4.5 ENERGY

This section was prepared pursuant to State CEQA Guidelines Section 15126 and Appendix F of the State CEQA Guidelines, which require that EIRs include a discussion of the potential energy impacts of projects. The analysis considers whether the project would result in inefficient, wasteful, and unnecessary consumption of energy.

Energy related to the project would include energy directly consumed for space heating and cooling, and electric facilities and lighting at residential units. Indirect energy consumption would be associated with the generation of electricity at power plants. Transportation-related energy consumption includes the use of fuels and electricity to power cars, trucks, and public transportation. Energy would also be consumed by equipment and vehicles used during project construction and routine maintenance activities.

4.5.1 Regulatory Setting

Energy conservation is embodied in many federal, state, and local statutes and policies. At the federal level, energy standards apply to numerous products (e.g., the U.S. Environmental Protection Agency's [EPA] EnergyStar™ program) and transportation (e.g., fuel efficiency standards). At the state level, Title 24 of the California Code of Regulations sets forth energy standards for buildings. Further, the State provides rebates/tax credits for installation of renewable energy systems, and offers the Flex Your Power program promotes conservation in multiple areas. At the local level, individual cities and counties establish policies in their general plans and climate action plans (CAPs) related to the energy efficiency of new development and land use planning and to the use of renewable energy sources.

FEDERAL

Energy Policy and Conservation Act, and CAFE Standards

The Energy Policy and Conservation Act of 1975 established nationwide fuel economy standards to conserve oil. Pursuant to this Act, the National Highway Traffic and Safety Administration (NHTSA), part of the U.S. Department of Transportation (DOT), is responsible for revising existing fuel economy standards and establishing new vehicle economy standards.

The Corporate Average Fuel Economy (CAFE) program was established to determine vehicle manufacturer compliance with the government's fuel economy standards. Compliance with the CAFE standards is determined based on each manufacturer's average fuel economy for the portion of their vehicles produced for sale in the country. EPA calculates a CAFE value for each manufacturer based on the city and highway fuel economy test results and vehicle sales. The CAFE values are a weighted harmonic average of the EPA city and highway fuel economy test results. Based on information generated under the CAFE program, DOT is authorized to assess penalties for noncompliance. Under the Energy Independence and Security Act of 2007 (described below), the CAFE standards were revised for the first time in 30 years.

Energy Policy Act of 1992 and 2005

The Energy Policy Act of 1992 (EPAct) was passed to reduce the country's dependence on foreign petroleum and improve air quality. EPAct includes several parts intended to build an inventory of alternative fuel vehicles (AFVs) in large, centrally-fueled fleets in metropolitan areas. EPAct requires certain federal, state, and local government and private fleets to purchase a percentage of light-duty AFVs capable of running on alternative fuels each year. In addition, financial incentives are also included in EPAct. Federal tax deductions are allowed for businesses and individuals to cover the incremental cost of AFVs. States are also required by EPAct to consider a variety of incentive programs to help promote AFVs. The Energy Policy Act of 2005 provides renewed and expanded tax credits for electricity generated by qualified energy sources, such as landfill gas; provides bond financing, tax incentives, grants, and loan guarantees for clean renewable energy and rural community electrification; and establishes a federal purchase requirement for renewable energy.

Energy Independence and Security Act of 2007

The Energy Independence and Security Act of 2007 is designed to improve vehicle fuel economy and help reduce U.S. dependence on oil. It represents a major step forward in expanding the production of renewable fuels, reducing dependence on oil, and confronting global climate change. The Energy Independence and Security Act of 2007 increases the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard requiring fuel producers to use at least 36 billion gallons of biofuel in 2022, which represents a nearly five-fold increase over current levels; and reduces U.S. demand for oil by setting a national fuel economy standard of 35 miles per gallon by 2020—an increase in fuel economy standards of 40 percent.

By addressing renewable fuels and the CAFE standards, the Energy Independence and Security Act of 2007 builds on progress made by the Energy Policy Act of 2005 in setting out a comprehensive national energy strategy for the 21st century.

STATE

State of California Energy Plan

CEC is responsible for preparing the State Energy Plan, which identifies emerging trends related to energy supply, demand, conservation, public health and safety, and the maintenance of a healthy economy. The current plan is the 1997 California Energy Plan. The plan calls for the State to assist in the transformation of the transportation system to improve air quality, reduce congestion, and increase the efficient use of fuel supplies with the least environmental and energy costs. To further this policy, the plan identifies a number of strategies, including assistance to public agencies and fleet operators in implementing incentive programs for zero-emission vehicles and addressing their infrastructure needs; and encouragement of urban design that reduces vehicle miles traveled (VMT) and accommodates pedestrian and bicycle access.

Integrated Energy Policy Report

Senate Bill (SB) 1389 (Chapter 568, Statutes of 2002) required CEC to: "conduct assessments and forecasts of all aspects of energy industry supply, production, transportation, delivery and distribution, demand, and prices. The Energy Commission shall use these assessments and forecasts to develop energy policies that conserve resources, protect the environment, ensure energy reliability, enhance the state's economy, and protect public health and safety" (Public Resources Code Section 25301(a)). This work culminated in the Integrated Energy Policy Report (IEPR).

CEC adopts an IEPR every two years and an update every other year. The 2017 IEPR is the most recent IEPR, which was adopted March 16, 2018. The 2017 IEPR provides a summary of priority energy issues currently facing the State, outlining strategies and recommendations to further the State's goal of ensuring reliable, affordable, and environmentally-responsible energy sources. Energy topics covered in the report include progress toward statewide renewable energy targets and issues facing future renewable development; efforts to increase energy efficiency in existing and new buildings; progress by utilities in achieving energy efficiency targets and potential; improving coordination among the State's energy agencies; streamlining power plant licensing processes; results of preliminary forecasts of electricity, natural gas, and transportation fuel supply and demand; future energy infrastructure needs; the need for research and development efforts to statewide energy policies; and issues facing California's nuclear power plants.

Senate Bill 1078: California Renewables Portfolio Standard Program

SB 1078 (Chapter 516, Statutes of 2002) establishes a renewable portfolio standard (RPS) for electricity supply. The RPS requires that retail sellers of electricity, including investor-owned utilities and community choice aggregators, provide 20 percent of their supply from renewable sources by 2017. This target date was moved forward by SB 1078 to require compliance by 2010. In addition, electricity providers subject to the RPS must increase their renewable share by at least 1 percent each year. The outcome of this legislation will impact regional transportation powered by electricity. As of 2017, the State has reported that 32 percent of retail electricity sales were served by renewable energy facilities (CEC 2018a).

Senate Bill X1-2: California Renewable Energy Resources Act

SB X1-2 of 2011 requires all California utilities to generate 33 percent of their electricity from renewables by 2020. SB X1-2 sets a three-stage compliance period requiring all California utilities, including independently-owned utilities, energy service providers, and community choice aggregators, to generate 20 percent of their electricity from renewables by December 31, 2013; 25 percent by December 31, 2016; and 33 percent by December 31, 2020. SB X1-2 also requires the renewable electricity standard to be met increasingly with renewable energy that is supplied to the California grid from sources within, or directly proximate to, California. SB X1-2 mandates that renewables from these sources make up at least 50 percent of the total renewable energy for the 2011-2013 compliance period, at least 65 percent for the 2014-2016 compliance period, and at least 75 percent for 2016 and beyond.

Senate Bill 100: California Renewables Portfolio Standard Program

SB 100 requires that all California utilities, including independently-owned utilities, energy service providers, and community choice aggregators, supply 44 percent of retail sales from renewable resources by December 31, 2024, 50 percent by December 31, 2026, 52 percent by December 31, 2027, and 60 percent by December 31, 2030. The law requires 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.

Senate Bill 350: Clean Energy and Pollution Reduction Act of 2015

The Clean Energy and Pollution Reduction Act of 2015 (SB 350) requires doubling of the energy efficiency savings in electricity and natural gas for retail customers through energy efficiency and conservation by December 31, 2030.

Energy Action Plan

The first Energy Action Plan (EAP) emerged in 2003 from a crisis atmosphere in California's energy markets. The State's three major energy policy agencies (CEC, CPUC, and the Consumer Power and Conservation Financing Authority [established under deregulation and now defunct]) came together to develop one high-level, coherent approach to meeting California's electricity and natural gas needs. It was the first time that energy policy agencies formally collaborated to define a common vision and set of strategies to address California's future energy needs and emphasize the importance of the impacts of energy policy on the California environment.

In the October 2005 *Energy Action Plan II*, CEC and CPUC updated their energy policy vision by adding some important dimensions to the policy areas included in the original EAP, such as the emerging importance of climate change, transportation-related energy issues and research and development activities. CEC recently adopted an update to the EAP II in February 2008 that supplements the earlier EAPs and examines the State's ongoing actions in the context of global climate change.

Assembly Bill 1007: State Alternative Fuels Plan

AB 1007 (Chapter 371, Statues of 2005) required CEC to prepare a state plan to increase the use of alternative fuels in California. CEC prepared the State Alternative Fuels Plan (SAF Plan) in partnership with the California Air Resources Board (CARB) and in consultation with other State, federal, and local agencies. The SAF Plan presents strategies and actions California must take to increase the use of alternative non-petroleum fuels in a manner that minimizes the costs to California and maximizes the economic benefits of in-state production. The SAF Plan assessed various alternative fuels and developed fuel portfolios to meet California's goals to reduce petroleum consumption, increase alternative fuel use, reduce greenhouse gas (GHG) emissions, and increase in-state production of biofuels without causing a significant degradation of public health and environmental quality.

Assembly Bill 32, Senate Bill 32, and Climate Change Scoping Plan and Update

Reducing GHG emissions in California has been the focus of the state government for approximately two decades (State of California 2018). GHG emission targets established by the state legislature include reducing statewide GHG emissions to 1990 levels by 2020 (AB 32 of 2006) and reducing them to 40 percent below 1990 levels by 2030 (SB 32 of 2016). Executive Order S-3-05 calls for statewide GHG emissions to be reduced to 80 percent below 1990 levels by 2050. These targets are in line with the scientifically established levels needed in the United States to limit the rise in

global temperature to no more than 2 degrees Celsius, the warming threshold at which major climate disruptions, such as super droughts and rising sea levels, are projected (United Nations 2015).

California's 2017 Climate Change Scoping Plan (2017 Scoping Plan), prepared by CARB, outlines the main strategies California will implement to achieve the legislated GHG emission target for 2030 and "substantially advance toward our 2050 climate goals" (CARB 2017:1, 3, 5, 20, 25–26). It identifies the reductions needed by each GHG emission sector (e.g., transportation, industry, electricity generation, agriculture, commercial and residential, pollutants with high global warming potential, and recycling and waste). In 2015, electricity generation accounted for 11 percent of the State's GHG emissions. California plans to significantly reduce GHG emissions from the energy through the development of renewable electricity generation in the form of solar, wind, geothermal, hydraulic, and biomass generation. The State is on target meet the SB X1-2-33 percent renewable energy target by 2020 and will continue to increase statewide renewable energy to 50 percent by 2030, as directed by SB 350. Additionally, the State will further its climate goals through improving the energy efficiency of residential and non-residential buildings by continual updates (i.e., every three years) to the Energy Code, which contains mandatory and prescriptive energy efficiency standards for all new construction.

LOCAL

Solano County General Plan

The Solano County General Plan includes various policies and implementation programs related to the conservation and efficient use of energy (Solano County 2008). Policies and implementation programs relevant to the project include:

- RS.P-49: Ensure energy conservation and reduced energy demand in the county through required use of energy-efficient technologies.
- RS.P-53: Enable renewable energy sources to be produced from resources available in Solano County, such as solar, water, wind, and biofuels to reduce the reliance on energy resources from outside the county.
- RS.P-54: Reduce Solano County's reliance on fossil fuels for transportation and other energy-consuming activities.
- RS.P-59: Encourage on-site renewable energy production and use and energy conservation measures.
- RS.I-49: Require all off-road diesel powered vehicles used for construction to be newer model, low-emission vehicles, or use retrofit emission control devices, such as diesel oxidization catalyst and diesel particulate filters verified by the California Air Resources Board.
- HS.I-56: Comply with the California Air Resources Board and Bay Area or Yolo-Solano Air Quality Management District rules, regulations, and recommendations for Solano County facilities and operations. Such operations shall comply with mandated measures to reduce emissions from fuel consumption, energy consumption, surface coating operations, and solvent usage.

Solano County Climate Action Plan

Solano County adopted its Climate Action Plan (CAP) in June 2011 (Solano County 2011). The CAP sets forth measures for reducing countywide GHG emissions to 20 percent below 2005 levels by 2020. The CAP includes a series of measures related to reducing energy use and increasing the supply of renewable energy. CAP measures relevant to the project include:

- E-5: Work with CalRecycle, Bay Area waste agencies, other jurisdictions, and interested private sector parties to develop an agricultural and food waste-to-energy biomass facility in Solano County.
- E-6: Partner with Solano Economic Development Corporation, Pacific Gas & Electric, and agricultural processing and industry energy businesses to increase building and process energy efficiency.
- W-4: Facilitate CalRecycle and the State Air Resources Board's implementation of the Landfill Methane Capture Strategy by requiring landfills to capture methane to the greatest extent possible.

4.5.2 Environmental Setting

ELECTRICITY SERVICE

Electric service to the landfill is provided via infrastructure built and maintained by Pacific Gas & Electric (PG&E). In addition, and for renewable energy purposes, a portion of the landfill gas (LFG) produced at the RHR Landfill is routed to an internal combustion engine located in a building (adjacent to the landfill) that converts the methane in the LFG to electric power. The internal combustion engine is rated to an output of 1.6 megawatts of renewable energy and generates approximately 12,900 megawatt hours per year. The generated electricity is then sold via a power purchase agreement to PG&E (Golder 2018).

NATURAL GAS SERVICE

PG&E supplies natural gas service throughout Solano County. However, the RHR Landfill does not have an active connection to or use natural gas currently at the RHR Landfill.

ALTERNATIVE FUELS

A variety of alternative fuels are used to reduce demand for petroleum-based fuel. The use of these fuels is encouraged through various statewide regulations and plans (e.g., Low Carbon Fuel Standard, AB 32 Scoping Plan). Conventional gasoline and diesel may be replaced (depending on the capability of the vehicle) with many transportation fuels, including:

- biodiesel,
- electricity,
- ethanol (E-10 and E-85),
- hydrogen,
- natural gas (methane in the form of compressed and liquefied natural gas),
- propane,
- renewable diesel (including biomass-to-liquid),
- synthetic fuels, and
- gas-to-liquid and coal-to-liquid fuels.

California has a growing number of alternative fuel vehicles through the joint efforts of CEC, CARB, local air districts, federal government, transit agencies, utilities, and other public and private entities. As of November 2019, California contained more than 26,500 alternative fueling stations (U.S. Department of Energy 2019).

ENERGY USE FOR TRANSPORTATION

Transportation is the second largest energy consumer nationwide, accounting for 27 percent of the total national energy use. On-road vehicles are estimated to consume approximately 80 percent of California's transportation energy demand, with cars, trucks, and buses accounting for nearly all of the on-road fuel consumption. Petroleum products (e.g., gasoline, diesel, jet fuel) account for almost 99 percent of the energy used in California by the transportation sector, with the rest provided by ethanol, natural gas, and electricity (Bureau of Transportation Statistics [BTS] 2017).

On-road vehicles use about 90 percent of the petroleum consumed in California. The California Department of Transportation (Caltrans) projected 19,427 million gallons of gasoline and diesel were consumed in Santa Clara County in 2015, an increase of approximately 2,342 million gallons of fuel from 2010 levels (Caltrans 2008).

Vehicle Miles Traveled and Gasoline Consumption

Though California's population and economy are expected to grow, gasoline demand is projected to decline from roughly 15.8 billion gallons in 2017 to less than 12.7 billion gallons in 2030. This decline comes in response to both increasing vehicle electrification and higher fuel economy for new vehicles (CEC 2017). Between 2008 and 2013, the total vehicle miles traveled (VMT) in California increased; however, during the same period of time VMT per capita decreased (BTS 2017). As noted in Section 3.2, "Air Quality," the project would result in a VMT increase over the existing operations. This increase is attributable to the projected increase in volume of solid waste accepted at the landfill and the increased distance traveled by haulers serving the project.

Total gasoline consumption in California varies from year to year because of a variety of factors such as gas prices, periods of economic growth and decline, and fuel economy of vehicles. Between January 2007 and May 2016, an average of approximately 672 billion gallons of gasoline were purchased in California. During this time, the volume of gasoline purchased ranged from a minimum of approximately 1.1 billion gallons in February 2013 to a maximum of approximately 1.37 billion gallons in August 2007 (California State Board of Equalization 2016).

Energy Used by Private and Commercial Vehicles

Commercial vehicles, generally composed of light-, medium-, and heavy-duty trucks, are typically fueled by diesel or gasoline and are part of the general fleet mix of vehicles present within the Solano County region transportation system.

Average fuel economy is expected to increase for automobiles and all types of trucks. The federal CAFE is the required average fuel economy for a vehicle manufacturer's entire fleet of passenger cars and light-duty trucks for each model year. Beyond improving average fuel economy for vehicle fleets, these standards are also intended to reduce petroleum consumption, increase the availability of alternative fuel vehicles, promote the advancement of innovative technologies, and reduce vehicle related greenhouse gas emissions. CAFE standards are regulated by DOT's NHTSA with the assistance of EPA (DOT 2018).

4.5.3 Environmental Impacts and Mitigation Measures

ANALYSIS METHODOLOGY

Levels of construction- and operation-related energy consumption by the project, are measured in megawatt-hours (MWh) of electricity, million Btu (MMBtu) of natural gas, and gallons of gasoline and diesel fuel. Energy consumption estimates were calculated using the California Emissions Estimator Model (CalEEMod) version 2016.3.2 computer program (California Air Pollution Control Officers Association 2017). Construction fuel consumption was calculated in CalEEMod using a heavy-duty construction equipment list provided by the project applicant and based on CalEEMod default anticipated hourly daily usage, days used, and worker commute trip VMT. Table 4.5-1 summarizes the levels of energy consumption for each phase of construction.

Table 4.5-1 Construction Energy Consumption

Phase	Diesel (Gallons)	Gasoline (Gallons)
Grading	164,138	1,868
Geomembrane Installation	10,596	0
Total	**174,735**	**1,868**

Notes: Gasoline gallons include on-road gallons from worker trips. Diesel gallons include off-road equipment and on-road gallons from worker and vendor trips.

Source: Calculations by Ascent Environmental in 2019. See Appendix H for more calculations and assumptions.

Operational diesel and gasoline consumption was calculated using CARB's 2014 Emissions Factor model (CARB 2014), estimated daily project-generated traffic and average trip lengths (SCS Engineers 2019). Where project-specific information was not known, CalEEMod default values based on the project's location were used. Table 4.5-2 summarizes the levels of energy consumption for the existing operations and the estimated project operations. A detailed discussion of the assumptions for daily trips and trip lengths is provided in Appendix G of this SEIR and a detailed breakdown of the gasoline and diesel consumption is provided in Appendix H of this SEIR.

Table 4.5-2 Net Change in Gasoline and Diesel Consumption

Operational Phase	Gasoline (gal/year)	Diesel (gal/year)
Existing Operations	6,976	1,786,274
With Project	19,043	2,273,690
Net Change in Fuel Consumption	+12,067	+487,416

Notes: gal/year = gallons per year.

Source: Calculations by Ascent Environmental in 2019. See Appendix H for more calculations and assumptions.

THRESHOLDS OF SIGNIFICANCE

The following significance criteria are based on CEQA Guidelines Appendix G, which state that implementation of the project would have a potentially significant adverse impact if it would:

- result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy, or wasteful use of energy resources, during project construction or operation; or
- conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

IMPACT ANALYSIS

Impact 4.5-1: Result in Inefficient and Wasteful Consumption of Energy

The project would not increase electricity and natural gas consumption at the project site relative to existing conditions; no new structures requiring energy supplies would be required. However, construction and operation of the project would result in additional fuel consumption, associated with the use of construction equipment and vehicles travelling to and from the landfill. However, as part of the project and on an ongoing basis, Recology would use modern, more fuel-efficient equipment, and as part of the project, the increase in transfer trucks under the project reflects a consolidation and overall reduction in the number of potential vehicles travelling to and from the landfill. For these reasons, the project would not result in wasteful, inefficient, or unnecessary consumption of energy. This impact would be **less than significant**.

The CEQA Guidelines requires the consideration of the energy implications of a project. CEQA requires mitigation measures to reduce "wasteful, inefficient, and unnecessary" energy use (Public Resources Code Section 21100, subdivision (b)(3)). Neither the law nor the State CEQA Guidelines establish criteria that define wasteful, inefficient, or unnecessary use. Compliance with the California Energy Code would result in energy-efficient buildings. However, compliance with the California Energy Code does not address all energy impacts that could potentially be associated with construction and operation of landfill activities. For example, energy would be required to transport solid waste to the project site. Energy use is discussed by project component below.

Construction Energy Consumption

Energy would be required to construct the proposed landfill expansion, operate and maintain construction equipment, and transport construction materials. The one-time energy expenditure required to expand the landfill would be nonrecoverable. Most energy consumption would result from the use of construction equipment and vehicle trips associated with commutes by construction workers and haul trucks supplying materials. The energy

needs for the project construction would be temporary and would not require additional capacity or increase peak or base period demands for electricity or other forms of energy. Furthermore, construction equipment use and associated energy consumption would be typical of that associated with general construction activities and would not necessitate the use of construction equipment in a manner that would be less energy efficient than those used at comparable construction sites in other parts of the State. Idling of onsite equipment during construction would be limited to no more than five minutes in accordance with YSAQMD requirements. Further, onsite construction equipment may include alternative-fueled vehicles where feasible. Finally, construction activities would employ best available engineering techniques, construction and design practices, and equipment operating procedures, thereby ensuring that the wasteful consumption of fuels and use of energy would not occur.

Operational Energy Consumption

Under the project, no new structures or onsite uses requiring additional electricity or natural gas supplies would be required onsite. However, operational activities as a result of the project could result in the consumption of additional fuel by haul trucks transporting solid waste to the site. More specifically, the increase in allowable tonnage at the landfill as part of the project could result in more deliveries of solid waste to the project site and higher fuel consumption, on a daily basis. However, the majority of new vehicles that are anticipated to travel to the project site would be transfer trucks, which reflect a consolidation of solid waste haul vehicles, and an associated reduction in fuel consumption (2 or more vehicles compared to one transfer truck). Furthermore, the RHR Landfill site represents one of the closest landfills that receives Bay Area solid waste supplies to the Bay Area. Continued and increased disposal of solid waste from the Bay Area at the RHR Landfill would reduce the need to utilize facilities located farther away, thereby reducing potential fuel consumption. As a result, the projected increase in solid waste haul vehicles traveling to and from the RHR Landfill as part of the project would not be considered inefficient, wasteful, or unnecessary. In addition, as noted in Section 4.7, "Greenhouse Gas Emissions and Climate Change," Recology regularly updates and modernizes its existing equipment and fleet, thereby providing more fuel- and energy-efficient equipment on an ongoing basis.

Therefore, the project's energy consumption through construction, building operation, and transportation would not be considered wasteful, inefficient, or unnecessary. This impact would be **less than significant**.

Mitigation Measures

No mitigation is required.

Impact 4.5-2: Consistency with Plans for Renewable Energy and Energy Efficiency

The project would be required to comply with federal and State energy standards regulations for reducing fuel consumption through construction and landfilling activities. Thus, this impact is **less than significant**.

As noted above, implementation of the project would not require the consumption of natural gas and/or additional electricity supplies. Furthermore, RHR Landfill and Recology would comply with current and future federal and State energy efficiency programs and regulations, including the Low Carbon Fuel Standard, CAFE Standards, and Low Emission Vehicle Program, would reduce the transportation fuel demand associated with the project. Adherence to the increasingly stringent vehicle efficiency standards, as well as Recology's consistent modernization of its existing fleet, would reduce energy demands associated with the project, consistent with applicable plans, policies, and regulations adopted for the purposes of avoiding or mitigating environmental effects related to energy. Further, the project would not remove or reduce the energy generated onsite via the existing LFG-to-energy facility that utilizes methane supplies from decomposing waste, which is consistent with the State's energy efficiency and renewable energy goals. Therefore, impacts would be **less than significant**.

Mitigation Measures

No mitigation is required.