3.1.2 Energy

This section addresses the potential energy impacts associated with implementation of The Villages – Escondido Country Club Project (Project). The section evaluates the Project's consistency with the energy conservation goals within Appendix F of the California Environmental Quality Act (CEQA) Guidelines (14 CCR 15000 et seq.), with an emphasis on avoiding or reducing the inefficient, wasteful, or unnecessary consumption of energy. The analysis considers the electricity, natural gas, and transportation fuel (petroleum) demand of the proposed Project, as well as the potential service delivery effects of this projected energy demand. Project-related energy conservation techniques and programs to be implemented are also identified.

The analysis is based on the review of existing resources, technical data, and applicable laws, regulations, and guidelines, as well as the *Greenhouse Gas Emissions Technical Report* prepared by Dudek (Appendix 2.4-1). Other information presented in this section was obtained from San Diego Gas & Electric (SDG&E), the California Energy Commission (CEC), the California Public Utilities Commission (CPUC), and the *City of Escondido General Plan* (General Plan; City of Escondido 2012).

3.1.2.1 Existing Conditions

The Project would result in the consumption of energy in a variety of forms, namely electricity, natural gas, and petroleum (diesel and gasoline). Consistent with Appendix F of the CEQA Guidelines, Part II, Section B, this section includes a discussion of existing energy supplies and energy use patterns for electricity, natural gas, and transportation fuel in the state and in the County of San Diego (County).

3.1.2.1.1 Environmental Setting

In 2015, California's estimated annual energy use included:

- Approximately 282,896 gigawatt hours of electricity (EIA 2017a)
- Approximately 23,394 million therms natural gas (approximately 6.4 billion cubic feet of natural gas per day) (EIA 2017b)
- Approximately 14 billion gallons of gasoline (CEC 2015a)

Electricity

Electricity usage in California for different land uses varies substantially by the types of uses in a building, types of construction materials used in a building, and the efficiency of all electricity-consuming devices within a building. Due to the state's energy efficiency standards and efficiency and conservation programs, California's per-capita use has remained stable for more than 30 years, while the national average has steadily increased.

SDG&E provides electric services to 3.6 million customers through 1.4 million electric meters located in a 4,100-square-mile service area that includes San Diego County and southern Orange County (SDG&E 2016). SDG&E is a subsidiary of Sempra Energy and will provide electricity to the Project site. According to CPUC, SDG&E consumed approximately 19,722 million kilowatt-hours (kWh) of electricity in 2015 (CPUC 2016).

SDG&E receives electric power from a variety of sources. According to CPUC's 2016 Biennial Renewables Portfolio Standard (RPS) Program Update, 36.4% of SDG&E's power came from eligible renewable energy sources in 2014, including biomass/waste, geothermal, small hydroelectric, solar, and wind sources (CPUC 2016). This is an improvement from the 15.7% that SDG&E maintained in 2011.

Based on recent energy supply and demand projections in California, statewide annual peak electricity demand is projected to grow an average of 890 megawatts per year for the next decade, or 1.4% annually, while per-capita consumption is expected to remain relatively constant at 7,200–7,800 kWh per person (CEC 2015b).

In San Diego County, the CEC reported an annual electrical consumption of approximately 19.9 billion kWh, with 13.1 billion kWh for nonresidential use and 6.8 billion kWh for residential use in 2014 (CEC 2016a).

Natural Gas

CPUC regulates natural gas utility service for approximately 10.8 million customers that receive natural gas from Pacific Gas and Electric Company (PG&E), Southern California Gas (SoCalGas), SDG&E, Southwest Gas, and several smaller natural gas utilities. CPUC also regulates independent storage operators Lodi Gas Storage, Wild Goose Storage, Central Valley Storage, and Gill Ranch Storage (CPUC 2017). SDG&E provides natural gas service to the City of Escondido, and will provide natural gas to the Project site.

The vast majority of California's natural gas customers are residential and small commercial customers, referred to as "core" customers, who accounted for approximately 32% of the natural gas delivered by California utilities in 2012. Large consumers, such as electric generators and industrial customers, referred to as "noncore" customers, accounted for approximately 68% of the natural gas delivered by California utilities in 2012 (CPUC 2017).

CPUC regulates the California utilities' natural gas rates and natural gas services, including in-state transportation over the utilities' transmission and distribution pipeline systems, storage, procurement, metering, and billing. Most of the natural gas used in California comes from out-of-state natural gas basins. However, California gas utilities may soon also begin receiving biogas into their pipeline systems.

In 2012, California customers received 35% of their natural gas supply from basins located in the Southwest, 16% from Canada, 40% from the Rocky Mountains, and 9% from basins located within California (CPUC 2017). Natural gas from out-of-state production basins is delivered into California via the interstate natural gas pipeline system. The major interstate pipelines that deliver out-of-state natural gas to California consumers are the Gas Transmission Northwest Pipeline, Kern River Pipeline, Transwestern Pipeline, El Paso Pipeline, the Ruby Pipeline, Questar Southern Trails, and Mojave Pipeline. Another pipeline, the North Baja–Baja Norte Pipeline, takes gas off the El Paso Pipeline at the California/Arizona border, and delivers that gas through California into Mexico. While the Federal Energy Regulatory Commission regulates the transportation of natural gas on the interstate pipelines, CPUC often participates in Federal Energy Regulatory Commission regulatory proceedings to represent the interests of California natural gas consumers (CPUC 2017).

Most of the natural gas transported via the interstate pipelines, as well as some of the California-produced natural gas, is delivered into the PG&E and SoCalGas intrastate natural gas transmission pipeline systems (commonly referred to as California's "backbone" natural gas pipeline system). Natural gas on the utilities' backbone pipeline systems is then delivered into the local transmission and distribution pipeline systems, or to natural gas storage fields. Some large noncore customers take natural gas directly off the high-pressure backbone pipeline systems, while core customers and other noncore customers take natural gas off the utilities' distribution pipeline systems. CPUC has regulatory jurisdiction over 150,000 miles of utility-owned natural gas pipelines, which transported 82% of the total amount of natural gas delivered to California's gas consumers in 2012 (CPUC 2017).

SDG&E is a wholesale customer of SoCalGas and currently receives all of its natural gas from the SoCalGas system (CPUC 2017).

Some of the natural gas delivered to California customers may be delivered directly to them without being transported over the regulated utility systems. For example, the Kern River/Mojave pipeline system can deliver natural gas directly to some large customers, "bypassing" the utilities' systems. Much of California-produced natural gas is also delivered directly to large consumers (CPUC 2017).

PG&E and SoCalGas own and operate several natural gas storage fields that are located in Northern and Southern California. These storage fields and four independently owned storage utilities—Lodi Gas Storage, Wild Goose Storage, Central Valley Storage, and Gill Ranch

Storage—help meet peak seasonal natural gas demand and allow California natural gas customers to secure natural gas supplies more efficiently (CPUC 2017).

California's regulated utilities do not own any natural gas production facilities. All of the natural gas sold by these utilities must be purchased from suppliers and/or marketers. The price of natural gas sold by suppliers and marketers was deregulated by the Federal Energy Regulatory Commission in the mid-1980s and is determined by market forces. However, CPUC decides whether California's utilities have taken reasonable steps to minimize the cost of natural gas purchased on behalf of their core customers (CPUC 2017).

As indicated in the preceding discussion, natural gas is available from a variety of in-state and out-of-state sources and is provided throughout the state in response to market supply and demand. Complementing available natural gas resources, biogas may soon be available via existing delivery systems, thereby increasing the availability and reliability of resources in total. CPUC oversees utility purchases and transmission of natural gas to ensure reliable and affordable natural gas deliveries to existing and new consumers throughout the state (CPUC 2017).

Petroleum

There are more than 27 million registered vehicles in California, and those vehicles consume an estimated 18 billion gallons of fuel each year (CEC 2013). Gasoline and other vehicle fuels are commercially provided commodities, and would be available to the Project via commercial outlets.

Petroleum accounts for approximately 92% of California's transportation energy sources. Technology advances, market trends, consumer behavior, and government policies could result in significant changes in fuel consumption by type and in total. At the federal and state levels, various policies, rules, and regulations have been enacted to improve vehicle fuel efficiency, promote the development and use of alternative fuels, reduce transportation-source air pollutants and greenhouse gas (GHG) emissions, and reduce vehicle miles traveled. Market forces have driven the price of petroleum products steadily upward, and technological advances have made use of other energy resources or alternative transportation modes increasingly feasible.

Largely as a result of, and in response to these multiple factors, gasoline consumption within the state has declined in recent years, while availability of other alternative fuels/energy sources has increased. In total, the quantity and availability and reliability of transportation energy resources have increased in recent years, and this trend may likely continue and accelerate (CEC 2013). Increasingly available and diversified transportation energy resources act to promote continuing reliable and affordable means to support vehicular transportation within the state.

3.1.2.1.2 Regulatory Setting

Federal, state, and local agencies regulate energy use and consumption through various means and programs. On the federal level, the U.S. Department of Transportation, the U.S. Department of Energy, and the U.S. Environmental Protection Agency (EPA) are three federal agencies with substantial influence over energy policies and programs. On the state level, CPUC and CEC are two agencies with authority over different aspects of energy. Relevant federal, state, and local energy-related regulations are summarized below.

Federal

Federal Energy Policy and Conservation Act

In 1975, Congress enacted the Federal Energy Policy and Conservation Act, which established the first fuel economy standards for on-road motor vehicles in the United States. Pursuant to the act, the National Highway Traffic Safety Administration is responsible for establishing additional vehicle standards. In 2012, new fuel economy standards for passenger cars and light trucks were approved for model years 2017 through 2021 (77 FR 62624–63200). Fuel economy is determined based on each manufacturer's average fuel economy for the fleet of vehicles available for sale in the United States.

Intermodal Surface Transportation Efficiency Act of 1991

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) promoted the development of intermodal transportation systems to maximize mobility, as well as address national and local interests in air quality and energy. ISTEA contained factors that metropolitan planning organizations were to address in developing transportation plans and programs, including some energy-related factors. To meet the new ISTEA requirements, metropolitan planning organizations adopted explicit policies defining the social, economic, energy, and environmental values guiding transportation decisions.

The Transportation Equity Act for the 21st Century

The Transportation Equity Act for the 21st Century (TEA-21) was signed into law in 1998 and builds upon the initiatives established in the ISTEA legislation, discussed above. TEA-21 authorizes highway, highway safety, transit, and other efficient surface transportation programs. TEA-21 continues the program structure established for highways and transit under ISTEA, such as flexibility in the use of funds, emphasis on measures to improve the environment, and focus on a strong planning process as the foundation of good transportation decisions. TEA-21 also provides for investment in research and its application to maximize the performance of the transportation system through, for example, deployment of Intelligent Transportation Systems, to help improve operations and management of transportation systems and vehicle safety.

Energy Independence and Security Act of 2007

On December 19, 2007, the Energy Independence and Security Act of 2007 (EISA) was signed into law. In addition to setting increased Corporate Average Fuel Economy standards for motor vehicles, the EISA includes other provisions related to energy efficiency:

- Renewable Fuel Standard (RFS) (Section 202)
- Appliance and Lighting Efficiency Standards (Sections 301–325)
- Building Energy Efficiency (Sections 411–441)

This federal legislation requires ever-increasing levels of renewable fuels—the RFS—to replace petroleum (EPA 2013, 2015). EPA is responsible for developing and implementing regulations to ensure that transportation fuel sold in the United States contains a minimum volume of renewable fuel. The RFS program regulations were developed in collaboration with refiners, renewable fuel producers, and many other stakeholders.

- The RFS program was created under the Energy Policy Act of 2005 and established the first renewable fuel volume mandate in the United States. As required under the act, the original RFS program (RFS1) required 7.5 billion gallons of renewable fuel to be blended into gasoline by 2012. Under EISA, the RFS program was expanded in several key ways that lay the foundation for achieving significant reductions of GHG emissions from the use of renewable fuels, for reducing imported petroleum, and encouraging the development and expansion of our nation's renewable fuels sector. The updated program is referred to as RFS2 and includes the following:
    - EISA expanded the RFS program to include diesel, in addition to gasoline.
    - EISA increased the volume of renewable fuel required to be blended into transportation fuel from 9 billion gallons in 2008 to 36 billion gallons by 2022.
    - EISA established new categories of renewable fuel and set separate volume requirements for each one.
    - EISA required EPA to apply lifecycle GHG performance threshold standards to ensure that each category of renewable fuel emits fewer GHGs than the petroleum fuel it replaces.

Additional provisions of the EISA address energy savings in government and public institutions, promoting research for alternative energy, additional research in carbon capture, international energy programs, and the creation of "green jobs."

State

California Building Standards

Part 6 of Title 24 of the California Code of Regulations was established in 1978, and serves to enhance and regulate California's building standards. Part 6 specifically establishes energy efficiency standards for residential and nonresidential buildings constructed in the State of California in order to reduce energy demand and consumption. Part 6 is updated periodically to incorporate and consider new energy efficiency technologies and methodologies. The 2016 Title 24 building energy efficiency standards, which became effective on January 1, 2017, will further reduce energy used in the state. In general, single-family homes built to the 2016 standards are anticipated to use about 28% less energy for lighting, heating, cooling, ventilation, and water heating than those built to the 2013 standards, and nonresidential buildings built to the 2016 standards will use an estimated 5% less energy than those built to the 2013 standards (CEC 2015c).

Title 24 also includes Part 11, known as California's Green Building Standards (CALGreen). The CALGreen standards took effect in January 2011, and instituted mandatory minimum environmental performance standards for all ground-up, new construction of commercial, low-rise residential and state-owned buildings, as well as schools and hospitals. The 2016 CALGreen standards became effective on January 1, 2017. The mandatory standards require the following:

- 20% mandatory reduction in indoor water use.
- 50% of construction and demolition waste must be diverted from landfills.
- Mandatory inspections of energy systems to ensure optimal working efficiency.
- Use of low-pollutant-emitting exterior and interior finish materials, such as paints, carpets, vinyl flooring, and particle board.

California Environmental Quality Act

Primary environmental legislation in California is found in CEQA and its implementing guidelines (14 CCR 15000 et seq.), which require that projects with potential adverse effects (or impacts) on the environment undergo environmental review. Adverse environmental impacts are typically mitigated as a result of the environmental review process in accordance with existing laws and regulations.

Integrated Energy Policy Report

CEC is responsible for preparing Integrated Energy Policy Reports, which identify emerging trends related to energy supply, demand, conservation, public health and safety, and the maintenance of a healthy economy. The CEC's 2015 Integrated Energy Policy Report discusses the state's policy goal to require that new residential construction be designed to achieve zero net energy (ZNE) standards by 2020, and that new non-residential construction follow by 2030, which is relevant to this Environmental Impact Report (EIR). Please see Section 2.4, Greenhouse Gas Emissions, of this EIR for additional discussion of the state's ZNE objectives and how the state's achievement of its objectives would serve to beneficially reduce the Project's GHG emissions profile and energy consumption.

Renewables Portfolio Standard

As most recently amended by Senate Bill (SB) 350 (2015), the RPS requires an annual increase in renewable energy generation by utility providers equivalent to at least 33% by 2020 and 50% by 2030. (Interim RPS targets also are set between 2020 and 2030.) These requirements were built on the requirement to achieve a 20% RPS by 2010.

State Vehicle Standards

In a response to the transportation sector accounting for more than half of California's carbon dioxide (CO_2) emissions, Assembly Bill 1493 (Pavley) was enacted on July 22, 2002. Assembly Bill 1493 required the California Air Resources Board (CARB) to set GHG emission standards for passenger vehicles, light-duty trucks, and other vehicles determined by the state board to be vehicles whose primary use is noncommercial personal transportation in the state. The bill required that CARB set GHG emission standards for motor vehicles manufactured in 2009 and all subsequent model years. The 2009–2012 standards resulted in a reduction of about 22% in GHG emissions compared to the emissions from the 2002 fleet, while the 2013–2016 standards resulted in a reduction of about 30%.

In 2012, CARB approved a new emissions-control program for model years 2017 through 2025. The program combines the control of smog, soot, and global warming gases and requirements for greater numbers of zero-emission vehicles into a single package of standards called Advanced Clean Cars. By 2025, when the rules would be fully implemented, new automobiles would emit 34% fewer global warming gases and 75% fewer smog-forming emissions (CARB 2011).

Although the focus of the state's vehicle standards is on the reduction of air pollutants and GHG emissions, one co-benefit of their implementation is a reduced demand for petroleum-based fuels.

Sustainable Communities Strategy

The Sustainable Communities and Climate Protection Act of 2008, or SB 375, coordinates land use planning, regional transportation plans, and funding priorities to help California meet its GHG emissions reduction mandates. As specifically codified in Government Code Section 65080, SB 375 requires the Metropolitan Planning Organization relevant to the project area (for this Project, the San Diego Association of Governments (SANDAG)) to include a Sustainable Communities Strategy in its Regional Transportation Plan. While the main focus of the Sustainable Communities Strategy is to plan for growth that will ultimately reduce GHG emissions, the strategy is also a part of a bigger effort to address many other development issues within the general vicinity, including transit and vehicle miles traveled (VMT), both of which influence the consumption of petroleum-based fuels.

CEQA Guidelines Appendix F

Appendix F of the CEQA Guidelines outlines what information should be included within an EIR regarding energy conservation where considered applicable or relevant. This appendix includes a list of energy impact possibilities and potential conservation measures and the goals of wise and efficient use of energy during development and operations.

Local

City of Escondido General Plan

The Mobility and Infrastructure Element of the City's General Plan (City of Escondido 2012) includes the following energy-related policies that are applicable to the Project.

> **Energy Policy 16.3:** Implement energy conserving land use practices that include compact development, provision of bikeways and pedestrian paths, and the incorporation of transit routes and facilities.
>
> **Energy Policy 16.4:** Encourage site and building design that reduces exterior heat gain and heat island effects (tree planting, reflective paving materials, covered parking, cool roofs, etc.).
>
> **Energy Policy 16.5:** Require, to the extent feasible, building orientations and landscaping that use natural lighting to reduce energy demands.
>
> **Energy Policy 16.6:** Evaluate and amend appropriate codes and ordinances in order to facilitate and encourage the installation of renewable energy systems and facilities (solar, wind, hydro-power, geothermal, and bio-mass), where appropriate, for all development.

Energy Policy 16.9: Coordinate with regional and local energy providers to increase energy conservation through public education programs.

3.1.2.2 Analysis of Project Effects and Determination as to Significance

3.1.2.2.1 Methodology and Assumptions

Information contained in this section is based on data gathered from the Project applicant; default assumptions within the California Emissions Estimator Model (CalEEMod), Version 2016.3.1; and best engineering judgment. The methodology is further explained in Section 3.1.2.2.3.

3.1.2.2.2 Guidelines for the Determination of Significance

The CEQA Guidelines, Section 15126.4, and Appendix F, Energy Conservation, require that environmental impact reports include a discussion of the potential energy impacts of projects, with particular emphasis on avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy (14 CCR 15000 et seq.).

The following section examines the impacts of the Project on energy consumption, including electricity, natural gas, and petroleum. This section presents a summary of the Project's anticipated energy needs and compares the energy use estimates of the Project to those of the regional and local supply and demand under existing conditions, and to regional and local supply and demand forecasted for the future.

The CEQA Guidelines provide no specific thresholds for impacts associated with energy consumption. However, Appendix F of the CEQA Guidelines presents guidance for evaluating whether a development project may result in significant impacts with regard to energy. Based on this guidance, a project could have a significant impact under CEQA related to energy consumption if the project would:

- Result in wasteful, inefficient, or unnecessary consumption of energy during construction or operation
- Conflict with existing energy standards and regulations
- Place a significant demand on local and regional energy supplies or require a substantial amount of additional capacity

3.1.2.2.3 Analysis

<u>Energy Consumption</u>

Electricity

Construction Use

Temporary electric power for as-necessary lighting and electronic equipment (such as computers inside temporary construction trailers and heating, ventilation, and air conditioning) would be provided by SDG&E. Electrically powered hand-tools would also be used during construction. The vast majority of the energy used during construction would be from petroleum. The electricity used for such activities would be temporary and negligible; therefore, impacts would be **less than significant**.

Operational Use

The Project's operational phase will require electricity for operating the various buildings. Although the specific building designs have not been finalized as of this writing, examples of energy efficiency measures that could contribute to the 15% reduction include enhancements to the building envelope, heating and cooling systems, or building placement. The Project's Specific Alignment Plan also includes the addition of two traffic signals, which are included in this analysis. The annual estimated electricity demand (kWh per year) for the Project was calculated using CalEEMod (based on the design features above) and is shown in Table 3.1.2-1, Estimated Electrical Demand – Operation. Additionally, project design features (PDFs) including **PDF-AQ-2** and **PDF-TR-1** will be implemented and were quantified as part of this analysis. See Section 2.1, Air Quality, and Section 2.7, Transportation and Traffic of this EIR for these PDFs, which are also included in Chapter 1, Project Description.

The Project is estimated to have a total electrical demand of 4,128,217 kWh per year. After accounting for the on-site solar production and design efficiencies, the Project is estimated to have a demand of 1,321,296 kWh per year from the local utility. As such, the Project's provision of on-site renewable energy resources will reduce its demand for electricity from the local energy provider by approximately 68%.

In 2015, SDG&E supplied 19,781 million kWh of electricity to San Diego County (CEC 2016a). The Project's demand on the local utility would be 1,321,296 kWh annually. The Project's annual electricity demand on the utility would account for 0.007% of SDG&E's total demand within the County. Therefore, the Project is not expected to have an impact on the local utility and due to the energy efficiency measures designed into the Project, it would not result in a wasteful use of energy. Impacts related to operational electricity use would be **less than significant**.

Natural Gas

Construction Use

Natural gas is not anticipated to be required during construction of the Project. Fuels used for construction would primarily consist of diesel and gasoline, which are discussed under "Petroleum." Any minor amounts of natural gas that may be consumed as a result of Project construction would be temporary and negligible and would not have an adverse effect; therefore, impacts would be **less than significant**.

Operational Use

Natural gas would be directly consumed throughout operations of the Project, primarily through building heating and use in the restaurant for cooking. As described above, the Project has included energy efficiency design measures that will also help reduce the heating loads and thus natural gas use. The natural gas demand for the Project was estimated using the CalEEMod. Table 3.1.2-2, Estimated Natural Gas Demand – Operation, shows the estimated natural gas use (in therms per year) for the Project during operation, which includes the sustainable design features.

As shown in Table 3.1.2-2, the Project is estimated to use 79,667 therms of natural gas per year. In 2015, SDG&E supplied 464.5 million therms of natural gas to customers (CEC 2016a). The Project's estimated natural gas use would account for 0.02% of the total supplied. This demand would not impact the local utility and because of the energy efficiency measures designed into the Project would not result in a wasteful use of energy. Therefore, natural gas consumption impacts would be **less than significant.**

Petroleum

Construction Use

Petroleum would be consumed throughout construction of the Project. Fuel consumed by construction equipment would be the primary energy resource expended over the course of construction, and VMT associated with the transportation of construction materials and construction worker commutes would also result in petroleum consumption. Heavy-duty construction equipment associated with construction activities would rely on diesel fuel, as would haul trucks involved in removing the materials from demolition and excavation. Construction workers would travel to and from the Project site throughout the duration of construction. It is assumed in this analysis that construction workers would travel to and from the site in gasoline-powered vehicles.

There are no unusual Project characteristics or construction processes that would require the use of equipment that would be more energy intensive than that used for comparable activities, or equipment that would not conform to current emissions standards (and related fuel efficiencies).

Heavy-duty construction equipment of various types would be used during each phase of construction. CalEEMod was used to estimate construction equipment usage, and results are included in Appendix 2.4-1. Based on that analysis, over all phases of construction, diesel-fueled construction equipment would run for an estimated 145,432 hours, as summarized in Table 3.1.2-3, Hours of Operation for Construction Equipment.

Fuel consumption from construction equipment was estimated by converting the total CO_2 emissions from each construction phase to gallons using the conversion factors for CO_2 to gallons of gasoline or diesel. Construction is estimated to occur in the years 2018–2023 based on the construction phasing schedule. The conversion factor for gasoline is 9.13 kilograms per metric ton CO_2 per gallon (kg/MT CO_2/gallon) and the conversion factor for diesel is 10.35 kg/MT CO_2/gallon (The Climate Registry 2016). The estimated diesel fuel usage from construction equipment is shown in Table 3.1.2-4, Construction Equipment Diesel Demand.

Fuel consumption from worker and vendor trips are estimated by converting the total CO_2 emissions from each construction phase to gallons using the conversion factors for CO_2 to gallons of gasoline or diesel. Worker vehicles are assumed to be gasoline fueled, and vendor/hauling vehicles are assumed to be diesel fueled.

Calculations for total worker, vendor, and hauler fuel consumption are provided in Table 3.1.2-5, Construction Worker Vehicle Gasoline Demand; Table 3.1.2-6, Construction Vendor Truck Diesel Demand; and Table 3.1.2-7, Construction Haul Truck Diesel Demand.

As shown in Tables 3.1.2-5 through 3.1.2-7, the Project is estimated to consume 772,127 gallons of petroleum during the construction phase, which would last approximately 66 months (extending approximately from 2018 to 2023). By comparison, California's consumption of petroleum is approximately 52.9 million gallons per day (CEC 2016b). Based on these assumptions, approximately 106 billion gallons of petroleum would be consumed in California over the course of the construction period. Construction of the Project would equate to 0.0007% of the total amount of petroleum that would be used statewide during the course of the construction period. As part of the traffic control plan required by the City, the Project will include appropriate work zone traffic control plans to ensure efficient ingress/egress of vehicles, and to maintain access to the degree possible to Country Club Lane during construction. This will help reduce idling time for vehicles during construction and thus reduce petroleum consumption. Therefore, because petroleum use during construction would be temporary and negligible and would not be wasteful or inefficient, impacts would be **less than significant**.

Operational Use

During operations, the majority of fuel consumption resulting from the Project would involve the use of resident and visitor motor vehicles traveling to and from the Project site, as well as fuels used for alternative modes of transportation that may be used by employees, visitors, and guests. The Project would create three residential complexes and a Village Center with various amenities. The Project includes a walking/bicycling trail network that will connect all three villages, the Village Center, and the adjacent community. The Project would also include 10 publicly accessible electric vehicle-charging stations.

Petroleum fuel consumption associated with motor vehicles traveling to and from the Project site is a function of the VMT as a result of Project operation. As shown in Appendix 2.4-1 (CalEEMod outputs), the annual VMT attributable to the proposed Project is expected to be 10,932,020 VMT. Similar to the construction worker and vendor trips, fuel consumption is estimated by converting the total CO_2 emissions from each land use type to gallons using the conversion factors for CO_2 to gallons of gasoline or diesel. Based on the annual fleet mix provided in CalEEMod, 92.5% of the fleet range from light-duty to medium-duty vehicles and motorcycles are assumed to run on gasoline. The remaining 7.5% of vehicles represent medium-heavy duty to heavy-duty vehicles and buses/recreational vehicles and are assumed to run on diesel. Calculations for annual mobile source fuel consumption are provided in Table 3.1.2-8, Mobile Source Fuel Consumption – Operation.

Mobile sources from the proposed Project would result in approximately 422,442 gallons of gasoline per year and 30,296 gallons of diesel consumed per year beginning in 2023. By comparison, California as a whole consumes approximately 19.3 billion gallons of petroleum per year (CEC 2016b). The anticipated increase in consumption associated with 1 year of Project operation constitutes 0.002% of the statewide use.

It should be noted that over the lifetime of the Project, the fuel efficiency of the vehicles being used by the visitors, employees, and guests is expected to increase. As such, the amount of petroleum consumed as a result of vehicular trips to and from the Project site during operation would decrease over time. There are numerous regulations in place that require and encourage increased fuel efficiency. For example, CARB has adopted a new approach to passenger vehicles by combining the control of smog-causing pollutants and GHG emissions into a single coordinated package of standards. The new approach also includes efforts to support and accelerate the numbers of plug-in hybrids and zero-emissions vehicles in California (CARB 2013). Additionally, in response to SB 375, CARB has adopted the goal of reducing per-capita GHG emissions from 2005 levels by 8% by the year 2020 and 13% by the year 2035 for light-duty passenger vehicles in the SANDAG planning area. This reduction would occur by reducing VMT through the integration of land use planning and transportation (SANDAG 2015). It relatedly should be noted that the Project would be located on an infill site, and that infill development generally is compatible with the objectives of SB 375. As discussed in detail in Section 2.4.2.2, Analysis, of the Greenhouse Gas Emissions section of this EIR, the Project's inclusion of multi-modal design features, traffic calming measures, and the integrated walking and bicycling trail all support the goals of SB 375 to reduce VMT. Also, because this Project is an infill Project, it would have inherently less VMT than a project located at the outskirts of a city. As such, operation of the Project is expected to use decreasing amounts of petroleum over time, due to advances in fuel economy. Also, the inclusion of electric-vehicle charging stations at the Village Center would result in the potential for reduced petroleum use during operation as Village Center patrons would have the option of commuting in and charging their electric vehicle.

In summary, although the Project would see an increase in petroleum use during operation, the use is a small fraction of the statewide use and due to efficiency increases will diminish over time. Additionally, the Project's location on an infill site and its inclusion of on-site walking/bicycling trails and other resident-serving amenities helps ensure that petroleum-based fuels are not inefficiently consumed. Given these considerations, the petroleum consumption associated with the Project would not be considered inefficient or wasteful and therefore would result in a **less than significant impact.**

Conflict with Energy Standards and Regulations

The Project would follow all energy standards and regulations during the construction phases. Construction equipment will meet Tier 3 standards in accordance with M-AQ-2 (see Section 2.1, Air Quality). The Project will also comply with measure R2-C1 of the Escondido Climate Action Plan, which would reduce construction equipment energy use. The Project applicant has committed to exceeding the current 2016 Title 24 energy standards by 15%, and also—as a matter of law—the Project would be constructed in accordance with the building code in place at the time of construction. The Project also involves implementation of rooftop solar photovoltaic systems, which will meet 70% of residential building electricity demand and 50% of the Village Center's electricity demand. The Project would be built and operated in accordance with all existing regulations at the time of construction. For the reasons stated, the proposed Project would not conflict with existing energy standards and regulations, and impacts are determined to be **less than significant.**

Demand on Local and Regional Energy Supply

Electricity

As described previously, the Project would involve minimal use of electricity during construction. The Project's annual electricity demand would account for 0.007% of SDG&E's

total demand in the County. In addition, the Project would implement design features, described previously under Energy Consumption: Electricity: Operational Use, to minimize its demand for electricity through the use of enhanced building energy efficiency standards and on-site renewable energy generation. Implementation of the proposed Project would not result in substantial amounts of local or regional energy supplies compared to existing conditions. The resultant increase in energy demand would not exceed the available capacity of SDG&E servicing infrastructure to the site or beyond. Therefore, impacts would be **less than significant**.

Natural Gas

As described previously, the Project would use a negligible amount of natural gas during construction. The Project is estimated to use 79,667 therms of natural gas per year. In 2015, SDG&E supplied 464.5 million therms of natural gas to customers (CEC 2016a). The Project's estimated natural gas use would account for 0.02% of the total. In addition, the Project would implement design features, described above, to minimize its demand for natural gas through the use of enhanced building energy efficiency standards. In sum, the Project's demand would not have a significant impact on the local utility; therefore, it would result in a **less than significant impact.**

Petroleum

During construction, the Project is anticipated to use 772,127 gallons over 5.5 years, or 140,387 gallons per year. County-wide, the total petroleum use by vehicles is expected to be 1,992,102,000 gallons per year by 2020 (Caltrans 2008). The total construction petroleum fuel use would constitute 0.007% of the County's projected use.

During operation, the Project is anticipated to use 452,738 gallons of petroleum per year. Because data were not available for the Project's build-out year (2023), the data from 2020 and 2025 were interpolated for Year 2023. By 2023, the County is expected to use 2,101,353,600 gallons of petroleum per year for transportation (Caltrans 2008). The operational petroleum use would account for 0.02% of the County's projected use.

Although the Project would see an increase in petroleum use during construction and operation, the use is a small fraction of the regional use and, due to efficiency increases, will diminish over time. Given these considerations, the petroleum consumption associated with the Project would not be considered a substantial demand on local or regional supply; therefore, it would result in a **less than significant impact**.

3.1.2.3 Cumulative Impact Analysis

The geographic scope of the cumulative impact analysis for energy would be the County of San Diego, because that is the region in which the local utility, SDG&E, operates. Therefore, this cumulative analysis uses the projection method, because it is speculative to address the energy impacts of individual projects within the County. The CEC, in its *California Energy Demand 2016–2026 Revised Electricity Demand Forecast, Volume 2: Electricity Demand by Utility Planning Area*, uses historical demand data to project future demand while incorporating adjustments for applicable regulations, economic/demographic growth, and climate change impacts (CEC 2016a).

Short-term and long-term cumulative development is expected to result in an increase in the demand for energy sources throughout the County. Several City and County programs and policies and SDG&E initiatives would serve to reduce total energy demand among cumulative projects. The Project would be required to comply with applicable federal, state, and local energy and building regulations. Additionally, minimum standards for energy efficiency are outlined in Part 6 of Title 24 of the California Code of Regulations. SDG&E and others offer incentive programs to encourage developers to exceed the current (2016) Title 24 standards. These programs encourage the use of Energy Star appliances, automatic light sensors, extra insulations and other measures to reduce energy consumption. The proposed Project, along with other cumulative projects, would be required to comply with City, County, and SDG&E programs, as well as statewide regulations such as Title 24 and CALGreen.

Over the Project's lifetime, the fuel efficiency of the vehicles being used by the visitors, employees, and guests is expected to increase. As such, the amount of petroleum consumed as a result of vehicular trips to and from cumulative projects during operation would decrease over time. There are numerous regulations in place that require and encourage increased fuel efficiency. Compliance with these regulations and programs would ensure that the petroleum and energy consumed by cumulative growth would not be wasteful, inefficient, or otherwise inconsistent with adopted plans or policies.

Furthermore, the City is expected to adopt a post-2020 qualified climate action plan (City of Escondido 2013). GHG reduction measures included in the plan may consist of project-level implementation measures, potentially, as well as City-wide policies, standards, and programs for other projects elsewhere. The project-level and City-wide measures would help achieve emissions reductions that would meet or exceed the established GHG reduction targets in line with statewide goals expressed as 2030 and 2050 targets. Adoption of a climate action plan would further reduce energy consumption associated with long-term operations of projects consistent with the proposed Specific Plan. Therefore, cumulative energy impacts would be **less than significant**.

3.1.2.4 Conclusion

The energy analysis provides an evaluation of the potential for significant impacts to the use of energy due to construction and operation of the Project. Construction of the proposed Project would result in a temporary use of electricity and petroleum due to the use of construction equipment, worker vehicles, vendor trucks, and hauling trucks. The analysis concludes that the construction energy use would result in a less than significant impact. Operational energy impacts associated with electricity, natural gas and petroleum use were also evaluated and were based on energy use from the buildings and Project-related vehicles. The operational energy impacts were also found to be **less than significant**.

Table 3.1.2-1
Estimated Electrical Demand – Operation

Building	Estimated Electrical Demand (kWh per year)
Single-family housing	3,396,360
Condo	322,081
Village Center	184,384
Restaurant	117,870
Parking lot lighting	52,800
Convenience store	36,070
Health club	16,900
Traffic signals	1,752
Subtotal	*4,128,217*
Solar PV production	(2,806,921)
Total	**1,321,296**

Notes: kWh = kilowatt-hour; PV = photovoltaic.
See Appendix 2.4-1.

Table 3.1.2-2
Estimated Natural Gas Demand – Operation

Building	Estimated Natural Gas Demand (Therms per year)
Single-family housing	65,061
Condo	7,422
Village Center	1,928
Restaurant	4,841
Convenience store	216
Health club	200
Total	**79,667**

Note: See Appendix 2.4-1.

Table 3.1.2-3
Hours of Operation for Construction Equipment

Construction Phase	Equipment	Hours of Equipment Use
Demolition – Phase 1	Crawler tractors, off-highway trucks, other construction equipment	2,520

Table 3.1.2-3
Hours of Operation for Construction Equipment

Construction Phase	Equipment	Hours of Equipment Use
Grading – Phase 1	Graders, off-highway trucks, rubber-tired dozers, rubber-tired loaders, and scrapers	8,352
Trenching WU – Phase 1	Excavators, off-highway trucks, and rubber-tired loaders	6,640
Grading – Phase 2	Graders, off-highway trucks, rubber-tired dozers, rubber-tired loaders, and scrapers	5,760
Paving – Country Club & El Norte	Excavators, graders, off-highway trucks, pavers, rollers, and rubber-tired loaders	2,752
Import – Phase 2	Graders, rubber-tired loaders, and rubber-tired dozers	1,128
Trenching DU – Phase 1	Off-highway trucks, rubber-tired loaders, and backhoes	1,440
Trenching WU – Phase 2	Excavators, off-highway trucks, and rubber-tired loaders	4,560
Grading – Phase 3	Graders, off-highway trucks, rubber-tired dozers, rubber-tired loaders, and scrapers	3,600
Surface Improvements – Phase 1	Graders, pavers, paving equipment, rollers, rubber-tired loaders, and scrapers	2,688
Paving – Country Club & Nutmeg	Excavators, graders, off-highway trucks, pavers, rollers, and rubber-tired loaders	2,432
Grading – Phase 4	Graders, off-highway trucks, rubber-tired dozers, rubber-tired loaders, and scrapers	4,464
Import – Phase 3	Graders, rubber-tired loaders, and rubber-tired dozers	456
Trenching DU – Phase 2	Off-highway trucks, rubber-tired loaders, and backhoes	1,000
Import – Phase 4	Graders, rubber-tired loaders, and rubber-tired dozers	1,728
Trenching WU – Phase 3	Excavators, off-highway trucks, and rubber-tired loaders	2,800
Building Construction	Cranes, forklifts, generator sets, tractors, and welders	79,920
Paving – El Norte & Nutmeg	Excavators, off-highway trucks, other construction equipment, pavers, and rubber-tired loaders	2,496
Surface Improvements – Phase 2	Graders, pavers, paving equipment, rollers, rubber-tired loaders, and scrapers	2,016
Trenching DU – Phase 3	Off-highway trucks, rubber-tired loaders, and backhoes	600
Trenching WU – Phase 4	Excavators, off-highway trucks, and rubber-tired loaders	3,520
Surface Improvements – Phase 3	Graders, pavers, paving equipment, rollers, rubber-tired loaders, and scrapers	1,296
Trenching DU – Phase 4	Off-highway trucks, rubber-tired loaders, and backhoes	760
Surface Improvements – Phase 4	Graders, pavers, paving equipment, rollers, rubber-tired loaders, and scrapers	1,584
Architectural Coating	Air compressors	920
	Total	**145,432**

Source: Appendix 2.4-1.
Notes: WU = wet utilities; DU = dry utilities.

Table 3.1.2-4
Construction Equipment Diesel Demand

Phase	Pieces of Equipment	Equipment CO_2 (MT)	kg/CO_2/Gallon	Gallons
Demolition – Phase 1	7	36.65	10.35	3,541.17
Grading – Phase 1	18	924.88	10.35	89,360.77
Trenching WU – Phase 1	10	216.54	10.35	20,921.66
Grading – Phase 2	18	637.85	10.35	61,628.12
Paving – Country Club & El Norte	8	92.12	10.35	8,900.16
Import – Phase 2	3	71.23	10.35	6,882.51
Trenching DU – Phase 1	5	38.69	10.35	3,738.49
Trenching WU – Phase 2	10	148.71	10.35	14,367.88
Grading – Phase 3	18	398.66	10.35	38,517.57
Surface Improvements – Phase 1	8	118.99	10.35	11,496.22
Paving – Country Club & Nutmeg	8	81.41	10.35	7,865.26
Grading – Phase 4	18	494.33	10.35	47,761.80
Import – Phase 3	3	28.80	10.35	2,782.29
Trenching DU – Phase 2	5	26.87	10.35	2,596.17
Import – Phase 4	4	97.85	10.35	9,454.43
Trenching WU – Phase 3	10	91.31	10.35	8,822.39
Building Construction	9	1,385.33	10.35	133,848.29
Paving – El Norte & Nutmeg	8	81.51	10.35	7,875.67
Surface Improvements – Phase 2	9	87.63	10.35	8,466.24
Trenching DU – Phase 3	5	16.12	10.35	1,557.71
Trenching WU – Phase 4	10	114.79	10.35	11,091.01
Surface Improvements – Phase 3	9	56.33	10.35	5,442.58
Trenching DU – Phase 4	5	11.82	10.35	1,142.32
Surface Improvements – Phase 4	9	76.16	10.35	7,358.88
Architectural Coating	1	19.57	10.35	1,891.29
			Total	**517,310.91**

Sources: Appendix 2.4-1 (pieces of equipment and equipment CO_2);The Climate Registry 2016 (kg/CO_2/gallon).
Notes: CO_2 = carbon dioxide; MT = metric ton; kg = kilogram; WU = wet utilities; DU = dry utilities.

Table 3.1.2-5
Construction Worker Vehicle Gasoline Demand

Phase	Trips	Vehicle CO_2 (MT)	kg/CO_2/Gallon	Gallons
Demolition – Phase 1	1,530	5.90	9.13	646.22
Grading – Phase 1	3,248	12.53	9.13	1,372.40
Trenching WU – Phase 1	2,158	8.33	9.13	912.38
Grading – Phase 2	2,240	8.64	9.13	946.33
Paving – Country Club & El Norte	1,118	4.31	9.13	472.07
Import – Phase 2	846	3.26	9.13	357.06
Trenching DU – Phase 1	504	1.95	9.13	213.58

Table 3.1.2-5
Construction Worker Vehicle Gasoline Demand

Phase	Trips	Vehicle CO_2 (MT)	kg/CO_2/Gallon	Gallons
Trenching WU – Phase 2	1,482	5.72	9.13	626.51
Grading – Phase 3	1,400	5.40	9.13	591.46
Surface Improvements – Phase 1	840	3.24	9.13	354.87
Paving – Country Club & Nutmeg	988	3.81	9.13	417.31
Grading – Phase 4	1,736	6.70	9.13	733.84
Import – Phase 3	342	1.32	9.13	144.58
Trenching DU – Phase 2	350	1.35	9.13	147.86
Import – Phase 4	1,080	4.17	9.13	456.74
Trenching WU – Phase 3	910	3.51	9.13	384.45
Building Construction	202,020	724.15	9.13	79,315.44
Paving – El Norte & Nutmeg	1,170	4.51	9.13	493.98
Surface Improvements – Phase 2	672	2.59	9.13	283.68
Trenching DU – Phase 3	210	0.81	9.13	88.72
Trenching WU – Phase 4	1,144	4.41	9.13	483.02
Surface Improvements – Phase 3	432	1.67	9.13	182.91
Trenching DU – Phase 4	266	1.01	9.13	110.62
Surface Improvements – Phase 4	528	1.98	9.13	216.87
Architectural Coating	4,140	13.44	9.13	1,471.60
			Total	**91,424.50**

Sources: Appendix 2.4-1 (construction worker CO_2); The Climate Registry 2016 (kg/CO_2/gallon).
Notes: CO_2 = carbon dioxide; MT = metric ton; kg = kilogram; WU = wet utilities; DU = dry utilities.

Table 3.1.2-6
Construction Vendor Truck Diesel Demand

Phase	Trips	Vehicle CO_2 (MT)	kg/CO_2/Gallon	Gallons
Demolition – Phase 1	0	0.00	10.35	0.00
Grading – Phase 1	0	0.00	10.35	0.00
Trenching WU – Phase 1	0	0.00	10.35	0.00
Grading – Phase 2	0	0.00	10.35	0.00
Paving – Country Club & El Norte	0	0.00	10.35	0.00
Import – Phase 2	0	0.00	10.35	0.00
Trenching DU – Phase 1	0	0.00	10.35	0.00
Trenching WU – Phase 2	0	0.00	10.35	0.00
Grading – Phase 3	0	0.00	10.35	0.00
Surface Improvements – Phase 1	4	2.25	10.35	217.39
Paving – Country Club & Nutmeg	0	0.00	10.35	0.00
Grading – Phase 4	0	0.00	10.35	0.00
Import – Phase 3	0	0.00	10.35	0.00
Trenching DU – Phase 2	0	0.00	10.35	0.00

Table 3.1.2-6
Construction Vendor Truck Diesel Demand

Phase	Trips	Vehicle CO_2 (MT)	kg/CO_2/Gallon	Gallons
Import – Phase 4	0	0.00	10.35	0.00
Trenching WU – Phase 3	0	0.00	10.35	0.00
Building Construction	54	787.91	10.35	76,126.57
Paving – El Norte & Nutmeg	0	0.00	10.35	0.00
Surface Improvements – Phase 2	4	1.50	10.35	144.93
Trenching DU – Phase 3	0	0.00	10.35	0.00
Trenching WU – Phase 4	0	0.00	10.35	0.00
Surface Improvements – Phase 3	4	0.96	10.35	92.75
Trenching DU – Phase 4	0	0.00	10.35	0.00
Surface Improvements – Phase 4	4	1.98	10.35	191.30
Architectural Coating	0	0.00	10.35	0.00
			Total	**76,772.95**

Sources: Appendix 2.4-1 (construction vendor CO_2); The Climate Registry 2016 (kg/CO_2/gallon).
Notes: CO_2 = carbon dioxide; MT = metric ton; kg = kilogram; WU = wet utilities; DU = dry utilities.

Table 3.1.2-7
Construction Haul Truck Diesel Demand

Phase	Trips	Vehicle CO_2 (MT)	kg/CO_2/Gallon	Gallons
Demolition – Phase 1	252	9.93	10.35	959.34
Grading – Phase 1	0	0.00	10.35	0.00
Trenching WU – Phase 1	0	0.00	10.35	0.00
Grading – Phase 2	0	0.00	10.35	0.00
Paving – Country Club & El Norte	0	0.00	10.35	0.00
Import – Phase 2	8,813	347.25	10.35	33,550.42
Trenching DU – Phase 1	0	0.00	10.35	0.00
Trenching WU – Phase 2	0	0.00	10.35	0.00
Grading – Phase 3	0	0.00	10.35	0.00
Surface Improvements – Phase 1	0	0.00	10.35	0.00
Paving – Country Club & Nutmeg	0	0.00	10.35	0.00
Grading – Phase 4	0	0.00	10.35	0.00
Import – Phase 3	3,563	140.39	10.35	13,564.07
Trenching DU – Phase 2	0	0.00	10.35	0.00
Import – Phase 4	10,125	398.94	10.35	38,545.10
Trenching WU – Phase 3	0	0.00	10.35	0.00
Building Construction	0	0.00	10.35	0.00
Paving – El Norte & Nutmeg	0	0.00	10.35	0.00
Surface Improvements – Phase 2	0	0.00	10.35	0.00
Trenching DU – Phase 3	0	0.00	10.35	0.00
Trenching WU – Phase 4	0	0.00	10.35	0.00

Table 3.1.2-7
Construction Haul Truck Diesel Demand

Phase	Trips	Vehicle CO_2 (MT)	kg/CO_2/Gallon	Gallons
Surface Improvements – Phase 3	0	0.00	10.35	0.00
Trenching DU – Phase 4	0	0.00	10.35	0.00
Surface Improvements – Phase 4	0	0.00	10.35	0.00
Architectural Coating	0	0.00	10.35	0.00
			Total	**86,618.93**

Sources: Appendix 2.4-1 (construction haul CO_2); The Climate Registry 2016 (kg/CO_2/gallon).
Notes: CO_2 = carbon dioxide; MT = metric ton; kg = kilogram.

Table 3.1.2-8
Mobile Source Fuel Consumption – Operation

Fuel	Vehicle MT CO_2	kg/CO_2/Gallon	Gallons
Gasoline	3,856.90	9.13	422,442.07
Diesel	313.56	10.35	30,296.03
		Total	**452,738.10**

Sources: Appendix 2.4-1 (mobile source CO_2); The Climate Registry 2016 (kg/CO_2/gallon).
Notes: MT = metric ton; CO_2 = carbon dioxide; kg = kilogram.

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