

4.5.1 INTRODUCTION

This section evaluates potential impacts associated with the consumption of energy that would result from the implementation of the Scott Ranch project.

As noted throughout the other sections, this RDEIR also evaluates the environmental impacts from the offsite construction and operation of the proposed regional park trail that would extend from the western boundary of the project site to Helen Putnam Regional Park. A detailed quantitative energy analysis for this related project is considered unnecessary because with the exception of a limited amount of petroleum-based fuel that would be used to operate the few pieces of equipment during trail construction, the regional park trail project would not result in a substantial use of energy resources.

4.5.2 ENVIRONMENTAL SETTING

4.5.2.1 Electricity Supply

Pacific Gas and Electric (PG&E) provides electrical power to businesses and residents in Petaluma (City of Petaluma 2019). To meet customer load, PG&E purchases wholesale electric energy and capacity from generators and suppliers, including cogeneration power plants and small power producers that include hydroelectric power plants, biomass, solar, and wind projects. Sonoma Clean Power (SCP) is a public electricity provider, operated in part by the City of Petaluma, that sources clean energy from renewable resources – geothermal, water, wind, solar, and biomass – for Sonoma and Mendocino Counties. The SCP works with PG&E and can replace PG&E’s electric generation service (SCP is able to offer cleaner generation sources that has fewer greenhouse gas emissions compared to PG&E’s mix) for residents and businesses in these counties but would continue to use PG&E’s wiring infrastructure to deliver cleaner energy to customers.

Electricity generated within the State of California in 2017 was from natural gas (43 percent), renewable resources (29 percent), large hydroelectric (18 percent), nuclear (9 percent), and coal (<1 percent) (CEC 2019a). The rest of the electricity used in the state was generated within the United States either in the Southwest or Pacific Northwest. In 2017, the State of California power mix, based on in-state generation and out-of-state purchases, was comprised of natural gas (34 percent), renewable resources (29 percent), large hydroelectric (15 percent), coal (4 percent), nuclear (9 percent), and additional unspecified sources of power (9 percent) (CEC 2019a). In 2017, the total system power for California was 292,039 GWh, which is up about 0.5 percent from 2016’s total system electric generation of 290,567 GWh (CEC 2019a).

4.5.2.2 Natural Gas

Natural gas is provided and distributed to residents and businesses in the City of Petaluma by PG&E. PG&E purchases gas supplies at daily, monthly and longer-term basis from producers and marketers in Canada, the Rockies, and the U.S. Southwest.

In 2012, natural gas used within California was extracted in the State of California (9 percent), Canada (16 percent), the Rocky Mountain region of the United States (40 percent), and in the southwest United States (35 percent) (CPUC 2019). In 2012, natural gas was used in California to produce electricity (45.6 percent), in residential uses (21 percent), in industrial uses (25 percent), and in commercial uses (8.6 percent). The total natural gas usage in 2012 was 23,130 million therms (CEC 2019b).

4.5.2.3 Petroleum Based Fuel

The Petroleum Industry Information Reporting Act (PIIRA) requires all retail transportation fueling stations in California to file a Retail Fuel Outlet Annual Report (CEC-A15). These stations report retail sales of gasoline, diesel, and other transportation fuels. Sales data reported does not include commercial fleets, government entities, or rental facilities/equipment yards.

In 2017, approximately 15.6 billion gallons of gasoline (non-diesel) and 1.9 billion gallons of diesel fuel were sold statewide (CEC 2019c). For Sonoma County in particular, estimated retail gasoline sales were 208 million gallons and retail diesel sales 23 million gallons (CEC, 2019c).

4.5.3 REGULATORY CONSIDERATIONS

4.5.3.1 Federal Laws, Regulations and Programs

Energy Independence and Security Act

In 2007, Energy Independence and Security Act (EISA) was signed into law. EISA aims to increase building, product, and vehicle efficiency; accelerate clean renewable fuel production; and institute other measures aimed at increasing U.S. energy independence and security. For more information on this Act, please see **Section 4.7.3, Greenhouse Gas**, of this RDEIR.

Energy Policy and Conservation Act

Enacted in 1975, the Energy Policy and Conservation Act established fuel economy standards for new light-duty vehicles sold in the US. The law placed responsibility on the National Highway Traffic and Safety Administration (a part of the US DOT) for establishing and regularly updating vehicle standards. The US

EPA administers the Corporate Average Fuel Economy (CAFE) program, which determines vehicle manufacturers' compliance with existing fuel economy standards. Since the inception of the CAFE program, the average fuel economy for new light-duty vehicles (autos, pickups, vans, and SUVs) steadily increased from 13.1 miles per gallon (mpg) for the 1975 model year to 27.5 mpg for the 2012 model year and is proposed to increase to 54.5 mpg by 2025.

Energy Star Program

In 1992, the US EPA introduced Energy Star as a voluntary labeling program designed to identify and promote energy-efficient products to reduce greenhouse gas emissions. The program applies to major household appliances, lighting, computers, and building components such as windows, doors, roofs, and heating and cooling systems. Appliances that meet specifications for maximum energy use established under the program are certified to display the Energy Star label. In 1996, US EPA joined with the US Department of Energy to expand the program, which now also includes qualifying commercial, industrial and residential buildings.

4.5.3.2 State Laws, Regulations, and Programs

Title 24

Title 24, Part 6, of the California Code of Regulations contains the CEC's Energy Efficiency Standards for Residential and Nonresidential Buildings. Title 24 was first established in 1978, in response to a legislative mandate to reduce California's energy consumption. Since that time, Title 24 has been updated periodically to allow for consideration and possible incorporation of new energy efficiency technologies and methods.

On April 23, 2008, the CEC adopted the 2008 standards, which applied to projects that submitted an application for a building permit on or after January 1, 2010. The CEC adopted the 2008 standards for a number of reasons: (1) to provide California with an adequate, reasonably priced, and environmentally sound supply of energy; (2) to respond to Assembly Bill 32 (AB 32; the Global Warming Solutions Act of 2006), which requires California to reduce its greenhouse gas emissions to 1990 levels by 2020; (3) to pursue the statewide policy that energy efficiency is the resource of choice for meeting California's energy needs; (4) to act on the findings of California's Integrated Energy Policy Report, which indicate that the 2008 Standards are the most cost-effective means to achieve energy efficiency, reduce the energy demand associated with water supply, and reduce greenhouse gas emissions; (5) to meet the West Coast Governors' Global Warming Initiative commitment to include aggressive energy efficiency measures in the update of all state building codes; and (6) to meet the Executive Order in the Green Building Initiative to improve the energy efficiency of nonresidential buildings through aggressive standards (CEC 2013). In 2013, updates were made to the 2008 Title 24 standards (effective January 1, 2014).

The California Green Building Standards Code, which is Part 11 of the Title 24 Building Standards Code, is commonly referred to as the CALGreen Code. The 2008 edition, the first edition of the CALGreen Code, contained only voluntary standards. The 2013 CALGreen Code is a code with mandatory requirements for new residential and nonresidential buildings (including buildings for retail, office, public schools, and hospitals) throughout California beginning on January 1, 2014. The 2013 CALGreen Code contains requirements for construction site selection, stormwater control during construction, construction solid waste reduction, indoor water use reduction, building material selection, natural resource conservation, site irrigation conservation, and more. Additionally, this code encourages buildings to achieve exemplary performance in the area of energy efficiency. For the purposes of energy efficiency standards, the CEC believes a green building should achieve at least a 15 percent reduction in energy usage when compared to California's mandatory energy efficiency standards. The updated 2016 CALGreen Code became effective January 1, 2017 and includes new requirements for additions to existing residential and non-residential development. California's Building Energy Efficiency Standards are updated on an approximately three-year cycle. The 2019 Standards will continue to improve upon the existing 2016 Standards and go into effect on January 1, 2020.

AB 32, Executive Orders S-3-05 and B-30-15, and SB 32

In addition to Title 24, a number of state laws and regulations, including AB 32, Executive Order S-3-05, Executive Order B-30-15, and SB 32, are anticipated to result in the future regulation of energy resources in California. (See **Section 4.7, Greenhouse Gas Emissions**, for additional information on AB 32, SB 32, and the two executive orders.) In order to achieve the GHG emission reductions targeted under AB 32, SB 32, and the two executive orders, it is generally expected that California will need to improve its overall energy efficiency and increase the use of renewable energy resources. Pursuant to AB 32 and SB 32, the California Air Resources Board (CARB) will work with other state agencies (including the CEC), to implement feasible programs and regulations that reduce emissions and improve energy efficiency (CARB 2019).

Renewable Portfolio Standard

Established in 2002 under SB 1078, accelerated in 2006 under SB 107, and expanded in 2011 under SB 2, California's Renewables Portfolio Standard (RPS) is one of the most ambitious renewable energy standards in the country. The RPS program requires investor-owned utilities, electric service providers, and community choice aggregators to increase procurement from eligible renewable energy resources to 33 percent of total procurement by 2020. In 2017, PG&E reached the 2020 goal 3 years ahead of schedule, with 33 percent of electricity delivered to customers coming from RPS-eligible sources (PG&E, 2019).

Senate Bill 350

Senate Bill 350 (SB 350) was signed into law in 2015. The legislation requires that, by 2030, 50 percent of all electricity provided by power plants in California must be from renewable sources. SB 350 further requires the CEC to establish annual targets for statewide energy efficiency savings and demand reduction that would achieve a cumulative doubling of statewide energy efficiency savings in electricity and natural gas by retail customers by 2030. The bill requires the state Public Utilities Commission to establish efficiency targets for investor-owned electrical and gas corporations consistent with the 2030 goal, and the CEC to establish annual targets for energy efficiency savings and demand reductions for local publicly-owned electric utilities consistent with the 2030 goal. Each retailer of electricity must regularly file an integrated resource plan (IRP) for review and approval.

Senate Bill 100

Senate Bill 100 (SB 100) was signed into law in 2018. The bill revises the RPS program goals to achieve the 50 percent renewable resources target by December 31, 2026 and reach a 60 percent target by December 31, 2030. Furthermore, the bill makes it state policy that eligible renewable energy resources and zero-carbon resources supply 100 percent of retail sales of electricity to California end-use customers and 100 percent of electricity procured to serve all state agencies by December 31, 2045. In achieving these goals, the bill also requires that California not increase carbon emissions elsewhere in the western grid nor allow for resource shuffling.

Other Energy Related Statutes and Executive Orders

Additional legislations and executive orders focused on energy efficiency in California are summarized briefly below:

- Assembly Bill 1613: This legislation, also known as the Waste Heat and Carbon Emissions Reduction Act, was designed to encourage the development of new combined heat and power systems in California with a generating capacity of up to 20 megawatts (MW).
- Senate Bill 1: This legislation enacted the Governor's Million Solar Roofs program and has an overall objective of installing 3,000 MW of solar photovoltaic systems.
- Senate Bill 1389: This legislation requires the CEC to prepare a biennial integrated energy policy report that contains an assessment of major energy trends and issues facing the state's electricity, natural gas, and transportation fuel sectors. It also requires the CEC to provide policy recommendations to conserve

resources; protect the environment; ensure reliable, secure, and diverse energy supplies; enhance the state's economy; and protect public health and safety.

- Executive Order S-14-08: This order established accelerated RPS targets—specifically 33 percent by 2020.
- Executive Order S-21-09: This order requires CARB to adopt regulations, by July 31, 2010, increasing California's RPS to 33 percent by 2020.
- Executive Order B-48-18: This order implements Governor Jerry Brown's call for a new target of 5 million zero-emission vehicles (ZEVs) in California by 2030 and 250,000 vehicle charging stations and 200 hydrogen refueling stations by 2025.
- Senate Bill SBX1-2: This legislation established new RPS goals of 20 percent of retail sales from renewables by the end of 2013, 25 percent by the end of 2016, and 33 percent by the end of 2020.¹

4.5.3.3 Local Plans and Policies

City of Petaluma General Plan 2025

The City of Petaluma General Plan 2025 contains goals and policies relating to energy conservation relevant to the proposed project:

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- Policy 4-P-18:** Develop and adopt local energy standards that would result in less energy consumption than standards set by the California Energy Commission's (CEC) Title 24 or updates thereto.
- Policy 4-P-19:** Encourage use and development of renewable or nontraditional sources of energy.
- Policy 4-P-20:** Continue to participate in undergrounding of public utility lines; whenever appropriate, require conversion of overhead lines to underground in conjunction with public and private projects.

¹ PG&E is currently under contract through 2020 to procure 37 percent of retail sales from renewable energy sources.

4.5.4 IMPACTS AND MITIGATION MEASURES

4.5.4.1 Significance Criteria

The impact of the proposed project on energy would be considered significant if it would exceed the following standards of significance, in accordance with Appendix G of the *State CEQA Guidelines*:

- Result in potential significant environmental impact due to wasteful, inefficient, and unnecessary consumption of energy resources during project construction or operation; or
- Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

4.5.4.2 Methodology

The analysis in this section focuses on the nature and magnitude of the change in energy resources due to construction and operation of the proposed project. To address the significance thresholds, the focus of this analysis is related to energy efficiency within the context of the existing regulatory environment. The methodology used to estimate the construction-phase energy use is described in **Impact EN-1** below.

The increased electricity and natural gas demand due to operation of the proposed project were estimated using the California Emissions Estimator Model (CalEEMod). The proposed project would result in daily vehicle trips to and from the project site, as a result of residential commutes and visitors trips to the park. The increase in the consumption of petroleum-based fuel associated with these trips was calculated based on vehicle miles travelled (VMT) associated with the proposed project and estimated in the traffic analysis presented in **Section 4.13, Transportation**, of this RDEIR.

4.5.4.3 Project Impacts and Mitigation Measures

Impact EN-1: Construction and operation of the proposed project would not result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation. (*Less than Significant*)

Construction

Project construction would require demolition, grading, utility installation, foundation construction, building construction, paving, and landscaping installation. All construction would be typical for the region and the nature of construction activity. During construction of the proposed project, energy would be consumed in the form of petroleum-based fuels used to power off-road construction vehicles and equipment on the project site, construction worker travel to and from the project site, delivery truck trips,

and operation of generators to provide temporary power for lighting and electronic equipment. The manufacturing of construction materials used by the proposed project would also involve energy use. Due to the large number of materials and manufacturers involved in the production of construction materials (including manufacturers in other states and countries), upstream energy use cannot be reasonably estimated. However, it is reasonable to assume that manufacturers of building materials such as concrete, steel, etc., would employ all reasonable energy conservation practices in the interest of minimizing the cost of doing business. Furthermore, neither the City nor the applicant has control over or the ability to influence energy resource use by the manufacturers of construction materials. Therefore, this analysis does not evaluate upstream energy use.

The average monthly and total consumption of gasoline and diesel fuel during project construction was estimated using the same assumptions and factors from CalEEMod that were used in estimating construction air emissions in **Section 4.2, Air Quality**. As shown in **Table 4.5-1, Off-Road Construction Equipment Diesel Fuel Consumption**, and **Table 4.5-2, Construction Worker Petroleum Fuel Consumption**, a total of approximately 113,347 gallons of diesel fuel, and 5,281 gallons of gasoline would be consumed over the project's construction horizon, or approximately 3,149 gallons of diesel fuel, and 147 gallons of gasoline per month.

**Table 4.5-1
Off-Road Construction Equipment Diesel Fuel Consumption**

Phase	Equipment Type	Units	Hours	Horse Power	Load Factor	Number of Days	Fuel Usage/ HP/hr	Diesel Usage (in gallons)
<i>Davidon (28-Lot) Residential Project Component</i>								
Site Preparation	Rubber Tired Dozers	3	8	247	0.4	33	0.05	3,912
	Tractors/Loaders/Backhoes	4	8	97	0.37	33	0.05	1,895
Grading	Excavators	2	8	158	0.38	98	0.05	4,707
	Graders	1	8	187	0.41	98	0.05	3,005
	Rubber Tired Dozers	1	8	247	0.4	98	0.05	3,873
	Scrappers	2	8	367	0.48	98	0.05	13,811
	Tractors/Loaders/Backhoes	2	8	97	0.37	98	0.05	2,814
Utility/Trenching	Cranes	1	7	231	0.29	65	0.05	1,524
	Forklifts	3	8	89	0.2	65	0.05	1,388
	Generator Sets	1	8	84	0.74	65	0.05	1,616
	Tractors/Loaders/Backhoes	3	7	97	0.37	65	0.05	2,449

Phase	Equipment Type	Units	Hours	Horse Power	Load Factor	Number of Days	Fuel Usage/ HP/hr	Diesel Usage (in gallons)
Construction	Welders	1	6	46	0.45	65	0.05	404
	Cranes	1	7	231	0.29	397	0.05	9,308
	Forklifts	3	8	89	0.2	397	0.05	8,480
	Generator Sets	1	8	84	0.74	397	0.05	9,871
	Tractors/Loaders/ Backhoes	3	7	97	0.37	397	0.05	14,961
Paving	Welders	1	8	46	0.45	397	0.05	3,287
	Cement and Mortar Mixers	1	8	9	0.56	29	0.05	58
	Pavers	2	8	130	0.42	29	0.05	1,267
	Rollers	2	8	80	0.38	29	0.05	705
Coatings	Air Compressors	1	6	78	0.48	28	0.05	314
Subtotal								89,652
Putnam Park Extension Project Component Phase 1								
Demolition	Concrete/Industrial Saws	1	8	81	0.73	5	0.05	118
	Excavators	3	8	158	0.38	5	0.05	360
Site Preparation	Rubber Tired Dozers	2	8	247	0.4	5	0.05	395
	Rubber Tired Dozers	3	8	247	0.4	1	0.05	119
	Tractors/Loaders/ Backhoes	4	8	97	0.37	1	0.05	57
Grading	Excavators	2	8	158	0.38	2	0.05	96
	Graders	1	8	187	0.41	2	0.05	61
	Rubber Tired Dozers	1	8	247	0.4	2	0.05	79
	Scrappers	2	8	367	0.48	2	0.05	282
	Tractors/Loaders/ Backhoes	2	8	97	0.37	2	0.05	57
Construction	Cranes	1	7	231	0.29	52	0.05	1,219
	Forklifts	3	8	89	0.2	52	0.05	1,111
	Generator Sets	1	8	84	0.74	52	0.05	1,293
	Tractors/Loaders/ Backhoes	3	7	97	0.37	52	0.05	1,960
	Welders	1	8	46	0.45	52	0.05	431
Paving	Cement and Mortar Mixers	1	8	9	0.56	3	0.05	6
	Pavers	2	8	130	0.42	3	0.05	131
	Rollers	2	8	80	0.38	3	0.05	73
Coatings	Air Compressors	1	6	78	0.48	3	0.05	34
Subtotal								7,882

Phase	Equipment Type	Units	Hours	Horse Power	Load Factor	Number of Days	Fuel Usage/ HP/hr	Diesel Usage (in gallons)
<i>Putnam Park Extension Project Component Phase 2 and 3</i>								
Site Preparation	Rubber Tired Dozers	3	8	247	0.4	3	0.05	356
	Tractors/Loaders/Backhoes	4	8	97	0.37	3	0.05	172
Grading	Excavators	2	8	158	0.38	10	0.05	480
	Graders	1	8	187	0.41	10	0.05	307
	Rubber Tired Dozers	1	8	247	0.4	10	0.05	395
	Scrappers	2	8	367	0.48	10	0.05	1,409
	Tractors/Loaders/Backhoes	2	8	97	0.37	10	0.05	287
Construction	Cranes	1	7	231	0.29	102	0.05	2,392
	Forklifts	3	8	89	0.2	102	0.05	2,179
	Generator Sets	1	8	84	0.74	102	0.05	2,536
	Tractors/Loaders/Backhoes	3	7	97	0.37	102	0.05	3,844
	Welders	1	8	46	0.45	102	0.05	845
Paving	Cement and Mortar Mixers	1	8	9	0.56	7	0.05	14
	Pavers	2	8	130	0.42	7	0.05	306
	Rollers	2	8	80	0.38	7	0.05	170
Coatings	Air Compressors	1	6	78	0.48	7	0.05	79
							Subtotal	15,770
							Project Total	113,304

Source: CalEEMod Model Data, Impact Sciences 2019 (See *Appendix 4.2*).

**Table 4.5-2
Construction Worker Petroleum Fuel Consumption**

Phase	Number of Daily Trips	Number of Days	Average Commute Distance (in miles)	Fuel Usage (mpg) ^{a, b}	Gasoline/Diesel Usage (in gallons)
Worker Trips (Gasoline)					
<i>Davidon (28-Lot) Residential Project Component</i>					
Site Preparation	18	33	10.8	22	292
Grading	20	98	10.8	22	962
Utility/Trenching	23	65	10.8	22	734
Construction	12	397	10.8	22	2,339
Paving	18	29	10.8	22	256
Coatings	2	28	10.8	22	27
Subtotal Gasoline Usage					4,610
<i>Putnam Park Extension Project Component, Phase 1</i>					
Demolition	15	5	10.8	22	37
Site Preparation	18	1	10.8	22	9
Grading	20	2	10.8	22	20
Building Construction	4	52	10.8	22	102
Paving	15	3	10.8	22	22
Coatings	1	3	10.8	22	1
Subtotal Gasoline Usage					191
<i>Putnam Park Extension Project Component, Phase 2 and 3</i>					
Site Preparation	18	3	10.8	22	27
Grading	20	10	10.8	22	98
Building Construction	273	102	10.8	22	300
Paving	15	7	10.8	22	52
Coatings	55	7	10.8	22	3
Subtotal Gasoline Usage					480
Total Gasoline Usage					5,281
Hauling Trips (Diesel)					
<i>Putnam Park Extension Project Component, Phase 1</i>					
Demolition	14		20	6.5	43
Total Diesel Usage					43

Source: CalEEMod Model Data, Impact Sciences 2019(See **Appendix 4.2**).

^a Bureau of Transportation Statistics. Average Fuel Efficiency of U.S. Light Duty Vehicles. Available at: <https://www.bts.gov/content/average-fuel-efficiency-us-light-duty-vehicles>, accessed October 1, 2019

^b Rentar Fuel Catalyst. Here Are the Diesel Truck Miles Per Gallon (MPG). Available online at: <https://rentar.com/diesel-truck-miles-per-gallon-mpg/>, accessed October 1, 2019.

Note: Average worker trip fuel usage from the year 2016, since construction is from 2020 to 2022, these emission estimates are conservative.

The estimated quantity of gasoline and diesel fuel use would be approximately 5,281 and 113,347 gallons, respectively, over the 36 months of construction.² The project will be required to comply with BAAQMD's standard construction measures that reduce fuel use, see **Mitigation Measure AIR-2** included in **Section 4.2, Air Quality**. Some of these measures include limiting vehicle speeds on the construction site and reducing idling time to five minutes maximum.

In addition, the proposed project would feature a sustainable design to comply with CALGreen, which would also result in the use of sustainable materials and recycled content that would reduce energy consumption during project construction. Construction materials would include recycled materials and products originating from nearby sources to the extent feasible in order to comply with CALGreen and to reduce costs and fuel use from transportation of materials.

Further, all grading (cut and fill) would be balanced on-site, eliminating the need for any haul trucks to remove or supply soil to the project site. Construction would include minimal demolition, with only about 3,000 square feet of demolition during Phase 1 of the Putnam Park Extension Project component. The project proposes to use, at a minimum, US EPA particulate matter emissions standards for Tier 3 engines or equivalent. Idling restrictions and the use of newer engines and properly maintained equipment would result in less fuel combustion and energy consumption. Furthermore, contractors and owners have a strong financial incentive to avoid wasteful, inefficient, and unnecessary consumption of energy during construction.

For the reasons listed above, the proposed project would not involve the inefficient, wasteful, and unnecessary use of energy during construction and energy consumption impact during construction would be less than significant.

Operation

Electricity and Natural Gas

According to the CalEEMod estimates, once fully operational, the project would result in a demand of approximately 723,371 thousand British Thermal Units per year (kBtu/year) of natural gas and would demand up to 242,463 kilowatt hour per year (kWh/year), or 0.24 GWh/year, of electricity (see **Appendix 4.2**).

² Davidon (28-Lot) Residential Project Component construction will last approximately 30 months with Putnam Park Extension Project component Phase 1 overlapping during the last three months of Davidon (28-Lot) Residential Project Component. The exact timing of Putnam Park Phase 2 and 3 are unknown at this time, however, in order to conduct a conservative analysis, it was assuming that these phases would overlap over a six-month period.

The project would be required to comply with the 2019 California Green Building Codes under Title 24 (CALGreen). The 2019 California Green Building Code goes into effect January 1, 2020 and represents the state policy on building energy efficiency. The goals of the Title 24 standards are to improve energy efficiency of residential and non-residential buildings, minimize impacts during peak energy-usage periods, and reduce impacts on state energy needs. Residences would incorporate sustainable design features, including solar energy generation, in compliance with the new Building Energy Efficiency Standards of California Building Code Title 24, which will require zero net electricity residences effective January 1, 2020. A net zero electricity residence generates enough energy from renewable sources to offset all on site electricity use.

Additionally, the project is subject to the City of Petaluma Municipal Code 17.04.010, which states wholly new construction projects are required to meet CALGreen Tier 2. To meet Tier 2, a project must exceed the latest CALGreen design standards by a minimum of 15 percent. In addition, the City of Petaluma, is currently considering an All Electric Building Code, these all-electric-requirements – called reach codes – would prohibit the construction of natural gas infrastructure for new buildings, thereby preventing the use of gas-powered appliances in those buildings.³ At this time, the City has not approved the All Electric Building Code and the proposed project would be constructed with natural gas powered furnaces, water heaters, cooktops and fireplace inserts.

The proposed project would also include the following features to minimize energy consumption, many of which are mandated by the CALGreen code, which would further reduce the amount of electricity and natural gas consumed by the proposed project from the estimates reported above in order to reach zero net electricity and reduce natural gas consumption (see **Section 3.0, Project Description**, for a complete list of energy conservation measures):

Indoor Features

- Approved high efficiency toilets (HET) as designated on the city’s list of qualifying HETs.
- Lavatory and/or bar faucets not exceeding 1.5 gallons per minutes
- Showerheads with a flow rate of 2.0 gallons per minute or less
- Shower units with more than one showerhead would have each showerhead plumbed so it can be turned on and off independently from each other
- Kitchen and/or utility sink faucets not exceeding 2.2 gallons per minute

³ City of Petaluma. *All Electric Building Codes (Reach Codes)*. Available online at: <https://cityofpetaluma.org/all-electric-building-rules/>, accessed March 10, 2020.

- High efficiency clothes washers (water factor of 6.0 or less)
- High efficiency dishwashers (Energy Star rated)

Outdoor Features

- Landscaping and irrigation systems that meet the following requirements, in accordance with the current Petaluma Water Efficient Landscape Ordinance:
 - Weather-based irrigation controller with rain shutoff
 - Flow sensor and master valve shutoff (large landscapes)
 - Matched precipitation (flow) rates for sprinkler heads
 - Drip/microspray/subsurface irrigation when appropriate
 - Minimum irrigation system distribution uniformity of 75 percent
 - Proper hydro-zoning, turf minimization and use of native/drought tolerant plants materials
 - Use of landscaping contouring to minimize precipitation runoff

In addition to measures required under state and local law, the proposed project would include an electric vehicle charger in each residence and electric vehicle charging stations in the lower parking lot. The electricity and natural gas reductions from these measures was not included in the CalEEMod modeling and, as a result, the total electricity and natural gas usage during project operation is a conservative estimate. As the project would comply with Title 24 and include the above sustainable project features to minimize energy use, electricity and natural gas use would not be inefficient, wasteful, and unnecessary.

Petroleum-Based Fuel

The proposed project would result in the consumption of petroleum-fuel related to vehicular travel (quantified as vehicle miles travelled (VMT)) to and from the project site. **Table 4.5-3, Estimated Petroleum-based Fuel Usage at Buildout**, below, presents the projected project consumption of approximately 4,150 gallons of diesel and 27,110 gallons of gasoline per year, or a total of 31,260 gallons of petroleum-based fuels per year based on an annual estimate of 715,130 VMT, see **Section 4.13, Transportation** and **Section 4.11, Population and Housing**.⁴

⁴ The residential daily VMT quantified in **Section 4.13, Transportation**, would be 19.6 VMT/capita. According to **Section 4.11, Population and Housing**, the project will include 77 residents. Therefore, the annual residential VMT would be 550,858 (19.6 VMT/capita/day * 365 days * 77 residents). This number was added to the VMT calculated in CalEEMod for the Putnam Park Extension Project component phases of construction. Phase 1 was assumed to

**Table 4.5-3
Estimated Petroleum-based Fuel Usage at Project Buildout**

Source	Fleet Mix ^a	Generation Factor ^{b, c}	Annual Consumption (in gallons)
Mobile			
Diesel (gallons)	16.6%	715,130/28.6 mpg	4,150
Gasoline (gallons)	83.4%	715,130/22 mpg	27,110
		Total	31,260

Source: Impact Sciences 2016

Notes:

mpg = miles per gallon

^a Data Source: FHWA OHPI, Highway Statistics, Fuel Consumption by State and Type

<http://www.fhwa.dot.gov/policyinformation/pubs/hf/pl11028/chapter5.cfm>

^b Bureau of Transportation Statistics. Average Fuel Efficiency of U.S. Light Duty Vehicles. Available at:

<https://www.bts.gov/content/average-fuel-efficiency-us-light-duty-vehicles>, accessed October 1, 2019c Diesel-powered vehicles typically get 30-35% more miles per gallon than comparable vehicles powered by gasoline. US Department of Energy, Fuel Economy Guide, <http://www.fueleconomy.gov/feg/pdfs/guides/FEG2013.pdf>

As shown in **Table 4.5-3**, the project operation would result in a demand of 4,150 gallons of diesel and 27,110 gallons of gasoline per year. This is a conservative estimate, given that it assumes no electric, hybrid, or other alternative fuel use vehicles in the fleet mix. Furthermore, this level of annual consumption is based on 2016 fuel efficiency rates (miles per gallon) shown in **Table 4.5-3**. Federal and state laws and regulations will continue to require further improvements in fuel efficiency in motor vehicles produced and/or sold in the US and total annual consumption of petroleum-based fuel is expected to decrease over time. Fuel consumption would also be reduced in the future years due to a 2018 executive order issued by Governor Jerry Brown setting a statewide goal of 5 million ZEVs on the road by 2030 and committing 2.5 billion in state funding to install charging stations.⁵ Therefore, the actual fuel usage will most likely be lower when the project becomes operational in 2022. Furthermore, as the residents and park visitors replace their older model cars, more efficient cars will take their place, further reducing the total fuel consumption in the future years of project operations. As a result, **Table 4.5-3** represents a high-end estimate of fuel use.

Beyond state requirements to ensure increases in fuel efficiency, the project Applicants will construct 240 volt outlets in the garages of each residence so that residents have the ability to charge electric vehicles. Additionally, the Putnam Park Extension Project component would include 4 electric-vehicle charging stalls in the parking lots. Residences will include exterior wall outlets and be required to use electric lawn

generate an annual VMT of 54,807. Phases 2 and 3 were assumed to generate an annual VMT of 109,465. Therefore, the project's total annual VMT is approximately 715,130 (550,858 + 54,807 + 109,465).

⁵ Office of Planning and Research. *Zero-Emission Vehicles*. Available online at: <http://opr.ca.gov/planning/transportation/zev.html>, accessed March 10, 2020.

equipment instead of fuel. Additionally, park vegetation and trail maintenance will be accomplished with electric equipment instead of fuel. Residences would use natural gas for furnaces, water heaters, cooktops, and fireplace inserts. Implementation of these project design features in conjunction with state laws requiring increases in vehicle efficiency and promotion of electric vehicles ensures that the project would result in an efficient use of petroleum fuel.

Conclusion

For the reasons listed above, the proposed project would comply with energy efficiency standards at project operation and would not result in the inefficient, wasteful, and unnecessary use of energy. Therefore, project impact related to energy consumption during operation- would be less than significant.

Mitigation Measures: No mitigation measures are required.

Impact EN-2: **The proposed project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. (*Less than Significant*)**

Construction

Electricity and natural gas from the PG&E supply and distribution systems would not be used during project construction. Therefore, there would be no impact on the existing supply and distribution systems. However, project construction would require petroleum-based fuels in order to operate off-road equipment. Consistent with **Mitigation Measure AIR-2**, this equipment will be properly maintained and restrictions will be placed on idling and speed on the project site, thereby reducing unnecessary fuel usage. As a result, the project will not conflict or obstruct with a state or local plan for renewable energy or energy efficiency.

Operation

Renewable Energy

Electricity for the proposed project will be provided by PG&E. As a publicly owned utility, PG&E is required to comply with SB 350, which requires utility companies to provide 33 percent renewable energy by the end of 2020 and 50 percent renewable by 2030. PG&E is currently under contract through 2020 to procure 37 percent of retail sales from renewable energy sources, exceeding the SB 350 target. Since the project would become operational in 2022, it can be assumed that over a third of the electricity provided by PG&E to the project site would be from renewable sources, consistent with its 2020 mix.

The project also lies within the service area of SCP. The SCP provides residences with either the CleanStart plan, a mix of 49 percent renewable energy, or the EverGreen plan, a mix of 100 percent clean, locally produced energy. Both residential service options exceed SB350's 2020 goals and the CleanStart Plan will continue to provide at least 49 percent renewable energy mix by project operation in 2022.

The California Public Utilities Commission and California Energy Commission have prepared a Zero Net Energy (ZNE) plan with the goal to have 100 percent of new homes within the state to achieve ZNE by 2020. As described in **Section 3.0, Project Description**, under Title 24 compliance, the project would be required to reach ZNE compliance. In order to achieve ZNE, the project site would include solar generation at each residence. Additional measures to meet ZNE requirements are provided in **Impact EN-1**.

Electricity and Natural Gas

As stated above, the proposed project would comply with Title 24 standards and CALGreen. CALGreen sets minimum and mandatory energy efficiency and materials requirements in order to reduce environmental impact through better planning, design, and construction practices. Title 24 (AB 970) contains energy efficiency standards for residences based on a state mandate to reduce California's energy demand. Specifically, Title 24 addresses a number of energy efficiency measures that impact energy use. See **Impact EN-1** above, which lists the Title 24 measures that the project will implement.

Additionally, the City of Petaluma's General Plan includes energy policies and programs with the goal to reduce reliance on non-renewable energy sources in existing and new development. Most of these policies are aimed toward the City, however, by complying with Title 24 and constructing the residences with solar generation capabilities, the proposed project would comply with the General Plan's energy policies.

Transportation

Federal and state California Corporate Average Fuel Economy (CAFE) standards were first created in 1975 to reduce energy consumption by increasing the fuel economy of cars and light trucks by establishing fleet-wide averages.⁶ All vehicles within the state are subject to this regulation. Therefore, vehicles related to both the construction and operation of the proposed project would be in compliance with the CAFE standards.

Conclusion

The project would comply with Title 24, 2019 CALGreen, and the ZNE program. Therefore, the proposed project would result in the increased generation of renewable energy with the installation of solar panels

⁶ Average fuel economy of cars and light trucks operational across the nation.

and compliance with ZNE programs. In addition, the proposed project would comply with all plans aimed at increasing energy efficiency. Therefore, the proposed project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency and this impact would be less than significant.

Mitigation Measures: No mitigation measures are required.

4.5.4.4 Regional Park Trail Impacts and Mitigation Measures

Environmental Setting

Currently there is no electricity or natural gas use at the regional park trail site and as the trail segment has yet to be developed is currently not generating any trips or otherwise using energy resources.

Impacts and Mitigation Measures

RPT Impact EN-1: **Construction and operation of the proposed regional park trail project would minimally increase the consumption of energy but would not result in significant environmental impact due to wasteful, inefficient or unnecessary consumption of energy or exceed the capacity of distribution systems. (*Less than Significant*)**

The proposed regional park trail project would minimally increase diesel fuel and gasoline use during construction due to a small number of construction worker trips and the use of construction equipment. Although energy consumption would temporarily increase, this use would not be wasteful, inefficient or unnecessary. This impact would be less than significant.

Due to the nature of the proposed project, the construction and operation of the regional park trail would not result in increases in electricity or natural gas use. Trail maintenance and public access may result in the use of electricity and natural gas in Helen Putnam Regional Park, but it would be minimal. Therefore, a less than significant impact would occur.

Mitigation Measures: No mitigation measures are required.

Cumulative Impact EN-1: **The proposed project and the regional park trail project would not result in a significant cumulative energy use impact. (*Less than Significant*)**

Based on the analysis above, the proposed project would not result in a wasteful use of energy resources and would comply with renewable energy plans. Additionally, the regional park trail would only use minimal petroleum fuel during construction and operation is expected to result in minimal increases electricity and natural gas use. Therefore, the proposed project and the regional park trail would result in a less than significant cumulative impact.

Mitigation Measures: No mitigation measures are required.

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