife would be limited as a result of the short duration of train passes and infrequent use of the wildlife crossings by wildlife. Therefore, CEQA does not require mitigation.

3.19.6.7 Hydrology and Water Resources

RSA

This cumulative analysis identifies the same cumulative RSAs for surface water, groundwater, and floodplains as those described in Section 3.8, Hydrology and Water Resources, because it is sufficiently broad to cover the area in which the potential cumulative impacts of the Central Valley Wye alternatives, in combination with other projects, could occur. The surface water RSA is defined as the receiving waters from the Sierra Nevada foothills that drain to the San Joaquin River Basin and includes waterbodies identified in Section 3.8.4.1, Definition of Resource Study Areas, and Figure 3.8-1.

The groundwater RSA is made up of the California Department of Water Resources (DWR) groundwater basin boundaries of the aquifers described in Section 3.8.4.1 and shown in Figure 3.8-2. The groundwater RSA also includes groundwater basins overlain by the footprints associated with the network upgrades, which includes the San Joaquin Valley and Tulare Lake groundwater basins and the Merced, Chowchilla, Madera, Delta-Mendota, Modesto, Turlock Merced, and Westside Subbasins.

The floodplain RSA boundary is made up of the Federal Emergency Management 100-year and 500-year floodplain boundaries described in Section 3.8.3.1 and shown in Figure 3.8-3. Much of the cumulative RSA is in a floodplain, which has a relatively flat gradient that generally slopes slowly to the west or southwest. As described in Section 3.8, most watercourses in the San Joaquin Valley drain from east to west and eventually to the San Joaquin River.

Cumulative Condition

Under the cumulative condition, ongoing urban development and agricultural practices are expected to continue within the cumulative RSAs. Urban development stemming from the population increase through 2040 would result in the conversion of large areas of land that is presently used for agriculture or is undeveloped to accommodate housing, commercial, office, transportation, parks, and schools. In addition, planned transportation projects such as the widening of SR 99 south of Madera, reconstruction of the SR 99/SR 233 interchange, and construction of the SR 152 Los Banos bypass, and the HSR Merced to Fresno and Fresno to Bakersfield Sections are located within the cumulative surface water RSA. Together, the Central Valley Wye alternatives, development planned under the general plans of Merced and Madera Counties and the cities of Chowchilla and Madera, planned transportation projects, as well as adjacent HSR sections and relevant additional future projects identified in Appendix 3.19-A and 3.19-B constitute the cumulative condition relevant to hydrology and water resources.

Surface Water Hydrology

Cumulative planned development and transportation projects would change how water flows to and between lakes, reservoirs, rivers, streams, canals, and floodplains within the surface water RSA. Construction of these projects would result in direct impacts on waterbodies when these features are crossed or when development occurs on or near the banks of these waterbodies. These projects would also increase the amount of impervious surface area, and earthmoving activities during construction would change topography. Cumulative impacts could occur if the incremental impacts of these projects combined to change drainage patterns such that runoff exceeded the capacity of existing or planned stormwater facilities, altered the route or capacity of a canal, stream or river, or changed runoff direction or rates to cause flooding. Changes affecting pollutant loads in stormwater runoff could also result in cumulative impacts on waterbodies (see next discussion on surface water quality).

Cumulative transportation projects affecting surface water hydrology would include transportation projects such as the Central Valley Wye alternatives and other HSR sections that require new crossings of waterways, and roadway projects that relocate existing highway stormwater drainage infrastructure, such as the widening of SR 99 south of Madera, SR 99/SR 233 interchange, and the SR 152 Los Banos bypass. While these transportation projects would modify and relocate individual drainage ditches and basins (hydromodification), existing laws and permit processes that control streambed alteration and limit changes to drainages, such as the federal Clean Water Act and the California Construction General Permit, would work together to avoid off-site or other cumulative hydromodification impacts from these transportation projects. Once constructed, BMPs and stormwater facilities built as part of these projects would capture and slow before release to waterways, thereby avoiding cumulative operations impacts.

The greatest potential for cumulative surface hydrology impacts during construction is related to potential increases in drainage volumes associated with increases in impervious surface area. New interchanges and roadway widening projects, and commercial and residential development planned in city and county general plans, such as the Yosemite Ranch Estates' 2,500-lot development in Merced County and the 2,062-acre Gateway Village and Gunner Ranch Specific Plans in Madera County, would add pavement area, rooftops, sidewalks, and other new construction that would replace existing agricultural and undeveloped land. This increase in impervious surface can result in periodic and permanent increases in stormwater runoff volumes during rain events. Laws and permitting processes, including local stormwater permits, generally require new development and transportation projects to incorporate temporary and permanent stormwater capture and infiltration features (e.g., basins, bioswales, storage features) during construction and operations such that runoff volumes would not exceed the capacity of planned and existing stormwater facilities to accommodate the runoff. These requirements and features work together to minimize impacts related to incremental contributions of new impervious surface and there would not be a cumulative construction or operations impact.

Surface Water Quality

This anticipated growth and development could contribute to the cumulative surface water quality degradation, and the collective effect of development could degrade stormwater quality by contributing pollutants, including eroded material, during construction and operations within the cumulative surface water RSA. Cumulative development could also affect surface water quality if the land uses change, the intensity of land use changes, or drainages are altered such that they facilitate introduction of pollutants to surface water. A cumulative impact would occur if the impacts of multiple projects combined to violate any water quality standards or waste discharge requirements or otherwise degrade water quality in water bodies in the RSA.

As a result of land use changes, the preservation of surface water quality is anticipated to be an increasing challenge through 2040. Planned projects could have construction schedules that overlap. For example, construction of the Westberry Bridge over the Fresno River could occur in the next 5 to 10 years, and multiple bicycle and pedestrian improvements as part of the Fresno River Trail could occur in the same timeframe. Construction in, across, or over rivers, streams and canals such as bridge projects planned over the Fresno River, Merced River, San Joaquin

River, Ash Slough or Berenda Slough, and numerous other intermittent streams or natural water bodies and irrigation and flood control canals and ditches has the potential to degrade surface water quality, and concurrent construction schedules for these multiple projects could exacerbate this degradation of surface water quality. Accordingly, construction and ongoing operations and maintenance of these overlapping projects would have the potential to result in cumulative impacts on surface water and stormwater quality.

Regulatory standards (National Pollutant Discharge Elimination System permit, municipal separate storm sewer system [MS4] permit, and local stormwater requirements), and avoidance features required as conditions of individual project approvals would minimize water quality impacts associated with construction. With these measures in place, and with Central Valley Wye alternatives IAMFs included in the project design, construction and operation within the cumulative RSA are not anticipated to violate water quality standards or waste discharge requirements or further degrade water quality within the RSA; therefore, cumulative surface water and stormwater quality impacts would not occur.

Groundwater

As discussed in Section 3.8, groundwater overdraft within the region has been a concern, and groundwater levels have dropped in shallow aquifers. New projects could permanently increase impervious surfaces thus reducing the amount of water recharging to these groundwater aquifers, and agriculture will continue to place demands on groundwater, particularly when surface water supplies are curtailed because of drought. Discharges to surface waters could affect groundwater quality through the percolation of contaminants to the deeper groundwater aquifer. Cumulative impacts would occur if planned development and agricultural expansions were to contribute to reductions in groundwater levels or to degradation of groundwater quality during construction or operations.

Construction of the Central Valley Wye alternatives and other projects could result in an increase in impermeable surfaces that would redirect runoff, possibly reducing infiltration and groundwater recharge, or adding construction pollutants to groundwater. These projects would be required to comply with a combination of the California Department of Transportation National Pollutant Discharge Elimination System permit, MS4 permit, and local stormwater requirements, and would incorporate low-impact development measures and post-construction stormwater measures, as required by Construction General Permit and MS4 permit, within the cumulative groundwater RSA. However, existing groundwater overdraft within the RSA is expected to continue for the foreseeable future, even with implementation of the Sustainable Groundwater Management Act. Discharges to surface waters could affect quality through the percolation of contaminants to the deeper groundwater aquifer. As a result, there would be cumulative impacts on both groundwater supply, recharge, and quality during construction and operation of planned development and transportation projects.

Floodplains

Planned development including major construction projects in the RSA could impede flood flows or increase the number of people or structures affected by flooding within the cumulative floodplain RSA. Future projects involving new and improved bridge crossings, such as the SR 99 bridge over the Merced River, the Schnoor and Cleveland Avenue Bridges over the Fresno River in the city of Madera, the new Westberry Bridge over the Fresno River, Granada Bridge over the Fresno River in Madera County, as well as multiple smaller bridge crossings in the flood RSA could require the placement of piers in a Federal Emergency Management or Central Valley Flood Protection Board floodway or floodplain. If the impacts on floodplains from these projects were to combine to redirect flood flows or increase flood elevations such that it placed structures within a floodplain such that they would be imperiled, it would be considered a cumulative impact.

All ongoing and planned projects are subject to and must comply with applicable federal, state, and local policies, programs, and ordinances, which would reduce the impact on floodplains and flood risks during construction and operations. The local flood control agencies and applicable flood control design criteria require projects in areas within the designated 100-year flood zones

to design project-specific drainage systems in accordance with findings of site-specific studies. Therefore, construction associated with planned projects in such areas would be designed to comply with regulatory agency requirements. Consistent with the standard requirements of those agencies, design of these bridge crossings would include measures to minimize construction and operations impacts of placing piers in the floodplains and floodways.

In addition, some development within a designated 100-year flood zone may divert or redirect flood flows. However, where these floodplains and floodways exist, project proponents would design projects so that little to no increase in water surface elevation would occur during project operations, in accordance with local regulations and permitting. In addition, new development within levee-protected zones could expose more people and structures to flooding risks. However, federal, state, and local agencies (i.e., USACE, DWR, municipalities, and local flood districts) will continue to coordinate so that levees are constructed, repaired, and maintained to provide adequate flood protection within potential inundation areas. Nor would this development, in combination with the Central Valley Wye alternatives, otherwise encroach on a 100-year floodplain. Accordingly, development under county and city general plans as well as other planned projects would not result in cumulative construction or operations impacts on localized or regional flooding by impeding or redirecting flood flows, or encroaching on the 100-year floodplain.

Contribution of the Central Valley Wye Alternatives

As previously described, potential impacts from cumulative development, including the Central Valley Wye alternatives, and planned transportation and development projects could combine to result in potential cumulative impacts on groundwater supply, recharge, and quality. As described in Section 3.8.6, Impact HYD#5: Temporary Groundwater Quality and Volume Impacts, the Central Valley Wye alternatives would not reduce groundwater supply as they would not tap any new or unpermitted groundwater sources and the use of groundwater during construction would be considerably less than the existing condition in the project footprint on account of high agricultural groundwater use. Construction of the SR 152 (North) to Road 19 Wye Alternative could require dewatering for construction of the tunnel, but these activities would occur in shallow groundwater and would not tap into the deeper aquifers that supply groundwater for agricultural and domestic purposes. If found to be contaminated, this groundwater would be treated prior to release. Therefore, none of the Central Valley Wye alternatives would considerably contribute to cumulative impacts associated with groundwater supply or quality.

Each of the four Central Valley Wye alternatives would introduce new impervious surfaces, which could increase impermeable surfaces and redirect runoff, reducing infiltration and groundwater recharge. Each of the four alternatives would include bridge and viaduct piers that would have a narrow, linear permanent impact area and relatively small new impervious areas for roads and other infrastructure. HYD-IAMF#1 identified in Section 3.8.6.3 would require the installation of on-site drainage capture, which would avoid a reduction in groundwater recharge potential. While the amount of new impervious surface would differ between alternatives, the four alternatives would each capture stormwater and infiltrate it into groundwater through stormwater basins and drainage swales, with little or no reduction in infiltration. Therefore, none of the Central Valley Wye alternatives would considerably contribute to cumulative impacts associated with groundwater recharge.

The Central Valley Wye alternatives would also result in temporary impacts on surface water quality during construction, associated with runoff from earthmoving and vegetation removal activities, which could result in pollutants infiltrating into soils and contribute to reductions in groundwater quality. Various controls, design features, and waste, dewatering, and Construction General Permit requirements detailed in HYD-IAMF#3, Prepare and Implement a Construction Stormwater Pollution Prevention Plan, and HYD-IAMF#4, Prepare and Implement an Industrial Stormwater Pollution Prevention Plan, would minimize the risk of polluted runoff and the potential for sedimentation impacts on water quality, including groundwater quality. IAMFs identified in Section 3.8 would require various controls in addition to compliance with regulations and permit requirements and would avoid reducing groundwater recharge capabilities by requiring the installation of on-site drainage capture. These facilities would allow for the infiltration of

stormwater runoff to groundwater aquifers. These provisions would also protect groundwater quality, and minimize the possibility of hazardous material spills in accordance with Central Valley Regional Water Quality Control Board standards. These features would allow infiltration of groundwater to minimize potential impacts on groundwater recharge capacity and quality. The IAMFs identified in Section 3.8 would also require various controls, design features, and waste, dewatering, and permit requirements to be incorporated so that dewatering activities would comply with permitting and regulatory requirements, and therefore would not contribute to degradation of groundwater quality. Therefore, the Central Valley Wye alternatives would not considerably contribute to cumulative groundwater quality impacts.

CEQA Conclusion

The permanent conversion of existing land uses to urban or transportation uses associated with new development and transportation projects would result in significant cumulative impacts on groundwater supply, recharge, and quality. The contribution of the Central Valley Wye alternatives to those groundwater cumulative impacts would not be considerable because the design does not require using deep groundwater sources, and features to protect groundwater supply, infiltration, and quality would be included in all Central Valley Wye alternatives. The SR 152 (North) to Road 19 Wye Alternative has the greatest potential to contribute to cumulative impacts on groundwater supply and quality; however, with incorporation of IAMFs identified in Section 3.8, these impacts would be minimized and there would not be cumulatively considerable contributions to significant cumulative impacts during construction or operations of this or any of the other Central Valley Wye alternatives. Therefore, CEQA does not require mitigation.

3.19.6.8 Geology, Soils, Seismicity, and Paleontological Resources

RSA

Geology, Soils and Seismicity

The northern half of San Joaquin Valley was identified as the cumulative RSA for geology, soils, seismicity, faulting, and dam failure inundation. This RSA is larger than the RSA described in Section 3.9, Geology, Soils, Seismicity, and Paleontological Resources, and was selected to develop a broad, regional consideration of cumulative impacts, and because it captures impacts on geology, soils, and seismicity associated with construction and operations of the Central Valley Wye alternatives and regional impacts on geology, soils, and seismicity associated with planned development. Specifically, the cumulative RSA allows for the analysis of additional projects that could regionally affect geology, soils, and seismicity.

This cumulative analysis identifies the same cumulative RSA for resource hazards as the resource hazards RSA described in Section 3.9, which includes a 0.5-mile boundary on either side of the Central Valley Wye alternatives project footprints. This RSA boundary is sufficient because many geologic and seismic hazards, such as soil failures, settlement, corrosivity, shrink-swell, erosion, and earthquake-induced liquefaction risks, are limited to the immediate project surroundings and are not cumulatively additive across projects.

Paleontological Resources

The northern half San Joaquin Valley was identified as the cumulative RSA for paleontological resources, which is larger than the RSA described in Section 3.9 (defined as 150 feet on either side of the Central Valley Wye alternatives' project footprints). This cumulative RSA was selected to develop a broad, regional consideration of cumulative impacts, and because it captures impacts on paleontological resources associated with construction and operations of the Central Valley Wye alternatives and regional impacts on paleontological resources associated with planned development. Specifically, the cumulative RSA allows for the analysis of additional projects that could affect paleontological resources in the region.

Cumulative Condition

Geology, Soils and Seismicity

Together, the Central Valley Wye alternatives, development planned under the general plans of Merced and Madera Counties and the cities of Chowchilla and Madera, as well as adjacent HSR sections and relevant planned and future residential, commercial, industrial, recreational, transportation, and agricultural projects identified in Appendix 3.19-A and 3.19-B constitute the cumulative condition relevant to geology, soils, seismicity. Most of the planned infrastructure development activities identified in Appendix 3.19-A and 3.19-B could be susceptible to seismic and geologic hazards in the cumulative RSA. If the impacts of these cumulative projects were to combine to create public risk related to geologic, soil, or seismic hazards, this would be considered a cumulative impact.

Major planned transportation projects, such as the widening of SR 99 south of Madera, reconstruction of the SR 99/SR 233 interchange, and construction of the SR 152 Los Banos bypass, and the HSR Merced to Fresno and Fresno to Bakersfield Section could be constructed on localized deposits of soils that increase geologic hazards from earthquake ground shaking, and secondary hazards from earthquake-induced liquefaction and slope failures. Regulatory standards such as the California Building Code, avoidance features, and the incorporation of BMPs would minimize the individual geological risks associated with construction and operation of planned development projects within the cumulative RSA and these impacts would not combine to result in a cumulative impact related to geologic hazards.

Construction of planned and future development projects in the cumulative RSA could occur on soils (including soil units on slopes) that could become unstable. Unstable slopes along some rivers and streams in the cumulative RSA could fail from additional earth loads at the top of the slope, undercutting by stream erosion at the toe of the slope, or additional seismic forces during a seismic event. The consequences of slope failure in the resource hazards cumulative RSA could be either loss of bearing support to future projects or increased load on structures that are in the path of the slope failure. Unstable soils in the RSA occur primarily near waterbody crossings, so the risk would be greatest at locations where the projects would cross waterbodies. Construction of any of the future bridge projects—including the SR 99 bridge over the Merced River and the Schnoor and Cleveland Avenue Bridges over the Fresno River in the city of Madera—could occur in areas of high groundwater, and could require dewatering for bridge column construction or the construction of below-grade underpasses, potentially resulting in erosion and soil settlement. For the Central Valley Wye alternatives, the Avenue 21 to Road 13 Wye Alternative would have the most waterbody crossings and the SR 152 (North) to Road 13 Wye Alternative would have the fewest. While these would be project-specific impacts that each of these projects would be responsible to address, it is not anticipated that these impacts would combine across projects to create a cumulative impact related to unstable soils.

Construction activities associated with the Central Valley Wye alternatives and planned development and transportation projects within the cumulative RSA could contribute to differential settlement of soils. If excavation for these projects occurs in loose, less-cohesive deposits that extend below groundwater levels, difficult excavations could increase the risk of personal injury, loss of life, or property damage for construction personnel on construction-related property. For the Central Valley Wye alternatives, these risks would be greatest for the alternative with the most waterbody crossings; specifically, the Avenue 21 to Road 13 Wye Alternative. While these would be project-specific risks during construction, it is not anticipated that these impacts would combine across projects to create additional public risk. Additionally, regulatory standards, avoidance features, and incorporation of BMPs would avoid or minimize impacts relating to unstable slopes, and differential settlement in areas of difficult excavation. For example, the Central Valley Wye alternatives would include IAMFs GEO-IAMF#1, Geologic Hazards; GEO-IAMF#2, Slope Monitoring; GEO-IAMF#5, Subsidence Monitoring; and GEO-IAMF#6, Geology and Soils. With these measures in place, construction and operation of planned development projects within the cumulative RSA would not greatly increase the risks of differential settlement

of soils, slope failure or areas of difficult excavation; therefore, there would not be a cumulative impact.

Construction and operation of infrastructure and development projects in the cumulative RSA would not contribute to cumulative impacts on seismicity; however, the increasing population could result in development in less suitable areas, where the risk of geologic and seismic hazards such as ground shaking, slope instability near rivers, or liquefaction in areas of liquefiable soils is higher than in existing developed areas. Development in these areas could result in more risk to the public and a greater chance of property damage. In addition, the increasing population could lead to the reuse of older buildings to accommodate the growth, which in turn could present a risk during a seismic event if such buildings are not upgraded to current standards, because these buildings were typically built to standards that were less stringent than current ones. Future development would require individual environmental review, such as permits, regulatory requirements, and design standards. Future projects will need to comply with Title 24 California Building Code requirements with adherence to geotechnical and stability regulations and will be designed to avoid or minimize impacts. Planned development projects identified in Appendix 3.19-A and 3.19-B would require project-specific analysis to evaluate the risks of seismic hazards, including ground shaking and liquefaction. Therefore, there would not be a cumulative impact related to seismicity during construction or operations.

Seismically induced dam failure could result in flooding in large areas of the north San Joaquin Valley, including identified in Appendices 3.19-A and 3.19-B (specifically, planned development projects within modeled inundation areas, and HSR segments and other planned transportation projects requiring the crossing of inundation areas of large dams). A seismically induced dam failure of one or more of the dams in the cumulative RSA would be an unlikely event because the seismic event would need to be large enough to cause catastrophic damage to the dam structures (see Section 3.8 and Section 3.9). Furthermore, DWR's dam safety program minimizes public risk involving dam failure inundation. Therefore, there would not be a cumulative impact during construction or operations related to risks associated with dam failure and inundation.

Paleontological Resources

Future projects in the RSA involving ground disturbance during construction would involve geologic units that have produced abundant and diverse fossil resources, including vertebrate remains, and are thus considered highly sensitive for paleontological resources (i.e., likely to produce additional similar finds in the future). Construction of planned and future projects in the RSA such as the Central Valley Wye alternatives, the HSR Merced to Fresno Section, HSR San Jose to Merced Section, SR 99 and local street widening, and other transportation and development projects would require ground-disturbing work in areas that include the Modesto, Riverbank, and Turlock Lake Formations and areas of undifferentiated Modesto Formation and Holocene deposits. These developments would have the potential to cumulatively disturb, damage, or destroy scientifically important fossil resources. Once lost, such resources cannot be recovered, and there would be a cumulative impact on paleontological resources resulting from construction of these projects.

Contribution of the Central Valley Wye Alternatives

As discussed previously, there are no geological, soil, or seismic hazards associated with cumulative development and transportation projects that would combine to form cumulative impacts to which the Central Valley Wye alternatives would contribute. However, there is potential for a cumulative impact related to the construction of multiple projects in geologic units considered sensitive for paleontological resources. As discussed in Section 3.9, regulatory standards, IAMFs, and implementation of BMPs associated with all four of the Central Valley Wye alternatives would minimize impacts on paleontological resources and the remaining potential for impact would be equal among the four alternatives. With these measures in place, construction of the Central Valley Wye alternatives would not result in the destruction of unique paleontological resources or sites. Therefore, there would not be a cumulatively considerable contribution to this cumulative impact from any of the Central Valley Wye alternatives.

CEQA Conclusion

The permanent conversion of existing land uses to urban or transportation uses associated with new development and transportation projects would result in a significant cumulative impact on paleontological resources. Regulatory standards, IAMFs, and BMPs would minimize the contribution of the Central Valley Wye alternatives and they would not result in a cumulatively considerable contribution. Therefore, CEQA does not require any mitigation.

3.19.6.9 Hazardous Materials and Wastes

RSA

The cumulative RSA for hazardous materials and wastes is the same as is documented in Section 3.10, Hazardous Materials and Wastes, which consists of the project footprint for each of the Central Valley Wye alternatives plus a 150-foot buffer from the project footprints to account for hazardous 1 mile on either side of the Central Valley Wye alternative alignments' centerlines. The cumulative RSA is also the same identified for potential environmental concern (PEC) sites: 1 mile on either side of the Central Valley Wye alternative alignments' centerlines. This cumulative RSA was selected to develop a broad, regional consideration of cumulative impacts, and because it captures impacts hazardous materials and wastes impacts associated with construction and operations of the Central Valley Wye alternatives, planned development, and the potential for large or regionally important sites within reasonable distance from the Central Valley Wye alternatives.

Cumulative Condition and Contribution of the Central Valley Wye Alternatives

Together, the Central Valley Wye alternatives, development planned under the general plans of Merced and Madera Counties and the cities of Chowchilla and Madera, as well as adjacent HSR sections and relevant additional future projects identified in Appendix 3.19-A and 3.19-B that fall within 1 mile of the Central Valley Wye alternatives constitute the cumulative condition relevant to hazardous materials and wastes. SR 152, SR 99, UPRR, and BNSF Railway serve as major transportation corridors within the region. Hazardous materials, hazardous wastes, and petroleum products are a subset of the types of goods routinely shipped along these transportation corridors. As described in Table 3.10-4, many of the existing PEC sites within the cumulative RSA are associated with major highway and rail transportation corridors, utility corridors, landfills, agricultural areas, and industrial facilities in the project vicinity.

Under the cumulative condition, ongoing urban development and agricultural practices are expected to continue within the cumulative RSA. Urban development stemming from the population increase through 2040 would result in the conversion of large areas of undeveloped or agricultural land to accommodate housing, commercial, office, transportation, parks, and schools within the two-county region of Merced and Madera Counties. Historically, the cumulative RSA has had general areas of hazardous materials and waste concerns, including transportation of hazardous materials and wastes; potential building materials containing hazardous substances; potential road and railway corridor hazardous substances; potential utility corridor hazardous substances; landfills; potential agricultural operation hazardous substances; potential industrial facility hazardous substances; naturally occurring hazards; school facilities; oil and gas wells; and PEC sites. The projected increase in population and development by the year 2040 is anticipated to contribute incrementally to the transport, storage, use, and disposal of hazardous materials and wastes within the cumulative RSA.

In addition, hazardous material transport and temporary storage activity is assumed to occur at landfill and recycling facilities and industrial-type facilities. Planned transportation and railroad projects, such as the SR 99, SR 99/SR 233, and SR 152 Los Banos bypass improvements, and the Gateway and UPRR undercrossing located within the cumulative hazardous materials and wastes RSA could contribute to the cumulative transport and potential risk for spills or releases of hazardous substances within the cumulative RSA. For the Central Valley Wye alternatives, these risks are anticipated to be greatest for those alternatives located along SR-152 given the higher traffic volumes along this route, namely, the SR 152 (North) to Road 13 Wye, SR 152 (North) to Road 19 Wye, and SR 152 (North) to Road 11 Wye Alternatives. A cumulative impact would

occur if the impacts of these projects were to combine to create new hazards to the public or the environment through the routine transport, use, or disposal of hazardous materials; through upset and accident conditions that involve the release of hazardous materials into the environment; or through hazardous material releases, including hazardous air emissions, such that they would pose a risk to human health or safety.

The use of hazardous materials during construction and operation of transportation and development projects is tightly controlled to protect human health and avoid releases. Future and planned development, including transportation projects such as the expansion of SR 99, or additional planned industrial and commercial developments, would be required to comply with regulatory requirements that would avoid individual hazardous materials impacts. For example, the Central Valley Wye alternatives would not utilize unusual amounts of hazardous materials and has in place IAMFs to address hazardous materials use and avoidance of PEC sites (see IAMFs HMW-IAMF#1, Transport of Materials, through HMW-IAMF#10, Hazardous Materials Plans, and SS-IAMF#4, Oil and Gas Wells). Additionally, by 2040, some of the existing PEC sites within the cumulative RSA would be investigated further and, if necessary, remediated with appropriate state regulatory agency oversight. With such measures and restrictions on the use of hazardous materials in place, the potential for the cumulative accumulation or release of hazardous materials is low and there would not be a cumulative impact.

CEQA Conclusion

The projected increase in population and development by the year 2040 is anticipated to contribute incrementally to the transport, storage, use, and disposal of hazardous materials and wastes within the cumulative RSA. However, these incremental contributions are tightly controlled by existing regulations and there would not be a significant cumulative impact under CEQA to which the Central Valley Wye alternatives would contribute. Therefore, CEQA does not require any mitigation.

3.19.6.10 Safety and Security

RSA

The area encompassing Merced and Madera Counties was identified as the cumulative RSA for safety and security, which is larger than the RSAs described in Section 3.11, Safety and Security (defined as areas ranging from within 0.25 mile to areas within 2 miles of the Central Valley Wye alternatives to service provider service areas). This cumulative RSA was selected to develop a broad, regional consideration of cumulative impacts, and because it captures impacts on safety and security from construction and operations of the Central Valley Wye alternatives and regional impacts on safety and security associated with planned development. Specifically, the cumulative RSA allows for the analysis of additional projects that could affect emergency service providers and community safety and security in both counties. The cumulative safety and security RSA is characterized mostly by large areas of undeveloped agricultural and rural land with limited population and more concentrated populations within several municipalities, including Merced, Atwater, Los Banos, Madera, and Chowchilla.

Cumulative Condition and Contribution of the Central Valley Wye Alternatives

Under the cumulative condition, ongoing growth trends within the cumulative RSA are expected to continue, resulting in the continued demand for emergency response services, law enforcement, and fire protection. Together, the Central Valley Wye alternatives, development planned under the general plans of Merced and Madera Counties and the cities of Chowchilla and Madera, as well as adjacent HSR sections and relevant additional future projects identified in Appendices 3.19-A and 3.19-B constitute the cumulative condition relevant to safety and security. Cumulative impacts on safety and security would occur if the impacts of this planned development and these projects, in combination with existing development, were to combine and result in inadequate emergency access or impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

As described in Section 3.18, Regional Growth, the population of Merced and Madera Counties is projected to increase approximately 52 percent and 58 percent, respectively, by 2040. Additionally, planned transportation improvements, including the HSR Merced to Fresno and adjacent San Jose to Merced Sections and the planned expansion of SR 99 through several locations in Merced and Madera Counties identified in Appendix 3.19-B, and planned residential developments, including the Sierra Meadows Subdivision in Eastern Madera County, would convert additional land to transportation or residential uses within the cumulative RSA. These new developments would likely result in the need for additional law enforcement, fire protection, and emergency service facilities and capabilities. In addition, planned roadway transportation improvements and regional growth could also potentially result in increased cumulative exposure of motorists, pedestrians, and bicyclists to traffic hazards.

Conversely, the planned HSR sections have the potential to cumulatively reduce the exposure of motorists, pedestrians, and bicyclist to traffic hazards through the construction of grade-separated crossings and the implementation of various roadway improvement. The Central Valley Wye alternatives includes numerous IAMFs that would avoid contributing to demand for law enforcement, fire protection, and emergency service facilities (see SS-IAMF#1, Construction Safety Transportation Plan Management; SS-IAMF#2, Safety and Security Management Plan; and SS-IAMF#3, Hazard Analyses). Local regulatory standards, avoidance features, and BMPs required as conditions of individual project approvals would avoid or minimize traffic hazards and associated safety impacts on motorists, pedestrians, and bicyclists. With these measures in place, permanent cumulative increases are not expected for emergency service demands and there would not be conflicts with local response plans.

Construction activities associated with new development and transportation facilities identified in Appendices 3.19-A and 3.19-B within the cumulative RSA would collectively result in the temporary exposure of workers and the general public to potential accidents or other hazards, as well as delayed response times of emergency responders from temporary and permanent road detours, closures, and relocations that contribute to localized traffic congestion. Overlapping multiple-year construction timeframes for multiple cumulative projects such as the HSR Merced to Fresno and San Jose to Merced Sections, the SR 99 widening from multiple locations beginning at the Stanislaus County line, crossing over the Merced River to SR 152 in Madera County to the city of Madera, the SR 152 Los Banos Bypass and Campus Parkway in Merced County, and various industrial, commercial, and residential projects could exacerbate safety impacts on construction workers and the general public. However, because these projects are geographically dispersed, they would not combine to produce a cumulative impact on emergency response times.

In the event that the new development and transportation facilities are constructed simultaneously, law enforcement, fire protection, and emergency service providers in Merced and Madera Counties could become overburdened. However, new or expanded local development would be designed and constructed to be consistent with local land use plans and emergency operation plans and would comply with agencies' approval conditions, including standard impact fees to pay for additional emergency facilities and other financing mechanisms to fund services required to maintain service standards (Madera County Building Inspection Division 2007; Merced County Department of Public Works, no date). With these measures in place, it is not anticipated that construction activities within the cumulative RSA would overburden law enforcement, fire protection, and emergency service providers; therefore, there would not be a cumulative impact. The Central Valley Wye alternatives would include numerous IAMFs that would avoid an impact (see SS-IAMF#1, SS-IAMF#2, and SS-IAMF#3). As a result, its contribution would not result in a new cumulative impact.

The permanent conversion of existing land uses to urban or transportation uses associated with development, including growth under county and city general plans and the other planned projects would result in an increased demand for emergency services, law enforcement, and fire protection. However, the planned transportation projects in the cumulative RSA would provide a long-term benefit for emergency response services within Merced and Madera Counties by widening and improving roadways and through the construction of new interchanges along

SR 99. These improvements would provide better access for emergency service providers, law enforcement, and fire protection by reducing congestion and increasing current roadway network connectivity. In addition, it is anticipated that the existing emergency operations plans for Merced and Madera Counties would be updated/amended to reflect the additional need for emergency services in response to a growing population. With these measures in place, construction and operation of planned development projects would improve access for emergency service providers, law enforcement, and fire protection and would prevent impacts on increased demands; therefore, there would not be a cumulative impact. The Central Valley Wye alternatives would include grade separations that would avoid conflicts with emergency services by allowing free passage of emergency vehicles even as HSR trains are passing. In addition, the Central Valley Wye alternatives would not include any stations, and therefore there would be minimal demands on emergency services during operations. As a result, the Central Valley Wye alternatives would not contribute to a cumulative impact.

Construction and operation activities associated with all new developments identified in Appendices 3.19-A and 3.19-B within the cumulative RSA could combine to result in the temporary and/or permanent exposure of workers and the general public to safety risks associated with Valley Fever, flooding and seismic-related risks, and landfill hazards. Planned developments occurring within the influence areas of airports could cumulatively result in new lighting and structures that could pose potential hazards to aircraft during take-off and landing at these airports. However, mitigation, regulatory standards, avoidance features, and the incorporation of BMPs required as conditions of individual project approvals would avoid or minimize the potential exposure of the workers and the public to safety risks associated with Valley Fever, flooding and seismic-related risks, and landfill hazards. Similarly, regulatory standards and avoidance features would avoid conflicts with aircraft and security risks associated with construction activities near or at airports. With these measures in place, construction and operation of planned development projects within the cumulative RSA would not result in the exposure of workers and the public to safety risks; therefore, there would not be a cumulative impact. The Central Valley Wye alternatives include numerous IAMFs that would avoid an impact (such as SS-IAMF#1; SS-IAMF#2; SS-IAMF#3; SS-IAMF#4; HYD-IAMF#2, Flood Protection; AQ-IAMF#1; and BIO-IAMF#13, Maintain Construction Sites). As a result, its contribution would not result in a cumulative impact.

Security risks, such as the potential for crime, violence, and acts of terrorism for rail facilities and system operations could increase because of multiple cumulative projects, including the HSR Merced to Fresno and San Jose to Merced Sections, and as a result of other planned urban and transportation developments that would increase population within the cumulative RSA. However, increased security procedures and HSR improvements to deter crime and terrorism include vulnerability assessments, intrusion detection, security lighting, and security and training procedures. Further, the goals and policies contained in the general plans for Merced and Madera Counties contain elements for the logical and efficient expansion and/or upgrading of law enforcement, fire protection, and emergency medical services to accommodate future growth in the cumulative safety and security RSA. With these measures in place, the HSR would not result in increased crime, violence, and acts of terrorism. Therefore, there would not be a cumulative impact. The Central Valley Wye alternatives include SS-IAMF#2 and SS-IAMF#3 that would avoid an impact. As a result, its contribution would not result in a cumulative impact.

CEQA Conclusion

The projected increase in population and development by the year 2040 is anticipated to contribute incrementally to demands for emergency services within the cumulative RSA. However, these increases in service demand are planned for locally and it is not anticipated that they would combine to result in a significant cumulative impact on adopted emergency plans or on emergency access. There would not be a significant cumulative impact under CEQA to which the Central Valley Wye alternatives would contribute. Therefore, CEQA does not require any mitigation.

3.19.6.11 Socioeconomics and Communities

RSA

This cumulative analysis identifies the area encompassing Merced and Madera Counties as the cumulative RSA for socioeconomics and communities. There are multiple RSAs described for socioeconomics and communities in Section 3.12, Socioeconomics and Communities; however, this two-county area was chosen for the cumulative RSA to develop a broad regional consideration of cumulative impacts, and because it captures impacts on socioeconomics and communities from construction and operations of the Central Valley Wye alternatives and regional impacts on socioeconomics and communities that are associated with planned development

Cumulative Condition and Contribution of the Central Valley Wye Alternatives

Under the cumulative condition, development planned under the general plans of Merced and Madera Counties, and the cities of Chowchilla and Madera, as well as adjacent HSR sections, transportation improvement projects, and relevant additional future projects identified in Appendices 3.19-A and 3.19-B constitute the cumulative condition relevant to transportation. Additionally, planned water and development projects such as storage and conveyance of non-project water in Friant Division and Hidden Unit Facilities, the North Fork Rancheria of Mono Indians Fee-to-Trust Casino/Hotel Project, and the PG&E Manufactured Gas Plant SQ-VQ Merced located within the cumulative socioeconomics and communities RSA would be considered part of the cumulative condition. Under the cumulative condition, recent development trends are anticipated to continue, potentially resulting in the disruption or division of communities; displacements and relocations of residences, businesses, community facilities, and agricultural operations; or contributions to changes in the local economy. Population growth and associated development pressures would also result in the removal of agricultural land from productive agricultural use at a rate similar to recent agricultural development trends in Merced and Madera Counties (see Section 3.14.4.1, Definition of Resource Study Areas). Planned development and transportation projects that would occur as part of the cumulative condition would likely include various forms of mitigation to address the disruption to communities, and displacement of residents and businesses. Such planned projects that are anticipated to be constructed by 2040 include residential, commercial, industrial, recreational, transportation, and agricultural projects.

Communities

Population growth in Merced and Madera Counties is projected to continue at the rate of 1.7 percent and 1.9 percent per year, respectively, with an estimated population increase for both counties totaling approximately 222,000 people by 2040 (CDOF 2014). Future residential and commercial development is expected to result in a net increase in housing units and to contribute to increased urbanization within the region. Transportation projects are expected to improve mobility and enhance emergency response times but may also potentially create new barriers that could disrupt community interactions or divide established communities. This growth, combined with planned water and development projects located within the cumulative socioeconomics RSA, could result in cumulative impacts if they combined to disrupt community interactions or divide established communities during construction or operations. Development of individual construction plans, coordination with local agencies, and construction phasing would minimize the potential for impacts on communities in the cumulative socioeconomic RSA where construction activities of different projects could overlap with each other. For example, the Central Valley Wye alternatives would include SO-IAMF#1, Construction Management Plan, SO-IAMF#2, Compliance with Uniform Relocation Assistance and Real Property Acquisition Policies Act, and SO-IAMF#3, Relocation Mitigation Plan, to minimize disruptions to existing communities.

As discussed in Section 3.12, three of the four Central Valley Wye alternatives (those generally following SR 152) would result in the physical division of the community of Fairmead, thereby affecting community cohesion. These impacts would be partially minimized during construction and operations through the incorporation of multiple IAMFs related to transportation, air quality, noise, and community coordination and mitigated through implementation of mitigation measures

SO-MM#1, Implement Measures to Reduce Impacts Associated with the Division of Residential Neighborhoods, and SO-MM#2, Implement Measures to Reduce Impacts Associated with the Division of Communities. Impacts relating to community cohesion would remain after mitigation for the community of Fairmead. However, there are no other projects proposed within the community of Fairmead that would further contribute to impacts on community cohesion. No other large-scale transportation feature is proposed that would physically divide the community. Therefore, while there would be an individual impact on community cohesion in Fairmead related to the three SR 152 (North) Central Valley Wye alternatives, there would not be a cumulative impact for construction or operations. Construction and operations of the Avenue 21 to Road 13 Wye Alternative would not result in an individual or cumulative impact on community cohesion.

Displacements and Relocations

Some transportation projects would require acquisition of land and may result in displacement and relocation of residences, businesses, agricultural operations, and community facilities. Additionally, planned water and development projects such as storage and conveyance of non-project water in Friant Division and Hidden Unit Facilities, the North Fork Rancheria of Mono Indians Fee-to-Trust Casino/Hotel Project, and the PG&E Manufactured Gas Plant SQ-VQ Merced located within the cumulative socioeconomic RSA could result in displacements. Development of individual project construction plans, coordination with local agencies, compliance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act, and construction phasing to avoid the construction activities of multiple projects overlapping simultaneously in the same geography as each other would minimize the potential for temporary and permanent impacts on socioeconomic in the cumulative socioeconomic RSA. However, if displacements from multiple projects were to happen simultaneously during construction and result in the inability of displaced property owners and tenants to relocate, there would be a cumulative impact. A cumulative impact could also occur if there is insufficient housing available because of an influx of workers moving from other regions into the RSA to work on construction of these planned projects, further complicating relocation of displaced residents.

Displacements and relocations would occur under each of the Central Valley Wye alternatives. The most residential displacements (119 residences) would occur under the SR 152 (North) to Road 19 Wye Alternative and would be concentrated in Fairmead. The fewest residential displacements would occur under the SR 152 (North) to Road 11 Wye and Avenue 21 to Road 13 Wye alternatives (62 and 65 residences, respectively). The projects listed in Appendices 3.19-A and 3.19-B are not expected to result in a large number of displacements of businesses or residences, as the majority of these projects are proposed on vacant land or land that is already being used for transportation land uses. It is also expected that the majority of the labor force working on these cumulative projects would come from the labor force already living in or very near the two-county RSA, thereby not requiring new housing (see the regional growth discussion in Section 3.18, for more information on construction employment). As shown on Table 3.12-11, there are sufficient comparable relocation properties available in the relocation RSA as a whole, though there are insufficient residential properties within the community of Fairmead under the SR 152 alternatives and within unincorporated Madera County under all Central Valley Wye alternatives to accommodate all the residents displaced under the SR 152 alternatives within the same community.

While these displacements would be a project-specific impact for the Central Valley Wye alternatives, these relocations would not combine with other relocations and displacements from other projects. Additionally, the Central Valley Wye alternatives would also include SO-IAMF#1, SO-IAMF#2, and SO-IAMF#3 to reduce the impacts of these relocations and they would not contribute to or create a new cumulative impact. As a result, it is not anticipated that there would be a cumulative impact related to displacements and relocations.

Economic Impacts

Cumulative economic impacts could occur if cumulative project development resulted in large-scale disruptions to the agricultural economy of the region or reduced local property tax revenue such that local budgets could no longer support the provision of community services. Future

development projects in the cumulative impacts RSA include dairy farm expansions, implementation of airport development and land use plans, and implementation of general and specific plans throughout Madera and Merced Counties. Planned projects would also include residential, commercial, and industrial developments, all of which would encourage population, housing, and job growth. This commercial, industrial, and residential development is expected to increase property tax venues and would support the regional economy and local budgets for public services.

Madera County Transportation Commission's *Final 2014 Regional Transportation Plan and Sustainable Communities Strategy* (MCTC 2014a) identifies transportation projects that would convert approximately 1,876 acres of important farmland to transportation uses between 2014 and 2040. The Central Valley Wye alternatives would further convert approximately 2,500 to 3,100 acres of farmland (depending on alternative) to nonagricultural use. The loss of agricultural land could negatively affect employment and tax revenue to the jurisdictions in the region. Conversely, planned projects such as the North Fork Rancheria of Mono Indians Fee-to-Trust Casino/Hotel Project, the PG&E Manufactured Gas Plant SQ-VQ Merced, planned commercial, residential, and industrial projects, and multiple dairy expansions located within the cumulative socioeconomics RSA could have positive impacts on local employment and the local economy. While there would be changes to the size of different sectors of the economy (agricultural vs. other sectors), taken as a whole, it is not anticipated that there would be a negative cumulative impact on the regional economy.

CEQA Conclusion

As indicated in the immediately preceding discussions, there are no anticipated cumulatively significant impacts under CEQA related to communities or socioeconomics to which the Central Valley Wye alternatives would contribute. Therefore, CEQA does not require any mitigation.

3.19.6.12 Land Use and Development

RSA

To develop a broad, regional consideration of cumulative impacts, the entire land area of Merced and Madera Counties was identified as the cumulative RSA for land use and development, which is larger than the RSA (defined as a 0.5-mile limit for the Central Valley Wye alternatives' right-of-way) described in Section 3.13, Land Use and Development. Land uses within the cumulative RSA include primarily rural areas that are predominantly agricultural (orchards, row crops, and dairy farms) with scattered single-family residential and commercial uses also present. Urbanized land uses include commercial, industrial, and residential within developed areas such as the cities of Chowchilla and Madera and small unincorporated communities. Cumulative impacts related specifically to agricultural lands are discussed separately (refer to Section 3.19.6.13, Agricultural Farmland). Cumulative impacts on communities are discussed under Socioeconomics and Community in this section.

Cumulative Condition and Contribution of the Central Valley Wye Alternatives

Under the cumulative condition, ongoing growth trends within the cumulative RSA are expected to continue, resulting in the continued conversion of undeveloped and agricultural land to residential, commercial, and industrial uses, as well as for transportation infrastructure. In general, this conversion of existing land uses is planned for by the communities and counties in which these projects occur. Taken together, development of the Central Valley Wye alternatives and adjacent HSR sections, with development planned under the general plans of Merced and Madera Counties and the cities of Chowchilla and Madera, and relevant additional future projects identified in Appendices 3.19-A and 3.19-B, constitute the cumulative condition relevant to land use and development. Cumulative impacts could occur if this cumulative growth resulted in changes in the pattern or density of land use such that it resulted in incompatible land use patterns within the cumulative RSA.

As described in Section 3.18, the population of Merced and Madera Counties is projected to increase approximately 52 percent and 58 percent, respectively, by 2040, resulting in the conversion of large areas of land that is presently used for agriculture or is undeveloped to

accommodate housing, commercial, office, transportation, parks, and schools. Planned residential and commercial projects and planned transportation improvements, including the HSR Merced to Fresno and adjacent San Jose to Merced Sections and the planned expansion of SR 99 through several locations in Merced and Madera Counties, would convert additional land to urban or transportation uses within the cumulative RSA.

Construction activities associated with new development and transportation facilities identified in Appendices 3.19-A and 3.19-B within the cumulative RSA would also collectively cause temporary closure of some rural roads and generate indirect impacts related to noise and vibration, aesthetics and visual resources, air quality, and agricultural lands. These activities could have overlapping multiple-year construction timeframes, such as for the HSR Merced to Fresno and San Jose to Merced Sections, SR 99 widening in multiple locations, and the Atwater-Merced Expressway in Merced County. These projects would be planned and regulatory standards and conditions of individual project approvals (avoidance features and mitigation) would minimize temporary closures and noise, dust, and visual impacts of construction. Additionally, although some of these activities may have overlapping timeframes, they would not generally overlap in geographic areas.

Development projects, including planned residential, commercial, and agricultural projects built under the cumulative condition would also result in changes in the pattern and density of land uses during construction. If this conversion introduced large areas of new types of land uses to the region, it could result in changes in the pattern or density of land use such that it resulted in incompatibility with existing adjacent land uses. However, existing land uses already contain developed and agricultural land uses that would continue to operate along existing and future transportation corridors. Because this development is generally planned and included in city and county general plans and transportation plans (such as RTPs), these changes in land use patterns and density would be compatible with adjacent land uses and agricultural and other existing land uses would continue to exist alongside new transportation and development projects within the RSA. Therefore, it is not anticipated that construction activities within the cumulative RSA would result in incompatible land uses and there would not be a cumulative impact. As these changes in land use would occur during construction, and as this development would be planned to be compatible with adjoining land uses, once constructed, there would also not be a cumulative operations impact related to this conversion of land.

CEQA Conclusion

There are no anticipated cumulatively significant impacts under CEQA related to land use to which the Central Valley Wye alternatives would contribute. Therefore, CEQA does not require any mitigation.

3.19.6.13 Agricultural Farmland

RSA

The cumulative RSA for agricultural farmland extends beyond the RSA identified for the Central Valley Wye alternatives for agricultural farmland (see Section 3.14.4.1). The cumulative RSA also includes the entirety of Merced, Madera, Stanislaus, and Fresno Counties. This cumulative RSA was selected because it captures the impacts on agricultural farmland from construction and operations of the Central Valley Wye alternatives regional impacts on Important Farmland and Protected Farmland (including lands under Williamson Act and Farmland Security Zone contracts) with development anticipated from future projects. Refer to Section 3.14.3, Compatibility with Plans and Laws, for more information on how the federal Farmland Protection Act relates to the determination of Important Farmland.

Cumulative Condition

Under the cumulative condition, ongoing growth trends within the cumulative RSA are expected to continue, resulting in the continued conversion of agricultural land to residential, commercial, and industrial uses, as well as for transportation infrastructure. Together, the Central Valley Wye alternatives, planned developments, and cumulative conditions disclosed under the general plans

of Merced, Madera, Stanislaus, and Fresno Counties and the cities of Chowchilla, Madera, and Merced, as well as adjacent HSR sections and relevant additional future projects identified in Appendix 3.19-A and Appendix 3.19-B, constitute the cumulative condition relevant to agricultural farmland. As described in Section 3.14, Agricultural Farmland, nearly 18,000 acres of agricultural land could be converted to a nonagricultural use in Merced and Madera Counties by 2040.⁶ Additionally, planned transportation improvements, including the HSR Merced to Fresno and adjacent San Jose to Merced Sections and the planned expansion of SR 99 through several locations in Merced and Madera Counties as well as various RTP projects identified in Stanislaus and Fresno Counties and listed in Appendix 3.19-B, would likely convert additional agricultural land (including lands under Williamson Act and Farmland Security Zone contracts) to urban or transportation uses within the cumulative RSA. Because farmland cannot easily be replaced once converted, a cumulative impact would occur if the construction of cumulative projects would result in conversion of large areas of agricultural to nonagricultural uses.

These planned projects would also temporarily use Important Farmland during construction to accommodate material laydown areas, staging areas, and concrete prefabrication yards while also permanently converting Important Farmland to nonagricultural use to accommodate HSR operations. Important Farmland temporarily used during construction of the Central Valley Wye alternatives and other planned HSR sections is anticipated to be restored and returned to agricultural use once construction activities cease. For example, design features of the Central Valley Wye alternatives would include AG-IAMF#1, Restoration of Important Farmland Used for Temporary Staging Areas.

Planned development and transportation projects would likely include various forms of mitigation to address Important Farmland conversion and temporary use. However, no mitigation could create new agricultural land to replace that which was permanently converted to nonagricultural use. In addition to the direct conversion of Important Farmland, growth and development through 2040 would contribute cumulatively to Important Farmland severance, resulting in parcels smaller than county thresholds for protected farmland contracts, easement encroachments, and infrastructure disruption that could lead to indirect conversions when these changes leave farmland without convenient access to roads, water, and other necessities to support agricultural use. Planned transportation projects such as the widening of SR 99 south of Madera, reconstruction of the SR 99/SR 233 interchange, and construction of the SR 152 Los Banos bypass, lane expansions of SR 145, and the HSR Merced to Fresno and Fresno to Bakersfield Sections located within the cumulative transportation RSA could contribute to cumulative conversion of important farmland to nonagricultural use, disruption of agricultural infrastructure, and creation of remnant parcels of important farmland.

Contribution of the Central Valley Wye Alternatives

As stated under the cumulative condition for agricultural farmland, the conversion of existing land uses to urban or transportation uses associated with development would result in the permanent conversion of Important Farmland through direct conversion to nonagricultural uses, and indirectly through parcel severance. This conversion of Important Farmland would be considered a cumulative impact on agricultural farmlands in the cumulative RSA. Through the incorporation of AG-IAMF#1 in the project design it is not anticipated that the Central Valley Wye alternatives would contribute to agricultural impacts related to temporary use of Important Farmland. However, the Central Valley Wye alternatives, excluding the electrical lines proposed to be reconducted, would result in the direct and permanent conversion of 2,145 to 2,305 acres of Important Farmland,⁷ depending on the alternative (see Table 3.14-14). The Central Valley Wye alternatives would also result in the indirect and permanent conversion of Important Farmland through the creation of 192 to 232 remnant parcels (depending on alternative) (see Table 3.14-14). Measures would be incorporated to avoid or minimize

⁶ No permanent impacts/conversions of Farmland to a nonagricultural use would occur in regard to power/transmission lines proposed to be reconducted; therefore, limiting the discussion to Merced and Madera Counties is appropriate.

⁷ Of which 3 acres would be attributed to the Site 6 – El Nido, El Nido Substation expansion proposed in the 2021 timeframe.

environmental or community impacts on Important Farmland within the temporary area of disturbance through coordination of construction activities with utility providers and compliance with design standards. However, all of the Central Valley Wye alternatives would result in the permanent conversion of Important Farmland either directly within the right-of-way or indirectly through parcel severance. Although the Authority has entered into an agreement with the Department of Conservation and its California Farmland Conservancy Program to implement agricultural land mitigation for the HSR system, no new agricultural land would be created to replace converted land. Therefore, the Central Valley Wye alternatives' contribution to these cumulative impacts would be cumulatively considerable.

CEQA Conclusion

All of the Central Valley Wye alternatives would cumulatively contribute to a cumulatively significant construction impact under CEQA because they would permanently convert Important Farmland and protected farmland to nonagricultural uses. No additional mitigation is available to avoid or further reduce the impact.

3.19.6.14 Parks, Recreation, and Open Space

RSA

The cumulative RSA for parks, recreation, and open space impacts extends beyond that identified for the Central Valley Wye alternatives for parks, recreation, and open space (see Figure 3.15-1, Parks, Recreation, and Open Space Resource Study Area), which consists of those areas within 1,000 feet of the centerline of the Central Valley Wye alternatives and any proposed roadway modifications associated with these alternatives. The cumulative RSA also includes the entire city of Chowchilla and its Sphere of Influence. This cumulative RSA was selected because it captures both the Central Valley Wye alternatives–related impacts and the potential regional impacts on parks, recreation, and open space associated with development anticipated under the *City of Chowchilla 2040 General Plan* (City of Chowchilla 2011).

The cumulative parks, recreation, and open space RSA is characterized mostly by large areas of undeveloped agricultural land with limited population and more concentrated population in Chowchilla. There are few parks, recreation, or designated open-space resources within the cumulative RSA, and there is limited demand for them because of the rural agricultural nature of all of the alternative alignments.

Cumulative Condition and Contribution of the Central Valley Wye Alternatives

Demand for and use of most parks and recreation facilities in the cumulative RSA has increased as areas, such as Chowchilla, have urbanized and would continue to increase in proportion to the population growth in the urbanized and urbanizing portions of the cumulative RSA. Together, the Central Valley Wye alternatives, development planned under the general plans of the city of Chowchilla, as well as adjacent HSR sections and relevant additional future projects identified in Appendices 3.19-A and 3.19-B constitute the cumulative condition relevant to parks, recreation, and open space. Cumulative impacts related to parkland would occur if the incremental demand associated with planned developments under the cumulative condition combine to result in shortage of park facilities for communities or in the loss of parkland that communities within the RSA presently used.

As described in Section 3.18, the population of Merced and Madera Counties is projected to increase approximately 52 percent and 58 percent, respectively, by 2040. To maintain the current quality of life, the incorporated areas and the other communities in the cumulative RSA would need to add parkland acreage to accommodate the population forecast for 2040. Relevant planning documents concentrate needs for park and recreational land within the urban and developed areas. In the case of the *City of Chowchilla 2040 General Plan* (City of Chowchilla 2011), the City of Chowchilla anticipates a shortage of parkland to support its projected future

population.⁸ According to the general plan, by 2040 the City of Chowchilla would require a total of 168.8 acres of neighborhood parkland and 112.6 acres of community parkland to meet the projected population's parkland acreage needs, as compared to a baseline of 32.3 acres of neighborhood parkland and 21.6 acres of community parkland in 2008. The Central Valley Wye alternatives would not contribute to demand for park and recreation facilities, because it is an enclosed transportation system and passengers would only disembark the train at stations. No stations are within the cumulative RSA.

A majority of the related projects in the cumulative RSA consist of roadway expansion projects. None of the planned projects identified in Appendices 3.19-A and 3.19-B, would result in the acquisition of parkland, recreation, or open space resources or otherwise have direct or indirect impacts on any parks, recreation, or open-space resources. Some construction projects located in the cumulative RSA may include the construction of new park or recreation facilities to serve projected increases in population. For example, the Rancho Calera project includes planned park/open space area and an open space corridor along Ash Slough, and neighborhood parks.

The City of Chowchilla requires new development to fund the provision of park and recreation facilities or to create new recreational facilities within project limits (such as a neighborhood park or public plaza within a new residential or commercial development) to meet the need created by that development. In that way, future development projects would not contribute to the shortage of facilities but would directly provide recreation areas or contribute funds for new parks to accommodate their incremental demand for parkland. Additionally, none of the cumulative projects is proposing to remove existing parkland from Chowchilla. Therefore, under the cumulative condition, the shortage of park facilities in Chowchilla is an existing concern; however, as none of the cumulative projects are anticipated to remove parkland and may provide additional parkland, this would not be considered a cumulative impact.

CEQA Conclusion

There are no anticipated cumulatively significant impacts under CEQA related to parks and recreation to which the Central Valley Wye alternatives would contribute. Therefore, CEQA does not require any mitigation.

3.19.6.15 Aesthetics and Visual Resources

RSA

The cumulative RSA for aesthetics and visual resources is the same as that identified in Section 3.16, Aesthetics and Visual Resources, which consists of the Central Valley Wye alternatives' viewshed (i.e., the area that could have views of Central Valley Wye alternatives' features). As described in Section 3.16, the cumulative RSA is characterized by mostly flat terrain and includes small urbanized communities and rural residential areas dispersed among a variety of agricultural land uses that range from low-lying row crops to view-confining orchards. In the western portion of the cumulative RSA is the San Joaquin River, along with smaller waterways. The San Joaquin River is planned for restoration, which will include recreational uses, but this restoration has not yet occurred.

Viewing distances in the cumulative RSA vary by location. In areas of open space, grazing lands, waterways, and agricultural areas planted with low-lying crops, viewing distances extend over wide areas because of the general scarcity of buildings and tall vegetation that could block views. In the largely agricultural landscape, crop changes can limit views, especially when low-lying field crops are replaced by orchards. Seasonal variation in vegetation also alters the viewshed when tall-growing field crops are harvested, or trees lose their leaves. Except where blocked by adjacent landscaping, development, or tree crops, the views can include the distant Sierra Nevada range. To account for the anticipated scale of the features, the cumulative RSA is considered all areas within a 0.5-mile distance of the Central Valley Wye alternatives' track

⁸ This lack of available parkland was only noted for Chowchilla and is discussed in Section 3.13. No shortage of parkland was noted in other city or county planning documents.

centerlines. This is generally the distance at which the Central Valley Wye alternatives infrastructure can be distinguished from background features in the landscape.

Notable exceptions to the predominantly rural landscape in the cumulative RSA are the presence of Chowchilla, small urban communities, and primary highways. Fairmead is a small community in the cumulative RSA with primarily low-density residential land uses. In addition, the Greenhills Estates development in Chowchilla is a partially developed medium-density residential community, generally shielded from outside views by sound walls, berms, and landscaping. In the existing developed areas, nighttime lighting is more prevalent than in the surrounding agricultural areas. The two primary state highways located within the RSA are SR 99 and SR 152. These generally straight highways add linear features to the landscape, often at an angle to the surrounding agricultural and nonagricultural land uses; neither route is designated a state scenic highway where it passes through the cumulative RSA.

The most important visual resources in the cumulative RSA include a significant historic resource, the Robertson Boulevard Tree Row (which serves as a gateway to Chowchilla and is one of the major symbols of the city); San Joaquin River, Chowchilla River, Ash Slough, and Berenda Slough; and panoramic views toward the Sierra Nevada range from Merced County. Chowchilla has designated West Robertson Boulevard from SR 99 to SR 152 as a scenic corridor (City of Chowchilla 2011).

Cumulative Condition

Over the past century, the visual character of most of the cumulative RSA has been transformed from open lands with prairie, marshes, and woodland areas to a primarily agricultural region with open fields and orchards, along with urbanized areas. Under the cumulative condition, the character of the agricultural portions of the RSA is anticipated to continue to change with the development and expansion of urban cityscapes and suburban development. Growth trends within the cumulative RSA will likely result in additional development adjacent to existing developed areas along transportation corridors such as SR 152 (particularly in Chowchilla where the *City of Chowchilla 2040 General Plan* (City of Chowchilla 2011 identifies extensive development areas) and SR 99.

Growth associated with the general plans as well as projects identified in Appendix 3.19-A and 3.19-B that would occur within the cumulative RSA include the HSR Merced to Fresno and San Jose to Merced Sections, multiple SR 99 widening and frontage road projects, and residential and service commercial development with county and city general plans. These activities could result in the permanent cumulative conversion of agricultural and open space to urban or transportation uses, which would result in new structures and transportation facilities that could permanently alter views. This could affect day or nighttime views in the RSA, degrading the existing visual character or quality of the RSA. This impact would be greatest where new development and transportation facilities are built immediately adjacent to existing sensitive residential viewers and block views that were previously open to surrounding lands, including neighborhoods in the vicinity of the historic and locally designated scenic Robertson Boulevard corridor, Fairmead, and along Road 13 and Road 19. Cumulative impacts would occur if the growth and cumulative projects associated with the cumulative condition resulted in a cumulative reduction in visual quality or would degrade the scenic views within the cumulative RSA.

For residents in areas that predominately view open agricultural land, open views across agricultural land would be changed to views influenced by new residential, commercial and transportation development. These new developments would alter the existing visual character of the existing rural landscape in many areas. The conversion of open agricultural land to new residential development would cover a broad (long and wide) area. Residents adjacent to new development would experience a reduction in visual quality from the change in rural land uses to transportation and urban uses. Therefore, planned and future development would degrade the existing visual character or quality of views, which are predominately agricultural views, for rural residents adjacent to planned development in the cumulative RSA. The degradation of existing visual quality from new development in the cumulative RSA would have a permanent cumulative impact on sensitive residential viewers.

Valley Wye Alternatives Impacts, these impacts would be greatest for residents along the alignment of the SR 152 (North) to Road 13 Wye Alternative and least for residents near the Avenue 21 to Road 19 Wye Alternative. The interference of views would intensify as more development occurred, eventually overtaking the intensity of visual impacts from the HSR infrastructure. In locations where new residential development is expected to replace existing agricultural uses, such as along Road 13 and Road 19, it is likely that development would include landscaping enclosing the residential area. IAMFs identified in Section 3.16 would minimize the impacts of the contrasting aesthetics of HSR infrastructure. New landscaping under mitigation measures AVR-MM#4, Provide Vegetation Screening along At-Grade and Elevated Guideways Adjacent to Residential Areas, and AVR-MM#6, Landscape Treatments along the HSR Overcrossings and Retained Fill Elements, would further reduce the impacts from the Central Valley Wye alternatives because the new landscaping treatments and vegetation screening would improve the existing visual quality in the area and effectively integrate HSR structures into the landscape. With implementation of these mitigation measures, the Central Valley Wye alternatives contribution to the cumulative impacts on rural residential visual quality would not be cumulatively considerable.

The Central Valley Wye alternatives would contribute to the alteration of the historic tree row lining Robertson Boulevard, causing a disruption in the straight, 6-mile procession of the historic palms that line the roadway. In the context of the sensitive viewers of the historic Robertson Boulevard Tree Row, removing blocks of consecutive trees for construction of HSR grade separations and a new SR 152 interchange would permanently diminish the visual strength of the tree rows lining the roadway. The visual strength of the tree rows could also be diminished by future development under the *City of Chowchilla 2040 General Plan* (City of Chowchilla 2011). Mitigation measures identified in Section 3.16, would enhance architectural and landscape design features to mark the SR 152/Robertson Boulevard interchange and would create a visual gateway to Robertson Boulevard and Chowchilla by incorporating new trees and landscaping. However, the removal of trees for an HSR crossing and the blockage of long views along Robertson Boulevard by the HSR grade separation cannot be mitigated, resulting in a cumulatively considerable contribution to the cumulative impact on visual quality.

CEQA Conclusion

The removal of a portion of a local scenic element, the palm tree row along Robertson Boulevard, would contribute to a reduction in the visual quality. The Central Valley Wye alternatives' construction activities would therefore constitute a cumulatively considerable contribution to cumulatively significant aesthetics and visual resource impacts when considered in combination with other projects associated with urban development pursuant to the *City of Chowchilla 2040 General Plan* (City of Chowchilla 2011). While mitigation measures are applied to reduce visual impacts on the area's visual quality related to HSR structures and facilities, no additional mitigation measures are available to fully reduce the Central Valley Wye alternatives' significant cumulative impacts on the tree row. Therefore, the cumulative aesthetic and visual resource impact would remain significant after mitigation.

3.19.6.16 Cultural Resources

RSA

This cumulative analysis identifies the same cumulative RSAs for the archaeological area of potential effect (APE) and architectural APE as those described in Section 3.17, Cultural Resources, because it is sufficiently broad to cover the area in which the potential cultural resources impacts of the Central Valley Wye alternatives, in combination with other projects, could result in cumulative impacts. The archaeological APE is defined as the area of ground proposed to be disturbed before, during, and/or after construction of the Central Valley Wye alternatives. The historic architectural APE is defined as all built environment resources at least 50 years of age at the time of the survey that may be directly or indirectly affected by the Central Valley Wye alternatives through construction or operations activities.

Cumulative Condition

Under the cumulative condition, ongoing urban development and transportation projects are expected to continue within the cumulative RSAs. Urban development stemming from the population increase through 2040 would result in the conversion of large areas of agricultural and undeveloped land to accommodate housing, commercial, office, transportation, parks, and schools. Together, the Central Valley Wye alternatives, development planned under the general plans of Merced and Madera Counties and the cities of Chowchilla and Madera, as well as adjacent HSR sections and relevant additional future projects identified in Appendix 3.19-A and 3.19-B constitute the cumulative condition relevant to cultural resources. Cumulative impacts on cultural resources would occur during construction if the impacts on cultural resources of the development and transportation projects in the cumulative condition combined to result in the physical demolition, destruction, relocation or alternation of historical, archaeological, or other cultural resources that would be determined significant in American history, architecture, archaeology, engineering, or culture, consistent with Criterion A through D of the National Register of Historic Places (NRHP) (see Section 3.17 for more information on application of the NRHP criteria).

The archaeological APE for cumulative impacts consists of those areas of ground that would be disturbed before, during, and after construction of the Central Valley Wye alternatives. The archaeological APE is limited to the area that is directly affected by the project footprints of the Central Valley Wye alternatives and areas that would be used for geotechnical drilling, grading, cut-and-fill, easements, staging/laydown areas, utility relocations, borrow sites, and biological mitigation areas. In reviewing other planned projects, it was determined to be unlikely that other projects could contribute to the cumulative condition for archaeological resources within the APE because past projects within the archaeological APE have not yielded significant archaeological resources and planned projects do not directly overlap with the project footprints of the Central Valley Wye alternatives in areas that have not already been disturbed by prior ground disturbing activity. Therefore, cumulative impacts on archaeological resources are not discussed further in the cumulative condition.

Two NRHP-eligible historic resources were identified within the historic architectural APE for cumulative impacts, the Chowchilla Canal and the Robertson Boulevard Tree Row. Planned development projects in Merced and Madera Counties include dairy farm expansions, implementation of airport development and land use plans, and implementation of general and specific plans throughout both counties. Planned projects would also include transportation projects such as the expansion of SR 99, and residential, commercial, and industrial developments. The residential and commercial growth expected in and around Chowchilla is described in the Introduction and Land Use sections of the *City of Chowchilla 2040 General Plan* (City of Chowchilla 2011; pages I-1 through L-69), and proposed development and expansion are described in the plan. This planned and proposed development and expansion is not anticipated to result in cumulative impacts on the Chowchilla Canal because it would not result in discontinuing the operations of the Chowchilla Canal, realigning the canal system, or making the agricultural setting of the canal system unrecognizable as generally agricultural.

The Robertson Boulevard Tree Row is a roadway with mature palm trees planted on either side of the road extending for several hundred feet. The linear rows of trees were previously determined eligible for listing in the NRHP under Criterion A in the area of community development and Criterion C in the area of landscape architecture. Transportation projects such as the Washington Road and Robertson Boulevard Intersection Project realignment and expansion project, the Central Valley Wye alternatives, and planned development under the *City of Chowchilla 2040 General Plan* (City of Chowchilla 2011) would all remove trees or otherwise degrade the integrity of the Robertson Boulevard Tree Row from SR 152 north to central Chowchilla. The effect of urbanization around the tree row in combination with the removal of trees under the Central Valley Wye alternatives would result in a cumulative impact on this resource.

Contribution of the Central Valley Wye Alternatives

The impacts of the proposed HSR project on the Robertson Boulevard Tree Row were addressed in the Merced to Fresno Final EIR/EIS, which concluded that the Central Valley Wye alternatives presented in that analysis would result in a potential impact (Authority and FRA 2012: page 3.17-54) because several trees would have to be removed to accommodate construction and operation of the rail corridor. This Final Supplemental EIR/EIS proposes alternatives that would result in impacts on different locations along the Robertson Boulevard Tree Row; however, all alternatives would still require the removal of trees. Mitigation measures (CUL-MM#1 and CUL-MM#4) would help reduce impacts, but even with implementation of mitigation, gaps in the tree row would remain and the impact would remain significant.

Therefore, the Central Valley Wye alternatives' contribution to this cumulative impact on cultural resources would be considerable for the Robertson Boulevard Tree Row. This contribution would be greatest under the Avenue 21 to Road 13 Wye Alternative, which would disturb approximately 5,590 linear feet of the tree row, and would be least under the SR 152 (North) to Road 11 Wye Alternative, which would result in the disturbance of approximately 4,088 linear feet of the tree row. The SR 152 (North) to Road 13 Wye Alternative would disturb approximately 4,516 linear feet of the tree row, and the SR 152 (North) to Road 19 Wye Alternative would disturb approximately 4,088 linear feet of the tree row.

CEQA Conclusion

Each of the Central Valley Wye alternatives would constitute a cumulatively considerable contribution to significant cumulative impacts on one NRHP-eligible historic architectural resource when considered in combination with other planned projects, because construction of the Central Valley Wye alternatives would result in the removal of palm trees in the row along Robertson Boulevard. No additional mitigation is available to avoid or further reduce the impact.

3.19.6.17 Environmental Justice

Effects of the Central Valley Wye alternatives on environmental justice communities are addressed in Chapter 5, Environmental Justice. Chapter 5 also includes a discussion of the effects of cumulative projects on environmental justice communities.