9. ENERGY

This EIR chapter describes the potential impacts of the Middle Green Valley Specific Plan on energy resources.

9.1 SETTING

Energy sources used in Solano County include (1) electricity generated by power plants, wind facilities, solar facilities, and dams and hydroelectric facilities; (2) fossil fuels provided by natural gas resources and petroleum refining; (3) geothermal resources; and (4) alternative energy and renewable energy resources.[1] The following sections further describe these sources:

9.1.1 Electricity

Pacific Gas and Electric Company (PG&E) supplies electricity to Solano County users. The county also includes major transmission line corridors serving the greater Bay Area. Three fossil-fueled power plants--the Potrero Power Plant, the Pittsburg Power Plant, and the Contra Costa Power Plant--are located in nearby San Francisco and Contra Costa counties. The Potrero Power Plant borders Solano County to the south. Additionally, a significant percentage of California's electricity supply comes from the in-state Diablo Canyon and San Onofre nuclear power plants. Solano County does not contain a nuclear power plant.

The Monticello Dam Power Plant, built in 1983, is located at the base of Monticello Dam at Lake Berryessa. The power plant has three generators with a combined capacity of 11,500 kilowatts. The electrical power is sent mostly to the North Bay area. The Solano Irrigation District (SID) owns and operates the hydroelectric power plant at Monticello Dam.

Solano County is also a significant wind energy resource area. According to the California Energy Commission (CEC), Solano County wind energy resources contribute six percent of all new wind development in California. As of 2003, approximately 700 wind turbines were located in Solano County.

The County has designated specific areas with notable wind energy resources including areas in the Specific Plan area vicinity (the Cordelia Hills between Suisun Marsh and the Napa Valley). The County has noted that the Cordelia Hills contain several ridges that are valuable for wind energy production and have a small number of wind turbine developments.

Because of favorable climatic conditions in Solano County, large-scale use of solar energy also represents a potentially significant energy resource. The county contains some commercial-scale solar developments, including the County Government Center.

[1] EDAW, Solano County Draft General Plan Draft Environmental Impact Report, April 18, 2008, pages 4.12-1 through 4.12-6; and EDAW, Solano County General Plan Update Energy Background Report, August 31, 2006, pages 3-5 through 3-14.

9.1.2 Fossil Fuels

PG&E supplies natural gas in Solano County. Essentially all of the county's transportation fuels are imported. Fuel operations in the county involve petroleum refining rather than production.

Fossil fuels are also both extracted and refined in Solano County. Substantial natural gas resources exist in the southern portion of the county near the San Francisco Bay/Sacramento–San Joaquin Delta area.

9.1.3 Geothermal Resources

Geothermal power uses heat from below the earth's surface to produce electricity or heat buildings and water systems. It is not known whether significant geothermal resources exist in Solano County.

Surveys conducted by state and federal geologic agencies do not indicate that Solano County possesses large amounts of high-temperature resources, but the potential for significant new geothermal resource areas in and near Solano County capable of generating electric power does exist. Solano County contains three geothermal springs located in the western portion of the county outside the Specific Plan area. These springs--the Vallejo White Sulfur Springs, Tolenas Springs, and an unnamed spring--all produce low-temperature geothermal resources.

9.1.4 Alternative Energy and Renewable Energy Resources

Energy transformation projects (also known as resource recovery projects or "waste-to-energy" development) convert agricultural and municipal wastes, respectively, to fuel or electricity. The primary purpose of most "transformation projects" is to dispose of wastes, with the associated energy produced sometimes representing a useful byproduct to offset disposal costs. In particular, landfill gas recovery systems and methane fermentation projects both produce methane gas, which can be burned in a gas turbine to generate electricity. Methane gas can be recovered from landfills and sewage treatment plants and converted to electricity.

Solano County produces large volumes of agricultural waste, much of which is disposed of by open burning. Transformation plants represent a potential alternative method of disposing of these wastes. Direct combustion projects, where agricultural refuse or municipal solid waste is burned to generate electricity, have greater environmental impacts and are usually more controversial than methane-producing projects.

9.2 PERTINENT PLANS AND POLICIES

9.2.1 Federal Regulations[1]

(a) National Energy Conservation Policy Act (NECPA). NECPA (Public Law 95-619) is a U.S. statute signed into law in 1978 as part of the National Energy Act. NECPA requires utilities to provide residential consumers with energy conservation audits and other services to encourage

[1]EDAW, Solano County Draft General Plan Draft Environmental Impact Report, April 18, 2008, pages 4.12-8 through 4.12-9; and EDAW, Solano County General Plan Update Energy Background Report, August 31, 2006, pages 3-1 through 3-2.

slower growth of electricity demand. NECPA was amended in 1985 by the Energy Policy and Conservation Act Amendments of 1985 (Public Law 99-58).

(b) Tax Credit for Wind-Generated Electricity. Beginning in the late 1990s, Congress introduced a tax subsidy on the production of renewable wind-generated electricity. The availability, expiration, and potential extension of the Production Tax Credit cause the boom and bust production of energy that typifies wind development in the United States. The Production Tax Credit's limitations have determined the role of the wind energy industry in the United States and contributed to the dominance of electric utility subsidies.

(c) Energy Star Program. Energy Star is a joint program of the United States Environmental Protection Agency and the Department of Energy. The program establishes criteria for energy efficiency for household products and labels energy efficient products with the Energy Star seal. Homes can be qualified as Energy Star homes as well if they meet efficiency standards. In California, Energy Star homes must use at least 15 percent less energy than the Title 24 regulations (see subsection 9.2.2(c) below), pass the California Energy Star Homes Quality Insulation Installation Thermal Bypass Checklist Procedures, have Energy Star windows, and have minimal duct leakage.[1]

9.2.2 State Agencies and Regulations[2]

(a) Relevant State Agencies. State agencies with pertinent energy-related responsibilities include the California Energy Commission, California Public Utilities Commission, and California Power Authority.

(1) California Energy Commission. Established in 1974 by the Warren-Alquist Act (Public Resources Code Section 25000 et seq.), the California Energy Commission (CEC) is the state's primary energy policy and planning agency. The commission has five major responsibilities: forecasting future energy needs and keeping historical energy data, licensing thermal power plants of 50 megawatts or larger, promoting energy efficiency through appliance and building standards, developing energy technologies and supporting renewable energy, and planning for and directing the state response to an energy emergency.

(2) California Public Utilities Commission. The California Public Utilities Commission (CPUC) has authority to set electric rates, regulate natural gas utility service, protect consumers, promote energy efficiency, and ensure electric system reliability.

(b) Renewable Energy Targets. California's Renewable Portfolio Standard (RPS), established in 2002 by Senate Bill (SB) 1078 (Chapter 516, Statutes of 2002), requires electricity providers to procure an annual increase of at least 1 percent of their electricity supplies from renewable resources so as to achieve a 20-percent renewable mix by no later than 2017. More recently, the CEC, the CPUC, and the California Power Authority (CPA) approved the *Energy Action Plan*, accelerating the 20 percent target date to 2010.

[1]Solano County, Solano County General Plan, December 2008, page RS-55.

[2]EDAW, Solano County Draft General Plan Draft Environmental Impact Report, April 18, 2008, pages 4.12-9 through 4.12-10; and EDAW, Solano County General Plan Update Energy Background Report, August 31, 2006, page 3-3.

(c) Energy Efficiency Standards (Title 24). The Energy Efficiency Standards for Residential and Nonresidential Buildings (Title 24, Part 6, of the California Code of Regulations) were established in 1978 as part of the California Building Standards Code in response to a legislative mandate to reduce California's energy consumption. The standards are updated regularly. Title 24 standards require that new construction include a variety of energy conservation measures such as ceiling, wall, and concrete slab insulation; vapor barriers; weather-stripping on doors and windows; closeable doors on fireplaces; insulated heating and cooling ducts; water heater insulation blankets; and certified energy-efficient appliances.[1]

9.2.3 Solano County General Plan

The Land Use, Resources, and Public Facilities and Services chapters of the Solano County General Plan contain the following policies and implementation programs relevant to consideration of the proposed Specific Plan and its potential energy impacts:

- *Allow solar energy generation projects in open space areas where consistent with other uses and values.* (Policy LU.P-40)
- *Ensure energy conservation and reduced energy demand in the county through required use of energy-efficient technology and practices.* (Policy RS.P-49)
- *Provide incentives for city and county residents and businesses to produce and use renewable sources of energy.* (Policy RS.P-50)
- *Promote Solano County as a model for energy efficiency and green building.* (Policy RS.P-51)
- *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.* (Policy RS.P-53)
- *Reduce Solano County's reliance on fossil fuels for transportation and other energy-consuming activities.* (Policy RS.P-54)
- *Encourage on-site renewable energy production and use and energy conservation measures.* (Policy RS.P-59)
- *Require all new and remodeled residential, commercial, industrial, institutional, and civic construction to exceed current (2008) Title 24 state energy-efficiency requirements by at least 20 percent, and require that all new residential homes and major renovations comply with the guidelines for the California Energy Star Homes Program. If the state increases the requirements of Title 24, examine the feasibility of increasing County energy efficiency requirements. Adopt an energy efficiency ordinance that requires upgrades as a condition of issuing permits for substantial remodels or additions. Require disclosure of the energy consumption of a home during the sale or lease of a residence or building.* (Implementation Program RS.I-38)

[1] http://www.energy.ca.gov/title24, viewed on March 17, 2009.

- *Require residential development of more than six units to participate in the California Energy Commission's New Solar Homes Partnership and to construct LEED-certified units or meet equivalent performance standards. For new affordable housing projects, performance standards shall be established pursuant to the requirements of the funding source(s). Require new construction or major renovation of commercial and industrial buildings over 10,000 square feet in size to incorporate renewable energy generation to provide the maximum feasible amount of the project's energy needs. Commercial buildings shall incorporate renewable energy generation to provide at least 20 percent of the project's needs.* (Implementation Program RS.I-46)

- *Require the use of Energy Star rated appliances and the most energy-efficient Energy Star rated water heaters and air conditioning systems that are feasible in the construction of new homes, in all substantial remodels when appliances are being replaced, and in any case where a permit is needed to install or replace appliances (e.g., water heaters, air conditioning).* (Implementation Program RS.I-47)

- *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 oxidation catalyst and diesel particulate filters verified by the California Air Resources Board.* (Implementation Program RS.I-49)

- *Require that development projects use landscaping and site design techniques that minimize energy use. These may include designing landscaping to shield or expose structures to maximize energy conservation or acquisition; and taking advantage of orientation, sun-shade patterns, prevailing winds, landscaping, and sunscreens. Amend development standards to require such techniques.* (Implementation Program RS.I-52)

- *Require the design and orientation of all buildings to maximize passive solar heating during cool seasons, avoid solar heat gain during hot periods, enhance natural ventilation, and promote effective use of daylight. Orientation should optimize opportunities for on-site solar generation.* (Implementation Program RS.I-55)

- *Where feasible, include appropriate facilities in new buildings to support the use of low/zero carbon fueled vehicles. This may include charging stations for electric vehicles which use green electricity sources.* (Implementation Program RS.I-56)

- *Investigate the feasibility of using solar (photovoltaic) streetlights instead of conventional streetlights.* (Implementation Program RS.I-57)

- *Increase efficiency of water, wastewater, stormwater, and energy use through integrated and cost-effective design and technology standards for new development and redevelopment.* (Policy PF.P-3)

- *Promote technologies that allow the use and reuse of solid waste, including biomass or biofuel as an alternative energy source.* (Policy PF.P-28)

In addition, the Housing Element of the General Plan contains the following relevant objective and policies:

- *Promote energy conservation in new and existing residential units.* (Objective I)

- *The County shall encourage the use of siting, construction and landscaping of structures to minimize energy consumption in housing.* (Policy I.1)

9.2.4 Leadership in Energy and Environmental Design (LEED) Program

Leadership in Energy and Environmental Design (LEED) is a program of the United States Green Building Council, a non-profit organization. LEED is a third-party certification program and the nationally accepted benchmark for the design, construction and operation of high-performance "green" buildings. Buildings are "LEED certified" based on criteria for energy efficiency, environmental design, indoor environmental quality, water savings, and materials selection.[1] County General Plan Implementation Program RS.I-46 calls for requiring development of more than six residential units in the county to construct LEED-certified units or meet equivalent performance standards (see section 9.2.3, Solano County General Plan, above).

9.3 IMPACTS AND MITIGATION MEASURES

9.3.1 Significance Criteria

Based on Appendix F of the CEQA Guidelines, the proposed Specific Plan would be considered to have a significant energy impact if it would:

(a) develop land uses and patterns causing wasteful, inefficient, and unnecessary consumption of energy or construct new or retrofitted buildings that would have excessive energy requirements for daily operation; or

(b) result in the need for new systems or substantial alterations to electrical, natural gas, or communication systems infrastructure.

9.3.2 Relevant Project Characteristics

The Specific Plan proposes that development within the plan area be subject to the following guidelines for energy efficiency:[2]

- *All new and remodeled residential, commercial, industrial, institutional and civic construction is required to exceed current Title 24 state energy-efficiency requirements by at least 20 percent.*

- *All new residential homes and major renovations are required to meet or exceed the guidelines for the California Energy Star Homes Program…*

[1]Solano County, Solano County General Plan, December 2008, page RS-55; and http://www.usgbc.org, visited on March 17, 2009.

[2]Solano County, Middle Green Valley Specific Plan, Preliminary Draft, October 28, 2009, pages 5-57 through 5-58.

- *Residential development of more than 6 units shall participate in the California Energy Commission's New Solar Homes Partnership and construct LEED-certified units or meet equivalent performance standards.*

- *New construction or major renovation of commercial and industrial buildings over 10,000 square feet in size shall incorporate renewable energy generation to provide at least 20 percent of the project's needs.*

- *Incorporate on-site renewable energy production, including installation of photovoltaic cells or other solar options.*

- *Selecting a building's orientation, massing and fenestration design to maximize effective daylighting to reduce building energy requirements, without increasing glare and/or electric lighting loads that offset glare is required. The selection and extent of window glazing should vary, depending on the criteria required by the window's location, including solar heat gain, energy performance, daylighting, views and glare factors. Exterior sun controls (including porches, overhangs, trellises, balconies and shutters) may be integrated into the building's fenestration design to effectively admit and block sun penetration as required.*

For mechanical systems, the Specific Plan refers to the applicable LEED rating system and proposes the following principles that would either be required or strongly encouraged (as noted) in development within the plan area: [1]

- *All roofs shall incorporate 500-square-foot minimum of solar panels to reduce the reliance on energy. Solar panel systems are to be integrated into the roof system and roof materials applications to obscure visibility.*

- *A high level of individual occupant control for thermal, ventilation and lighting systems should be incorporated. Occupancy sensors and time clock controls should be incorporated into the building's mechanical design to reduce energy usage.*

- *Retaining a Commissioning Agent (a professional qualified to evaluate and certify that a building is designed, constructed and functions in accordance with the Owner's specified operational requirements) is encouraged. Owners may choose to have the Commissioning Agent produce a recommissioning manual for the building to assure it continues to meet established standards such as energy conservation and indoor air quality.*

For building envelopes, the Specific Plan proposes the following relevant principles: [2]

- *The building envelope (which defines the conditioned and unconditioned spaces in the house) should form a continuous insulated barrier and a continuous air barrier. The two barriers are usually formed by different materials. Standard insulation products, such as batt or loose fill products, do not seal against air leakage. For most homes, the sheet goods that form the decking, sheathing, and finish materials are the primary air barrier. Seal holes between materials with durable caulks, gaskets, and foam sealants.*

[1]Solano County, Middle Green Valley Specific Plan, Preliminary Draft, October 28, 2009, page 5-58.

[2]Solano County, Middle Green Valley Specific Plan, Preliminary Draft, October 28, 2009, pages 5-58 through 5-59.

- *Window area shall be less than 50 percent of the gross wall area and the skylight area shall be less than 5 percent of the gross roof area.*

- *The use of Energy Star rated windows is required.*

For indoor lighting and appliances, the Specific Plan proposes the following relevant principles: [1]

- *It is required that all homes utilize ENERGY STAR® rated appliances and the most energy-efficient Energy Star rated water heater and air conditioning systems that are feasible, including but not limited to dishwashers, refrigerators, ceiling fans and washing machines.*

- *It is intended that all homes utilize natural gas for clothes dryers, cooking stoves, heating, central air furnaces, water heaters and/or boilers.*

- *Specifying ENERGY STAR® light fixtures that use less energy and produce less heat than traditional incandescent light fixtures is encouraged. A broad range of choices and styles are available through many lighting manufactures, which can be found at www.energystar.gov.*

- *Use of compact fluorescent bulbs in recessed can lights is encouraged.*

9.3.3 Impacts and Mitigation Measures

Potential for Inefficient Energy Consumption. The land use patterns and energy efficiency guidelines proposed by the Specific Plan would promote compact development and reduce potential energy demands of development within the plan area to levels substantially below demand levels associated with more conventional rural residential development. In particular, the Specific Plan incorporates development and design energy efficiency guidelines that reiterate and implement the following applicable Solano County General Plan energy conservation policies and implementation programs listed in section 9.2.3 (Solano County General Plan) above: Policies RS.P-51, 54, and 59; related Implementation Programs RS.I-38, 46, 52 and 55; and Housing Element Objective 1 and Policy I.1. The Specific Plan therefore would not result in land uses and patterns that would cause wasteful, inefficient, and unnecessary consumption of energy, or buildings that would have excessive energy requirements. Project energy consumption impacts would therefore be ***less-than-significant*** (see criterion [a] under section 9.3.1, "Significance Criteria," above).

Mitigation. No significant impact has been identified; no mitigation is required.

Need for New or Altered Energy Infrastructure. Energy usage and demand would increase as a result of future plan area development under the Specific Plan area. It is assumed that internal combustion automobile travel would continue to be the predominant travel mode of choice into the near future. As described in subsection 9.3.2 above, the Specific Plan contains guidelines for incorporating energy efficiency features and onsite renewable energy production into future plan area development. Beyond local development area energy infrastructure extension needs, Specific Plan buildout would not be expected to result in the need for substantial new energy systems or any substantial alterations to existing electrical, natural gas,

[1] Solano County, Middle Green Valley Specific Plan, Preliminary Draft, October 28, 2009, page 5-59.

or communications systems; nor would project buildout physically affect or require alteration to known existing major electrical, natural gas or communications systems in the area. Project effects on new energy systems needs and on existing energy infrastructure would therefore be ***less-than-significant*** (see criterion [b] under section 9.3.1, "Significance Criteria," above).

Mitigation. No significant impact has been identified; no mitigation is required.