

Chapter 5
Consequences of Project Implementation

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5.1 Introduction

This section of the Supplemental Recirculated Environmental Impact Report (SREIR) addresses the consequences of project implementation that could occur from potentially lower trip internal capture rates (ICRs) than evaluated in the Draft Environmental Impact Report (DEIR) and Final Environmental Impact Report (FEIR) (collectively, the “2016 EIR”) for the Grapevine Project (project).

The 2016 EIR were circulated and publicly reviewed in 2016, and the FEIR was certified by Kern County on December 6, 2016. As discussed in Chapter 2, *Introduction*, of this SREIR, the 2016 EIR certification was subsequently rescinded by the Board of Supervisors at a hearing on March 12, 2019, and the County received an application to readopt the approvals for the proposed project on March 14, 2019. On April 12, 2019, the County published a Notice of Preparation (NOP) for an SREIR to evaluate potential traffic, air pollution, greenhouse gas (GHG), noise, public health and growth inducing impacts that could occur from lower ICRs than considered in the 2016 EIR.

The ICR represents the percentage of trips staying within a community compared to total trips generated by the uses in a community. Residential and mixed-use development, such as the proposed project, generate vehicle trips that begin and end within a project study area. These are called “internal” trips. Trips that end or begin outside the project study area are called “external” trips. If a project area uses generate an average daily total of 1,000 trips, for example, and 500 trips begin and end within the community, the average daily ICR would be 50 percent. Traffic trip volumes are highest during “peak” morning (AM) and evening (PM) periods. If a project generates 300 trips during the AM peak period, and 100 of these trips begin and end within the project, the AM peak hour ICR would be 33.3 percent. External trips are generally longer and result in higher vehicle miles travelled (VMT) than internal trips. A project’s ICRs change as land uses and transportation patterns, which are affected by transit options and technologies, change over time. An ICR analysis generally reflects and considers ICRs and transportation patterns that exist at a specific a point in time of the project buildout process.

The original DEIR (2016) used projections for the ICRs as peak period traffic impacts generated from the Kern County Council of Governments (Kern COG) 2014 Regional Transportation Plan (RTP)/Sustainable Communities Strategy (SCS) Travel Demand Model (KernCOG model). The analysis considered the ICR rates for home to work trips (“Home-Based Work” trips) and home to school, shopping, recreational and other non-work-related trips (“Home-Based Other/Non-Home-Based” trips). The KernCOG model projected that, for all trips combined, at buildout the project would have an AM peak period ICR of 72.2 percent and a PM peak period ICR of 71.4 percent.

During the DEIR (2016) comment period, the California Department of Transportation (Caltrans) requested that Fehr & Peers, the project’s traffic consultants, conduct a review of Home-Based Work ICRs in certain other California locations. The review found that the average Home-Based Work ICR for the California communities was 57.4 percent and based on this information Caltrans requested that the project analysis utilize a Home-Based Work ICR of 28.7 percent, 50 percent lower than the results of the review.

As a result, the DEIR (2016) traffic analysis was revised in the FEIR (2016) to incorporate the 28.7 percent Home-Based Work trip ICR requested by Caltrans. When combined with the KernCOG model ICRs for non-work Home-Based Other/Non-Home-Based trips, the ICRs for all project trips considered in the FEIR (2016) were 59.8 percent in the AM peak period and 64.2 percent in the PM period. These results are lower than the 72.2 percent AM peak period and 71.4 percent PM peak period ICRs analyzed in the DEIR (2016). The FEIR (2016) revised the project's mitigation measures and considered the significance of all significant impacts that were determined to potentially occur using the lower AM and PM peak period ICRs. The FEIR (2016) considered the significance of all GHG-related significant impacts that were determined to potentially occur using the lower AM and PM peak period ICRs.

To identify a range of potential ICR scenarios that could result in higher VMT compared to the 28.7 percent HBW trip ICR analyzed in the FEIR (2016), the FEIR's 28.7% HBW ICR was updated with more current information published after the certification of the 2016 EIR (Updated 28.7% HBW ICR). As explained in greater detail in Chapter 4.16, *Transportation and Traffic*, following certification of the 2016 EIR, the tenth edition of the Institute of Transportation Engineers (ITE) Manual was published in 2017. The ITE Manual provides widely utilized trip generation rates for specific land uses, such as housing or commercial development. As shown in Table 4.16-26 of Chapter 4.16, *Transportation and Traffic*, total project trips using the more current, tenth edition of the ITE Manual are slightly lower than generated by the ninth edition of the ITE Manual used in the FEIR (2016) analysis. The lower number of total trips generated by the tenth edition of the ITE Manual also results in a slight decrease in weekday VMT compared with the FEIR (2016). Potential project impacts under the Updated 28.7% HBW ICR scenario were compared with the FEIR (2016), and no new significant impacts were identified.

The Updated 27.8% HBW ICR uses the same ICRs as the FEIR (2016), including an AM peak period ICR of 59.8 percent, and PM peak period ICR of 64.2 percent. These ICRs incorporate the assumed Home-Based Work trip ICR of 28.7 percent requested by Caltrans during the DEIR review process. The number of total daily and peak AM and PM period trips in the Updated 27.8% HBW ICR was calculated using the tenth edition of the ITE Manual. Also, the project ICRs generated by the 2014 KernCOG TD and the 2018 KernCOG TDF model were compared for use in the Updated 27.8% HBW ICR. The 2014 KernCOG model was found to generate lower and more conservative project ICRs than the 2018 KernCOG model and was retained for the Updated 27.8% HBW ICR and Reduced ICR Scenario analysis. The Updated 27.8% HBW ICR, which incorporates the 2017 ITE Manual, was then used as the baseline for screening the 22 potential project development scenarios and identifying reduced ICR scenarios for more detailed analysis.

A total of 22 Screening Scenarios were developed by the project's traffic consultant, Fehr & Peers, to evaluate how daily, AM, and PM peak hour trip generation rates and VMT could vary with ICRs that were 10 and 20 percent lower than used in the 2016 EIR or from other identified development patterns, such as primarily residential or commercial/light industrial development, that could also affect project VMT. As described in the Fehr & Peers (2019) Traffic Study, none of the scenarios were found to generate a greater amount of daily average and peak hour trips than identified in the 2016 EIR, and five of the scenarios were found to generate higher levels of VMT than in the 2016 EIR. Vehicular emissions are partially dependent on project VMT, so these five Reduced ICR

Scenarios are evaluated in this SREIR. The five Reduced ICR Scenarios assessed quantitatively in this SEIR, include the following:

- **Scenario A.** Proposed project development of 12,000 dwelling units and 5,100,000 square feet of commercial/light industrial uses at 100 percent of full buildout with a 10 percent reduction in the daily and peak hour ICRs used in the 2016 EIR.
- **Scenario B.** Proposed project development of 12,000 dwelling units and 5,100,000 square feet of commercial/light industrial uses at 100 percent of full buildout with a 20 percent reduction in the daily and peak hour ICRs used in the 2016 EIR.
- **Scenario C.** Proposed project development of 12,000 dwelling units and 5,100,000 square feet of commercial/light industrial uses at 75 percent of full buildout (9,000 dwelling units and 3,185,000 square feet of commercial/light industrial uses) with a 20 percent reduction in the daily and peak hour ICRs used in the 2016 EIR.
- **Scenario D.** Development of 14,000 dwelling units and schools and parks as required by applicable land use laws and regulations, with no complementary commercial/light industrial amenities or on-site employment-generating land uses
- **Scenario E.** Development of 12,000 dwelling units and schools and parks as required by applicable land use laws and regulations, with no complementary commercial/light industrial amenities or on-site employment-generating land uses

5.2 Significant Environmental Effects that Cannot Be Avoided

Section 15126.2(b) of the California Environmental Quality Act (CEQA) Guidelines requires that an Environmental Impact Report describe any significant impacts, including those that can be mitigated but not reduced to less-than-significant levels.

The following environmental impacts of the Updated 28.7% HBW ICR and five Reduced ICR Scenarios related to traffic, air pollution, GHG, noise, public health, and growth inducement were determined to be significant and unavoidable (refer to Table 5-1, *Summary of Significant Impacts of the Project*).

Table 5-1. Summary of Significant Impacts of the Updated 28.7% HBW ICR, and Five Reduced ICR Scenarios

Resources	Project and Scenario Impacts	Cumulative Impacts
Air Quality	ROG and NO _x emissions during construction would result in temporary increases above the established thresholds. CO emissions during operation of the Updated 28.7% HBW ICR scenario, and five Reduced ICR Scenarios would exceed San Joaquin Valley Air Pollution Control District thresholds. Since the Updated 28.7% HBW ICR scenario, and five Reduced ICR Scenarios could locate land uses with sources that have the potential to generate substantial odors in close proximity to receptors, as well as locate sensitive receptors in an area with existing ambient odors Even with mitigation measures, temporary (construction) and permanent (operation) impacts are considered significant and unavoidable .	Annual ROG emissions during construction would result in temporary significant impacts. Even with implementation of mitigation measures, cumulative emissions of ROG are considered cumulatively significant and unavoidable .

Table 5-1. Summary of Significant Impacts of the Updated 28.7% HBW ICR, and Five Reduced ICR Scenarios

Resources	Project and Scenario Impacts	Cumulative Impacts
Greenhouse Gas Emissions	Construction and operation of the Updated 28.7% HBW ICR, and five Reduced ICR Scenarios would result in GHG emissions from vehicular traffic, area sources (landscaping maintenance), electrical generation, natural gas consumption, water supply and wastewater treatment, and solid waste. Although many other agencies with the necessary jurisdiction are currently taking action to reduce GHG emissions, the County cannot assure that these measures would ultimately be implemented or sufficient to address climate change. Therefore, GHG emissions would be considered significant and unavoidable .	Although many other agencies with the necessary jurisdiction are currently taking action to reduce GHG emissions, the County cannot assure that these measures would ultimately be implemented or sufficient to address climate change. Therefore, GHG emission impacts of the Updated 28.7% HBW ICR, and five Reduced ICR Scenarios would be considered cumulatively significant and unavoidable .
Noise	Mitigation measures would provide for the best available measures for the reduction of construction noise impacts, should any site plan refinements occur during the project review and approval process that result in project noise sources moving closer to sensitive receptors to the extent that significant impacts would occur to sensitive receptors. While the implementation of Mitigation Measures, would help to reduce the impacts of the Updated 28.7% HBW ICR, and five Reduced ICR Scenarios, noise impacts would be significant and unavoidable .	The project, the Updated 28.7% HBW ICR, and five Reduced ICR Scenarios would introduce new sources of noise and groundborne vibrations during construction and operation of the project. Even with implementation of mitigation measures, the Updated 28.7% HBW ICR, and five Reduced ICR Scenarios, when combined with past, present, and reasonably foreseeable projects, would result in a cumulatively significant and unavoidable noise impact.
Population and Housing	There are no feasible mitigation measures to avoid direct and indirect population growth at the project site while achieving any of the project objectives of developing a sustainable new mixed-use community near employment and retail centers of the TRCC. Impacts of the project, the Updated 28.7% HBW ICR, and five Reduced ICR Scenarios related to growth are significant and unavoidable .	Although the project site is located in an area designated for future urbanized development in the RTP/SCS, the net increase in population on the project site, in combination with past, present, and reasonably foreseeable projects, would contribute to population growth associated in the region. Impacts of the project, the Updated 28.7% HBW ICR, and five Reduced ICR Scenarios would be cumulatively significant and unavoidable .
Transportation and Traffic	Mitigation measures would reduce impacts related to implementation of the Updated 28.7% HBW ICR, and five Reduced ICR Scenarios for transportation and traffic to less than significant .	The Updated 28.7% HBW ICR, and five Reduced ICR Scenarios, in combination with past, present, and reasonably foreseeable projects would result in cumulatively significant and unavoidable traffic related impacts regarding conflicting with applicable plans, ordinances and policies, and contributing to the cumulative exceedance of LOS standards.

5.3 Significant Irreversible Impacts

Section 15126.2(c) of the CEQA Guidelines defines an irreversible impact as an impact that uses nonrenewable resources during the initial and continued phases of the project. Irreversible impacts can also result from damage caused by environmental accidents associated with the project. Irretrievable commitments of resources should be evaluated to ensure that such consumption is justified. Buildout of the Updated 28.7% HBW ICR, and five Reduced ICR Scenarios would commit nonrenewable resources during construction and ongoing utility services during operations. During operations, oil, gas, and other nonrenewable resources would be consumed. Therefore, an

irreversible commitment of nonrenewable resources would occur as a result of long-term operation of the Updated 28.7% HBW ICR, and five Reduced ICR Scenarios. However, assuming that those commitments occur in accordance with the adopted goals, policies, and implementation measures of the Kern County General Plan (KCGP), as a matter of public policy, those commitments have been determined to be acceptable. The KCGP ensures that any irreversible environmental changes associated with those commitments will be minimized.

5.4 Significant Cumulative Impacts

According to Section 15355 of the CEQA Guidelines, the term *cumulative impacts* “refers to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.” Individual effects that may contribute to a cumulative impact may be from a single project or a number of separate projects. Individually, the impacts of a project may be relatively minor, but when considered along with impacts of other closely related or nearby projects, including newly proposed projects, the effects could be cumulatively considerable.

The 2016 EIR and this SREIR considered the potential cumulative effects of the Updated 28.7% HBW ICR and five Reduced ICR Scenarios related to traffic, air pollution, GHG, noise, public health, and growth inducing impacts. With respect to those impact categories, impacts for the following issue areas have been found to be cumulatively considerable:

- Air Quality;
- GHG Emissions;
- Noise;
- Population and Housing; and
- Transportation and Traffic.

5.5 Growth Inducement

The KCGP recognizes that certain forms of growth are beneficial, both economically and socially. Section 15126.2(d) of the CEQA Guidelines provides the following guidance on growth-inducing impacts: a project is identified as growth inducing if it “could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment.”

Growth inducement can be a result of new development that requires an increase in dwelling units or an increase in employment, removes barriers to development, or provides resources that lead to secondary growth. The Updated 28.7% HBW ICR, and Scenarios 1, 2, and 4 would add new residential, commercial, and industrial uses to the project site, and Scenarios 9 and 10 would add new residential uses to the project site, representing a substantial increase in population and housing relative to existing conditions. This is considered a significant impact that would also induce growth in the surrounding area. Growth inducement is discussed in detail in Section 4.13, *Population and Housing*, of this SREIR.

With respect to residential land uses, the Updated 28.7% HBW ICR, and five Reduced ICR Scenarios are anticipated to result in a net increase above existing conditions of between 38,400

and 44,800 residents at buildout. The Updated 28.7% HBW ICR, and five Reduced ICR Scenarios, would accordingly result in substantial population growth on the project site and, with the exception of Scenarios 9 and 10 (which would not provide commercial or industrial uses), consistent with the project objectives of development of a sustainable new mixed-use community near the employment and retail centers at the Tejon Ranch Commerce Center (TRCC).

The Updated 28.7% HBW ICR, and five Reduced ICR Scenarios could accommodate a portion of the planned growth in County population, employment, and housing, and help meet the County's need to accommodate residential growth in an environmentally superior development pattern that includes sustainable, mixed-use community design features. The project would represent approximately 30 percent of the total housing needs for the 9-year period in unincorporated Kern County (21,583 units) and approximately 9 percent of the housing needs for the County as a whole (67,675 units). The amount of population and housing that could be generated by the Updated 28.7% HBW ICR, and five Reduced ICR Scenarios would be the same or lower than considered in the 2016 EIR. No new or greater growth inducing onsite or surround areas impacts would occur.

With respect to employment during construction, the Updated 28.7% HBW ICR, and five Reduced ICR Scenarios would not induce substantial growth because it would employ primarily people who already live in Kern County. Some portion of the construction workforce may relocate to the Lebec, Arvin and other cities in Kern County, which would create a potential demand for existing vacant and entitled new residential units. At full buildout, the commercial, industrial, and other land uses of the Updated 28.7% HBW ICR, Scenarios 1, and 2 within the project site would require an operational work force of approximately 8,720 people, while Scenario 4 would generate approximately 6,540 onsite jobs, and Scenarios 9 and 10 (which do not include onsite commercial/industrial uses) would generate approximately 1,308 jobs. In addition, the project site is situated immediately adjacent to the existing and expanding TRCC job generator. Uses at the TRCC currently employ approximately 3,500 people. The TRCC is estimated to generate 14,832 employees at buildout. Therefore, the Updated 28.7% HBW ICR, and five Reduced ICR Scenarios would result in a large increase in employment; however, as discussed in Section 4.13, *Population and Housing*, this growth is consistent with planned growth levels and is located at a site that was recognized as suitable for additional growth in the Kern COG RTP/SCS. The Updated 28.7% HBW ICR, and five Reduced ICR Scenarios, also balance new residential uses with job growth to avoid inducing unplanned growth offsite. The Updated 28.7% HBW ICR, and five Reduced ICR Scenarios would accordingly accommodate planned growth, and not induce unplanned growth.

With respect to removing barriers to development, such as through providing access to previously undeveloped areas, the project site is bifurcated by Interstate 5 (I-5), which provides access to the site. The Updated 28.7% HBW ICR, and five Reduced ICR Scenarios include construction of a roadway network and community-serving infrastructure within the Grapevine Specific and Community Plan boundaries, and also include limited off-site roadway and infrastructure improvements. Roadway improvements would connect to adjacent areas that are already designated for service industrial under the KCGP. The remaining surrounding land use designations and zone classifications are related to agriculture and mineral and petroleum exploration and extraction, and would not be served by project infrastructure. Because the Updated 28.7% HBW ICR, and five Reduced ICR Scenarios include infrastructure sized to serve project needs, they would not remove barriers to off-site development.

Although the Updated 28.7% HBW ICR, and five Reduced ICR Scenarios accommodate planned population growth at a suitable location, as discussed further in Section 4.13, *Population and Housing*, the net increase in population on the project site remains significant and unavoidable. While population growth would result from the Updated 28.7% HBW ICR, and five Reduced ICR Scenarios, the growth would facilitate the provision of needed housing for the TRCC while also providing community amenities, services, and transportation options designed to address the transportation, land use, air quality, and other effects of additional growth in an environmentally superior manner. The project site's strategic location adjacent to the existing TRCC and the I-5/Grapevine Road interchange, which has an existing adopted KCGP land use designation 4.3 (Specific Plan Required) and provides a logical basis for accommodating new population growth utilizing sustainable design features.

It is also important to note that the strategic objective of providing needed housing for an existing and expanding employment center is consistent with the forecasted development pattern and land use strategy presented in the Kern COG SCS.

There are no feasible mitigation measures to avoid population growth at the project site while achieving any of the project objectives of developing a sustainable new mixed-use community near employment and retail centers of the TRCC.

5.6 Energy Conservation

Public Resources Code Section 21100(b)(3) and CEQA Guidelines Appendix F requires a description (where relevant) of the wasteful, inefficient, and unnecessary consumption of energy caused by a project. In 1975, the California State Legislature adopted Assembly Bill (AB) 1575 in response to the oil crisis of the 1970s. Appendix F of the CEQA Guidelines provides guidance for assessing potential impacts that a project could have on energy supplies, focusing on the goal of conserving energy by ensuring that projects use energy wisely and efficiently. Because Appendix F does not include specific significance criteria, this threshold is based on the goal of Appendix F. Therefore, an energy impact is considered significant if the project would:

Develop land uses and patterns that cause wasteful, inefficient, and unnecessary consumption of energy or construct new or retrofitted buildings that would have excessive energy requirements for daily operation.

As listed in Section 3.3, *Project Objectives*, one of the objectives of the project is to create a sustainable community that includes project design features that reduce water demand, conserve energy, incorporate water quality features, encourage alternative modes of transportation, and provide a mix of land uses with a range of housing types and densities. As part of the proposed Grapevine Specific and Community Plan, sustainability principles were developed to reduce the energy needs of the project. In addition, Section 4.7, *Greenhouse Gas Emissions*, describes effects on GHG emissions that would be caused by implementation of the project, including a discussion on the effects of the project on energy as it relates to GHG emissions. Also, compliance with all applicable building codes, as well as with County policies and proposed mitigation measures identified in this SREIR, result in lower energy consumption and higher energy conservation than older structures built under prior editions of applicable building code requirements. The project does not include a regional indoor mall or other unusual or excessive energy-consuming land uses.

As discussed above in Section 5.3, resources that would be consumed as a result of project implementation include water, electricity, and fossil fuels during construction and operation.

Additionally, construction would require the manufacture of new materials, some of which would not be recyclable, and the energy required for the production of these materials would also result in an irretrievable commitment of natural resources. The anticipated equipment, vehicles, and materials required for construction of the project are detailed in Chapter 3, *Project Description*. The amount and rate of consumption of these resources would result in significant environmental impacts or the unnecessary, inefficient, or wasteful use of resources. Compliance with all applicable building codes, as well as County policies and the mitigation measures identified in this SREIR would ensure that all natural resources are conserved to the maximum extent possible.

Title 24, California's Energy Efficiency Standards for Residential and Non-residential Buildings, was established by the California Energy Commission (CEC) in 1978 in response to a legislative mandate to create uniform building codes to reduce California's energy consumption, and provide energy efficiency standards for residential and non-residential buildings. In 2010, the CEC updated Title 24 standards with more stringent requirements. The 2010 Standards are expected to substantially reduce the growth in electricity and natural gas use. Additional savings result from the application of the Standards on building alterations. For example, requirements for cool roofs, lighting, and air distribution ducts are expected to save about additional of electricity. These savings are cumulative, doubling as years go by.

The reduction in energy consumption and associated emissions is not directly proportional to the extent that Title 24 requirements are exceeded; that is, the reduction is less than the 15 percent improvement above 2016 Title 24 requirements specified in Mitigation Measure MM 4.3-5 and MM 4.7-4. The degree of reduction for generation of electricity also reflects future requirements of the Renewal Portfolio Standard in that a higher percentage of renewable energy in the serving utilities energy mix would reduce the GHG emissions per unit of electricity used (e.g., kilowatt-hour) and the corresponding GHG emission reduction on a mass basis would be less. Table 4.7-6, *Project Consistency with Scoping Plan Greenhouse Gas Emission Reduction Strategies*, demonstrates consistency with all feasible Scoping Plan emission reduction strategies. Finally, the project would adhere to all Federal, State, and local requirements for energy efficiency.

Mitigation Measures MM 4.3-5 and MM 4.7-4 require an Energy Plan documenting compliance with applicable energy conservation requirements of applicable Title 24 standards in the California Code of Regulations (CCR), including verification that the project will exceed the energy conservation requirements of 2016 Title 24 standards by 15 percent. The Energy Plan would provide a menu of energy efficiency design elements, along with other design considerations and options, to builders, developers, and property owners as part of the internal design review process. Each developer, builder, or property owner would incorporate the design elements required to comply with then-applicable Title 24 requirements, and select from the menu or implement other available technologies as may be needed to reduce energy consumption 15 percent below 2016 Title 24 requirements.

Therefore, the Updated 28.7% HBW ICR, and five Reduced ICR Scenarios would be designed to support sustainable communities that and would not result inefficient, wasteful, or unnecessary consumption of building energy and transportation energy.

Project Construction Energy Use

Heavy-duty construction equipment of various types would be used during each phase of construction. The CalEEMod output provided in Volumes 6 through 8, Appendix E.1 includes the proposed construction schedule and assumed equipment usage. Based on that analysis, over all phases of construction, diesel-fueled on-site construction equipment would run for approximately 1,713,508 hours. Assuming an average diesel fuel efficiency of 1.74 gallons per hour (EPA, 2010), on-site construction equipment would consume approximately 2,981,504 gallons of diesel. With a conversion factor of 40.7 kilowatt hours (kWh) per gallon of diesel, the energy consumption due to on-site equipment operation would be approximately 121,347,210 kWh.

Approximately 147,483 vehicle miles traveled (VMT) are estimated for moving soils on-site. Assuming an average diesel fuel efficiency of 6 miles per gallon for medium-heavy-duty and heavy-heavy-duty haul trucks (EIA n.d.), hauling would consume approximately 24,581 gallons of diesel. With a conversion factor of 40.7 kWh per gallon of diesel, the energy consumption due to hauling would be 1,000,426 kWh.

During the building construction phase, it is expected that vendors will travel to and from the site in diesel-fueled vehicles to deliver materials. CalEEMod estimates that over the entire duration of construction, vendor trips would generate approximately 15,578,419 VMT. Assuming an average diesel fuel efficiency of 6 miles per gallon (Energy Information Administration, 2013), vendor trips would consume approximately 2,596,403 gallons of diesel. With a conversion factor of 40.7 kWh per gallon of diesel, the energy consumption due to hauling would be approximately 105,673,609 kWh.

The number of construction workers required would vary based on the construction phase and activity. The fuel construction workers would require for transportation would depend on the total number of worker trips estimated for the duration of construction activity. CalEEMod estimates that over the entire duration of construction, worker trips would generate approximately 78,831,792 VMT. Assuming an average fuel efficiency of 17.5 miles per gallon (Economic Perspective, 2013), demolition and construction activities on site would use approximately 4,504,674 gallons of gasoline for construction worker trips. With a conversion factor of 33.7 kWh per gallon of gasoline, the annual energy consumption due to gasoline-fueled transportation by construction worker trips to and from the project site would be 151,807,508 kWh. In summary, based on the fuel usage amounts presented previously, construction of the Updated 28.7% HBW ICR would use approximately 4,504,674 gallons of gasoline and 5,602,488 gallons of diesel.

The Updated 28.7% HBW ICR, and Scenarios 1 and 2 are expected to have similar construction energy use profiles as determined in the 2016 EIR, as they propose the same amount of construction as compared to the 2016 EIR. Scenario 4 proposes 25 percent fewer residential units and 25 percent less commercial/industrial development as compared to the Updated 28.7% HBW ICR and thus would result in a corresponding reduction in construction-related energy use. Although Scenario 9 would construct 2,000 more residential units than the 28.7% HBW ICR, it would not result in any commercial/industrial development and is thus expected to have a similar or reduced construction energy use profile, as compared to the 28.7% HBW ICR. Scenario 10 would construct the same number of dwelling units as the 28.7% HBW ICR, but none of its proposed commercial/industrial uses and thus would result in a corresponding reduction in construction-related energy use.

Project Operation Energy Use

Daily operation of the proposed project would generate demand for electricity and natural gas to serve project land uses. As discussed in Section 4.17, *Utilities and Service Systems*, the analysis of project electrical and natural gas demand was based upon a land use program of 12,000 residential units and 10,748,400 square feet of commercial use as originally proposed in the project EIR NOP. As discussed in Chapter 3, *Project Description*, the project currently includes 5,100,000 square feet of commercial uses. Consequently, the estimated electrical and natural gas demands in this EIR are conservative. Assuming the commercial use levels described above, the peak electrical demand for project operations would be approximately 200 megawatts (MW) (Utility Specialists, 2014). Assuming the commercial use levels described above and in the project NOP, the anticipated gas load generated by project operations is conservatively estimated to be approximately 4,345,000 cubic feet per hour (Utility Specialists, 2014).

With respect to energy consumption associated with project vehicle trips, for the Original Trip Internalization assumptions, it was estimated that the project would generate a total of 891,723,339 VMT annually. Assuming an average fuel efficiency of 17.5 miles per gallon (EIA), the proposed project would increase consumption of gasoline by 50,955,619 gallons annually. With a conversion factor of 33.7 kWh per gallon of gasoline, the annual energy consumption due to these trips would be 1,717,204,373 kWh. For the Reduced Trip Internalization assumptions, it was estimated that the project would generate a total of 1,091,956,269 VMT annually. Assuming an average fuel efficiency of 17.5 miles per gallon (Economic Perspective, 2013), the proposed project would increase consumption of gasoline by 62,397,501 gallons annually. With a conversion factor of 33.7 kWh per gallon of gasoline, the annual energy consumption due to these trips would be 2,102,795,787 kWh.

The Updated 28.7% HBW ICR, and Scenarios 1 and 2 are expected to have similar operational energy use profiles as analyzed in the 2016 EIR, as they propose the same amount of development as compared to the project assumed by the 2016 EIR. Scenario 4 proposes 25 percent fewer residential units and 25 percent less commercial/industrial development as compared to the Updated 28.7% HBW ICR and thus would result in a corresponding reduction in operation-related energy use. Although Scenario 9 would construct 2,000 more residential units than the Updated 28.7% HBW ICR, it would not result in any commercial/industrial development and is thus expected to have a similar or reduced operational energy use profile, as compared to the Updated 28.7% HBW ICR. Scenario 10 would construct the same number of dwelling units as the Updated 28.7% HBW ICR, but none of its proposed commercial/industrial uses and thus would result in a corresponding reduction in operation-related energy use.

Project Design Features, Development Criteria, and Mitigation Measures to Avoid Wasteful, Inefficient Energy Consumption

As discussed above, the Updated 28.7% HBW ICR would create a sustainable community that includes project design features to reduce water demand, conserve energy, incorporate water quality features, encourage alternative modes of transportation, and provide a mix of land uses with a range of housing types and densities. The same would be true for the five Reduced ICR Scenarios. Moreover, as part of the proposed Grapevine Specific and Community Plan, sustainability principles and design criteria were developed to reduce the energy needs of the Updated 28.7% HBW ICR, which criteria would also apply to the five Reduced ICR Scenarios. In addition, this

SREIR incorporates several mitigation measures that implement efficient energy consumption, discourage wasteful energy consumption, and reduce the reliance on fossil fuels by the Updated 28.7% HBW ICR, and these measures would also apply to the five Reduced ICR Scenarios. These sustainability principles, policies, design criteria, development standards, and mitigation measures are summarized below. Together, their implementation will ensure that the project, the Updated 28.7% HBW ICR scenario, or the five Reduced ICR Scenarios, would not develop land uses and patterns that cause wasteful, inefficient, and unnecessary consumption of energy or construct new or retrofitted buildings that would have excessive energy requirements for daily operation.

Reducing Construction Phase Energy Consumption:

To reduce energy consumption related to construction material manufacturing, use, and disposal, the Specific Plan's Sustainability Principles require the Updated 28.7% HBW ICR to establish and operate a community waste recycling program including education and outreach, recycled waste pickup and drop-off services (see Volume 2, Appendix B). These principles would also apply to the five Reduced ICR Scenarios. More specifically, per this project design feature, the master developer will establish and provide builders with guidelines for construction material selection and responsible waste management guidelines that include, but are not limited to the following:

- Use recycled building materials, such as timber beams, barn siding, used brick, used concrete, etc., whenever practicable;
- Use low volatile organic compound finishes, including, but not limited to, those found in paints and coatings, adhesives and sealants, carpet, and composite woods;
- Use building materials and products that are locally and regionally extracted and manufactured and or recycled, when available;
- Roofing and paving materials and systems should maximize efficient energy use and natural rainwater infiltration;
- Builders, developers, and property owners are to recycle a minimum of 50 percent construction waste, including waste and unused materials generated during the construction and building process and existing waste and unused materials on site prior to construction. Recycling options may include the use of on-site spoils and bulk site clearing materials for existing project needs, such as backfill, mulch, erosion and sedimentation control; donation of materials to charitable organizations; or exported for use in other local construction projects in the project area; and
- Construction debris and waste recycling is to be ensured through administration by an on-site recycling coordinator and the presence of recycling/separation areas.

In addition, the Special Plan incorporates project design standards that promote the use of construction materials that require less energy to manufacture or construct. For example, the Special Plan encourages the use of permeable pavement in the development of parcels, residences, or commercial sites. The Special Plan further provides that permeable pavement may also be utilized in public rights of way where the maintenance entity and safety agencies agree to such use. The Special Plan's Development Standards also permit street sections to be narrowed to increase pedestrian safety, reduce vehicle speeds, enhance the project character, minimize travel lane width, reduce pavement, impervious surface, and stormwater runoff. (See Volume 2, Appendix C.)

Moreover, this SREIR describes a variety of mitigation measures that will minimize energy use during the construction phase by construction vehicles and equipment, and that will minimize energy consumption associated with construction materials manufacturing and use, as summarized below:

- Mitigation Measure MM 4.4-1 limits work to designated construction areas and limits construction vehicle speeds within a specified distance of sensitive biological resources to 15 miles per hour and generally prohibits construction in such areas during nighttime hours except if maintenance is required or in cases of emergency. When nighttime construction is permitted in these areas, this measure requires vehicle speeds to be further limited to 10 miles per hour and for all associated lighting to be minimized;
- Mitigation Measure MM 4.3-2 requires the preparation of a Fugitive Dust Control Plan that, among other requirements, limits traffic speed on unpaved roads to a maximum of 25 miles per hour, subject to additional speed restrictions required by Mitigation Measure MM 4.4-1 (described above);
- Mitigation Measure MM 4.3-3 requires that qualifying construction equipment use Tier 2 engines at the commencement of construction (2016), Tier 3 engines starting in construction year 5 (2020), Tier 4 Interim engines starting in construction year 10 (2025), and Tier 4 Final engines starting in construction year 15 (2030). With implementation of MM 4.3-3, idling time is also limited to 5 minutes for off-road equipment, in accordance with a California Air Resources Board (CARB) Airborne Toxics Control Measure for In-Use Off-Road Diesel-Fueled Fleets (13 CCR 2449 et seq.);
- Mitigation Measure MM 4.17-16 requires building permit applicants to submit a Construction/Demolition Recycling Plan to the Kern County Public Works Department for review and approval that includes measures to recycle demolition debris and construction wastes to the extent feasible. Per this mitigation measure, an onsite recycling coordinator must also be designated by the project proponent to facilitate recycling of all construction waste through coordination with the onsite contractor, local waste haulers, and/or other facilities that recycle construction/demolition wastes. The onsite recycling coordinator will also be responsible for ensuring that wastes requiring special disposal are handled according to state and County regulations that are in effect at the time of disposal. Additional measures to be included in the Recycling Plan include: (a) reducing the quantity of waste generated by construction activities (e.g., by using onsite spoils and bulk site-clearing materials for existing project needs, such as backfill, mulch, erosion and sedimentation control), donating reusable materials to charitable organizations, or exporting materials for use in other construction projects; (b) maintaining a centralized information repository on site to identify which construction materials can be recycled and provide direction as to which sources will accept recyclable building and construction materials; and (c) requiring building or construction materials that are not recyclable to be taken to the nearest waste disposal facility. These materials shall be transported in bulk to reduce multiple truck trips, thereby reducing emissions generated from, and energy consumption associated with, waste transportation.

Reducing Transportation Energy Consumption and Its Reliance on Fossil Fuels:

Strategic land use and transportation planning minimizes the Updated 28.7% HBW ICR's energy and fossil fuel consumption by promoting land use and transportation patterns that reduce reliance on the automobile and promote alternative transportation such as walking and bicycling. The same would be true for the five Reduced ICR Scenarios. As described in Specific Plan, "[t]he Specific Plan is designed to include multi-modal transportation options to reduce reliance on single-occupancy vehicles. This is accomplished by creating a series of compact neighborhoods linked by streets, transit, and bicycle and pedestrian trails that will provide convenient access to employment, shopping, professional services, schools, and parks" (see Volume 2, Appendix B). Moreover, the Planning Principles section of the Specific Plan requires the project to "[r]educe carbon footprint and maximize energy efficiency through the following programs and use of the Grapevine Sustainability Principles' (Appendix C) guidance as a menu of potential options to enhance sustainability of development: (a) air quality emission-reduction programs; (b) construction-related energy efficiency and generation programs; and (c) on-site renewable energy, water conservation, and waste recycling and reduction programs" (see Volume 2, Appendix B). In addition, the Specific Plan requires the Grapevine community to balance homes with jobs along a major transportation corridor, and be designed to reduce reliance on single-occupancy vehicles by creating a series of compact neighborhoods linked by streets, transit, and bicycle and pedestrian trails, which will provide convenient access to employment, shopping, professional services, schools, and parks (see Volume 2, Appendix B). Each village will contain a village center comprised of high-density housing opportunities, with sub areas located closest to I-5 to include the most intensive commercial and higher-density residential uses in order to utilize freeway exposure and support efficient transportation patterns. Village centers in these Sub Areas will be designated Village Mixed Use (VMU); the VMU districts are envisioned as dense mixed-use centers with compact development that will encourage walkability. By developing walkable and bicycle-friendly neighborhoods that put homes in close proximity to jobs, shopping, schools and other project amenities, the project will minimize energy consumption associated with vehicle use by reducing the length and number of vehicle trips.

In furtherance of this land use strategy, the Specific Plan provides for a network of pedestrian, bikeways, equestrian, and multi-use trails located both within the road system and adjacent to Grapevine Creek, Cattle Creek, the southern foothills, the open space area adjacent to the California Aqueduct, and at other locations throughout the Specific Plan (see Volume 2, Appendix B). These include multi-purpose trails, recreational trails on existing Ranch roads, new recreational trails (5 feet wide), and public roads with Class I or II bike lanes. Moreover, the Specific Plan lays out Transportation Demand Management (TDM) Strategies to be employed by the project-specific Transportation Management Agency to reduce vehicle trips, including:

- Coordinating employer work schedules and transit schedules;
- Providing discounted bus passes to users;
- Organizing ridesharing programs;
- Offering a bike-share or car-share program;
- Offering formal rideshare programs;
- Offering employer-sponsored shuttle/vanpool services; and

- Offering incentives to employees to reduce single-occupancy vehicle travel. (See Volume 2, Appendix B.)

Circulation implementation measures described in the Specific Plan also call for the provision of bicycle storage racks, wayfinding, street furniture including benches, trash receptacles, bike racks, drinking fountains, etc., transit stops and shelters coordinated with bikeways and trails, parkways and planting strips that enhance the pedestrian experience, safe routes to schools and parks, shade trees adequately spaced 25 to 30 feet on center, park and ride lots to facilitate ride sharing and transit use, and high-density and mixed-use near transit corridors. (See Volume 2, Appendix B.)

The Special Plan also includes development criteria that minimize project energy consumption related to vehicle use. For example, the parking requirements in the plan state that: (1) Shared-vehicle (e.g., vanpools) and electric or plug-in hybrid vehicle (electric/hybrid vehicle) use is encouraged and, to promote shared-vehicle use, preferential parking for shared-vehicle spaces and electric/hybrid vehicles will be provided at a ratio of 1 space for every 50 spaces; (2) Non-residential uses will provide one electric vehicle charging station for every 50,000 square-foot of gross leasable area and (3) Multi-family residential uses will provide one electric vehicle charging station for every 15 dwelling units (or portion thereof). (See Volume 2, Appendix C.)

In addition, Chapter 4 of this SREIR describes a variety of mitigation measures that will minimize energy consumption associated with project vehicle use, promote efficient transportation alternatives, and reduce reliance on fossil fuels. All of these measures would apply to the Updated 28.7% HBW ICR scenario, and five Reduced ICR Scenarios and are as summarized below:

- Mitigation Measure MM 4.16-1 requires all project circulation elements, including on-site public roadways and driveways, to be designed and constructed in compliance with the goals, policies and design criteria described in the Grapevine Specific and Community Plan and the Grapevine Special Plan (see Volume 2, Appendices B and C, respectively), including the above described policies and design criteria that would reduce project reliance on fossil fuels and overall vehicle energy consumption;
- Mitigation Measure MM 4.16-2 requires that a Transportation Management Association (TMA) be formed in part to implement a variety of transportation demand measures that reduce vehicle trips and encourage multi-modal movement in a phased manner. This mitigation measure also requires the TMA to organize rideshare and car-share programs, sponsor shuttle/vanpool service in collaboration with employers, implement preferential carpool/vanpool parking programs, coordinate with local schools to establish and maintain a Safe Routes to School program to facilitate students walking and biking to schools; and to conduct marketing campaigns to encourage non-automotive transit modes for commuting;
- Mitigation Measure MM 4.16-3 requires the project proponent to conduct an appropriate traffic study to determine if traffic volumes are consistent with trip distribution assumptions identified in the EIR, and any required improvements identified shall be made part of the conditions of approval of any final subdivision maps or commercial/industrial site plans and be implemented prior to issuance of any building or grading permits;
- Mitigation Measure MM 4.16-6 requires the implementation of various measures to ensure adequate performance standards at internal project roadways and intersections;

- Mitigation Measure MM 4.7-2 requires as part of the subdivision map approval process the project proponent to provide evidence to the County that the following measures to reduce energy consumption related to vehicle use and to minimize reliance on fossil fuels are being implemented:
 - Require service fleet vehicles to be powered with alternative fuel technology where feasible, as determined by the individual project applicants.
 - Designate at least two locations with adequate pedestrian, bicycle, and parking facilities for off-site transit connection service.
 - Provide multiple travel options for residents, workers, and visitors through a comprehensive multi-modal network including, but not limited to, transit, paths, trails, and connections integrated into the overall circulation network.
 - Ensure that higher density residential, commercial and offices and other high- demand uses are located near, and provide connection through the TMA measures to, transit hubs.
 - Locate two transit hubs in the village centers on both sides of I-5 that would be accessible by local and regional transit routes and community multi- modal paths and trails.
 - Establish a Transit Management Association to promote, manage, and monitor transit and mobility services and infrastructure, as further described in Section 4.16, *Transportation and Traffic*.
 - Promote alternative fuels for transit system, if available.
 - Encourage use of best feasible alternative fuel technology to be used in homeowners association, refuse fleet, and other community service vehicles.
 - Provide a framework for a community-wide parking plan that is based on parking demand and need.
 - Provide preferential parking for carpool, shared, electric, and hydrogen vehicles.
 - Require builders to install broadband infrastructure or other communication technologies that encourage telecommuting and working from home.
 - Integrate traffic calming measures into the community-wide circulation network to promote reduced speeds and encourage pedestrian and bicycle trips.
 - Provide sidewalks and crosswalks at all streets (along with general pedestrian connectivity throughout project) to encourage pedestrian traffic and offer an alternative to vehicle trips.
 - Construct a multi-purpose internal trail system that includes off-road bikeways within the street right-of-way (paseos) and within a greenway system.
 - Require garages in single family homes to be wired with a 240 kilovolt (kV) outlet, suitable for future electric car charging devices or service.
 - Require non-residential uses to have at least one electric vehicle charging station for every 50,000 square feet of gross-leasable areas.
 - Require one electric vehicle charging station for every 15 dwelling units.

- Require the TMA to work with automotive dealers to help promote compressed natural gas electric and hybrid electric vehicles.
- Incorporate electric truck charging capabilities in loading docks by installing a 240 kV outlet in the vicinity of the loading dock.
- Install cool pavements if approved by Caltrans and County Roads to roadway uses, provided that road installation and maintenance durability and costs are comparable to existing approved roadway materials (since early replacements or more intensive repair result in higher energy use and thus higher GHG emissions).
- All single family homes are required to be wired for a 240 kV line to accommodate electric vehicle charging uses and devices.
- Mitigation Measure 4.3-9 requires each application for a tentative tract map, parcel map (except finance map), and commercial site plan review to include telecommunication infrastructure to provide internet service for all occupied structures, and to provide a community intranet with access for homeowners associations, interest groups, residents, and employers and employees. This measure further requires the intranet to provide information regarding, among other topics, carpool and transit services, as well as energy conservation opportunities and financial incentives for energy-efficiency improvements and technology systems. Finally, MM 4.3-9 requires each application for a building permit to include broadband internet infrastructure to encourage telecommuting and working from home and in satellite offices.
- Mitigation Measure 4.3-10 requires that, concurrent with the initial application for a tentative tract map, parcel map (exclusive of a financing map), or commercial site plan review, the project proponent shall submit a Mobility Plan describing the system of sidewalks, greenway trails, community trails, a dedicated transit easement, and two transit hubs to serve as alternative means of transportation on the project site. The Mobility Plan shall also require, consistent with MM 4.16-2 and the requirement to form a TMA, the ongoing operation of the TMA to implement ongoing transportation improvements and programs. Implementation of the approved Mobility Plan shall be required for each subsequent tentative tract map, parcel map (exclusive of financing map), and commercial site plan review. Per this mitigation measures, the Mobility Plan must:
 - Reinforce and serve the Land Use Plan.
 - Through the TMA, provide future residents, visitors, and employees with information on multiple modes of transit/non-single-occupancy-vehicle accessibility for internal and external trips.
 - Through the TMA, provide options to reduce vehicle trips and emissions by linking effective travel demand management with transportation systems and parking policies.
 - Through the TMA, provide residents and employees on the project site with multiple modes of transportation options (e.g., walk, bike, public transit, private auto, car share, bike share).
 - Provide for 50 percent on average of residential units (single family and multi-family) to be located within 0.5 miles of a village center that includes retail and service uses.

- Provide parks within a 10-minute walk (0.5 mile) of 80 percent of all residential units.
- Provide a transit route easement no less than 25 feet wide to provide for a dedicated bus lane and bus pull-outs from the dedicated transit centers to the primary village mixed use center areas on the east and west sides of I-5.
- Through the TMA, work with automotive dealers to help promote electric, compressed natural gas, hybrid electric vehicles, and vehicles using future zero or low emission technologies approved for use in California by CARB (CARB-approved zero and low emission vehicles).
- Through the TMA, engage in outreach and education for agencies and businesses located on the site, and project residents, about CARB-approved zero and low emission vehicles, that would help achieve California's air quality, GHG, and climate change mandates, and that could potentially meet the performance and affordability needs of project employers, employees and residents.
- Require TMA implementation of a combination of measures to provide adequate temporary bike or personal electric vehicle (e.g., scooter) parking during large public events conducted at civic center, large amphitheaters, fairgrounds or athletic stadium uses that may be permitted, temporarily permitted, or conditionally permitted on the project site pursuant to the Specific Plan. Such measures may include, but are not limited to, providing valet bike parking, temporarily anchored bike parking racks, or a secured temporary bike parking enclosure.
- Mitigation Measure 4.3-11 provides that each component of the Mobility Plan shall incorporate TDM features to reduce dependence on the automobile and provide for a more efficient use of transportation resources among project occupants, thereby reducing pollutant emissions. Related to this is the requirements of MM 4.16-2, which requires the creation and ongoing operation of a TMA to coordinate and support the operation of ongoing transportation programs, including but not limited to transit and on-demand services. The following are key TDM elements that are inherent in the overall Mobility Plan:
 - Sidewalks, greenway trails, and community trails that link residential, schools, shopping, and employment areas;
 - Small- to medium-sized streets and blocks that allow for shorter walking distances to retail, parks, schools, and other destinations;
 - Pedestrian environments incorporated with public streets;
 - Transit route easement connecting the residential and commerce areas;
 - Parking behind buildings to encourage walking in retail areas along street frontage; and
 - Provide bus shelters.
- Mitigation Measure 4.3-12 requires that applications for commercial site plan review and building permits for non-residential buildings shall include lockers and showers to encourage active transportation such as biking and walking to and at work in lieu of motorized vehicle. Proof of compliance shall be provided to the County prior to the issuance of occupancy permits. Moreover, for buildings with over 10 tenant-occupants, changing/shower facilities must be provided as follows: for 11 to 50 tenant-occupants, one shower and two 2-tier

- lockers; for 51 to 100 tenant-occupants, one shower and three 2-tier lockers; for 101 to 200 tenant-occupants, two showers and four 2-tier lockers; and for over 200 tenant-occupants, two additional showers for each 200 additional tenant-occupants and one 2-tier locker for each 50 additional tenant-occupants.
- Mitigation Measures 4.3-13 requires, in summary, that applications for commercial site plan review and building permits for non-residential buildings include preferential parking for electric cars, low emission vehicles, and carpools/vanpools to encourage use of such vehicles, as well as Electric Vehicle Charging Spaces at specified ratios, as well as the installation of electrical infrastructure to support the future installation of Electric Vehicle Supply Equipment. Mitigation Measure 4.3-14 imposes similar requirements on all applications for a tentative tract map, parcel map (except financing map), or commercial site plan review that include parking structures, parking lots with 20 or more parking spaces that service uses other than residential or nonresidential buildings (e.g., trailhead, park), and parking structures and parking lots that serve multifamily residential buildings with 15 or more multifamily units.
 - Mitigation Measure 4.3-15 provides that applications for building permits submitted to the County by the project proponent/developer must include plans and specifications County demonstrating that the following features have been incorporated into the building designs or specifications for multifamily residential buildings:
 - Visitor parking shall include preferentially located parking spaces for electric vehicles.
 - Bicycle parking shall be provided as specified in Section A4.106.9, Residential Voluntary Measures, of the California Green Building Standards (CALGreen) Code or as required by County Code Section 22.52.1225B, whichever is more stringent.
 - Mitigation Measure 4.3-16 requires all applications for building permits submitted to the County by the project proponent /developer to include plans and specifications demonstrating to the County that one 208/240 volts of alternating current receptacle for charging electric vehicles shall be installed in each detached and attached single-family residence in a manner consistent with 2016 CALGreen Code Voluntary Tier 1 Section A4.106.4.1. The installation shall comply with requirements of the 2016 CALGreen Code Section 4.106.4.1, or the most applicable code at the time of construction. The project proponent/developer shall offer a further credit of \$500 to 50 percent of future homeowners (as requested by homeowner) to pay for the type of charging device then in use for electric vehicles or, with County approval, to pay for other energy conservation uses. The availability of this electric vehicle incentive benefit shall be disclosed and promoted at the time of initial sale of single-family homes and shall thereafter be promoted by the TMA on its website.
 - Mitigation Measure 4.3-17 further requires the project proponent/developer to provide site plans and building and design specifications to the County demonstrating compliance with the Electric Vehicle Supply Equipment (EVSE) charging station measures specified in MM-4.3-13. If and to the extent subsequently approved by the County, compliant with state laws, and resulting in no new significant impacts to the environment following County review and approval, EVSE charging stations may be replaced by “alternative energy fueling stations,” which may include other types of electric vehicle charging technology (e.g., operating at higher or lower voltages), or alternative vehicular fuel technology that results in zero or near

zero (as defined by CARB) GHG emission such as hydrogen fuel cells, biofuels, or other qualifying fuel technologies. An electric charging station shall allow for simultaneous charging of two electric vehicles. In addition, MM 4.3-17 requires that Business Park and Institutional land use designations must provide a minimum of one EVSE on site for the first 50,000 square feet of usable floor space and additional alternative energy vehicle fueling stations for each additional 50,000 square feet of usable floor space thereafter. In addition, this measure mandates that all multifamily residential buildings of at least 15 residential units provide a minimum of one EVSE for the first 15 residential units and an additional EVSE for each additional 15 residential units thereafter, that each village center shall provide a minimum of one EVSE, and that two primary transit centers on either side of I-5 must provide a minimum of one EVSE.

Energy Efficiency Through Compliance with Law:

The Updated 28.7% HBW ICR is required to comply with a variety of local, state and federal laws that will reduce its energy consumption and its reliance on fossil fuels, while increasing energy efficiency and conservation, all of which would also apply to the five Reduced ICR Scenarios. Chief among these laws are the California Building Efficiency Standards set forth in CCR Title 24. CCR Title 24 was established in 1978 and serves to enhance and regulate California's building standards. Part 6 of Title 24 specifically established Building Energy Efficiency Standards that are designed to ensure new and existing buildings in California achieve energy efficiency and preserve outdoor and indoor environmental quality. These energy efficiency standards are reviewed every few years by the Building Standards Commission and the CEC (and revised if necessary) (Public Resources Code [PRC] Section 25402[b][1]). The regulations have the overall goal of "reducing of wasteful, uneconomic, inefficient, or unnecessary consumption of energy" (PRC Section 25402). These regulations are analyzed for technological and economic feasibility (PRC Section 25402[d]) and cost effectiveness (PRC Sections 25402[b][2] and [b][3]). These building code standards save energy, increase electricity supply reliability, increase indoor comfort, avoid the need to construct new power plants, and reduce air pollutant emissions either by reducing the quantity of energy required by the building (e.g., with water conservation measures that reduce water use and thus the quantity of water requiring emission-causing transportation and treatment, or with energy efficiency standards such as enhanced insulation that reduce the need for heating and air conditioning (HVAC) and likewise result in less energy consumption and air pollutant emissions from these HVAC uses).

The current Title 24 standards are the 2016 Title 24 Building Energy Efficiency Standards, which became effective January 1, 2017, following certification of the 2016 EIR. The 2019 Title 24 Building Energy Efficiency Standards, which will be effective January 1, 2020, will further reduce energy used and associated GHG emissions compared to current standards. In general, single-family residences built to the 2019 standards are anticipated to use approximately 7 percent less energy due to energy efficiency measures than those built to the 2016 standards; further, as newly-mandated state standards requiring rooftop solar electricity generation is factored in, single-family residences built under the 2019 standards will use approximately 53% less energy than those built under the 2016 standards (CEC, 2018). Nonresidential buildings built to the 2019 standards are anticipated to use an estimated 30 percent less energy than those built to the 2016 standards (CEC, 2018). The 2016 EIR did not include the reduced energy consumption or corresponding reduced air pollutant emissions from compliance with the 2019 Building Code, which become effective on

January 1, 2020, or the newly mandated state standards requiring rooftop solar electricity generation.

Per Mitigation Measures MM 4.3-5 and 4.7-4, the project proponent is required to provide the Kern County Planning and Natural Resources Department with an Energy Plan documenting compliance with applicable energy conservation requirements of applicable Title 24 standards in the California Code of Regulations, including verification that the project will exceed the energy conservation requirements of 2016 Title 24 standards by at least 15 percent. The required Energy Plan must also confirm that a menu of energy efficiency design elements, along with other design considerations and options, has been made available by the project proponent to builders, developers, and property owners as part of the internal design review process. Each developer, builder, or property owner is then required to incorporate the design elements required to comply with then-applicable Title 24 requirements, and select from the menu or implement other available technologies as may be needed to reduce energy consumption at least 15 percent below 2016 Title 24 requirements. All provisions outlined in the approved Energy Plan will be required as either conditions of approval for any commercial/industrial site plan or included as notes on all final subdivision maps.

The reduction in energy consumption and associated emissions is not directly proportional to the extent that Title 24 requirements are exceeded. The degree of reduction for generation of electricity also reflects future requirements of the Renewal Portfolio Standard in that a higher percentage of renewable energy in the serving utilities energy mix would reduce the GHG emissions per unit of electricity used (e.g., kilowatt-hour) and the corresponding GHG emission reduction on a mass basis would be less. Table 4.7-6, *Project Consistency with Scoping Plan Greenhouse Gas Emission Reduction Strategies*, demonstrates consistency with all feasible Scoping Plan emission reduction strategies. Finally, the Updated 28.7% HBW ICR would adhere to all Federal, State, and local requirements for energy efficiency, as would the five Reduced ICR Scenarios.

In addition to Title 24, the Updated 28.7% HBW ICR is required to comply with a number of local, state and federal laws adopted to reduce GHG emissions, which compliance will often entail a reduction in energy consumption, increased energy conservation, or a reduction in the project's reliance on fossil fuels. All of these laws would also apply to the five Reduced ICR Scenarios. Specifically, per Mitigation Measure MM 4.7-1, the Updated 28.7% HBW ICR, and the five Reduced ICR Scenarios would all be required to comply with all related rules and regulations, including but not limited to the following:

- Pavley Motor Vehicle Standards (AB 1493);
- Low Carbon Fuel Standard (CCR, Title 17, Division 3, Chapter 1, Subchapter 10, Article 4, Subarticle 7, Section 95480 et seq.);
- Renewable Portfolio Standard (Senate Bill X1 2 and Senate Bill 350);
- Wood Burning Fireplaces and Wood Burning Heaters (San Joaquin Valley Air Pollution Control District Rule 4901);
- Solid Waste Diversion (AB 341) and statewide reduction in potable urban water usage of 25 percent relative to water use in 2013 (Executive Order B-29-15);
- Model Water Efficient Landscape Ordinance (CCR Title 23, Division 2, Chapter 2.7);

- Kern County Code of Ordinances – Landscaping Requirements and Water Efficient Landscaping (Kern County Code of Ordinances, Title 19, Chapter 19.86, Sections 19.86.050 and 19.86.060);
- California Water Code (CCR, Division 6, Part 2.10, Sections 10910–10915);
- U.S. Environmental Protection Agency and National Highway Traffic Safety Administration GHG and Corporate Average Fuel Economy standards for passenger cars, light-duty trucks, and medium-duty passenger vehicles (75 Federal Register [FR] 25324–25728 and 77 FR 62624–63200) and for medium- and heavy-duty vehicles (76 FR 57106–57513);
- Cap-and-Trade Program for Electricity, Stationary Sources, and Fuels CCR, Title 17, Division 3, Chapter 1, Subchapter 10, Article 5, Section 95801 et seq.);
- Advanced Clean Cars Program (CCR, Title 13, Division 3, Chapter 1, Articles 1, 2, 6 (parts); Chapter 2, Articles 1, 2.1, 2.3, 2.4 (parts); Chapter 4.4 (parts); Chapter 8 (parts);
- Under Inflated Vehicle Tires (CCR, Title 17, Division 3, Chapter 1, Subchapter 10, Article 4, Subarticle 8, Section 95550 et seq.);
- Heavy-Duty Vehicle Greenhouse Gas Emission Reduction Regulation (CCR Title 17, Division 3, Chapter 1, Subchapter 10, Article 4, Subarticle 1, Section 95300 et seq.);
- Management of High Global Warming Potential Refrigerants for Stationary Sources (CCR Title 17, Division 3, Chapter 1, Subchapter 10, Article 4, Subarticle 5.1, Section 95380 et seq.);
- Small Containers of Automotive Refrigerant (CCR Title 17, Division 3, Chapter 1, Subchapter 10, Article 4, Subarticle 5, Section 95360 et seq.);
- High-Global Warming Potential Greenhouse Gases in Consumer Products (CCR Title 17, Division 3, Chapter 1, Subchapter 8.5, Article 2);
- CALGreen Code as adopted by the Building Standards Commission (CCR Title 24, Part 11 Emergency Building Standard DSA-SS EF-02/15).

Reducing Energy Consumption Through Project Design:

Further energy savings will be achieved by the project through compliance with a variety of design requirements specifically intended to minimize the project's energy consumption and reliance on fossil fuels. For example, per Mitigation Measure MM 4.7-2, the Updated 28.7% HBW ICR is required to implement all of the following energy saving design features (all of which requirements would also apply to the five Reduced ICR Scenarios):

- Equip a minimum of 70 percent of public and community pools and spas with active solar water heating systems where heating is necessary or desired;
- Provide all single-family homebuyers with the option to include a photovoltaic array system as a home design feature;
- Implement energy-efficient design practices such as high-performance glazing, Energy Star compliant systems and appliances, radiant heat roof barriers (including but not limited to high-albedo white thermoplastic polyolefin roof membrane), high-efficient HVAC with hot-

gas reheat, insulation on all pipes, programmable thermostats, solar access, shading of HVAC systems from direct sunlight, use of formaldehyde-free insulation, use of recycled-content gypsum board, and sealed ducts, orientation of building and incorporation of landscaping to maximize passive solar (heating during cool seasons, and minimize heat gain during hot season), and designs that take advantage of prevailing winds;

- Site and design building to take advantage of daylight where feasible and consistent with building purpose;
- Use trees, landscaping and sunscreens to west and south exterior building walls to reduce energy use where feasible and consistent with building and site purpose, and consistent with other applicable requirements such as encouraging higher density and restricted plant palette; and
- Install cool pavements if approved by Caltrans and County Roads to roadway uses, provided that road installation and maintenance durability and costs are comparable to existing approved roadway materials (since early replacements or more intensive repair result in higher GHG emissions).

In addition, the Special Plan requires the Updated 28.7% HBW ICR to provide energy-efficient exterior light fixtures that meet the most current CEC standards for lighting efficiency and, along with Mitigation Measures MM 4.1-4 and MM 4.7-5, requires compliance with the County's Dark Sky Ordinance to reduce unnecessary night lighting (see Volume 2, Appendix C). Mitigation MM 4.6-6 requires all applications for a tentative tract map, parcel map (except financing map), or commercial site plan review to include plans and analysis to demonstrate 50% of the Updated 28.7% HBW ICR's anticipated electrical energy demand at buildout shall be satisfied from on-site renewable energy generation. Subsequent building permit applications must also include plans identifying renewable energy source and specifications, or location of renewable source if not located on a specific building pad for which a building permit is being sought. These systems are required to be installed in connection with the development of residential units, nonresidential buildings, public buildings, and Specific Plan utility facilities located within the Specific Plan area. In addition, the applicant has agreed that the project shall produce or cause to be produced renewable electricity, or secure GHG offsets or credits recognized or validated by the CARB or the San Joaquin Valley Air Pollution Control District, that provide for a level of renewable energy generation that is equivalent to the installation of one photovoltaic (i.e., solar) power system no smaller than a 2-kilowatt solar panel installation for every single-family residence, and for every 1,600 square feet of non-residential roof area, on the project site. Finally, MM 4.7-7 requires all residential builders to offer homebuyers energy efficient major appliances (i.e., dishwashers, clothes washers, refrigerators, fans, and room air conditioners) and HVAC systems that meet the more stringent of applicable CEC requirements or ENERGY STAR requirements, or equivalent. All of these measures and requirements would apply to the Updated 28.7% HBW ICR scenario, as well as to the five Reduced ICR Scenarios.

Reducing Energy Consumption Related to Water Use and Stormwater Management:

The treatment, pumping and transport of water and wastewater require the consumption of energy resources. A variety of Specific Plan policies (see Volume 2, Appendix B) and Special Plan design criteria (see Volume 2, Appendix C) require the implementation of measures to reduce overall

project water demand, promote efficient water delivery to the project, and to ensure efficient stormwater management practices, all of which will reduce overall project energy use and apply to the Updated 28.7% HBW ICR and the five Reduced ICR Scenarios. The Specific Plan's Sustainability Principles provide extensive water conservation measures, including, but not limited to implementing a Water Wise Program that (i) includes all feasible measures that will reduce water and energy use, (ii) establishes a Maximum Applied Water Allowance budget for each type of use, (iii) requires that residential development use 25 percent less water than average for the region, (iv) requires low flow fixtures for new construction; (v) implements water-saving landscape design guidelines, (vi) requires that 75 percent of the landscaping plant palette to consist of native and drought tolerant species, and (vii) implements water conservation and efficiency measures specific to project golf courses (see Volume 2, Appendix B)

To further reduce energy consumption associated with water use and delivery, recycled water provided by an on-site wastewater treatment plant would be piped through a non-potable distribution system primarily for landscape irrigation throughout the project site and the project would comply with recent water conservation requirements, including Executive Orders restricting potable water use, landscaping pallets, and other measures (FEIR [2016], page 4.10-39). The project's wastewater treatment plant will also be subject to local regulation regarding water conservation per the Central Valley Regional Water Quality Control Board (FEIR [2016], page 4.9-17).

With respect to stormwater controls, the Special Plan and Grapevine Sustainability Principles require that development within Grapevine implement Low Impact Development (LID) standards to minimize impervious surfaces and thus promote infiltration (see Volume 2, Appendix C). Specifically, the Master Developer will require that infrastructure improvement standards incorporate environmentally sensitive drainage control methods and maximize recharge opportunities through a comprehensive LID approach; greenways will be constructed to implement non-traditional "green infrastructure; and pockets of green space will be constructed throughout the community to allow for natural percolation of runoff." Implementing on-site infiltration of stormwater through LID techniques reduces energy consumption otherwise required by the construction and operation of traditional stormwater management and treatment infrastructure.

In addition to Specific and Special Plan requirements, Chapter 4 of this SREIR describes a variety of mitigation measures that will minimize energy consumption associated with the Updated 28.7% HBW ICR scenario's water use and stormwater management, all of which would also apply to the five Reduced ICR Scenarios, as summarized below:

- Mitigation Measure MM 4.9-2 requires the applicant to prepare a stormwater and drainage plan that will ensure the retention of all stormwater within the project site consistent with Kern County's design standards. The stormwater and drainage management features to be included in the plan may include but are not limited to routing and management of proposed project stormwater runoff with both distributed LID best management practices (BMPs) (e.g., bioretention, biofiltration, infiltration trenches, stormwater planter boxes, flow dispersion of roof and driveway runoff) and a series of retention basins, referred to as "community-scale BMPs" to comply with the Kern County required sump volume capacity of capturing and retaining the runoff generated by the Intermediate Storm Design Discharge 10-year, 5-day storm event;

- Mitigation Measure MM 4.9-4 requires the project proponent to provide evidence that maintenance inspection of common area stormwater treatment controls shall be conducted by the Tejon Castac Water District, project area Geologic Hazard Abatement District, or other government agency with treatment control management responsibilities, as identified and approved by the Kern County Administrative Office, in consultation with the Kern County Planning and Natural Resources Department. The maintenance interval must be at least once per year, and must include common area treatment control maintenance responsibilities and obligations in the conditions, covenants, and restrictions (CC&Rs), or similar restrictions, applicable to all private residences, commercial areas, or other privately owned or managed facilities within the project.
- Mitigation Measure MM 4.9-8 requires the project proponent to participate in the groundwater management planning and implementation actions by the Tejon Castac Water District under the Sustainable Groundwater Management Act to protect and manage groundwater resources in the project area;
- Mitigation Measure MM 4.17-8 requires the project proponent to provide written verification of compliance with applicable water efficiency design standards required by the California Uniform Building Code and the Grapevine Special Plan;
- Mitigation Measure MM 4.17-9 requires the project proponent to record CC&Rs on property deeds requiring a Maximum Applied Water Allowance budget for each type of residential and commercial use on the project;
- Mitigation Measure MM 4.17-14 requires the project's use of available tertiary treated recycled water produced by the project wastewater treatment facilities to meet non-residential irrigation demands;
- Mitigation Measure MM 4.17-15 requires the project proponent to construct additional water and wastewater treatment facilities to provide water and wastewater services to the project site, including a wastewater facility that produces tertiary treated/recycled water for outdoor irrigation on the project site, once capacity at existing Tejon-Castac Water District facilities reaches 75 percent;
- Mitigation Measure MM 4.7-2 requires as part of the subdivision map approval process the project proponent to provide evidence to the County that the following measures to reduce energy consumption related to water use and stormwater management are being implemented:
 - Implement a water wise program that includes all feasible measures to reduce indoor water use and associated energy use (e.g., for interior fixtures, require tankless water heaters and low-flow plumbing and fixtures), as described in Section 4.17, *Utilities and Service Systems*;
 - Implement landscape standards that include irrigation standards to maximize efficiency and decrease water use and waste. Prepare and distribute landscape design guidelines to minimize the use of exterior water by requiring each homeowner to select from landscape materials that are within the Maximum Applied Water Allowance budget that will be assigned to each lot or home, as described in Section 4.17, *Utilities and Service Systems*;

- Use recycled water from on-site wastewater treatment plant(s) as a permanent source of water for landscaped common areas and other authorized uses, as described in Section 4.17, *Utilities and Service Systems*;
- Use recycled water for irrigation of 50 percent of commercial landscape areas, as described in Section 4.17, *Utilities and Service Systems*;
- Use native species and drought tolerant species for a minimum of 75 percent of the ornamental plant palette in non-turf areas for all commercial, industrial, common and public areas, and residential front-yard landscaping to minimize water demand, as described in Section 4.17, *Utilities and Service Systems*;
- Minimize turf areas and encourage alternative ground covers (20 percent maximum turf in landscaped commercial areas and 45 percent maximum turf in residential front yard landscaping), as described in Section 4.17, *Utilities and Service Systems*;
- Design irrigation systems to conform to the hydrozones of the landscape design plan and optimize water efficiency by matching plant type, utilizing drip or subsurface irrigation wherever possible, and applying water at agronomic rates, as described in Section 4.17, *Utilities and Service Systems*;
- Require “smart” controllers, such as weather-based irrigation controllers or other self-adjusting irrigation controllers, for all irrigation systems that will accommodate all aspects of the landscape and irrigation design plans, as described in Section 4.17, *Utilities and Service Systems*;
- Require use of removal covers for pools and spas. (“Automatic” covers may result in accidental drownings or other injuries); efficient pumps and motors for pools and spas are already required under applicable Building Energy Efficiency Standards (CCR, Title 24, Part 6 §§ 110.3, 110.4, 110.5) and Title 20 Standards (CCR, Title 20 §§ 1605.1(g), 1605.3(g)); and
- Educational information on energy and water conservation and efficiency for project residents, customers, tenants and large energy users shall be maintained on the Grapevine community website.

Energy Conservation Through Project Recycling Programs:

Recycling solid waste saves energy that would otherwise be expended by manufacturing recyclable materials from scratch. In addition to the construction material recycling program described above, the Specific Plan’s Sustainability Principles (see Volume 2, Appendix B) and the Special Plan (see Volume 2, Appendix C) promote energy conservation through recycling by mandating the establishment of a community waste recycling program administered by an on-site recycling coordinator that includes education and outreach, recycled waste pickup and drop-services, and on-site recycling/separation areas. In addition, Chapter 4 of this SREIR describes a variety of mitigation measures that will conserve energy resource through project waste recycling, all of which would apply to the Updated 28.7% HBW ICR and five Reduced ICR Scenarios, as summarized below:

- Mitigation Measure MM 4.17-17 requires implementation of mandatory three-cart residential solid waste collection within the project area. Per this mitigation measure, household

- recyclable materials (i.e., cardboard, paper) and green waste (i.e., yard trimmings) shall be diverted from the landfill and hauled to the nearest recycling facility, as applicable, and green waste that can be composted on-site shall be reused within common area landscaping;
- Mitigation Measure MM 4.17-18 requires the project proponent to coordinate with Kern County for the implementation of universal solid waste collection on all residential and commercial development, and to vote for (or waive protest rights connected with the imposition of such) solid waste collection fees or assessments;
 - Mitigation Measures MM 4.17-19 and MM 4.17-21 require the project proponent to construct segregated, onsite screened storage for the collection of multifamily residential solid waste and source separated recyclable materials. The required area must be distinct and in addition to any requirements for the development of multifamily units, and it must not prevent security of the recyclables. In addition, this measure requires that recycling area bins or containers provide for the preclusion of vectors and offer protection against adverse environmental conditions, such as rain or snow, which might render the collected materials unmarketable. In addition, this measure mandates that driveways and/or travel aisles provide, at a minimum, unobstructed access for collection vehicles and personnel, and that a sign clearly identifying all recycling/solid waste collection and loading areas and the materials accepted be posted adjacent to all points of direct access to the area;
 - Mitigation Measure MM 4.17-20 requires project-area businesses generating four cubic yards or more of commercial solid waste per week to recycle and take one, or any combination of the following actions:
 - Subscribe to source separated recycling service with a regional franchise hauler authorized to provide service for the area in which the business is located;
 - Subscribe to a mixed solid waste recycling service with a regional franchise hauler authorized to provide service for the areas in which the business is located;
 - Self-recycle and certify compliance with Kern County Ordinance No. G-8337; and
 - Undertake a combination of such measures, or such alternate measures as may be approved by the County to reduce the amount of waste from the commercial sector being taken to a landfill;
 - Mitigation Measure MM 4.17-22 requires streets within the project area to be wide enough to safely accommodate the maneuverability of standard refuse collection vehicles, including the ability to turn around in cul-de-sac areas and the ability to make right turns without encroachment into on-coming traffic. This measure further requires that mandatory three-cart universal solid waste collection within the project area be used to prevent self-haulers from driving long distances to the nearest landfill to dispose of municipal solid waste. Universal solid waste collection will decrease vehicle trips to the landfill thereby reducing the amount of energy otherwise consumed by the avoided vehicle trips;
 - Mitigation Measure MM 4.17-23 requires the project proponent will designate and dedicate one contiguous area sufficient to accommodate up to a 20-acre facility, to be located in Plan Areas 6c through 6e, to Kern County Public Works Department for a transfer station to facilitate self-haul and special waste collection; and

- Mitigation Measure MM 4.7-2 requires as part of the subdivision map approval process the project proponent to provide evidence to the County that the following measures to reduce energy consumption through recycling are being implemented:
 - Ensure recycling of construction debris and waste through administration by an on-site recycling coordinator and presence of recycling/separation area, as described in Section 4.14, *Public Services*, and by maintaining on the Grapevine Community website information about recycling, and the availability of and potential uses for recycled materials, such as the use of salvaged and recycled content materials for hard surface and non-plant landscaping materials.
 - Establish and operate a community waste recycling program including education and outreach, recycled waste pickup and drop-off services, as described in Section 4.14, *Public Services*.

As detailed above, the Updated 28.7% HBW ICR is subject to a wide variety of policies, design criteria, development standards and mitigation measures that together will ensure that the project maximizes energy conservation and reduces its overall reliance on fossil fuels. All of these policies, design criteria, development standards and mitigation measures would also apply to the five Reduced ICR Scenarios. Therefore, the project, the Updated 28.7% HBW ICR and the five Reduced ICR Scenarios would all be designed to support sustainable communities that would help to reduce the inefficient, wasteful, or unnecessary consumption of building energy and transportation energy and would be designed to be as energy efficient as possible. Accordingly, the Updated 28.7% HBW ICR and the five Reduced ICR Scenarios would not result in the inefficient, wasteful, or unnecessary consumption of building energy, nor would any such scenario develop land uses and patterns that cause wasteful, inefficient, and unnecessary consumption of energy or construct new or retrofitted buildings that would have excessive energy requirements for daily operation.