3.14 UTILITIES

This section describes the existing physical and regulatory setting related to water supply, wastewater, electricity, and natural gas utilities and discusses the potential effects of the EIS Alternatives on these utilities.

3.14.1 Affected Environment

Water Supply

The existing SFVAMC Fort Miley Campus and the Mission Bay area are served by the San Francisco Public Utilities Commission (SFPUC), which is a department of the City and County of San Francisco. Approximately 96 percent of SFPUC's water supply is conveyed through the Regional Water System (RWS), which is made up of a combination of runoff into local Bay Area reservoirs and diversions from the Tuolumne River through the Hetch Hetchy Water and Power Project. A small portion of San Francisco's water demand is also met by locally produced groundwater and secondary-treated recycled water.

Regional Water System

SFPUC's RWS stretches from the Sierra Nevada to the Bay Area and serves approximately 2.5 million residential, commercial, and industrial customers in the Bay Area and the Sierra Nevada foothills (SFPUC, 2011a). Through the RWS's three integrated water supply and conveyance systems (Hetch Hetchy, Alameda, and Peninsula Systems), SFPUC provides an average of approximately 265 million gallons per day (mgd) to users in Tuolumne, Alameda, Santa Clara, San Mateo, and San Francisco Counties (SFPUC, 2011b).

Most of the water supply for the RWS originates in the upper Tuolumne River watershed high in the Sierra Nevada. This water, referred to as Hetch Hetchy water, is transported in pipes and tunnels to the Bay Area, requiring only primary disinfection and pH adjustment to control pipeline corrosion. The RWS travels 160 miles via gravity from Yosemite to the Alameda East Portal at Sunol Valley. On average, the Hetch Hetchy Reservoir provides more than 85 percent of the water delivered to the Bay Area. During times of drought, the water received from the Hetch Hetchy system can amount to more than 93 percent of the total water delivered.

On average, Bay Area reservoirs (Calaveras, San Antonio, Crystal Springs, San Andreas, Stone Dam, and Pilarcitos Reservoirs) provide approximately 15 percent of the water delivered by SFPUC's RWS. Reservoir storage allows the system to carry over part of its water supply from year to year. The Alameda watershed, located in Alameda and Santa Clara Counties, collects surface water for storage in Calaveras and San Antonio Reservoirs. In addition, the Sunol Filter Galleries near the town of Sunol provide groundwater that contributes less than 1 percent of San Francisco's water supply. The Peninsula watershed in San Mateo County captures surface water for storage in lower and upper Crystal Springs and San Andreas Reservoirs, and in a smaller reservoir, Pilarcitos. The six reservoirs in Alameda, Santa Clara, and San Mateo Counties capture rain and local runoff and store some Hetch Hetchy water. All local water from the Alameda and Peninsula watersheds is treated and filtered before it is delivered. A small portion of retail demand is met by locally produced groundwater, which is used primarily for irrigation at local parks and on highway medians, and by recycled water, which is used for wastewater treatment process water, sewer box flushing, and similar washdown operations. SFPUC also retails groundwater (pumped from the Pleasanton well field) to the Castlewood development in Alameda County.

San Francisco's retail water supply is conveyed through the Peninsula System to San Francisco by several major pipelines. On the east side of the City's water distribution system, two pipelines terminate at University Mound near John McLaren Park. On the west side of the distribution system, two pipelines terminate at Sunset Reservoir and one terminates at Merced Manor Reservoir. Ten reservoirs and eight water tanks store the water, and 18 pump stations and approximately 1,250 miles of pipelines move water throughout the system and deliver water to homes, businesses, and institutions in San Francisco. SFPUC is engaged in a systemwide water system improvement plan (WSIP) to repair, replace, and seismically upgrade portions of the regional water system. The program, scheduled for completion in 2015, includes improvements to the system's aging pipelines, tunnels, dams, reservoirs, pump stations, and storage tanks.

Local Water Supply Sources

San Francisco is located atop all or part of seven groundwater basins: the Westside, Lobos, Marina, Downtown, Islais Valley, South, and Visitacion Valley Basins. The Lobos, Marina, Downtown, and South Basins are located wholly within the city limits, and the other three extend south into San Mateo County. The portion of the Westside Basin aquifer located within San Francisco is referred to as the North Westside Basin. All of the basins except the Westside and Lobos Basins are generally inadequate to supply a significant amount of groundwater for municipal supply because their yields are low. For the past several decades, groundwater has been pumped from wells located in Golden Gate Park and at the San Francisco Zoo within the North Westside Basin; based on flow meter data, approximately 1.5 mgd is produced by these wells (SFPUC, 2011b). The groundwater from the North Westside Basin is mostly used by the City's Recreation and Park Department for irrigation in Golden Gate Park and at the zoo. The California Department of Water Resources (DWR) has not identified the North Westside Basin as overdrafted, nor as projected to be overdrafted in the future (SFPUC, 2011b).

In addition to local water supply sources, local recycled water provides a small percentage of San Francisco's water. The Harding Park, Pacifica, and proposed Westside and Eastside recycled water projects are being developed in San Francisco (retail service area). The Harding Park and Pacifica projects are currently under construction, the proposed Westside recycled water project is in the preliminary design stage, and the proposed Eastside recycled water project is in the planning stage. Together, these projects will provide up to 6 mgd of recycled water to a variety of users in San Francisco, primarily for landscape irrigation and toilet flushing. Recycled water produced as part of these projects will undergo tertiary treatment, which will result in water quality sufficient to meet the needs and requirements associated with each end use (SFPUC, 2011b).

Water Supply Reliability Planning

The WSIP is a multiyear program to upgrade SFPUC's RWS and local water systems. The WSIP will implement capital improvements that promote SFPUC's ability to provide reliable, affordable, high-quality drinking water to its regional retail customers in Alameda, Santa Clara, and San Mateo Counties, as well as San Francisco customers, in an environmentally sustainable manner. The WSIP is structured to cost-effectively meet water quality requirements, improve seismic and delivery reliability goals through the year 2030, and meet water supply objectives until the year 2018 (SFPUC, 2010).

The California Urban Water Management Act of 1983 (Water Code Sections 10610–10657) requires that all urban water suppliers providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually prepare an urban water management plan (UWMP). These plans were first submitted to DWR in 1985; updated plans must be submitted to DWR every 5 years. In June 2011, SFPUC adopted the most recent UWMP for the City and County of San Francisco. The UWMP forecasts a slight increase in residential water demand as a result of San Francisco's estimated 0.4 percent average growth rate per year through 2035 (SFPUC, 2011b). The demand is expected to be offset by increased efficiency (e.g., more efficient plumbing in newer and remodeled housing). As population grows, so does the demand for health care. The UWMP forecasts increased water usage for "services," which include health care (SFPUC, 2011b).

Water Demand

From 2007 to 2010, San Francisco customers used an average of 68 mgd of water. A little more than half the city's water use is residential, the majority for multifamily residences. Nonresidential users, which include the manufacturing, transportation, trade, finance, and government sectors, represent about 29 percent of consumption. The remainder is "unaccounted-for water," which refers to unmetered water uses such as pipe flushing and street cleaning, as well as meter inaccuracies and system water losses. In 2009–2010, San Francisco's gross per-capita use, including all residential, commercial, and municipal users, was less than 80 gallons per capita per day. In the same year, residential per-capita use was estimated to be approximately 50 gallons per capita per day.

SFPUC provides water to the existing SFVAMC Fort Miley Campus. The water system infrastructure supporting the Campus, which transports the Campus's potable water as well as water for the Campus's fire suppression system, was originally constructed in 1934; however, several building additions and expansions, which also included expansions of the original water distribution system, have been completed since that time. The system distributes water throughout the Campus via a loop system. The system consists of the following components:

- One 500,000-gallon reservoir located in Building 29, on the southwestern part of the Campus
- Three pumps, including a primary pump (P-1), a secondary pump (P-2), and a fire pump (P-3) located in Building 30 (pump station), adjacent to Building 29 on the southwestern part of the Campus
- One 40,000-gallon water tower, termed Structure 206, on the northwestern part of the Campus

The reservoir is fed from the City's water distribution system through primary and secondary connection points located on Clement Street. From the reservoir, the primary and secondary pumps (P-1 and P-2) pressurize the existing SFVAMC Fort Miley Campus's loop water system and feed the water tower. The water tower maintains system pressure when the pumps are not running.

Between 2004 and 2011,[1] the existing SFVAMC Fort Miley Campus had an average water demand of approximately 46.6 million gallons per year, or approximately 0.13 mgd.

[1] Water demand for 2011 was projected to be approximately 48.1 million gallons per year.

Wastewater and Stormwater

SFPUC oversees San Francisco's wastewater collection and conveyance infrastructure. This infrastructure consists of a combined sewer system for both sewage and stormwater that collects, conveys, treats, and discharges the water. The system uses natural watershed areas wherever possible to take advantage of gravity flow for the collection, transport, treatment, and discharge of wastewater and stormwater. The conveyance infrastructure consists of approximately 24,800 manholes, 25,000 catch basins, 19 small lift stations, and more than 976 miles of sewers ranging from 8 inches in diameter to large multicompartmental structures measuring up to 44 feet by 25 feet (SFPUC, 2010). The wastewater and stormwater that flow to facilities for treatment are ultimately discharged into San Francisco Bay or the Pacific Ocean through outfall structures along the shoreline (SFPUC, 2009).

San Francisco is divided into two major drainage areas, Oceanside and Bayside. The City operates three wastewater treatment facilities: The Southeast Water Pollution Control Plant (SEP), Oceanside Water Pollution Control Plant (OSP), and North Point Wet Weather Treatment Facility. The SEP and OSP both operate year-round, while the North Point Water Pollution Control Facility operates only during wet weather.

The SEP, built in 1952 and expanded between 1977 and 1982, is located on the east side of San Francisco near Third Street and Evans Avenue in the Bayview District. The plant treats all eastside sewage flows, including flows in the Mission Bay area, during dry weather; the SEP treats an average dry-weather flow of 67 mgd. The SEP can treat up to 250 mgd during wet weather (i.e., primary treatment capacity of 250 mgd and secondary treatment capacity of 150 mgd). The SEP would treat flows from the potential new SFVAMC Mission Bay Campus.

The OSP, the City's newest treatment facility, was completed in 1993. This facility, located off the Great Highway near the San Francisco Zoo, serves the city's west side, including the existing SFVAMC Fort Miley Campus. The OSP treats an average dry-weather flow of approximately 17 mgd and can treat up to 65 mgd during wet weather (i.e., primary treatment capacity of 65 mgd and secondary treatment capacity of 43 mgd). The plant provides primary- and secondary-level treatment before discharging treated effluent into the Pacific Ocean through the 4.5-mile Southwest Ocean Outfall (SFPUC, 2009).

The North Point Water Pollution Control Plant has operated since 1951. This facility is located on Bay Street and the Embarcadero near lower Telegraph Hill and the North Waterfront area. The plant operates only during rain events, providing primary treatment to combined flows collected during storms, and has a treatment capacity of 150 mgd. On average, the facility operates 30 times per year.

SFPUC's sewer system discharges treated wastewater through two outfall pipes, one to San Francisco Bay and the other to the Pacific Ocean. The average dry-weather flow is approximately 80 mgd. During wet weather, the system can treat up to 575 mgd of combined stormwater and wastewater (SFPUC, 2014).

SFPUC is evaluating the potential implementation of a sewer system improvement program to address issues of aging infrastructure and system deficiencies related to climate change, and to improve operational efficiency and reduce community impacts.

The existing wastewater system serving the SFVAMC Fort Miley Campus is a combined system that collects both wastewater from the buildings and stormwater. Stormwater runoff is collected from parking lots, streets, pedestrian walkways, landscaped areas, and building roofs. It is then concentrated in gutters and drain pipes and conveyed to SFPUC's combined sewer interceptor on Clement Street. A small separate storm drainage system conveys stormwater off-site on the north side of the Campus along the slope facing the Golden Gate Bridge. This system is described further in Section 3.18, "Hydrology and Water Quality."

It is estimated that 78 percent of total domestic water used by SFVAMC ends up as wastewater (SFVAMC, 2012). Therefore, on average, the existing SFVMAMC Fort Miley Campus would generate an estimated average of approximately 36.3 million gallons of wastewater per year, or approximately 0.10 mgd.

Electricity and Natural Gas

Pacific Gas and Electric Company (PG&E), which is regulated by the California Public Utilities Commission (CPUC), provides electricity and natural gas to approximately 15 million people throughout a 70,000-square-mile service area in northern and central California, including the existing SFVAMC Fort Miley Campus and the Mission Bay area (PG&E, 2011). Electricity to the Mission Bay area is served by the Potrero and Embarcadero Substations. Specific information about electric and natural gas service is provided below.

Electricity

Approximately 5.1 million customers receive electricity through 141,215 circuit miles of electric distribution lines and 18,616 circuit miles of interconnected transmission lines. PG&E produces its power from a mixture of sources, including hydropower, gas-fired steam, and nuclear energy, and acquires electricity from more than 400 plants owned by independent power producers and some out-of-state power producers.

San Francisco uses approximately 5,000 gigawatt-hours of electricity per year, with peak usage (the highest hourly demand) at approximately 0.9 gigawatt. Hospital and health care uses account for approximately 3 percent. Office uses represent the largest category of electricity consumption at approximately 36 percent. Citywide, total yearly electricity consumption grew by 9 percent between 1994 and 2000 but decreased by approximately 2.4 percent by 2001 (the last year for which annual data were available).

The 2002 Electricity Resource Plan (2002 ERP) prepared by SFPUC and the San Francisco Department of the Environment discusses electricity sources and projected citywide demand to identify a plan for meeting the City's goal of having a greenhouse gas–free electrical system by 2030. The 2011 Update of San Francisco's 2002 ERP describes the next steps to achieving this goal and summarizes the progress made thus far.

The primary goal of the 2002 ERP, closing down the Hunters Point and Potrero Power Plants, has been achieved; these power plants were closed in May 2006 and February 2011, respectively. In 2002, all electric transmission lines serving San Francisco ran up the Peninsula, creating transmission constraints that required these two power plants to remain in operation to maintain reliable electrical service (SFPUC, 2011c). The 2002 ERP provided the framework for the City to identify transmission upgrades that, once completed, allowed for the 2006 shutdown of the Hunters Point Power Plant. The Potrero Power Plant was shut down after the TransBay Cable began commercial operation. The TransBay Cable is a 53-mile, high-voltage direct-current transmission line that runs underneath San Francisco Bay and increases the ability to deliver power into San Francisco by 400 megawatts

(MW). The 2002 ERP proposed that SFPUC construct 200 MW of new in-city generation (known as the San Francisco Energy Reliability Project); however, the TransBay Cable project along with other transmission system improvements was identified as an alternative approach to closing the Potrero Power Plant while maintaining reliability. The new investment in transmission infrastructure, along with in-City demand reduction and supply resources, precludes the need to build a large-scale, central generation plant in the City in the foreseeable future (SFPUC, 2011c).

PG&E provides electric services to the existing SFVAMC Fort Miley Campus through the existing power distribution system, which consists of 15-kilovolt (kV) PG&E service cables, 15-kV metal-clad switchgear, 12 substations and load centers, various switchboards, panel boards, and motor control centers. From 2006 through 2011,[2] the Campus had an average electricity demand of approximately 22,144 megawatt-hours (MWh) per year.

The existing system is being upgraded through the Electrical Systems Upgrades Project. As part of this project, PG&E is upgrading an existing feeder line along Clement Street to convert the existing secondary service to the existing SFVAMC Fort Miley Campus to a low-level transmission service (Ketcherside, pers. comm., 2011). To make use of the increased loads, SFVAMC is replacing and upgrading the existing infrastructure to provide adequate and reliable power to the Campus, and to accommodate future building loads. Specifically, the existing underground 4.16-kV ring bus feeders will be replaced with new underground 15-kV double ring bus feeders, cable pull boxes, and feeder loop isolation switches around the Campus's perimeter. A total of 12 substation transformers and electrical distribution panels will provide power to the various buildings at 480-volts or 208/120-volts. Further, additional substation transformers and distributions can be installed to the 15-kV feeder loop to provide capacity for future load growth.

SFVAMC's electrical needs are also supported by an existing backup power system consisting of stationary engine generators, as well as one portable engine-generator:

- One 1,000-kilowatt (kW) engine-generator unit located in Building 203 serves the critical and life-safety loads for Buildings 200 and 203.
- Two 675-kW engine-generators located in Building 205 are connected to a paralleling switchgear that feeds all other critical loads on the existing SFVAMC Fort Miley Campus.
- One stand-alone 35-kW engine-generator is located in Building 17.
- One new 1,000-kW engine-generator has been installed in the existing paralleling switchgear located in Building 205.
- One portable trailer–mounted 1,000-kW engine-generator is available for use in the event of failure at any stationary unit.

The overall total capacity of the backup power system is 4.385 kW, more than 50 percent of the expected full future load, making the backup system's capacity adequate to support future critical and life-safety power needs.

[2] Electricity consumption for 2011 was projected to be approximately 23,338 megawatts.

In an effort to further help meet VA's requirements under the Energy Policy Act of 2005 (described below in Section 3.14.2, "Regulatory Framework") at the SFVAMC Fort Miley Campus, VA has proposed to install solar photovoltaic (PV) systems at five locations at the Campus: four locations on existing rooftops (Buildings 12, 200, 203, and 205) and one location on an existing parking structure (Building 209). This solar PV system has the potential to provide an annual electricity output of approximately 941.5 MWh, or about 4.4 percent of electricity usage at the SFVAMC Fort Miley Campus in 2012 (VA, 2012). The purpose of the project is to increase energy efficiency through the use of an on-site system for generating renewable electricity; reduce energy consumption costs and decrease reliance on off-site electricity supplies; and contribute toward the achievement of energy efficiency and greenhouse gas reduction goals established by VA and Executive Order 13514.

To date, a 255-kW solar PV system has been installed on top of Building 209, consisting of 1,022 Samsung modules integrated into a steel structure that was built on top of the existing parking structure. Electricity generated from this newly installed solar PV system was integrated into SFVAMC's electricity distribution system as of fall 2013. This solar PV system helps VA meet the overall goal of increased renewable energy use.

Natural Gas

Natural gas is delivered to PG&E's 4.3 million natural gas customers through approximately 42,141 miles of distribution pipeline and 6,438 miles of transportation pipelines from three major sources: California, the southwestern United States, and Canada. San Francisco's annual demand for natural gas is approximately 27 million metric British thermal units (MMBtu).

Natural gas is fed to the existing SFVAMC Fort Miley Campus through a single main gas line from PG&E. This line is a 4-inch-diameter high-pressure line that runs from the 4300 block of Clement Street onto the southwestern part of the Campus near Building 30. A pressure regulator at this location lowers the incoming pressure to 11 pounds per square inch for all of the Campus piping. A meter adjacent to the pressure regulator tracks the Campus's natural gas usage. Most of the Campus's natural gas service is firm gas with no automatic shut-off valves, with the exception of a 6-inch-diameter line that feeds into Building 205 (Energy Plant). This line is equipped with an earthquake valve (located at the southeast corner of the building), which will close when activated by an earthquake of a specific magnitude. The emergency natural gas shutoff valve is controlled by the energy plant operators. From 2006 through 2011,[3] the Campus had an average natural gas demand of approximately 131,000 MMBtu.

3.14.2 Regulatory Framework

Safe Drinking Water Act

Originally enacted in 1974, the Safe Drinking Water Act aimed to protect public health by regulating the nation's public drinking water supply. The law was amended in 1986 and 1996 and requires many actions to protect drinking water and its sources: rivers, lakes, reservoirs, springs, and groundwater wells. The Safe Drinking Water Act authorizes the U.S. Environmental Protection Agency (EPA) to set national health-based standards for drinking water to protect against both naturally occurring and human-made contaminants that may be found in

[3] The natural gas demand of the existing SFVAMC Fort Miley Campus in 2011 was projected to be approximately 123,000 cubic feet.

drinking water. Construction and operation of the EIS Alternatives may result in impacts on water sources and/or water distribution systems that provide public drinking water. Therefore, the EIS Alternatives are subject to the regulations set forth under the Safe Drinking Water Act.

Combined Sewer Overflow Control Policy

In 1994, EPA adopted the Combined Sewer Overflow (CSO) Control Policy (50 *Federal Register* 18688, April 11, 1994), which established a two-phase control program for communities with combined sewer systems. In the first phase of this program, communities receiving permits from EPA for their combined sewer systems must implement a series of nine technology-based controls designed to reduce the frequency of CSOs and limit their effects on receiving waters. In the second phase, permit recipients also must either:

- ensure that, on average, no more than four CSO events will occur per year;
- provide primary treatment (remove floatables and settleable solids) for at least 85 percent of the total discharge; or
- remove enough pollutants before they enter the sewer system to prevent degradation of receiving waters.

In 1997, San Francisco completed the improvements identified in the City's wastewater master plan, bringing the City into compliance with EPA's CSO Control Policy. These improvements consisted mainly of constructing storage culverts and installing discharge weirs (e.g., screens) and skimmers at all CSO outlets. The added storage reduced the frequency of CSOs, and the discharge facilities allow the City to provide at least primary treatment for 100 percent of its stormwater and wastewater discharges. Therefore, although the City averages approximately 10 CSOs each year, it is currently in compliance with the CSO Control Policy as a result of the removal of solids and the primary treatment provided. As a facility sited in San Francisco, SFVAMC would need to facilitate the City's compliance with the CSO Control Policy.

Department of Veteran Affairs Strategic Sustainability Performance Plan

The *Department of Veteran Affairs Strategic Sustainability Performance Plan* (VA SSPP) was prepared in response to a directive in Section 8 of Executive Order 13514, "Federal Leadership in Environmental, Energy, and Economic Performance." That directive requires federal agencies to "develop, implement, and annually update an integrated Strategic Sustainability Performance Plan that will prioritize agency actions" to meet sustainability objectives identified in statutes, regulations, and executive orders. The VA SSPP provides approaches to addressing sustainability goals for a variety of resource areas, including energy and water conservation and alternative fuels, for VA facilities. The EIS Alternatives would be subject to the performance goals and sustainability measures established in the VA SSPP because the Alternatives involve a VA facility operated by the Veterans Health Administration.

Energy Policy Act of 2005

The Energy Policy Act of 2005, signed by President George W. Bush on August 8, 2005, seeks to reduce reliance on nonrenewable energy resources, and provides incentives to reduce the current demand on these resources. For example, under the Energy Policy Act, consumers and businesses may obtain federal tax credits for purchasing fuel-efficient appliances and products. Driving fuel-efficient vehicles and installing energy-efficient appliances

can provide many benefits, such as lower energy bills, increased indoor comfort, and reduced air pollution; therefore, businesses are eligible for tax credits for buying hybrid vehicles, building energy-efficient buildings, and improving the energy efficiency of commercial buildings. Additionally, tax credits are given for installing qualified fuel cells, stationary microturbine power plants, and solar-powered equipment.

3.14.3 Environmental Consequences

Significance Criteria

A NEPA evaluation must consider the context and intensity of the environmental effects that would be caused by, or result from, the EIS Alternatives. Other environmental assessment documents were reviewed and the following criteria were selected for the evaluation.

An Alternative analyzed in this EIS is considered to result in an adverse impact related to utilities if it would:

- require or result in the construction of new electricity or natural gas generation or transmission facilities, the construction of which could cause significant environmental effects;
- require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects; or
- require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

For the purposes of this analysis, utility impacts are considered adverse if the construction of new or expanded utility infrastructure or facilities under an EIS Alternative would cause a significant effect.

Assessment Methodology

To assess potential impacts of the EIS Alternatives related to water, wastewater, electricity, and natural gas, SFVAMC's existing water, electricity, and natural gas infrastructure and demands were reviewed first. To evaluate the impacts of a particular EIS Alternative, projections were generated for these utilities based on the square footage of the proposed facilities. Current utility use was then compared to the projected future utility demands of each Alternative. Specifically, water use rates were based on the Commercial Buildings Energy Consumption Survey (CBECS): Energy Characteristics and Energy Consumed in Large Hospital Buildings in the United States in 2007 (US EIA, 2012). Electricity and natural gas consumption rates were based on consumption rates contained in the California Emissions Estimator Model (CalEEMod). The wastewater generation rate has been agreed upon between SFVAMC and SFPUC.

Alternative 1: SFVAMC Fort Miley Campus Buildout Alternative

Short-Term Projects

Construction

Alternative 1 short-term projects would involve the construction of 17 projects over 7 years, with completion anticipated by August 2020. These short-term projects would involve construction of 600,992 gross square feet (gsf) (384,452 gsf of which would be net new) at the existing SFVAMC Fort Miley Campus. Construction of Alternative 1 short-term projects would require the relocation of utility infrastructure in some cases, as well as a temporary increase in energy consumption and fuel use.

Existing utility systems would require alteration as necessary to support the new, expanded, and modified facilities at the SFVAMC Fort Miley Campus. New infrastructure may need to be installed or existing utility systems may require modification to provide service to new buildings. Unneeded utility infrastructure would be removed and/or abandoned.

Utility Service Systems

Construction of Alternative 1 short-term projects would involve the use of construction equipment and vehicles, which would temporarily increase energy consumption and fuel use for the duration of construction. Using this construction equipment, however, would not adversely affect the existing SFVAMC Fort Miley Campus's utility service systems, such as electricity or natural gas, because the construction equipment and vehicles would likely be fueled primarily off-site. Further, impacts of energy consumption by construction vehicles and equipment on utility service systems would be short term. Impacts would be minor.

Water Supply

Implementing Alternative 1 short-term projects would require improvements to the existing water distribution system at the SFVAMC Fort Miley Campus because of utility conflicts with proposed facilities and other site improvements. Improving the water system would involve removing and abandoning existing water mains within the footprints of proposed buildings and installing new water mains to provide potable water and fire suppression water to new buildings. Specifically, new domestic-water service connections would be established to provide potable water to the buildings, and new fire hydrants and fire sprinkler system services would be installed to meet National Fire Protection Association Fire Code requirements.

In addition, the existing 40,000-gallon water tower (Structure 206) would be relocated to the northwest corner of the SFVAMC Fort Miley Campus as part of Alternative 1 short-term projects, to make room for the proposed Building 40. The water tower receives water from the reservoir in Building 29 and then back-feeds the water distribution system when the pumps are not running; it provides backup water that can serve the SFVAMC Fort Miley Campus fully for at least 8 hours, if needed. The water tower is essential to proper functioning of the Campus's water system, to meet needs for both potable water and fire-suppression water. After being relocated, the water tower would continue to serve the Campus's water distribution needs, providing the same capacity and function as it currently serves at its existing location. Impacts would be minor.

Fire Suppression System

Several utility lines that serve the existing SFVAMC Fort Miley Campus are located within the footprint of the Alternative 1 short-term projects. These lines would be relocated as necessary before construction of the new short-term facilities to prevent service interruptions during construction. To accomplish this, project engineers would prepare and implement a plan to provide alternate service to these buildings before demolition and during construction. Domestic water, fire suppression water, and combined storm/sanitary sewer lines, underground electric, natural gas, and compressed air lines would require relocation.

In addition, the existing 40,000-gallon water tower (Structure 206) would be relocated as part of Alternative 1 short-term projects to make room for the proposed Building 40. Distribution lines for both potable water and fire-suppression water are connected to the water tower, which acts as backup supply for the SFVAMC Fort Miley Campus. The water tower would be relocated to the northwest corner of the SFVAMC Fort Miley Campus as part of Alternative 1 short-term projects and would continue to serve the Campus's water distribution needs. Project engineers would prepare and implement a plan to maintain water service to the Campus during relocation so that service would not be disrupted. Before relocation of the water tower, water to the tank would be shut off, the tank would be drained, and all power would be disconnected to remove the potential for flooding or electrical hazards.

A dedicated fire-water line for the facility's fire suppression system would be installed between the point of connection for the new facilities' fire water and the relocated water lines. A domestic-water line would also be installed between the point of connection for the new facilities' domestic water and the relocated water lines. Landscaping irrigation would be provided via existing irrigation systems or via new water feeds from existing water lines at the existing SFVAMC Fort Miley Campus. Because no interruption to the fire suppression system is anticipated and existing water supplies would be able to serve the projects' fire suppression system, no impacts would occur during construction of Alternative 1 short-term projects.

Operation

Operation of the existing SFVAMC Fort Miley Campus following the completion of construction would result in an increase in water demands, wastewater generation, and electricity and natural gas demands, as well as an increase of 4 percent (0.69 acre) in the Campus's overall impervious area.

Water Supply

From 2004 through 2011, the Campus had an average water demand of approximately 46.6 million gallons per year (0.13 mgd). Based on the average water consumption per square foot for large hospitals, as reported in the Commercial Buildings Energy Consumption Survey (CBECS): Energy Characteristics and Energy Consumed in Large Hospital Buildings in the United States in 2007 (US EIA, 2012), the Alternative 1 short-term projects would increase water demand by an estimated 10.3 million gallons per year (0.028 mgd).[4] Projected water demand would total 56.9 million gallons per year (0.156 mgd) through 2020.

[4] This value is based on an increase of 152,200 square feet as proposed as part of the short-term projects (not including new parking, as parking does not have an associated water demand) and a rate of 67.7 gallons/square foot/year.

These estimates assume that the current water consumption rate would continue and that no water conservation measures would be implemented. The VA SSPP, however, establishes water conservation goals for VA facilities that are to be achieved by 2020. Specifically, the VA SSPP states that VA facilities have a target to reduce the use of potable water by 26 percent[5] by 2020, as compared to the base year (2007); in addition, VA facilities have a target to reduce industrial and landscaping water use by 20 percent by 2020, as compared to the base year (2010). Therefore, implementing water conservation measures as part of Alternative 1 short-term projects and applying those measures to existing water usage to meet the maximum reduction targets specified in the VA SSPP would result in an estimated water demand total of 45.5 million gallons per year (0.125 mgd).

Table 3.14-1 summarizes the projected water demands of Alternative 1 short-term projects.

Table 3.14-1: Projected Water Demands of Short-Term Projects for Alternatives 1 and 2 through 2020

Projection Type	Increase in Water Demand[1] (million gallons)		Total Water Demand[2] (million gallons)	
	Per Year	Per Day	Per Year	Per Day
Without VA SSPP Reduction Target	10.3	0.028	56.9	0.156
With SSPP Reduction Target[3]	8.24	0.023	45.5	0.125

Notes: VA SSPP = *Department of Veteran Affairs Strategic Sustainability Performance Plan*

1 The increase in water demand represents the water demand associated with short-term projects only.

2 The total water demand represents existing water demands plus estimated water demands associated with short-term projects.

3 The VA SSPP states that VA facilities have a target to reduce potable-water use by 26 percent and a target to reduce landscaping/ industrial water use by 20 percent by 2020. Because the water demand projections do not distinguish between demands for potable and nonpotable water, this analysis conservatively assumes an overall 20 percent reduction in all water demands by 2020.

Source: Water demand calculated by AECOM in 2014; US EIA, 2012.

SFPUC has confirmed that the growth projections used in SFPUC's 2010 UWMP included implementation of Alternative 1 short-term projects (Petrick, pers. comm., 2011; Lau, pers. comm., 2014). Regardless of whether SFVAMC implements the VA SSPP's reduction target, SFPUC would be able to accommodate the short-term projects, and those projects would not require a major expansion of the existing water utility system.

Given the projected incremental increase in the percentage of San Francisco's total increased water demand and the consideration of short-term projects for Alternative 1 in SFPUC's UWMP, operational impacts of Alternative 1 short-term projects on water supply would be minor.

Wastewater and Stormwater

As discussed previously, the existing SFVAMC Fort Miley Campus is located within the service area of the City's combined sewer system; therefore, both domestic wastewater and stormwater flow into the sewers. The only exception is a small separate storm drainage system on the north side of the existing Campus, along the north-facing slope, that conveys stormwater off-site. Specifically, stormwater runoff collected from parking lots,

5 Although the VA SSPP requires VA facilities to meet targets of a 26 percent reduction in potable water use by 2020 and a 20 percent reduction in industrial and landscaping water use by 2020, SFVAMC has committed to a 30 percent reduction target; therefore, the projected calculations provided are considered to be conservative. In addition, since the water demand projections do not distinguish between demands for potable and nonpotable water, the analysis throughout this EIS conservatively assumes an overall 20 percent reduction in all water demands by 2020.

streets, pedestrian walkways, landscaped areas, and building roofs is concentrated in gutters and drain pipes and conveyed to SFPUC's combined sewer interceptor on Clement Street or to the smaller separate storm drainage system on the north side of the Campus. This method of discharge would generally continue with implementation of Alternative 1 short-term projects.

Alternative 1 short-term projects would not significantly alter land use or impervious site characteristics adversely; however, there would be a 4 percent increase (0.69 acre) in impervious area as compared to existing conditions. In addition, landscaping and sustainable features (e.g., green roofs) would be incorporated as part of building design. These features would provide improved ground/soil absorption of runoff and control erosion and pollution, and would improve the quality of stormwater runoff. The use of energy dissipaters to prevent concentrated flows would also minimize the impact of stormwater flows. Site drainage would flow via at-grade catch basins and area drains to landscaped areas and underground gravity lines. All buildings and the site contours would be designed to minimize stormwater runoff to the extent practicable.

Because construction at the SFVAMC Fort Miley Campus, a federal facility, under Alternative 1 short-term projects would have a net new footprint greater than 5,000 gsf, SFVAMC would be required to comply with Section 438 of the Energy Independence and Security Act (EISA) and to implement Low Impact Development (LID) techniques. (See the discussion of EISA in Section 3.8.2, "Regulatory Framework," of Section 3.8, "Hydrology and Water Quality.") Examples of LID techniques include bioretention areas, permeable pavements, cisterns/recycling, and green roofs. LID techniques must mimic predevelopment stormwater runoff conditions by using site design techniques that store, infiltrate, evaporate, and detain runoff.

In addition, SFVAMC would be required to comply with Article 4.2 of the San Francisco Public Works Code (Webster, pers. comm., 2015). Article 4.2, as described in Section 3.8.2, "Regulatory Framework," of Section 3.8, "Hydrology and Water Quality," requires proponents of development projects to submit and receive approval of a stormwater control plan that meets guidelines adopted by SFPUC. These guidelines contain requirements pertaining to the type, design, sizing, and maintenance of postconstruction stormwater best management practices (BMPs). Because part of the SFVAMC Fort Miley Campus is located within the combined sewer area and existing imperviousness is greater than 50 percent, the stormwater runoff rate and volume from the Campus would have to decrease by 25 percent from the 2-year, 24-hour design storm. In the northern portion of the Campus, which is located within the separate sewer area, the requirement is to capture and treat the rainfall from a design storm of 0.75 inch. As detailed design of wastewater and stormwater infrastructure has not yet been completed, Alternative 1 short-term projects may result in direct adverse impacts related to wastewater and stormwater.

SFVAMC must develop a maintenance plan for all proposed stormwater controls. In addition, Management Measure HYD-1, as described in Section 3.8, "Hydrology and Water Quality," would be implemented at the SFVAMC Fort Miley Campus to ensure proper sizing of infrastructure to handle stormwater and wastewater flows. With implementation of Management Measure HYD-1, in addition to requirements to reduce stormwater runoff rates and volumes relative to existing conditions, potentially adverse operational impacts from Alternative 1 short-term projects related to stormwater would be reduced to a minor level. For additional discussion of stormwater runoff from the site as it relates to CSO events and flooding, see Section 3.8, "Hydrology and Water Quality," including Management Measure HYD-1.

Sewer service to the existing SFVAMC Fort Miley Campus is provided via connections to existing wastewater lines. Wastewater generated at the Campus is treated by the OSP. As discussed previously, the average water demand for the Campus from 2004 through 2011 was approximately 46.6 million gallons per year (0.13 mgd). It is estimated that 78 percent of total domestic water used at the SFVAMC Fort Miley Campus ends up as wastewater; therefore, the Campus would have an existing average wastewater generation rate of 36.3 million gallons per year (0.10 mgd).

Table 3.14-2 lists the projected wastewater generation rates for Alternative 1 short-term projects with and without implementation of the VA SSPP reduction target for water consumption.

Table 3.14-2: Projected Wastewater Generation Rates for Short-Term Projects for Alternatives 1 and 2 through 2020

Projection Type	Increase in Wastewater Generation[1] (million gallons)		Total Wastewater Generation[2] (million gallons)	
	Per Year	Per Day	Per Year	Per Day
Without VA SSPP Reduction Target	8.0	0.022	44.4	0.122
With SSPP Reduction Target[3]	6.4	0.018	35.5	0.097

Notes: VA SSPP = *Department of Veteran Affairs Strategic Sustainability Performance Plan*

1 The increase in wastewater generation represents the wastewater associated with short-term projects only.

2 The total wastewater generation represents existing wastewater plus estimated wastewater generation associated with short-term projects.

3 The VA SSPP states that VA facilities have a target to reduce potable-water use by 26 percent and a target to reduce landscaping/ industrial water use by 20 percent by 2020. Because the water demand projections do not distinguish between demands for potable and nonpotable water, this analysis conservatively assumes an overall 20 percent reduction in all water demands by 2020.

Source: Wastewater generation calculated by AECOM in 2014 assuming that 78 percent of water demand = wastewater generated; SFVAMC, 2012.

Short-term projects under Alternative 1 would involve adding some new buildings that would support medical uses similar to those at the existing SFVAMC Fort Miley Campus; however, the changes would not substantially change the quantity of wastewater discharged. Further, Alternative 1 short-term projects would involve implementing the VA SSPP, which would provide guidelines and practices for making stormwater and sewer improvements. Following these guidelines would reduce the impact of potentially increasing stormwater and sewer water loads on the existing infrastructure and its limited capacity. Specifically, the increase in wastewater generation under Alternative 1 short-term projects would represent an increase of only 0.104 percent[6] in dry-weather flows at the OSP, which serves the Campus. Increased sanitary flows would not adversely affect the OSP (Braswell, pers. comm., 2011).

In addition, compliance with Section 438 of the EISA and Article 4.2 of the San Francisco Public Works Code would reduce impacts from increased impervious area and associated stormwater, because SFVAMC would be required to reduce stormwater runoff rates and volumes relative to existing conditions. Therefore, no expansion of existing wastewater/stormwater facilities or infrastructure would be required and implementation of Management Measure HYD-1 would ensure proper sizing of new infrastructure to handle stormwater and wastewater flows.

6 The OSP treats an average dry-weather flow of approximately 17 mgd. The percent increase is calculated as: 1 - ((17 mgd - 0.018 mgd)/17 mgd) = 0.095 percent.

Operational impacts of Alternative 1 short-term projects related to wastewater and stormwater would be minor with implementation of Management Measure HYD-1.

Electricity and Natural Gas

Although Alternative 1 short-term projects would involve expanding the existing SFVAMC Fort Miley Campus, overall energy efficiency would likely improve with the decommissioning, demolition, and replacement of older, energy-intensive buildings. Consistent with the VA SSPP, SFVAMC intends to incorporate physical features and operational measures to sustain and improve environmental efficiencies by implementing a sustainable-design master plan to achieve a 30 percent reduction in greenhouse gas emissions by 2020. The improvements in the Sustainable Design Master Plan include the use of stand-alone technologies such as installing photovoltaic panels on the roofs of new and/or existing buildings, as partial shades over windows, or in open land areas as a method of providing buildings with electrical power on-site.

Table 3.14-3 summarizes the projected electricity demands of Alternative 1 short-term projects with and without implementation of VA SSPP targets for reduction of greenhouse gas emissions.[7] Usage of electricity and natural gas would be reduced as needed to meet the VA SSPP reduction targets, which may not directly translate into a 30 percent reduction in electricity and natural gas usage. However, for the purpose of estimating VA SSPP reductions for this EIS, a 30 percent reduction in electricity and natural gas usage is presented. Without implementation of the VA SSPP reduction target, the projected demand for operation of the short-term projects for Alternative 1 would increase electricity consumption at the SFVAMC Fort Miley Campus by an estimated 15 percent over existing consumption (22,144 MWh per year). This increase would be accommodated by the Electrical Systems Upgrades Project, which is being implemented on the Campus; therefore, no further system upgrades or infrastructure modifications would be necessary.

Table 3.14-3: Projected Electricity and Natural Gas Demands of Short-Term Projects for Alternatives 1 and 2 through 2020[1]

Projection Type	Electricity Demand per Year (MWh/yr)		Natural Gas Demand per Year (MMBtu/yr)	
	Increase in Demand	Total Demand[2]	Increase in Demand	Total Demand[2]
Without VA SSPP Reduction Target	3,328	25,472	19,687	150,687
With VA SSPP Reduction Target[3]	2,343	17,844	13,859	105,559

Notes: MMBtu/yr = million metric British thermal units per year; MWh/yr = megawatt-hours per year; VA SSPP = *Department of Veteran Affairs Strategic Sustainability Performance Plan*

1 Parking garage square footage is not included in electricity and natural gas demand projections because associated demands are assumed to be minimal.

2 Total demands include existing demands (22,144 MWh/yr for electricity and 131,000 MMBtu/yr for natural gas) in addition to the short-term projects' demands.

3 The VA SSPP has a target to reduce greenhouse gas emissions by 30 percent by 2020 for buildings and by 29.6 percent by 2020 for the fleet (vehicles). Although these targets may not directly translate into 30 percent reductions in electricity and natural gas usage, for the purpose of this EIS, a 30 percent reduction is presented as an estimate.

Source: Electrical and natural gas demands calculated by AECOM in 2014; CalEEMod Version 2013.2.2.

7 The VA SSPP has a 30 percent greenhouse gas reduction target for buildings by 2020 and a 29.6 percent greenhouse gas reduction target for the fleet (vehicles) by 2020.

To ensure that the emergency power supply would be adequate in the event of a power failure, a 1,000-kW engine-generator has been installed at the existing paralleling switchgear located in Building 205 to accommodate the increased demand associated with Alternative 1 short-term projects. This addition has increased the overall total capacity of the backup power system to 3,385 kW, thus making the backup system adequate to support future mission-critical and life-safety power needs.

In September 2013, SFVAMC installed solar PV systems at the SFVAMC Fort Miley Campus that generate electricity that is integrated into SFVAMC's distribution system, providing 941.5 MWh per year. A geothermal system was also installed in 2014 to provide heating and cooling to several buildings. These on-site electricity systems reduce the need to purchase electricity from off-site supplies and help SFVAMC achieve the goals for energy efficiency and greenhouse gas reduction that have been established by VA and Executive Order 13514 (VA, 2011a and 2011b). These solar PV and geothermal systems would also serve to offset a portion of the increased electricity demand generated by Alternative 1 short-term projects in terms of reducing demands on off-site electricity supplies.

Natural gas is provided to the existing SFVAMC Fort Miley Campus via a single 4-inch-diameter high-pressure line that extends north from the 4300 block of Clement Street to near Building 30 on the southwestern part of the Campus. The Campus currently uses 131,000 MMBtu per year. Table 3.14-3 summarizes the natural gas demands of Alternative 1 short-term projects without implementation of the VA SSPP's greenhouse gas reduction target of 30 percent by 2020. Without implementation of the VA SSPP's reduction target, the projected demand for operation of Alternative 1 short-term projects would increase natural gas consumption at the Campus by 15 percent. Existing infrastructure capacity is considered adequate to accommodate anticipated demand at the Campus. Should on-site improvements and connections be required, such improvements would be coordinated with PG&E during the continued planning of the short-term projects. The new electric and natural gas distribution lines would be constructed and operated in compliance with federal, State, and local regulatory requirements, minimizing the potential for adverse impacts. As a result, operational impacts of Alternative 1 short-term projects related to electricity and natural gas would be minor.

Long-Term Projects

The Alternative 1 long-term project would involve adding one new building at the existing SFVAMC Fort Miley Campus at the site of the existing Building 12, which would be demolished as part of the short-term projects for this alternative. Thus, the development footprint for the Alternative 1 long-term project would take up 0 net new acre within the previously developed areas of the existing 29-acre Campus. Improvements to the water distribution, sewer, stormwater, and energy systems would be similar to improvements for the short-term projects under Alternative 1.

Construction

The long-term project for Alternative 1 would involve construction of one project for Building 213 (Clinical Addition Building) over 24 months. The Alternative 1 long-term project would involve construction of 170,000 gsf, which would all be net new gsf, at the existing SFVAMC Fort Miley Campus. Construction impacts of the Alternative 1 long-term project would be similar to those of Alternative 1 short-term projects. Any impacts of construction on utility systems would range in significance from no impact to minor.

Operation

Water Supply

Impacts of the Alternative 1 long-term project on water supply would be similar to those of Alternative 1 short-term projects. Without implementation of the VA SSPP reduction target, the increase in water demand under the Alternative 1 long-term project through 2027 is projected to be 11.5 million gallons per year (0.032 mgd), for a total water demand of 68.4 million gallons per year (0.187 mgd). (Total water demand includes existing water demands as well as water demands for short-term and long-term projects.)

However, should SFVAMC achieve the VA SSPP's reduction target goal by 2020, the increase in water demand through 2027 is projected to be 9.2 million gallons per year (0.025 mgd), for a total water demand of 54.7 million gallons per year (0.150 mgd). (Again, total water demand would include existing, short-term project, and long-term project water demands.)

Table 3.14-4 summarizes the projected water demands of the Alternative 1 long-term project.

Table 3.14-4: Projected Water Demands of Long-Term Projects for Alternatives 1 and 2 through 2027

Projection Type	Increase in Water Demand[1] (million gallons)		Total Water Demand[2] (million gallons)	
	Per Year	Per Day	Per Year	Per Day
Without VA SSPP Reduction Target	11.5	0.032	68.4	0.187
With SSPP Reduction Target[3]	9.2	0.025	54.7	0.150

Notes:
VA SSPP = *Department of Veteran Affairs Strategic Sustainability Performance Plan*
1 The increase in water demand represents the water demand associated with long-term projects only.
2 The total water demand represents existing water demands plus estimated water demands associated with short-term and long-term projects.
3 The VA SSPP states that VA facilities have a target to reduce potable water use by 26 percent and a target to reduce landscaping/ industrial water use by 20 percent by 2020. Because the water demand projections do not distinguish between demands for potable and nonpotable water, this analysis conservatively assumes an overall 20 percent reduction in all water demands by 2020.
Source: Water demand calculated by AECOM in 2014; US EIA, 2012

SFPUC has confirmed that the growth projections used in SFPUC's 2010 UWMP included implementation of the long-term project for Alternative 1; regardless of whether SFVAMC implements the VA SSPP's reduction target, SFPUC would be able to accommodate the long-term project (Petrick, pers. comm., 2011; Lau, pers. comm., 2014). Therefore, implementing the Alternative 1 long-term project would not require a major expansion of the existing water utility system, and operational impacts on water supply are anticipated to be minor.

Wastewater and Stormwater

The impacts of the Alternative 1 long-term project related to wastewater and stormwater would be similar to those of Alternative 1 short-term projects. Without implementation of the SSPP reduction target, the increase in wastewater generation under the Alternative 1 long-term project through 2027 is projected to be 9.0 million gallons per year (0.025 mgd), and the total annual wastewater generation at the existing SFVAMC Fort Miley Campus is estimated to be 53.4 million gallons per year (0.146 mgd). (Total annual wastewater generation

includes existing wastewater generation as well as wastewater generated by Alternative 1 short-term and long-term projects.)

However, should SFVAMC achieve the VA SSPP's reduction target goals, the increase in wastewater generation through 2027 as a result of the Alternative 1 long-term project is projected to be 7.2 million gallons per year (0.020 mgd) and the total annual wastewater generation at the Campus is estimated to be 42.7 million gallons per year (0.117 mgd). (Again, total annual wastewater generation would include existing wastewater generation as well as wastewater generated by Alternative 1 short-term and long-term projects.) Table 3.14-5 summarizes the projected wastewater generation rates for Alternative 1 long-term projects.

Table 3.14-5: Projected Wastewater Generation Rates of Long-Term Projects for Alternatives 1 and 2 through 2027

Projection Type	Increase in Wastewater Generation[1] (million gallons)		Total Wastewater Generation[2] (million gallons)	
	Per Year	Per Day	Per Year	Per Day
Without VA SSPP Reduction Target	9.0	0.025	53.4	0.146
With VA SSPP Reduction Target[3]	7.2	0.020	42.7	0.117

Notes: VA SSPP = *Department of Veteran Affairs Strategic Sustainability Performance Plan*

1 The increase in wastewater generation represents the wastewater associated with long-term projects only.

2 The total wastewater generation represents existing wastewater generation plus estimated wastewater generation associated with short-term and long-term projects.

3 The VA SSPP states that VA facilities have a target to reduce potable-water use by 26 percent and a target to reduce landscaping/ industrial water use by 20 percent by 2020. Because the water demand projections do not distinguish between demands for potable and nonpotable water, this analysis conservatively assumes an overall 20 percent reduction in all water demands by 2020.

Source: Wastewater generation calculated by AECOM in 2014 assuming 78 percent of water demand = wastewater generated; SFVAMC, 2012.

As described for short-term projects under Alternative 1, complying with Section 438 of the EISA and Article 4.2 of the San Francisco Public Works Code would reduce impacts from increased impervious area and associated stormwater, because SFVAMC would be required to reduce stormwater runoff rates and volumes relative to existing conditions. However, as detailed design of wastewater and stormwater infrastructure has not yet been completed, Alternative 1 long-term projects may result in direct adverse impacts related to wastewater and stormwater. Management Measure HYD-1 would be implemented at the SFVAMC Fort Miley Campus to ensure that infrastructure would be properly sized to handle stormwater and wastewater flows. This management measure would require the implementation of sustainable stormwater design BMPs to achieve predevelopment stormwater runoff conditions at the site after construction. For the same reasons as described for Alternative 1 short-term projects, operational impacts of the Alternative 1 long-term project related to wastewater/stormwater are anticipated to be reduced to a minor level with implementation of Management Measure HYD-1.

Electricity and Natural Gas

The impacts of the Alternative 1 long-term project related to electricity and natural gas would be similar to those of Alternative 1 short-term projects. Table 3.14-6 summarizes the projected increase in electricity and natural gas demand under the Alternative 1 long-term project through 2027 with and without implementation of the VA SSPP's greenhouse gas reduction target. Without implementation of the SSPP reduction target, the projected

demand for operation of the short-term and long-term projects would increase SFVAMC's electricity and natural gas consumption by approximately 32 percent compared to current usage. The increase in electrical consumption would be accommodated by the Electrical Systems Upgrades Project, currently being implemented on the SFVAMC Fort Miley Campus. The increase in electricity demand would also be partially offset by the recent installation of solar PV and geothermal systems at the SFVAMC Fort Miley Campus to reduce demands on off-site electricity supplies. Operational impacts of the Alternative 1 long-term project related to electricity and natural gas are anticipated to be minor.

Table 3.14-6: Projected Electricity and Natural Gas Demands of Long-Term Projects for Alternatives 1 and 2 through 2027[1]

Projection Type	Electricity Demand per Year (MWh)		Natural Gas Demand per Year (MMBtu)	
	Increase in Demand	Total Demand[2]	Increase in Demand	Total Demand[2]
Without VA SSPP Reduction Target	3,812	29,284	22,552	173,239
With VA SSPP Reduction Target[3]	2,684	20,528	15,877	121,436

Notes: MMBtu/yr = million metric British thermal units per year; MWh/yr = megawatt-hours per year; VA SSPP = *Department of Veteran Affairs Strategic Sustainability Performance Plan*

1 Parking garage square footage is not included in electricity and natural gas demand projections because associated demands are assumed to be minimal.

2 The total demand represents existing demand (22,144 MWh/yr for electricity and 131,000 MMBtu/yr for natural gas) plus estimated demand associated with short-term and long-term projects.

3 The VA SSPP has a target to reduce greenhouse gas emissions by 30 percent by 2020 for buildings and by 29.6 percent by 2020 for the fleet (vehicles). Although these targets may not directly translate into 30 percent reductions in electricity and natural gas usage, for the purpose of this EIS, a 30 percent reduction is presented as an estimate.

Source: Electrical and natural gas demands calculated by AECOM in 2014; CalEEMod Version 2013.2.2.

Alternative 2: SFVAMC Fort Miley Campus Buildout Alternative

Short-Term Projects

Construction

As with construction of Alternative 1 short-term projects, construction of Alternative 2 short-term projects would involve the use of construction equipment and vehicles, which would temporarily increase energy consumption and fuel use for the duration of construction. Alternative 2 short-term projects include construction of a total of 485,445 gsf, which is 115,547 gsf less than for short-term projects under Alternative 1 Therefore, construction impacts of Alternative 2 short-term projects would be similar to or less than those of Alternative 1 short-term projects. Any impacts on utility systems resulting from construction would range in significance from no impact to minor.

Operation

Operation of Alternative 2 short-term projects would be the same as operation of Alternative 1 short-term projects, because the net new gross square footage would be identical (Table 2-1 and Figure 2-1). Therefore, the impacts of Alternative 2 short-term projects related to utility service systems would be the same as those of Alternative 2 short-term projects. These impacts would be minor.

Long-Term Projects

Construction

Alternative 2 long-term projects include construction of a total of 285,487 gsf, which is 115,487 gsf more than under Alternative 1, because Alternative 2 includes construction of Building 213 in addition to the seismic retrofit of Buildings 1, 6, and 8. Therefore, construction impacts of Alternative 2 long-term projects would be similar to, although slightly greater than, those of Alternative 1 long-term projects. Any impacts of construction on utility systems would range in significance from no impact to minor.

Operation

Operation of Alternative 2 long-term projects would be the same as operation of the Alternative 1 long-term project (Tables 2-2 and 2-4 and Figures 2-2 and 2-4). Therefore, the impacts of Alternative 2 long-term projects would be the same as the impacts of Alternative 2 short-term projects. These impacts would be minor.

Alternative 3: SFVAMC Fort Miley Campus Plus Mission Bay Campus Alternative

Short-Term Projects

Alternative 3 short-term projects (during both construction and operation) would be the same as the short-term projects for Alternative 1 (Table 2-1 and Figure 2-1). Therefore, the impacts of Alternative 3 short-term projects would be the same as the impacts of Alternative 1 short-term projects. These impacts would be minor.

Long-Term Projects

Alternative 3 long-term projects (during both construction and operation) would involve development of ambulatory care and parking structure uses at a potential new SFVAMC Mission Bay Campus (Table 2-5 and Figure 2-5).

Construction

Construction impacts of Alternative 3 long-term projects would be similar to those of Alternative 1 short-term and long-term projects; therefore, any impacts on utility systems resulting from construction would range in significance from no impact to minor.

Operation

Water Supply

Based on demand data provided in the Commercial Buildings Energy Consumption Survey (CBECS): Energy Characteristics and Energy Consumed in Large Hospital Buildings in the United States in 2007 (US EIA, 2012), the total water demand associated with Alternative 3 long-term projects at the potential new SFVAMC Mission Bay Campus through 2027 is projected to be 9.5 million gallons per year (0.026 mgd) (Table 3.14-7). However, should SFVAMC implement water conservation measures to achieve the VA SSPP's maximum reduction targets,

the total water demand for Alternative 3 long-term projects at the potential new Campus would be 7.6 million gallons per year (0.021 mgd) (Table 3.14-7).

Table 3.14-7: Projected Water Demands of Alternative 3 Long-Term Projects through 2026 (at the Existing SFVAMC Fort Miley Campus) and through 2027 (at the Potential New SFVAMC Mission Bay Campus)

Projection Type	Total Water Demand[1] (million gallons)	
	Per Year	Per Day
Water Demand at the Existing SFVAMC Fort Miley Campus (through 2026)[2]		
Without VA SSPP Reduction Target	56.9	0.156
With VA SSPP Reduction Target[4]	45.5	0.125
Water Demand at the Potential New SFVAMC Mission Bay Campus (through 2027)[3]		
Without VA SSPP Reduction Target	9.5	0.026
With VA SSPP Reduction Target[4]	7.6	0.021
Totals		
Without VA SSPP Reduction Target—through 2027 at Both Campuses	**66.4**	**0.182**
With VA SSPP Reduction Target—through 2027 at Both Campuses[4]	**53.1**	**0.145**

Notes: SFVAMC = San Francisco Veterans Affairs Medical Center; VA SSPP = *Department of Veteran Affairs Strategic Sustainability Performance Plan*

1 The total water demand represents existing water demands (i.e., 46.6 million gallons per year (0.128 million gallons per day) at the SFVAMC Fort Miley Campus and 0 million gallons per year (0 million gallons per day) at the potential new SFVAMC Mission Bay Campus) plus estimated water demands associated with short-term and long-term projects.

2 No additional projects are proposed at the SFVAMC Fort Miley Campus under Alternative 3 long-term projects. Therefore, total water demands are those associated with existing demands and short-term projects described in Table 3.14-2.

3 These values are based on an increase of 140,000 square feet as proposed as part of Alternative 3 long-term projects (not including new parking, as parking does not have an associated water demand) and a rate of 67.7 gallons per square foot per year. There are no existing SFVAMC water demands at the potential new SFVAMC Mission Bay Campus.

4 The VA SSPP states that VA facilities have a target to reduce potable-water use by 26 percent and a target to reduce landscaping/industrial water use by 20 percent by 2020. Because the water demand projections do not distinguish between demands for potable and nonpotable water, this analysis conservatively assumes an overall 20 percent reduction in all water demands by 2027.

Source: Water demand calculated by AECOM in 2014; US EIA, 2012

The overall total (existing, short-term, and long-term) projected water demand at both SFVAMC Campuses under Alternative 3 is estimated to be 66.4 million gallons per year (0.182 mgd). However, with implementation of conservation measures for existing, short-term, and long-term project water demands to meet the VA SSPP's maximum targets, the total projected water demand for both Campuses under Alternative 3 would be 53.1 million gallons per year (0.145 mgd).

In addition, recycled water could be used at the potential new SFVAMC Mission Bay Campus in the future for nonpotable uses such as toilet flushing, cooling, and irrigation, thereby reducing demands for potable water. The City and County of San Francisco's Recycled Water Ordinance requires property owners to install recycled-water systems in new construction, modified, or remodel projects. Because the potential new SFVAMC Mission Bay Campus would be located within a designated recycled-water-use area and involve the construction of more than

40,000 square feet, SFVAMC would be required to install recycled-water systems at the potential new Campus and use recycled water there (when it becomes available) for all uses authorized by the State of California, unless otherwise exempted.

SFPUC has confirmed that the growth projections used in SFPUC's 2010 UWMP included implementation of the potential new SFVAMC Mission Bay Campus (Petrick, pers. comm., 2011; Lau, pers. comm., 2014a) and that the existing water supply would be able to support the facilities under Alternative 3. In addition, SFPUC has confirmed that the existing distribution infrastructure in the Mission Bay area should be able to accommodate the potential new Campus as proposed under Alternative 3 long-term projects (Lau, pers. comm., 2014b). Furthermore, the new water distribution lines for this new facility would be constructed and operated in compliance with federal, State, and local regulatory requirements, minimizing the potential for adverse impacts. Therefore, operational impacts of Alternative 3 long-term projects on water supply would be minor.

Wastewater and Stormwater

Wastewater generation by long-term projects at the potential new SFVAMC Mission Bay Campus under Alternative 3 through 2027 is expected to be an estimated 7.4 million gallons per year (0.020 mgd) without implementation of the VA SSPP's reduction target and 5.9 million gallons per year (0.016 mgd) with implementation (Table 3.14-8). Because the facilities would be new, Alternative 3 long-term projects at the potential new Campus would likely require construction of additional wastewater lines to service new buildings and new stormwater systems. The new wastewater lines would be constructed and operated in compliance with federal, State, and local regulatory requirements, minimizing the potential for significant environmental impacts.

The overall total (existing, short-term, and long-term) estimated wastewater generation at both SFVAMC Campuses under Alternative 3 is estimated to be 60.8 million gallons per year (0.166 mgd). With implementation of conservation measures to meet the VA SSPP's maximum targets for existing, short-term project, and long-term project wastewater generation as part of Alternative 3, the estimated total wastewater generation for both Campuses would be 48.6 million gallons per year (0.133 mgd) (Table 3.14-8). It should be noted, however, that wastewater from the two campuses would be treated at different wastewater treatment plants; wastewater from the SFVAMC Fort Miley Campus would be treated at the OSP and wastewater at the potential new SFVAMC Mission Bay Campus would be treated at the SEP.

The long-term projects under Alternative 3 would involve adding landscaping and sustainable features such as green roofs as part of building design, which would reduce the amount of impervious surface on the site. These features would also reduce the amount of nonpermeable surfaces, which would improve ground/soil absorption of runoff, control erosion and pollution, and improve the quality of stormwater runoff. The use of energy dissipaters to prevent concentrated flows would also minimize the impact of stormwater flows. Site drainage would flow via at-grade catch basins and area drains to landscaped areas, and to underground gravity lines. In addition, the buildings and the site contours would be designed to minimize stormwater runoff to the extent practicable.

Table 3.14-8: Projected Wastewater Generation Rates for Alternative 3 Long-Term Projects through 2026 (at the Existing SFVAMC Fort Miley Campus) and through 2027 (at the Potential New SFVAMC Mission Bay Campus)

Projection Type	Total Wastewater Generation[1] (million gallons)	
	Per Year	**Per Day**
Wastewater Generation at the Existing SFVAMC Fort Miley Campus (through 2026)[2]		
Without VA SSPP Reduction Target	44.4	0.122
With VA SSPP Reduction Target[4]	35.5	0.097
Wastewater Generation at the Potential New SFVAMC Mission Bay Campus (through 2027)[3]		
Without VA SSPP Reduction Target	7.4	0.020
With VA SSPP Reduction Target[4]	5.9	0.016
Totals		
Without VA SSPP Reduction Target—through 2027 at Both Campuses	**60.8**	**0.166**
With VA SSPP Reduction Target—through 2027 at Both Campuses[4]	**48.6**	**0.133**

Notes:
SFVAMC = San Francisco Veterans Affairs Medical Center; VA SSPP = *Department of Veteran Affairs Strategic Sustainability Performance Plan*

1 The total wastewater generation represents existing wastewater (i.e., 36.3 million gallons per year (0.100 million gallons per day) at the SFVAMC Fort Miley Campus and 0 million gallons per year (0 million gallons per day) at the potential new SFVAMC Mission Bay Campus) plus estimated wastewater generation associated with short-term and long-term projects.

2 No additional projects are proposed at the SFVAMC Fort Miley Campus under Alternative 3 long-term projects. Therefore, total wastewater generation consists of existing generation and wastewater associated with short-term projects described in Table 3.14-2.

3 These values are based on an increase of 140,000 square feet as proposed as part of Alternative 3 long-term projects (not including new parking, as parking does not generate wastewater). There is no existing SFVAMC wastewater generation at the potential new SFVAMC Mission Bay Campus.

4 The VA SSPP states that VA facilities have a target to reduce potable-water use by 26 percent and a target to reduce landscaping/industrial water use by 20 percent by 2020. Because the water demand projections do not distinguish between demands for potable and nonpotable water, this analysis conservatively assumes an overall 20 percent reduction in all water demands by 2020.

Source: Wastewater generation calculated by AECOM in 2014 assuming 78 percent of water demand = wastewater generated; SFVAMC, 2012.

At this time, the acreage of new impermeable area at the site is unknown; however, SFVAMC would be required to comply with Section 438 of the EISA and implement LID techniques because construction at this federal facility would have a net new footprint greater than 5,000 gsf. In addition, SFVAMC would be required to comply with Article 4.2 of the San Francisco Public Works Code, which requires submittal and approval of a stormwater control plan for development projects that meets guidelines adopted by SFPUC. If the potential new SFVAMC Mission Bay Campus would be located within the combined sewer area and existing imperviousness is greater than 50 percent, the stormwater runoff rate and volume from the site would have to decrease by 25 percent from the 2-year, 24-hour design storm. If the potential new SFVAMC Mission Bay Campus would be located in the separate sewer area, the requirement would be to capture and treat the rainfall from a design storm of 0.75 inch. SFVAMC also must develop a maintenance plan for all proposed stormwater controls. As detailed design of wastewater and stormwater infrastructure has not yet been completed, Alternative 3 long-term projects may result in direct adverse impacts related to wastewater and stormwater.

Management Measure HYD-1 would be implemented at the potential new SFVAMC Mission Bay Campus to ensure that infrastructure would be properly sized to handle stormwater and wastewater flows. In addition, the use of LID or other techniques described in Management Measure HYD-1 to infiltrate, evaporate, and detain stormwater would ensure that predevelopment stormwater runoff conditions would be maintained and aid SFVAMC in complying with Section 438 of the EISA and Article 4.2 of the San Francisco Public Works Code. Operational impacts from Alternative 3 long-term projects related to stormwater and wastewater would be reduced to a minor level with implementation of Management Measure HYD-1 as well compliance with requirements to reduce stormwater runoff rates and volumes relative to existing conditions. For additional discussion of stormwater runoff from the site as it relates to CSO events, see Section 3.8, “Hydrology and Water Quality.”

Overall, operational impacts of Alternative 3 long-term projects on wastewater and stormwater would be reduce to a minor level with implementation of Management Measure HYD-1.

Electricity and Natural Gas

The potential new SFVAMC Mission Bay Campus proposed under Alternative 3 would have an anticipated electricity demand of approximately 3,139 MWh per year and an estimated natural gas demand of 18,572 MMBtu per year from 2024 through 2027 without implementation of the VA SSPP’s target for reduction of greenhouse gas emissions (Table 3.14-9). Total electricity demand for SFVAMC Alternative 3, including existing demand and demand for short-term and long-term projects, is projected to be 28,611 MWh per year and natural gas demand is projected to be 169,259 MMBtu per year.

To support this demand, Alternative 3 long-term projects would require the installation of additional distribution lines to provide the potential new SFVAMC Mission Bay Campus with electrical and natural gas service. PG&E has indicated that its existing electricity and natural gas infrastructure in the vicinity would have sufficient capacity to support the new Campus (Ketcherside, pers. comm., 2011b). Nonetheless, because the facilities would be new, Alternative 3 long-term projects at the potential new Campus would likely require construction of distribution lines to service the new buildings. The new electric and natural gas distribution lines would be constructed and operated in compliance with federal, State, and local regulatory requirements, minimizing the potential for adverse impacts. Therefore, operational impacts of Alternative 3 long-term projects on electricity and natural gas are anticipated to be minor.

Table 3.14-9: Projected Electricity and Natural Gas Demands of Alternative 3 Long-Term Projects through 2026 (at the Existing SFVAMC Fort Miley Campus) and through 2027 (at the Potential New SFVAMC Mission Bay Campus)[1]

Projection Type	Electricity Demand per Year (MWh)		Natural Gas Demand per Year (MMBtu)	
	Increase in Demand	Total Demand[4]	Increase in Demand	Total Demand[4]
Electricity and Natural Gas Demand at the Existing SFVAMC Fort Miley Campus (through 2026)[2]				
Without VA SSPP Reduction Target	0	25,472	0	150,687
With VA SSPP Reduction Target[5]	0	17,844	0	105,559
Electricity and Natural Gas Demand at the Potential New SFVAMC Mission Bay Campus (through 2027)[3]				
Without VA SSPP Reduction Target	3,139	3,139	18,572	18,572
With VA SSPP Reduction Target[5]	2,210	2,210	13,075	13,075
Totals				
Without VA SSPP Reduction Target—through 2027 at Both Campuses		28,611		169,259
With VA SSPP Reduction Target—through 2027 at Both Campuses[5]		20,054		118,634

Notes: MMBtu/yr = million metric British thermal units per year; MWh/yr = megawatt-hours per year; VA SSPP = *Department of Veteran Affairs Strategic Sustainability Performance Plan*

1 Parking garage square footage is not included in electricity and natural gas demand projections because associated demands are assumed to be minimal.

2 No additional projects are proposed at the SFVAMC Fort Miley Campus under Alternative 3 long-term projects. Therefore, total electricity and natural gas demands are those associated with existing demands in addition to short-term projects described in Table 3.14-3).

3 There is no existing SFVAMC-related electricity or natural gas demand at the potential new Mission Bay Campus.

4 The total demand represents the existing demand (22,144 MWh/yr for electricity and 131,000 MMBtu/yr for natural gas) plus estimated demands associated with short-term and long-term Alternative 3 projects.

5 The VA SSPP has a target to reduce greenhouse gas emissions by 30 percent by 2020 for buildings and by 29.6 percent by 2020 for the fleet (vehicles). Although these targets may not directly translate into 30 percent reductions in electricity and natural gas usage, for the purpose of this EIS, a 30 percent reduction is presented as an estimate.

Source: Electrical and natural gas demands calculated by AECOM in 2014; CalEEMod Version 2013.2.2.

Alternative 4: No Action Alternative

Short-Term and Long-Term Projects

Construction

Under Alternative 4, there would be no new construction or retrofitting of existing buildings. Therefore, no construction-related impacts on utility service systems, water supply, or fire suppression systems would occur.

Operation

Under Alternative 4, the LRDP would not be implemented, and the existing facility would continue to function at its current capacity. Therefore, no impacts on existing water supply, wastewater and stormwater, or electricity and natural gas infrastructure would occur.

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