4.P Energy Resources

4.P.1 Introduction

This section describes existing energy use and systems at the Project Site and vicinity, including electrical and natural gas infrastructure, and gas, electricity, and fuel use. It also evaluates the impacts of each of the proposed development scenarios on energy resources and infrastructure, including impacts associated with onsite renewable energy development. Feasible mitigation measures are identified to reduce significant impacts.

4.P.2 Environmental Setting

Regional Energy Infrastructure

Electricity

Pacific Gas and Electric Company (PG&E) currently provides electricity to San Francisco and northern San Mateo County, including Brisbane. Electricity is supplied to the Project Site vicinity by transmission and submarine lines. One local power plant, the Potrero Generating Station, owned and operated by Mirant, once provided a total generating capacity of 363 megawatts (MW). However, this aging power plant was shut down on January 1, 2011. The Trans Bay Cable, owned and operated by the Steel River Transmission Company, was completed in November 2010 to replace the lost power from the Potrero Generating Station and to eliminate the need for new power plants in the San Francisco region. The Trans Bay Cable consists of a submarine cable system that runs 53 miles under San Francisco Bay and transfers up to 400 MW (approximately 40 percent of San Francisco's power demand) from the Pittsburg Substation in Pittsburg to PG&E's Potrero Substation in San Francisco. The Pittsburg Substation receives power through transmission lines from several different power plants in California and the Western United States (Trans Bay Cable, LLC, 2011; Pattern Energy Group LP, 2011).

Transmission lines along US Highway 101 between the Martin Substation[1] and the San Mateo Substation in the City of San Mateo import up to 1,230 MW of power into San Francisco and northern San Mateo County. The San Mateo Substation receives power from several power plants (Pittsburg Power Plant, Los Medanos Energy Center, and Delta Energy Center) as well as power from the 500-kilowatt (kV) Western United States power grid via the Tesla 500/230 kV Substation (CPUC, 2003).

In 2006, PG&E completed construction of the Jefferson-Martin 230kV transmission line that extends from the Martin Substation to the Jefferson Substation in Redwood City and crosses a portion of Brisbane (CPUC, ND). PG&E determined that the project was required by September 2005 to ensure that the electric system included adequate capacity to reliably serve the San Francisco and northern San Mateo County area (CPUC, 2003).

[1] Located in Brisbane and Daly City along Geneva Avenue between Bayshore Boulevard and Sherwin Avenue.

Natural Gas

Approximately 85 percent of the natural gas used in California is delivered through interstate pipelines from out-of-state basins located in the southwestern United States, the Rocky Mountains, and Canada. California sources for natural gas supplies are primarily from gas fields in the Sacramento Valley. Natural gas transmission and distribution in Brisbane are provided by PG&E, whose transmission pipelines are connected to interstate pipelines. In Northern California, PG&E has two main transmission lines, referred to as the Redwood Path, that connect to transmission lines in Malin, Oregon and convey natural gas from Western Canada, the Rocky Mountains, and California sources to customers throughout Northern California. The northern system also delivers gas to, and receives gas from, PG&E storage, Lodi Gas Storage, and Wild Goose Storage fields. PG&E owns and operates an underground natural gas storage field called Los Medanos field, near Concord (CPUC, 2010a).

Existing Infrastructure Serving the Project Site

Electricity

At the Project Site, electricity is provided through a mix of underground cables and overhead lines. Existing electrical infrastructure serving existing properties is primarily located within Tunnel Avenue. Along the eastern side of Tunnel Road in the former landfill area, PG&E overhead electrical lines serve the existing Sierra Point Lumber and Van Arsdale-Harris Lumber properties. Overhead electrical lines extend from the area between Brisbane's fire station and Icehouse Hill to Bayshore Boulevard. An existing 230-kV underground electrical transmission line runs beneath Bayshore Boulevard (BKF, 2011).

Natural Gas and Petroleum

Natural gas is conveyed to customers in Brisbane through a series of underground pipelines. PG&E owns and operates an existing 6-inch natural gas main along Tunnel Avenue and a 24-inch gas main along Bayshore Boulevard. The 6-inch gas line serves the Sierra Point Lumber and Van Arsdale-Harris Lumber properties within the Project Site, as well as several properties outside the Project Site.

Motor vehicles consume 57 percent of all petroleum. Only a small amount of both the petroleum and natural gas used in the state is produced locally, necessitating that California be a significant importer of fuels. An existing fueling station is located along Bayshore Boulevard north of MacDonald Avenue.

Project Site Energy Usage

Electricity and Natural Gas

Specific historical energy usage was not available for all existing uses on the Project Site. To provide an estimate of this usage, the Bay Area Air Quality Management District (BAAQMD) greenhouse gas model BGM (Version 1.1.9 Beta) was used to estimate annual electricity and natural gas usage based on industrial land uses at the Project Site and their square footage. Based

on this model, it is estimated that 1,784.6 megawatt hours of electricity and 10,002.5 million British Thermal Units (Btu) of natural gas are used annually on the Project Site, exclusive of Recology's operation. Recology has reported its 2010 baseline energy use as 6,300 megawatt hours of electricity and 400,000 cubic feet of natural gas (406 million Btu) annually (Arup, 2010).

Fuel Use

Existing light industrial land uses at the Project Site result in offsite vehicle use. Based on the URBEMIS model runs conducted to estimate baseline air pollutant emissions associated with the Project Site development,[2] it is assumed that 1.7 percent of baseline offsite vehicle use is diesel fuel-based and 98.3 percent is gasoline-based.

The 2010 annual baseline volume of consumed diesel and gasoline fuel was estimated by comparing the baseline-related generation of carbon dioxide (CO_2) emissions to emission factors identified by The Climate Registry (TCR, 2011). With total baseline transportation emissions of 2,084.6 metric tons per year, it is estimated the existing light industrial uses within the Project Site consume approximately 3,309 gallons of diesel fuel and approximately 222,514 gallons of gasoline each year.

4.P.3 Regulatory Setting

Development within the Project Site must comply with federal, state, regional, and local regulations. This section discusses these requirements to the extent that they may affect the way Project Site development occurs.

This section presents applicable state and local laws, regulations, and policies as they relate to energy use and conservation.

Federal Regulations

Corporate Average Fuel Efficiency Standards

In response to the *Massachusetts et al. vs. Environmental Protection Agency et al.* ruling, the Bush Administration issued an executive order on May 14, 2007, directing the United States Environmental Protection Agency (U.S. EPA) and United States Department of Transportation (US DOT) to establish regulations that reduce greenhouse gas (GHG) emissions from motor vehicles, non-road vehicles, and non-road engines by 2008. On December 19, 2007, the Energy Independence and Security Act of 2007 was signed into law, requiring an increased Corporate Average Fuel Economy (CAFE) standard of 35 miles per gallon (mpg) for the combined fleet of cars and light trucks by the 2020 model year. On October 10, 2008, the National Highway Traffic Safety Administration (NHTSA) released a final environmental impact statement analyzing proposed interim standards for model years 2011 to 2015 passenger cars and light trucks. NHTSA issued a final rule for model year 2011 on March 23, 2009 (US DOT and U.S. EPA, 2009).

[2] The baseline for the air quality upon which this analysis is based is the date of the latest air quality monitoring data presented in Table 4.B-1 (See Section 4.B, *Air Quality*), which is 2010.

On May 19, 2009, President Obama announced a national policy for fuel efficiency and emissions standards in the US auto industry. The proposed rulemaking is intended as a collaborative effort between the US DOT and U.S. EPA with the support of the United Auto Workers Union. The proposed federal standards apply to passenger cars, light-duty trucks, and medium duty passenger vehicles built in model years 2012 through 2016. If finalized, the proposed rule would surpass the 2007 CAFE standards and require an average fuel economy standard of 35.5 mpg in 2016. On May 22, 2009, the US DOT and U.S. EPA issued a notice of upcoming joint rulemaking on this issue (U.S. EPA, 2009). A Draft Environmental Impact Statement has been issued and the comment period for this ended on November 9, 2009. On June 30, 2009, the U.S. EPA granted the waiver for California for its greenhouse gas emission standards for motor vehicles; this is described in more detail below.

Energy Independence and Security Act of 2007

In addition to setting increased CAFE standards for motor vehicles, the Energy Independence and Security Act (EISA) includes the following additional provisions:

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

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 Regulations

California Green Building Standards Code, California Code of Regulations Title 24

The California Green Building Standards Code (24 California Code of Regulations [CCR] Part 11), also known as the CALGreen Code, is California's first green building standards code and became effective January 1, 2011. The purpose of the code is to improve public health and welfare through the design and construction of buildings that reduce negative impacts and encourage sustainable construction practices, including energy efficiency. The CALGreen Code applies to planning, design, operation, construction, use, and occupancy of residential buildings three stories or less, including motels, hotels, apartments, and one-and two-family dwellings; non-residential buildings including state-owned buildings, state university, and community college buildings; and privately owned buildings used for retail, office, and medical services. The CALGreen Code establishes mandatory minimum green building standards but also includes two voluntary packages of green actions, called tiers. A city and/or county may adopt the CALGreen Code's voluntary tiers consistent with adoption of local amendments for other building standards.[3]

[3] As noted below, Brisbane Municipal Code Section 15.80 specifies green building standards for new developments, including meeting a minimum Leadership in Energy and Environmental Design (LEED) "Silver" rating on the Green Building Project Checklist for all new commercial projects over 10,000 square feet and achieving a "green home" rating on the MultiFamily GreenPoint Checklist for any residential developments with 20 or more units.

Residential and non-residential buildings must meet the minimum mandatory energy efficiency standards as currently required by 24 California Code of Regulations (CCR) Part 6 (see next description below). Additionally, while not specifically required by this code, a 15-percent reduction in building energy usage compared to current mandatory energy efficiency standards is recommended by the California Energy Commission.

California Energy Efficiency Standards for Residential and Nonresidential Buildings

California's Energy Efficiency Standards for Residential and Nonresidential Buildings (24 California Code of Regulations [CCR] Part 6) contain specific energy efficiency standards that apply to all residential and non-residential buildings. Anyone obtaining a building permit from a local agency after January 1, 2010 must provide the required documentation showing compliance with these standards. Mandatory energy efficiency requirements are provided for:

- Air conditioners and condensing units, heat pumps, water heating systems and equipment;
- Natural gas system furnaces;
- Exterior walls, floors, ceilings, and doors;
- Insulation and roofing products;
- Indoor/outdoor lighting control devices and equipment;
- Ventilation;
- Pipe insulation;
- Air distribution systems; and
- Refrigerated warehouses.

Appliance Efficiency Regulations, California Code of Regulations Title 20

California's Appliance Efficiency Regulations (20 CCR Part 160-1608) contain standards for both federally regulated appliances and non-federally regulated appliances. The regulations are updated regularly to allow consideration of new energy efficiency technologies and methods. The current regulations were adopted by the California Energy Commission on November 18, 2009. The standards outlined in the regulations apply to appliances that are sold or offered for sale in California. More than 23 different categories of appliances are regulated, including refrigerators, freezers, water heaters, washing machines, dryers, air conditioners, pool equipment, and plumbing fittings.

California Occupational Safety and Health Regulations

The California Occupational Safety and Health Regulations outline specific requirements for any person planning to conduct excavation. The excavator is required to notify the Underground Service Alert at least two days prior to excavation and to delineate the area to be excavated (Underground Service Alert North, ND). Any operator of a subsurface utility in the area who receives notification must locate and field mark the approximate location of any utilities that could be affected by the excavation. Utilities in conflict with the excavation must be exposed by digging with hand tools prior to the use of any power equipment.

California Public Utilities Commission Regulations

The California Public Utilities Commission (CPUC) has constitutional authority to regulate privately owned public utilities, including electric, natural gas, telecommunications, water, railroad, rail transit, and passenger transportation companies. As part of its mission, the CPUC "…ensures the provision of safe, reliable utility service and infrastructure at reasonable rates" to their consumers including a commitment to enhancement of the environment and a "healthy California economy." The CPUC regulates utility services and promotes innovation as well as a competitive marketplace for services (CPUC, 2003).

CPUC Decision 95-08-038 contains the rules for the planning and construction of new transmission facilities, distribution facilities, and substations. Decision 95-08-038 requires permits for the construction of certain power line facilities or substations if the voltages would exceed 50 kV or the substation would require the acquisition of land or an increase in voltage rating above 50 kV. Distribution lines and substations with voltages less than 50 kV need not comply with Decision 95-08-038; however, the utility must obtain any nondiscretionary local permits required for the construction and operation of these projects. Compliance with the California Environmental Quality Act (CEQA) is required for construction of facilities constructed in accordance with Decision 95-08-038.

Executive Order S-14-08

Executive Order S-14-08, signed by then-Governor Arnold Schwarzenegger in 2008, established a Renewable Portfolio Standard (RPS) target for California that requires all retail sellers of electricity to serve 33 percent of their load with renewable energy by 2020.

Senate Bill 1078 and Senate Bill X1-2

Senate Bill (SB) 1078 established an RPS for electricity supply. The RPS requires that retail sellers of electricity provide 20 percent of their supply from renewable sources by 2017. This was amended in 2011 by SB X1-2 to increase the amount of electricity generated from eligible renewable energy resources per year, so that amount equals at least 33 percent of total retail sales of electricity in California per year by December 31, 2020, consistent with Executive Order S-14-08, above.

Senate Bill 1368

Senate Bill (SB) 1368 prohibits any retail seller of electricity in California from entering into a long-term financial commitment for base load generation if the GHG emissions are higher than those from a combined-cycle natural gas power plant. This performance standard applies to electricity generated out-of-state, as well as in-state, and to publicly owned as well as investor-owned electric utilities.

Senate Bill 1389

Senate Bill (SB) 1389, the *California Integrated Energy Policy*, was adopted in August 2002 and requires the California Energy Commission (CEC) to prepare an Integrated Energy Policy Report (IEPR) for electricity, natural gas, and transportation fuels. The IEPR contains an analysis of the

policies and actions that are necessary to ensure that the state has adequate energy resources—including a range of alternative energy resources—to meet its needs. The IEPR also includes recommendations to reduce energy demand and to improve the state's energy infrastructure.

Assembly Bill 1007

Assembly Bill 1007, (Pavley, Chapter 371, Statutes of 2005) required the CEC to prepare a state plan to increase the use of alternative fuels in California (State Alternative Fuels Plan). The CEC prepared the State Alternative Fuels Plan in partnership with the California Air Resources Board and in consultation with other state, federal, and local agencies. The final State Alternative Fuels Plan, published in December 2007, would attempt to achieve an 80-percent reduction in greenhouse gas emissions associated with personal transportation, even as California's population increases. Measures proposed that would reduce petroleum fuel use include:

1. Lowering the energy needed for personal transportation by tripling the energy efficiency of on-road vehicles by 2050 through:
    a. Conventional gas, diesel, and flexible fuel vehicles (FFVs) averaging more than 40 miles per gallon (mpg).
    b. Hybrid gas, diesel, and FFVs averaging almost 60 mpg.
    c. All electric and plug-in hybrid electric vehicles (PHEVs) averaging well over 100 mpg (on a greenhouse gas equivalents [GGE] basis) on the electricity cycle.
    d. Fuel cell vehicles (FCVs) averaging over 80 mpg (on a GGE basis).
2. Moderating growth in per capita driving, reducing today's average per capita driving miles by about 5 percent or back to 1990 levels.
3. Changing the energy sources for transportation fuels from the current 96 percent petroleum-based to approximately:
    a. 30 percent from gasoline and diesel from traditional petroleum sources or lower GHG emission fossil fuels such as natural gas.
    b. 30 percent from transportation biofuels.
    c. 40 percent from a mix of electricity and hydrogen.
4. Producing transportation biofuels, electricity, and hydrogen from renewable or very low carbon-emitting technologies that result in, on average, at least 80 percent lower life cycle GHG emissions than conventional fuels.
5. Encouraging more efficient land uses and greater use of mass transit, public transportation, and other means of moving goods and people.

Executive Order S-03-05

Executive Order S-03-05 mandates that California emit 80 percent fewer greenhouse gases in 2050 than it emitted in 1990. Energy efficiency and reduced vehicle miles traveled (VMT) would play important roles in achieving this aggressive goal.

Executive Orders S-14-08 and S-21-09

Since 2006, California has had a mandate to increase the use of renewable generation to 20 percent of retail electricity sales by 2010 (see description of SB 1078, above, and SB 107). In November 2008, Governor Schwarzenegger signed Executive Order S-14-08, which raises California's renewable energy goals to 33 percent by 2020. This enhanced target is intended to help California meet statewide greenhouse gas emission reduction targets (refer to Section III.S). This has been reiterated by California Executive Order S-21-09 which charges the California Air Resources Board (CARB), by July 31, 2010, to establish a regulation consistent with this 33 percent target by 2020. This is a further increase in RPS over SB 1078 and SB 107.

Local Regulations

Local regulations pertaining to energy use and conservation are discussed below.

Brisbane Municipal Code

Brisbane Municipal Code Section 15.80 specifies green building standards for new developments, including meeting a minimum Leadership in Energy and Environmental Design (LEED) "Silver" rating on the Green Building Project Checklist for all new commercial projects over 10,000 square feet and achieving a "green home" rating on the MultiFamily GreenPoint Checklist[4] for any residential developments with 20 or more units. To meet these requirements, a variety of energy, stormwater, and water efficiency measures can be implemented that are integrated in green building design, siting, construction, and operations.

City of Brisbane General Plan

The 1994 Brisbane General Plan Conservation Element contains the following applicable policies and programs on energy:

> ***Policy 139*:** Promote the conservation of non-renewable energy resources.
>
> ***Policy 140*:** Encourage energy-efficient building design and site planning.
>
> > *Program 140a*: Continue to administer building codes that contain State requirements for energy conservation.
> >
> > *Program 140b*: As a part of the review of land use applications for subdivisions, specific plans and new non-residential and multi-family projects, encourage the design and siting of structures and the use of landscape materials in terms of utilizing natural resources for heating and cooling.
>
> ***Policy 141*:** Encourage the installation of energy-efficient appliances.

[4] Build It Green, a nonprofit organization, has developed New Home Construction Green Building Guidelines and a MultiFamily GreenPoint Checklist, based upon the Multi-Family Green Building Guidelines established by the Alameda County Waste Management Authority. See Section 15.80.020 of the Brisbane Municipal Code for more information.

4.P.4 Impacts and Mitigation Measures

Significance Criteria

Appendix F of the CEQA Guidelines provides guidance for assessing energy impacts of projects. The appendix provides three goals:

- Decreasing overall per capita energy consumption;
- Decreasing reliance on natural gas and oil; and
- Increasing reliance on renewable energy sources.

Consistent with Appendix F goals, the significance criteria used to evaluate environmental impacts in this analysis focus on avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy. Thus, the Project Site development would have a significant effect on the environment if it were to:

- Use large amounts of energy or fuel, or consume energy or fuel in a wasteful manner
  - During construction:
    - As the result of construction activities, or
    - By resulting in the construction or expansion of energy infrastructure that would cause significant environmental effects, or
  - Following construction, during project operations:
    - Use large amounts of energy or use energy in a wasteful manner within Project Site buildings or other onsite operations (stationary source consumption), or
    - Use fuel in a wasteful manner as the result of vehicle trips associated with Project Site development (mobile source consumption).

Impact Assessment Methodology

Electrical loads for the DSP and DSP-V were obtained from *Brisbane Baylands Draft Infrastructure Plan – Dry Utilities Systems* (BKF, 2011). These preliminary estimates were developed based on estimated electrical loads assigned to specific land uses and the proposed square footage of such uses. Because the types of proposed land uses under the CPP and CPP-V scenarios generally are similar to those proposed under the DSP and DSP-V scenarios (with the exception of residential uses, which are not proposed under the CPP or CPP-V scenario), electrical and gas loads for the CPP and CPP-V scenarios were estimated using the same energy generation rates as those used for the DSP and DSP-V scenarios, with the exception that energy loads for the proposed Recology expansion were based on the 2011 *Recology Master Plan – Resource Conservation, Consumption, and Generation* report (Arup, 2011). The actual electrical loads would be calculated as specific future development projects are proposed within the Project Site. The estimated future electrical loads used for this analysis are based on commonly accepted consumption factors.

Natural gas loads for the DSP and DSP-V also were projected based on proposed land uses and square footages of such uses. Title 24 standards were used to estimate the electricity and natural gas that would be used by buildings within the Project Site.

Projected vehicular fuel use associated with ongoing Project Site development operations were estimated using URBEMIS model runs conducted to estimate baseline and Project-related air pollutant emissions, with the exception that estimates of vehicular fuel use associated with the proposed Recology expansion were based on the 2011 *Recology Master Plan – Resource Conservation, Consumption, and Generation* report (Arup, 2011).

Because the precise type and mix of renewable energy generation technologies that would be installed within the Project Site are unknown at this time, projected renewable energy generation on the Project Site is based on the findings of the *Feasibility Study of Economics and Performance of Solar Photovoltaics at the Brisbane Baylands Brownfield Site in Brisbane, California*, a study conducted by the United States Environmental Protection Agency (U.S. EPA) to assess the Project Site for a possible photovoltaic (PV) system installation and estimate the cost, performance, and site impacts of different PV options. This study is summarized and discussed in greater detail under Impact 4.P-2 below, is incorporated by reference into this EIR, and is included as **Appendix N** of this EIR.

To determine whether Project Site development would use large amounts of energy or fuel, the analysis below provides a quantitative overview of the energy that would be consumed during construction and operation of Project Site development. The analysis also weighs Project Site development's energy efficiency features when considering the potential for wasteful energy consumption.

In addition to evaluation of the amount of energy that would be consumed by Project Site construction activities and ongoing operations of uses, an evaluation was undertaken to determine whether the construction of energy infrastructure proposed to be developed within the Project Site would itself result in significant impacts. This evaluation entailed reviewing construction impact evaluations contained throughout this document and determining whether energy infrastructure substantially contributed to any significant unavoidable impacts identified in this document.

Project Impacts and Mitigation Measures

Impact 4.P-1: Would Project construction result in the use of large amounts of energy, use energy in a wasteful manner during construction, or result in the construction or expansion of energy infrastructure that would cause significant environmental effects?

Impact Significance by Scenario (before Mitigation)			
DSP	**DSP-V**	**CPP**	**CPP-V**
SM	SM	SM	SM

SU = Significant Unavoidable
SM = Significant but Mitigable
LTS = Less than Significant
- = no impact

DSP, DSP-V, CPP, and CPP-V

Construction activities associated with development of the Project Site would require the following sources of energy:

- Electricity, for operation of hand tools, air compressors, mobile project offices, and security lighting
- Diesel, for grading and construction equipment, delivery trucks, and earth hauling trucks
- Gasoline, to fuel construction worker commute vehicles

Proposed Energy Infrastructure

Development of the Project Site would require installation of both onsite and offsite electrical infrastructure improvements to serve the Project Site under all four development scenarios.

Proposed onsite electrical lines would be installed in a joint trench with proposed gas and communications infrastructure, which would be designed and constructed to PG&E standards. Under all four scenarios, proposed improvements would include new utility trenches for electricity and natural gas, placement of existing overhead electrical lines underground, and construction of new transformers, switches, and primary and secondary boxes.

Proposed electrical utility onsite infrastructure would be fed with a 21-kV loop system. One end of the system loop would feed the Baylands with a 21-kV line from the PG&E Martin Substation installed underground in a combined joint trench. Based on an initial review, PG&E has indicated that there may be adequate capacity at the Martin Substation, which is located on Geneva Avenue between Bayshore Boulevard and Sherwin Avenue. The second circuit would serve the Project Site with a 21-kV feed from the existing Bayshore Boulevard primary power lines south of the Baylands installed in an underground trench running parallel to Bayshore Boulevard until it reaches the proposed Baylands connection point.

Transformers, switches, and primary and secondary boxes would be designed and installed throughout the Project Site, as required by the approved land uses. Based on the final Tunnel Road alignment and future land uses, the existing overhead line would be undergrounded or located in an underground joint trench elsewhere within the Project Site. In addition, overhead electrical service lines running through Icehouse Hill and along Bayshore Boulevard would require undergrounding pursuant to PG&E Rule 20. The final designs and composite plan would be coordinated with PG&E during the design process. This would include coordination of undergrounding with PG&E per Rule 20A.[5]

Project Site development would include construction of new offsite electrical infrastructure, including an underground 21-kV transmission line from the existing PG&E Geneva Substation to the Project Site and one to two new circuits.

New natural gas infrastructure also would include a high pressure tap to connect to the existing PG&E 24-inch gas transmission main, and a transmission system with 4- or 6-inch pipelines. To deliver the required gas load to the Project Site, a high pressure tap would be constructed to connect into the existing 24-inch gas transmission main in Bayshore Boulevard. Two subsurface regulation pits would be constructed on the Project Site near the tap and would require an

[5] PG&E places approximately 30 miles of overhead electric facilities underground within its service area each year. This work is done under provisions of the company's Rule 20A.

approximately 20-foot-long-by-45-foot-wide area for installation and access easements. The pressure regulation stations would act to reduce the pressure of the gas arriving from the high pressure main so that it operates at a pressure safe for distribution to customers within the Project Site.

During the design process, PG&E would review the potential alternative of constructing a back-tie between the existing 24-inch gas line in Bayshore Boulevard and an existing gas main south of the site along US Highway 101 (BKF, 2011). The back-tie would eliminate the need for the two proposed regulator pits near the connection to the existing 24-inch gas main in Bayshore Boulevard.

Installation of the proposed electrical and gas transmission lines would correspond with the phasing of proposed roadway and building construction. Proposed distribution lines serving the individual buildings would be constructed in a combined joint trench with electrical and communications facilities. The final design and composite plan would be coordinated with PG&E during the design process (BKF, 2011).

Relocation of existing lines and installation of new facilities also would require trenching and movement of existing facilities. Based on the final Tunnel Avenue alignment and proposed uses, the existing overhead line would be undergrounded or located in an underground joint trench elsewhere on the site.

Energy Consumption During Project Site Construction

Construction of proposed energy infrastructure and other onsite development would require the use of energy, such as the use of fuels for vehicles and electricity to run equipment. Construction activities would result in wasteful, inefficient, or unnecessary use of energy if construction equipment is old or not well maintained, if equipment is left to idle when not in use, if travel routes are not planned to minimize vehicle miles traveled, or if excess lighting or water is used during construction activities. Energy would also be used in a wasteful manner if alternative energy sources, such as solar energy, are not used where feasible, in place of more traditional sources.

Project Site construction would not be expected to result in demand for fuel greater on a per-unit-of-development basis than other development projects in the region, with the exception that remediation of hazardous materials needs to be undertaken within the Project Site. Remediation activities would result in energy consumption that would not need to be consumed on sites where remediation is unnecessary. Because Project Site remediation is, in fact, required and not optional, the energy consumed returning the Project Site to a safe and healthy condition is not considered to be wasteful. Although the extent of Project Site development is large, construction and development would occur over a 20-year period, and demand for construction-related electricity and fuels would be spread out over that time frame. In addition, **Mitigation Measures 4.B-2a and 4.B-2b** (construction air emissions) and **Mitigation Measure 4.N-12** (construction circulation patterns) would be implemented to address construction-related air emissions and would have the effect of reducing construction-related quality fuel consumption.

Impacts of Installation of Energy Infrastructure

The construction of proposed new energy infrastructure, including renewable energy generation facilities, would include the excavation, removal, or relocation/grading of onsite soils; removal of existing surface materials, such as paving; removal of existing vegetation; use of construction equipment and vehicles; and extension of aboveground power lines to connect to the existing power grid – activities that could result in significant construction impacts. Construction activities related to the installation of such infrastructure also could result in damage to existing utilities and interruption of service to existing uses within and surrounding the Project Site.

Construction activities related to installation of proposed electric, gas, and renewable energy facilities would result in significant impacts related to ground disturbance, damage to existing vegetation, and construction-related traffic, air emissions, and noise. These construction-related impacts are discussed, and specific mitigation measures are proposed, as follows, in other sections of this EIR: **Mitigation Measures 4.B-2a and 4.B-2b** (construction air emissions); **Mitigation Measures 4.C-1a through 4.C-1c**, **Mitigation Measures 4.C-2a through 4.C-2c**, and **Mitigation Measures 4.C-4d, 4.C-4e, and 4.C-4f** (biological resources); **Mitigation Measures 4.D-2 and 4.D-4** (archaeological resources and human remains); **Mitigation Measure 4.E-2a** (ground settlement); **Mitigation Measures 4.G-2a, 4.G-2b, 4.G-2d** and **4.G-2f** through **4.G-2h** (hazardous materials); **Mitigation Measures 4.J-4a and 4.J-4b** (construction period noise); and **Mitigation Measure 4.N-12** (construction circulation patterns). Implementation of these measures is recommended to reduce construction impacts related to the installation of energy infrastructure to less-than-significant levels. See Sections 4.A (*Aesthetics and Visual Resources*), 4.B (*Air Quality*), 4.C, (*Biological Resources*), and 4.F (*Greenhouse Gas Emissions*) for a discussion of operational impacts of energy generation infrastructure and facilities in relation to potential light and glare, air quality, bird strike, and greenhouse gas emissions impacts.

Conclusion: Energy use during Project Site construction would result in substantial consumption of energy, which is considered to be a significant impact under all four proposed development scenarios. To reduce this impact to a less-than-significant level, implementation of **Mitigation Measure 4.P-1** would be required under all development scenarios. Implementation of **Mitigation Measures 4.B-2a and 4.B-2b**, as recommended in Section 4.B, *Air Quality,* and **Mitigation Measure 4.N-12**, as recommended in Section 4.N, *Traffic and Circulation*, of this EIR also would help to ensure that wasteful, inefficient, or unnecessary energy use during construction would be avoided or minimized.

In addition, as noted above, energy use during Project Site construction would (with the exception of site remediation) be similar on a unit basis to other developments throughout the region. Although the extent of Project Site development is large, construction and development would occur over a 20-year period, and demand for construction-related electricity and fuels would be spread out over that time.

Impacts from installation of energy infrastructure are addressed by mitigation measures in other sections of this EIR, as indicated in the discussion above.

Mitigation

Mitigation Measure 4.P-1: During all Project Site construction activities, construction contractors shall implement the following measures to prevent the wasteful or inefficient use of energy during construction:

Mitigation Measure Applicability by Scenario			
DSP	**DSP-V**	**CPP**	**CPP-V**
✓	✓	✓	✓
✓ = measure applies - = measure does not apply			

- Implement work schedules and procedures that minimize equipment idle time and double-handling of material;
- Minimize equipment idling time either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California Airborne Toxic Control Measure Title 13, Section 2485 of California Code of Regulations [CCR]);
- Switch off office equipment and lights when not in use;
- Use solar power sources for road signs and other applicable equipment that will be required at the construction site;
- Design all temporary roads to minimize travel distances; and
- Maintain and properly tune all construction equipment in accordance with manufacturer's specifications. It shall be the contractor's responsibility to ensure that all equipment has been checked by a certified mechanic and determined to be running in proper condition prior to operation.

Conclusion with Mitigation: With implementation of **Mitigation Measure 4.P-1**, along with other construction-period mitigation measures identified above, impacts related to energy use during construction would be reduced to less-than-significant levels under each of the four development scenarios.

Impact 4.P-2: Would Project buildings or other onsite operations use large amounts of energy, or use energy in a wasteful manner?

Impact Significance by Scenario (before Mitigation)			
DSP	**DSP-V**	**CPP**	**CPP-V**
SM	SM	SM	SM
SU = Significant Unavoidable SM = Significant but Mitigable LTS = Less than Significant - = no impact			

DSP, DSP-V, CPP, and CPP-V

Operational use of energy includes the heating, cooling, and lighting of buildings; water heating; operation of electrical systems and plug-in appliances within buildings; parking lot and outdoor lighting; the transport of electricity, natural gas, and water to the areas where they would be consumed; and operation of the proposed onsite recycled water plant. Given the substantial increase in the level of development of the Project Site that would occur under any of the four proposed development scenarios, the increase in energy use resulting from the proposed Project Site development also would be substantial.

Electrical Energy Consumption

Under all of the proposed development scenarios, Project Site operations would contribute to a substantial increase in electricity consumption. **Table 4.P-1** presents the estimated electrical demand and onsite generation for each of the proposed development scenarios.

TABLE 4.P-1
ESTIMATED ELECTRICAL DEMAND AND GENERATION FOR THE DSP, DSP-V, CPP, AND CPP-V SCENARIOS

Scenario	Electrical Demand in Megawatt Hours (MWh)	Onsite Renewable Energy Production in Megawatt Hours (MWh)	Onsite Net Energy Consumption/(Generation) in Megawatt Hours (MWh)
DSP	72,000	42,400 (58.9%)	29,600
DSP-V	74,900	42,400 (56.6%)	32,500
CPP	65,800	42,400 (64.4%)	23,400
CPP-V	63,900	51,600 (80.8%)	12,300

SOURCES: BKF, 2011; Arup, 2012; CDM Smith, 2012; ESA, 2013.

As shown in Table 4.P-1, the DSP and DSP-V scenarios would result in the greatest electrical load because they would involve the largest amount of new development (based on square feet of new space). The greatest onsite generation of electricity would occur in the CPP-V scenario as the result of energy production within the Recology site (see discussion of renewable energy production below).

As noted above, each of the four proposed development scenarios would include development of alternative energy technologies on the Project Site, producing approximately 42,000 to 45,000 megawatt hours (MWh) of energy annually. Under the DSP and DSP-V scenarios, this would include production, though solar energy generation, of approximately 42,000 to 45,000 megawatt hours (MWh) of energy annually (Salasovich et al., 2012). The CPP and CPP-V scenarios are intended to generate an equivalent amount of renewable energy through a combination of solar and small-scale wind facilities installed on rooftops and within spaces dedicated to other uses, as well as within stand-alone solar "farms." Under all four proposed development scenarios, onsite renewable energy generation would offset a significant portion of onsite energy use (see Table 4.P-1 and discussion of renewable energy production below).

The proposed Recology expansion is projected to generate 75,000,000 kWh per year of renewable energy from a combination of biogas capture and use, solar PV, and solar hot water (Arup, 2010). Small wind turbines would also be employed for renewable energy generation but are not included in the calculation of total renewable energy production. Approximately 27.6 million kWh/year of this total would be available for export from the Recology facility. (See further discussion under "Renewable Energy Generation" below.)

As previously noted, existing electrical consumption within the Project Site is 8,084.6 megawatt hours. Thus, under all Project Site development scenarios, even with proposed onsite renewable energy generation, increases in electrical consumption would be substantial.

Renewable Energy Generation

The United States Environmental Protection Agency (U.S. EPA), in accordance with the RE-Powering America's Land initiative, selected the Baylands for a feasibility study of renewable energy production. The study was conducted to assess the Project Site for a possible photovoltaic (PV) system installation and estimate the cost, performance, and site impacts of different PV options, and to recommend financing options that could assist in the implementation of a PV system at the site. The study report, *Feasibility Study of Economics and Performance of Solar Photovoltaics at the Brisbane Baylands Brownfield Site in Brisbane, California* (Salasovich et al., 2012) is included as Appendix N of this EIR, and its findings are summarized below.

DSP and DSP-V Scenarios. The U.S. EPA study looked at the feasibility of implementation of a PV system on the 684-acre area encompassed by the proposed Specific Plan for the DSP and DSP-V scenarios, which includes approximately 25 acres dedicated to renewable energy generation, as well as building-integrated and rooftop renewable energy-generating features. According to the study, the DSP and DSP-V scenarios include approximately 24.7 acres appropriate for installation of a ground-mounted PV system and 257.4 acres appropriate for installation of roof-mounted PV. This would allow for installation of a 24- to 28-MW PV system producing approximately 42,000 to 45,000 megawatt hours (MWh) of energy annually. The study also notes that in order for the site to be net-zero (i.e., to generate as much energy as it uses), an approximately 50-MW PV system would have to be installed to offset the energy use of the buildings. As shown in Table 4.P-1, proposed onsite electrical generation would supply between 56.6 percent (DSP-V scenario) and 80.8 percent (CPP-V scenario) of Project Site electrical demand. Thus, to achieve net-zero use of electricity, a combination of improved building energy efficiency (improved conservation beyond current state and local requirements) and expanded provision of onsite renewable energy generation would be needed. The additional acreage needed to be devoted to renewable energy production in each scenario would depend on the extent to which building energy efficiencies could be increased, as well as the extent to which roof-mounted solar installations could be added to buildings and other structures within the Project Site.

Typically, a minimum of 2 useable acres is recommended to site PV systems. Useable acreage is typically characterized as "flat to gently sloping" southern exposures that are free from obstructions and get full sun for at least a 6-hour period each day. For example, eligible space for PV includes under-used or unoccupied land, vacant lots, and/or unused paved area, e.g., a parking lot or industrial site space, as well as existing and future building rooftops.

As noted in the feasibility study, some grading would be necessary to accommodate a PV system. Further, removal of existing unused structures, fences, or electrical poles would increase the unshaded area to incorporate more PV panels. As with implementation of other Project Site development components, installation of remedial technologies on the Project Site would require implementation of recommended remedial actions.

In addition, as part of onsite renewable generation, a tie-in to the PG&E electrical grid would be needed. The closest electrical tie-in location to the Project Site is at the PG&E Martin Substation at

3150 Geneva Avenue. A detailed interconnection study would have to be performed through PG&E to determine the feasibility of using the Martin Substation as a tie-in point for a PV system.

CPP and CPP-V Scenarios. The Concept Plans prepared for the CPP and CPP-V scenarios assume that renewable energy production for those scenarios would be equivalent to the renewable energy production of the DSP and DSP-V scenarios. Because site grading plans for the CPP and CPP-V scenarios would be similar to the grading for the DSP and DSP-V scenarios, the findings of the EPA renewable energy feasibility study should also apply to the CPP and CPP-V scenarios. With the exception of projected energy generation under the Recology expansion component of the CPP-V, specific renewable energy facilities are not shown under the CPP or CPP-V scenario. Based on the U.S. EPA study, feasible renewable energy generation under the CPP and CPP-V is anticipated to consist of a combination of small-scale wind and solar facilities installed on rooftops and spaces dedicated to other uses, as well as within stand-alone solar "farms" on land dedicated to that use, although the placement and configuration of such facilities would differ from what is proposed under the DSP and DSP-V scenarios.

As specified in the Recology Master Plan, expanded Recology facilities would include renewable energy production, including biogas production for fleet vehicular and building heating use, installation of photovoltaics for building electrical use, solar water heating, and cogeneration system sized for larger heat demands. Overall, these facilities are projected to generate 75,000,000 kWh per year of renewable energy from a combination of biogas capture and use, solar PV, and solar hot water (Arup, 2011). These technologies are expected to generate the equivalent of approximately 27.6 million kWh of energy over and above onsite demand, which would be available for export. Small wind turbines would also be employed for renewable energy generation but are not included in the calculation of total renewable energy production.

Natural Gas Consumption

Based on the analysis conducted for Section 4.F, *Greenhouse Gas Emissions*, of this EIR, estimated natural gas loads for the DSP and DSP-V scenarios are 189,629 million Btu[6] and 183,685 million Btu, respectively. Natural gas loads required under the CPP and CPP-V scenarios (72,356 million Btu and 73,496 million Btu, respectively) would be lower than those required under the DSP and DSP-V scenarios. By comparison, existing natural gas use within the Project Site is 10,002.5 million Btu annually. Thus, Project Site development would result in a substantial increase in existing natural gas consumption. Estimates of natural gas use are based on compliance with Title 24 standards. While the Project Site development-related increase would represent a substantial increase in natural gas consumption by uses within the Project Site, on a per-square-foot basis, Project Site development would consume natural gas at a rate similar to other developments throughout the state that comply with Title 24 requirements only.

The threshold for this impact also considers whether Project Site development's energy consumption would be wasteful. To reduce natural gas consumption rates, and ensure that wasteful use of natural gas is avoided, Mitigation Measure 4.P-2a requires Project Site development to

6 A British thermal unit (symbol Btu or sometimes BTU) is a traditional unit of energy, which is approximately equivalent to the amount of energy needed to heat 1 pound (0.454 kg) of water.

exceed the Title 24 energy efficiency standards effective as of the date of certification of this EIR by at least 20 percent.

Conclusion: All four Project Site development scenarios would result in a substantial increase in the consumption of electricity and natural gas within the Project Site, as described above. While Project Site development-related electrical consumption would be largely offset by renewable energy generation, the total increase in energy consumption would nevertheless remain substantial and is therefore considered to be significant, requiring mitigation for all four development scenarios.

As previously noted, Brisbane Municipal Code Section 15.80 specifies green building standards for new developments, including meeting a minimum Leadership in Energy and Environmental Design (LEED) "Silver" rating on the Green Building Project Checklist for all new commercial projects over 10,000 square feet and achieving a "green home" rating on the MultiFamily GreenPoint Checklist[7] for any residential developments with 20 or more units. Additional mitigation measures are as follows.

Mitigation

Mitigation Measure 4.P-2a: All new buildings within the Project Site subject to the provisions of Brisbane Municipal Code Section 15.80 shall be required to achieve a LEED Gold rating, rather than the LEED Silver rating now required by the Municipal Code. In addition, all appliances installed within the Project Site as part of original building construction shall be ENERGY STAR rated or equivalent.

Mitigation Measure Applicability by Scenario			
DSP	**DSP-V**	**CPP**	**CPP-V**
✓	✓	✓	✓

✓ = measure applies
- = measure does not apply

Mitigation Measure 4.P-2b: All street and parking lot lighting within the Project Site shall be energy efficient light emitting diode (LED) based lighting.

Mitigation Measure 4.P-2c: Should the CPP scenario be selected, Project Site development shall provide for an equivalent amount of onsite renewable energy generation as the DSP scenario (42,000 to 45,000 megawatt hours). Should the CPP-V scenario be selected, Project Site development shall provide for an equivalent amount of onsite renewable energy generation as the DSP scenario (42,000 to 45,000 megawatt hours) in addition to the renewable energy generation proposed as part of the Recology expansion.

Conclusion with Mitigation: A number of Project Site development features and EIR mitigation measures will reduce the significant increase in energy consumption to a less-than-significant level. Each of the proposed development scenarios include development of alternative energy-generating technologies on the Project Site and implementation of energy-saving design and building techniques, which would offset energy use. Among these are the green building standards for new developments contained in the Brisbane Municipal Code, which include

[7] Build It Green, a nonprofit organization, has developed New Home Construction Green Building Guidelines and a MultiFamily GreenPoint Checklist, based upon the Multi-Family Green Building Guidelines established by the Alameda County Waste Management Authority. See Section 15.80.020 of the Brisbane Municipal Code for more information.

meeting a minimum (LEED) "Silver" rating on all new commercial projects over 10,000 square feet and achieving a "green home" rating on the MultiFamily GreenPoint Checklist for any residential developments with 20 or more units.

Project Site development would result in a substantial increase in electrical use within the Project Site because the site is large and is currently largely unoccupied. However, on a per-square-foot-of-building basis, development of the Project Site would result in 56.6 to 80.8 percent less electrical consumption than would comparable development projects that comply with the requirements of Title 24 but do not provide for onsite electrical energy generation.

In addition, inefficient, wasteful, and unnecessary consumption of energy would avoided or reduced with implementation of **Mitigation Measure 4.F-1** (see Section 4.F, *Greenhouse Gas Emissions*), which sets energy efficiency performance standards. In addition, **Mitigation Measures 4.P-2a through 4.P-2c** would further reduce energy use by ongoing operations of Project Site uses. For these reasons, with mitigation, Project Site development's impact with respect to fuel use would be less than significant.

Impact 4.P-3: Would vehicle trips associated with Project Site development use fuel in a wasteful manner?

Impact Significance by Scenario (before Mitigation)			
DSP	**DSP-V**	**CPP**	**CPP-V**
SM	SM	SM	SM

SU = Significant Unavoidable
SM = Significant but Mitigable
LTS = Less than Significant
- = no impact

DSP, DSP-V, CPP, and CPP-V

All of the proposed development scenarios would result in a substantial increase in fuel use associated with vehicle trips to, from, and within the Project Site. **Table 4.P-2** below shows projected fuel use under each of the development scenarios. Based on the URBEMIS model runs conducted to estimate baseline and Project Site development-related air pollutant emissions, it is assumed that 1.2 percent of the proposed offsite vehicle use would be diesel fuel-based and 98.8 percent would be gasoline-based. As shown in Table 4.P-2, the CPP scenario would result in the greatest increase in fuel use over existing conditions.

TABLE 4.P-2
ESTIMATED FUEL USE FOR THE DSP, DSP-V, CPP, AND CPP-V SCENARIOS

Development Scenario	Fuel Use (gallons per year)					
	Diesel			Gasoline		
	Existing	Proposed	Increase over Existing	Existing	Proposed	Increase over Existing
DSP	3,309	47,273	43,964	222,514	4,526,019	4,303,505
DSP-V	3,309	45,000	41,691	222,514	4,308,455	4,085,941
CPP	3,309	80,916	77,607	222,514	7,747,119	7,524,605
CPP-V	3,309	77,260	73,951	222,514	7,397,059	7,174,545

SOURCE: ESA, 2012.

The use of fuels from Project Site development-related vehicular traffic would increase substantially under each Project Site development scenario. As shown in Table 4.P-2, the CPP and CPP-V scenarios would consume substantially more fuel than the DSP and DSP-V scenarios. As discussed in Section 4.F, *Greenhouse Gas Emissions*, the CPP and CPP-V scenarios would produce between 14 and 25 percent more GHG emissions than the DSP and DSP-V scenarios and would result in significant unavoidable greenhouse gas emissions impacts, primarily as the result of generating more vehicle trips and vehicle miles traveled than the DSP and DSP-V scenarios.

To reduce fuel use, each of the four Project Site development scenarios includes a number of transit, bicycle, and pedestrian improvements that would encourage alternative modes of travel, along with implementation of a Transportation Demand Management (TDM) program to further reduce the number of vehicle trips. (See Chapter 3, *Project Description*, and Section 4.N, *Traffic and Circulation*, for a discussion of these features.) The overall result of the CPP and CPP-V scenarios would be a significant unavoidable greenhouse gas emissions impacts (see Section 4.F, *Greenhouse Gas Emissions*), largely resulting from increased vehicular fuel consumption over a substantially larger number of vehicle miles traveled than the DSP and DSP-V scenarios, which were determined to have less-than-significant greenhouse gas emissions impacts. In the CPP-V scenario, the proposed Recology expansion would produce biogas fuels as a by-product of its operations that would be used to fuel the Recology truck fleet and would also produce excess energy that could be exported for use outside the Project Site.

Conclusion: Project Site development would result in a substantial increase in fuel use for each of the four proposed development scenarios. Inefficient, wasteful, and unnecessary consumption of fuel would be avoided or reduced with implementation of the following mitigation measures to help minimize fuel use associated with Project Site development-related trips: **Mitigation Measure 4.B-4** (see Section 4.B, *Air Quality*), which imposes operational emission controls; **Mitigation Measures 4.N-1f and 4.N-13** (see Section 4.N, *Traffic and Circulation*)**,** which require preparation of a Transportation Demand Management program; **Mitigation Measure 4.N-7** (see Section 4.N, *Traffic and Circulation)***,** which requires the provision of bus service to and from proposed land uses; and **Mitigation Measure 4.N-11** (see Section 4.N, *Traffic and Circulation*), which requires the provision of bicycle parking onsite.

With these mitigation measures, Project Site development's impact with respect to fuel use would be less than significant.

Overall Conclusion

Development of the Project Site would result in a substantial increase in energy use under each of the four proposed development scenarios. However, each of the proposed development scenarios would include development of alternative energy-generating technologies on the Project Site and implementation of energy-saving design and building techniques, which would offset energy use. In addition, a number of Project Site development features and EIR mitigation measures would reduce fuel use related to ongoing operations of Project Site uses, including implementation of a Transportation Demand Management program; requirements for the provision of bus service to and from proposed land uses; and requirements for the provision of bicycle trails and parking within the Project Site.

For these reasons, Project Site development's impact with respect to energy would be less than significant.

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