SECTION 9.0

Alternatives

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9.1 Introduction

The California Environmental Quality Act (CEQA) requires consideration of "a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives" [14 CCR. 15126.6(a)]. Thus, the focus of an alternatives analysis should be on alternatives that "could feasibly accomplish most of the basic objectives of the project and could avoid or substantially lessen one or more of the significant effects" [14 CCR 15126.6(c)]. The CEQA Guidelines further provide that "[a]mong the factors that may be used to eliminate alternatives from detailed consideration in an EIR are: (i) failure to meet most of the basic project objectives, (ii) infeasibility, or (iii) inability to avoid significant environmental impacts" (*Id*.).

On December 4, 2002, the City and County of San Francisco (CCSF) Board of Supervisors passed Resolution 827-02 adopting an Electricity Resource Plan (revised December 2002). The Electricity Resource Plan was prepared by the San Francisco Public Utility Commission (SFPUC) and the San Francisco Department of Environment (SFE) pursuant to the requirement of Ordinance 124-01. The Electricity Resource Plan provided the context for the development of the San Francisco Electric Reliability Project (SFERP). As explained in Section 3.0, Purpose and Need, the Electricity Resource Plan establishes priorities and provides for the development of a portfolio of new energy resources to shut down the Hunters Point power plant and Potrero Unit 3 and to set the City on a sustainable course that shows a progressive decline in dependence on fossil fuels while meeting the City's electric reliability requirements. The portfolio of new resources includes energy efficiency improvements, renewables, distributed generation using renewable and clean technologies, transmission additions and new, highly efficient and operationally flexible gas-fired generation at appropriate sites. The SFERP constitutes part of the new, highly efficient and operationally flexible component of the plan. Selected recommendations presented in the Electricity Resource Plan applicable to the proposed project are presented below.

- **Recommendation 1.B.22**. The City should expeditiously develop sufficient highly efficient and operationally flexible new generating resources to enable the closure of Hunters Point Unit 4 by the end of 2004. The amount of new generation needs to satisfy Independent System operation (ISO) reliability requirements based on objective load flow analyses.
- **Recommendation 1.B.23**. The City should facilitate the early retirement of Potrero Unit 3 to avoid costly upgrades and the extended operation of this outdated plant. New City power facilities used as replacement power must reduce air emissions.
- **Recommendation 1.B.25**. The quantity of new natural gas-fired generation procured by the City should be based on a California Independent System Operator (CAISO)-reviewed load flow study that determines the amount of power necessary to

maintain system reliability while complying with all state and federal environmental regulations. All studies will be based on the latest CAISO-accepted electricity demand forecast. Whenever investment in demand-side management programs and sustainable resources can offset new fossil fuel development to meet demand forecasts, this will be the City's preferred course.

9.2 Project Objectives

The SFPUC has identified several basic objectives, based on the findings and recommendations contained in the Electricity Resource Plan, for the development of a power project. These objectives include:

1. Facilitate the shutdown of older, more polluting in-City generation (consistent with ERP Recommendation 1.B.22 and 1.B.23).
2. Minimize local impacts of electrical generation.
3. Maintain the City of San Francisco's electric reliability (consistent with ERP Recommendation 1.B.25).

The remainder of this section sets forth the alternative project sites evaluated, as well as an evaluation of other generation and emission control technologies.

9.3 No Project Alternative

9.3.1 Description

If the No Project alternative is selected, the City would not receive authorization to construct and operate a new power generation facility. Energy required for local reliability and peaking requirements that would have been produced by the SFERP would need to be generated by another local source, such as the Potrero power plant. As Section 3.0, Purpose and Need, describes, currently the sources of power that are available are older power generation facilities (Potrero and Hunters Point power plants). These power plants release larger quantities of NO_x than the proposed facility and have questionable reliability because they are between 27 and 45 years old. The Hunters point power plant is expected to shut down once the Jefferson-Martin 230-kV transmission line is placed in service. However, as described in Section 3, Purpose and Need, without the SFERP, there is currently no certain known alternative to eliminate the reliability must run agreement for the Potrero power plant and thus facilitate its closure.

The No Project alternative is not considered feasible because it does not meet the objectives for the development of new power generation facilities to close down existing, dirty generation facilities that impact low income/minority communities while maintaining local electric reliability.

9.3.2 Potential Environmental Impacts

The proposed project will produce electricity to maintain the local electrical system's reliability while discharging less NO_x emissions for each energy unit generated when

compared to other existing, older fossil fuel generation facilities. Further, the superior operating flexibility of the proposed combustion turbines, that is, a 10-minute start versus the current 24-hour start times for Potrero 3 and Hunters Point 4, affords operators greater flexibility in dispatching plants to meet system requirements. These characteristics provide beneficial environmental impacts.

Potential environmental impacts from the No Project alternative would result in greater NO_x emissions because new power plants, including the proposed project, would not be brought into operation to facilitate the closure of older, higher NO_x-emitting plants.

9.4 Proposed and Alternative Sites

The City desires to facilitate the shutdown of older in-City generation while maintaining the reliability of the local electrical system. To meet these objectives, extensive electrical studies were conducted by CAISO. In November 2004, CAISO approved the SF Action Plan, which provides that, upon construction of Jefferson-Martin, the Hunters Point Power Plant can be shut down. Potrero Unit 3 can then be released from its Reliability Must Run (RMR) contract if the SFERP is developed within the City and a fourth combustion turbine is located at the San Francisco International Airport.

For the three combustion turbines that comprise the SFERP, the site selection criteria used to screen project sites focused on parcels located north of Martin Substation in industrially zoned areas, near necessary infrastructure (i.e., 115-kV electrical substations and natural gas lines). The City sought to site the proposed project near a 115-kV electrical substation to avoid potential power flow imbalances that could be caused by line outages. Areas around the 115-kV substations (Larkin, Mission, Potrero, and Hunters Point) were reviewed to narrow down the best substation area to site the project, and then to identify available parcels for a power plant.

The Larkin Substation was eliminated from consideration because there is no industrially zoned land in the vicinity. While there is some industrial land adjacent to Mission Substation, this substation was eliminated from consideration to site three combustion turbines because there was insufficient land to locate multiple combustion turbines in the vicinity, and because of the expense of a natural gas interconnection in this area. In addition, the Mission Substation is surrounded by commercial/residential uses. Thus, a further rationale for eliminating the Mission Substation from consideration was the potential impact on neighboring residences.

The Hunters Point Substation was eliminated from the analysis due to environmental justice concerns. Specifically, communities in the vicinity of Hunters Point Substation have borne and continue to bear the impacts of substantial industrial activity, most notably the Hunters Point Power Plant and the Southeast Water Pollution Control Plant. To ameliorate environmental justice concerns, it has been the City's objective since 1998 to close down the Hunters Point Power Plant. Given the longstanding impacts of the Hunters Point Power Plant on the local communities, and continued community concerns about the impacts from Southeast Water Pollution Control Plant, City policy makers are determined to avoid siting any new City-sponsored generation in the Hunters Point area.

The remaining substation, Potrero Substation, was thus identified as the most promising for interconnection of the SFERP. Although environmental justice concerns also exist with regard to communities in the vicinity of Potrero Substation, the City is seeking to address these concerns through project configuration, design and mitigation as is described in Section 4.0, Environmental Justice. Some of the benefits of the proposed project site are its proximity to the Potrero Substation and a major PG&E natural gas line.

9.4.1 The Proposed Site

The proposed site for SFERP is a 4-acre parcel owned by the City, as described in more detail in Section 1.0, Executive Summary, and Section 2.0, Project Description. This site (the "MUNI" site), which is located between 25th Street and Cesar Chavez Street and approximately 720 feet east of Illinois Street, is industrial land surrounded by industrial development. The site is currently used for temporary industrial purposes. For example, a temporary concrete batch plant currently occupies the northern portion of the site. The Port of San Francisco's Pier 80 marine terminal is located immediately adjacent and to the south. MUNI is planning to build a new streetcar maintenance facility, MUNI Metro East, on the 13-acre parcel due west of the proposed project site. A concrete, ready mix plant and a drayage company border the site on the north. The site is located in the City of San Francisco and is zoned for industrial use. Development of a power plant in this area would be consistent with the San Francisco General Plan and zoning ordinance.

The site is near PG&E's 115-kV Potrero Substation, located between 22nd and 23rd Street on Illinois Street. The existing substation will have sufficient transmission capacity to serve a new 145-MW plant, when the Potrero-Hunters Point (AP-1) 115-kV underground cable is projected to be completed (late 2005). Natural gas would be supplied from the PG&E gas transmission main located at Illinois and 25th streets. Additional natural gas compressors would be necessary. Water supply for the proposed plant would be obtained from the City's combined sewer system via an effluent pumping station—to be located near Marin and Cesar Chavez streets, a pipeline, and an onsite primary, secondary, and tertiary treatment system that will produce Title 22-quality recycled water. Wastewater from the plant would be returned to the combined sewer system.

The plant would be located in an industrial area of San Francisco and would be partially screened by several industrial structures at the proposed MUNI Metro East streetcar maintenance facility. The nearest uses are located approximately 1,600 feet from the site.

9.4.2 Alternative Sites

9.4.2.1 Configuration

The proposed project configuration is the result of considering a variety of design and operating limitations. The main factors affecting the configuration include available gas turbine generators provided as a result of the State of California's settlement with the Williams Companies, the need for fast-starting electrical generation to increase electrical reliability in San Francisco, environmental justice, and cost. The City reviewed a number of configurations including siting all four combustion turbines at one site, siting three combustion turbines at one site and one combustion turbine elsewhere, siting two combustion turbines at one site and two elsewhere, and lastly, returning the combustion turbines to the

State of California and not siting any combustion turbines (the No Project Alternative). After analyzing the possible variations, the City determined that siting multiple combustion turbines at one site offered several advantages; most notably, lower capital and operating costs, and reduced permitting and construction schedules. However, in order to distribute the impacts of power generation more equitably, the City is currently proceeding with siting three units at the MUNI site and the fourth unit at the San Francisco International Airport.

9.4.2.2 Alternative Sites

Five sites were identified as potentially suitable to site multiple turbines. Figure 9-1 (figures are located at the end of this section) shows the location of the alternative sites that were potentially suitable for construction of SFERP.

9.4.2.3 Alternative Site Selection Criteria

The criteria developed to evaluate the alternative sites' suitability for the SFERP correspond with the reasons the proposed site was selected. These criteria include the following:

- Environmental justice considerations
- Availability of sufficient land area
- Proximity to an existing substation
- Proximity to PG&E main gas pipeline
- Consistency with the General Plan and zoning ordinances, height restrictions, and existing land uses
- The ability, with implementation of reasonable mitigation measures, to have a less-than-significant impact on the environment
- Location in area appropriate for industrial development

The alternative site locations, shown in Figure 9-1, were evaluated using the above criteria. The site characteristics are summarized in Table 9-1 and described in the following subsections.

TABLE 9-1
Comparison Using Site Selection Criteria

Alternative Site	Site Size (acres)	Land Use Compatibility	Available Linear Facilities[a]		Distance to Residential[b]
MUNI Site (proposed site)	4	Zoned: Industrial; undeveloped	W: G: T:	<0.8 mile <0.2 mile <0.6 mile	1,600 feet
Mirant Site	4.5	Zoned: Industrial	W: G: T:	1.0 mile <0.1 mile <0.1 mile	600 feet
Western Pacific Site	9	Zoned Industrial undeveloped	W: G: T:	<0.9 mile <0.4 mile 0.8 mile	2,000 feet

TABLE 9-1
Comparison Using Site Selection Criteria

Alternative Site	Site Size (acres)	Land Use Compatibility	Available Linear Facilities[a]		Distance to Residential[b]
Port of San Francisco's Pier 70	5	Zoned: Industrial; developed and part of historic district	W: G: T:	<1.3 mile <0.2 mile <0.1 mile	900 feet
Cesar Chavez Street	2.8	Zoned: Industrial	W: G: T:	<0.8 mile <0.4 mile <1.0 mile	1,400 feet
Illinois Street	11	Zoned: Industrial; developed	W: G: T:	<1.1 mile <0.1 mile <0.1 mile	600 feet

Notes:
[a] W: = recycled water; G: = natural gas; T= transmission.
[b] Distances rounded to the nearest 100 feet.

9.4.2.3 Alternative Site Descriptions

In this section, each of the alternative sites is described and analyzed based on its feasibility for use. Environmental considerations are presented in Subsection 9.4.3. The City's rationale for selecting the MUNI site is summarized in Subsection 9.5.

9.4.2.3.1 Western Pacific Site. The Western Pacific site is an approximately 9-acre parcel under the jurisdiction of the Port of San Francisco (Port) and is subject to the State Lands trust. As such, this 9-acre parcel is subject to the public trust for navigation, waterborne commerce and fisheries. The Port plans to develop and integrate the 9-acre Western Pacific parcel into the Port's Pier 80 operations through the creation of a Pier 80 Terminal Complex. This Complex will add open yard and covered shed space to accommodate cargo distribution, assembly, and processing related to the Pier 80 terminal operations. Siting the project on the Western Pacific 9-acre parcel may not be compatible with the Port's plans to enhance its marine terminal capabilities at Pier 80. In addition, although electric power plants that depend upon navigable waters to operate have been permitted on trust lands, the proposed project does not require a waterfront location for its operation. The common law Public Trust doctrine, and the cases interpreting the doctrine, recognize that trust lands may be used for purposes that are not inherently water dependent, but that directly promote trust purposes. Examples of this type of use would be cargo warehouses or railroad terminals. Since the proposed project does not clearly satisfy the criteria for trust permitted uses, a proposed use of the 9-acre Western Pacific parcel for this purpose may be subject to scrutiny by the Attorney General, who is charged with enforcement of trust restrictions, and the State Lands Commission, a state agency responsible for overseeing local trust grantees. Given the issues of compatibility with the Port's marine terminal plans, and the uncertainty as to consistency of the use under the trust doctrine, the entitlement process for the project use at this location would be lengthy, and the outcome uncertain.

9.4.2.3.2 Mirant Site. The Mirant site is located north of the proposed project site on a 4.5-acre parcel of land that is a portion of the 26 acre Potrero Power Plant, which is currently owned by Mirant Potrero, LLC (Mirant), a wholly owned subsidiary of Mirant Corporation. The

project site formerly housed several industrial activities including a blacksmith shop, the turbine hall of PG&E's decommissioned Station A, a natural gas storage tank, a gas compressor building, a gas metering building, and a maintenance facility. Three large buildings on the site: Station A, the compressor building and the metering building, date back to the early 1900s. The site is zoned heavy industrial and is surrounded with commercial and industrial facilities. PG&E's Potrero substation is located immediately adjacent and to the west. Other industrial uses are located east and north of the site including the Potrero Power Plant Unit 3, a 206-MW natural-gas-fired, boiler-steam turbine-generator and three diesel fueled, simple cycle peaking combustion turbines, units 4, 5 and 6, each rated at 51 MW. The site is near PG&E's natural gas load center, where the three natural gas transmission pipelines that serve the City connect to a common header. The nearest residential receptors are located approximately 600 feet from the site.

Mirant Corporation is currently under bankruptcy protection, delinquent in taxes owed to the City and a defendant in recently settled legal actions brought by the State regarding Mirant's conduct during the State's energy crisis. In addition, the City has opposed Mirant's proposed plan to build a new 540 MW combined cycle power plant, Potrero 7, on this site. Over the past year, the City and Mirant engaged in protracted negotiations for the purchase by the City of the Mirant site. Notwithstanding its best efforts, the City was unable to conclude an option agreement with Mirant, in part due to the need for bankruptcy court approval of any agreement. Thus, in late 2004, the City concluded that a change of site was necessary to support timely development the SFERP.

9.4.2.3.3 Port of San Francisco's Pier 70. The Port of San Francisco's Pier 70 site is located adjacent to and north of the Potrero Power Plant. The site is a 5-acre parcel of industrial land in an area zoned Heavy Industrial. This land is currently used for vehicle storage by the City's car towing contract operator. The site is near PG&E's Potrero 115-kV Substation and natural gas load center.

Property surrounding the site is used for industrial/commercial uses, with the Potrero Power Plant located immediately south; the Port of San Francisco surrounds the site on the north, east, and west.

The nearest residential receptors are located approximately 900 feet from the site.

The Pier 70 site was acquired by the San Francisco Port Commission from Bethlehem Steel Corporation, and is held subject to the terms of a statutory trust grant (California Statutes of 1968, Chapter 1333, the Burton Act). The site was not historically tide or submerged land, and thus is not subject to the common law use restrictions imposed under the Public Trust doctrine. However, once the property was acquired by the Port, its use was limited by the Burton Act. This Act authorizes the Port Commission to lease land for non-trust purposes, if the property is not required for the trust purposes specified in the statute, provided that the use is in the public interest. The San Francisco Charter adds an additional condition, requiring the Port to obtain maximum profit from the use of lands deemed surplus to the needs of the trust, so that the revenue can be used to support the Port's public trust objectives.

This portion of the Pier 70 complex is currently occupied in part by a group of structures referred to as the Building 12 complex. Pier 70 is the site of an industrial complex of about 30 buildings associated with the former Union Iron Works and Bethlehem Steel Shipyard.

This complex has been the subject of several historical resources surveys that have consistently determined that the area is potentially eligible for the National Register of Historic Places as a historic district. To be compatible with the area's status as a potential historic district, the combustion turbines would need to be erected within the Building 12 complex and the complex would need to be rehabilitated to retain its historic character. There is community resistance to this location due to the desire to see it later developed as part of the historic district redevelopment.

9.4.2.3.4 Cesar Chavez Site. The Cesar Chavez site is located near the Port of San Francisco's container terminal, near the Western Pacific site. The site is 2.8 acres, and includes a building that would require demolition. The site is developed and zoned heavy industrial. The surrounding land uses are industrial, with the Port's container terminal located to the south, industrial uses to the north, and MUNI is planning to site a new streetcar maintenance facility due west of the site.

The nearest residential receptors are located approximately 1,400 feet from the site.

The site is near PG&E's Potrero Substation and natural gas pipeline and water supply and discharge would be via the combined sewer system.

A major disadvantage of the Cesar Chavez site is that the owner has not shown any interest in selling the property to the City notwithstanding a number of overtures by the City to commence negotiations in late 2003 and early 2004.

A further disadvantage of the property is that the parcel size is considered small, and at best minimally adequate for the installation of the SFERP. The small size would require designing the power plant with a compressed layout. This effort would increase construction and maintenance costs for the project. In addition, there would be no space available for a water treatment facility, requiring that this equipment be located elsewhere.

9.4.2.3.5 Illinois Street Site. The Illinois Street site is located south of the proposed project site. The site is approximately 11 acres of developed land that is zoned heavy industrial and is surrounded by industrial uses to the north, south, and east, with commercial/industrial land uses to the west. Existing structures on the site will require demolition and the site is within 600 feet of residential areas.

The site is near PG&E's Potrero Substation and natural gas pipeline and water supply and wastewater discharge would be via the combined sewer system.

Ownership of the Illinois Street site is complex, involving a variety of owners and real estate trusts. These entities, as represented by the managing owner, did not appear to be interested in selling the property to the City in the 2003-early 2004 timeframe when the City was exploring alternative sites. Moreover, the shape of the parcel is irregular, including a large amount of land that would be of little use to the City and that contains buildings of potential historic importance, most notably warehouses from the sugar refinery. In preliminary negotiations, the City was informed that if it proceeded with a transaction at all, the owners would likely insist on sale of the entire parcel because fragmentation would likely render the remaining property unsaleable. Thus, the cost to the City would likely increase because the City would be required to buy more property than it needs.

9.4.3 Environmental Considerations

In this section, the potential environmental impacts of the four alternative sites and the No Project Alternative are discussed. Potential environmental impacts from use of the proposed site are presented in more detail in each of the 16 environmental subsections of Section 8 of the AFC. Table 9-2 (located at the end of this section) provides a summary of the impacts of each alternative site compared to the proposed site. The No Project Alternative would not meet the basic project objectives of the City of facilitating the closure of existing in-City generation and maintaining reliability. Although the No Project Alternative would not result in the impacts associated with the SFERP, environmental impacts from the No Project Alternative could be more severe to the extent that as a result of the No Project Alternative, it remains infeasible to shut down existing dirtier within-City generation.

9.4.3.1 Air Quality

The plant's configuration and operation would be essentially the same from an air quality perspective at every location. The type and quantity of air emissions from the alternative sites would be identical. However, the impacts on the human population and the environment may differ slightly because of the location of residences and other human uses in the project vicinity. All of these sites are in the same air basin and offsets acquired by the City would be equally appropriate for every site. Potential impacts of the project to residents are discussed in Subsection 8.6, Public Health, and potential impacts on wildlife are discussed in Subsection 8.2, Biological Resources.

With the No Project Alternative, air quality in the Bay Area Air Quality Management District (BAAQMD) would be slightly worse than with the project. There would be no permanent reduction in air pollutants resulting from the purchase of emission reduction credits. The in-City generation required to maintain electrical reliability would have to be provided by the existing, older generating plants. These older generating plants would create more air pollution than the proposed project. Thus, overall, the air quality would be worse than if the plant were built.

9.4.3.2 Biological Resources

As the proposed site and all of the alternative sites are urban—developed sites with little biological habitat value—the potential biological impacts associated with the development of a power plant on each of these sites would be similar. These potential biological impacts are associated with the power plant features and not necessarily the habitat value of the sites. The biological impacts presented for the proposed site (presented in Subsection 8.2.4 of the AFC) would be expected for all of the alternative sites. These impacts would include air quality impacts to sensitive habitats (none are present in the local area), noise and light emissions from the power plant, collision and electrocution potential for tall project features.

The No Project Alternative would result in the continued operation of older in-City power plants, which would result in higher levels of air pollutants emitted per unit of electricity produced. Additionally, these older power plants use bay waters for their once-through cooling systems. These cooling systems are known to entrain aquatic species in the cooling water, which would result in higher biological impacts relative to the development of a new power plant that would use recycled water in the cooling water system.

9.4.3.3 Cultural Resources

The area surrounding the alternative sites, Potrero Point, has been the site of industrial activities since the late 1850s. The area has supported such industries as gun powder magazines, sugar processing, electrical and city gas generation, and shipbuilding. Based on literature searches, no prehistoric cultural resource sites were identified in the area. However, research indicated that prehistoric Native American populations heavily used the entire shoreline of San Francisco Bay. Therefore, the potential to encounter prehistoric cultural resources on the alternative sites is similar.

The entire Potrero Point area has had industrial activity over the last century. There is a moderate potential of encountering buried historical resources during construction of a power plant at all of the alternative sites. During test trenching conducted in 1979 by Wirth and Associates, a portion of a powder magazine was encountered. Therefore, the potential to impact buried historic resources in the area of the alternative project sites is deemed similar.

The MUNI site is undeveloped land and has no permanent structures. Therefore, there are no buildings on the site with cultural significance.

The Mirant site has two buildings onsite that CEC staff has previously found to be eligible for historic status (the Compressor House and Meter House). Siting the SFERP at the Mirant site would require demolition of the Compressor House and Station A. However, this impact could be partially mitigated by retaining the Meter House for use in the SFERP. Additionally, the siting of a power plant on this site could change the existing setting of the Union Iron Works Pier 70 Historic District, located north of the proposed site. However, a power plant on the Potrero Power Plant site would result in a minor alteration in the setting of this large potentially historic district, and would not be significant.

The Port of San Francisco's Pier 70 site includes part of the Union Iron Works Pier 70 Historic District, which consists of 23 buildings and structures. If construction of a power plant on this site could be accomplished within an existing structure without significantly altering the structure, then the impact could be lessened. However, construction of a power plant within an existing historic structure would result in a considerable increase in the power plant construction costs. Furthermore, even with treatment of those features extending outside of the existing structure, some change in the setting and feel could occur to the historic district.

The Illinois Street property includes potentially historic sugar warehouses. However, it is unlikely that these properties would have to be demolished to accommodate a power plant on the property.

Thus, the cultural impacts on alternative sites would be most severe at the Pier 70 property, followed by the Mirant property. Impacts on the MUNI, Illinois, Western Pacific and Cesar Chavez properties would be substantially similar.

9.4.3.4 Land Use

The proposed and alternative project sites are located in San Francisco and are zoned heavy industrial. The siting of a power plant on any of the alternative sites is consistent with current zoning. However, the Port of San Francisco's Pier 70 property is part of an area that

is potentially eligible to be an historic district and includes historic buildings. Thus, siting of a power plant on this parcel may result in impacts to historic structures. In addition, the Port plans to develop and integrate the Western Pacific site into the Pier 80 marine terminal operations immediately adjacent to the south. It is uncertain whether siting a power plant on the Western Pacific site would either be compatible with Port plans or consistent with the Port's mandate to use its public trust property to promote waterborne commerce, navigation, and fisheries.

With the No Project Alternative, the land uses would remain as they are and are presumed to be consistent with existing land use plans and policies.

9.4.3.5 Noise

The ambient noise levels in the vicinity of the alternative project sites are dominated by vehicular traffic and the industrial nature of the area. The ambient noise levels are expected to be in the range of 55 dBA L_{90}. The alternative project sites near 23rd and Illinois streets have the potential of impacting residential uses being located in the commercial areas (live/work units). The MUNI, Western Pacific, and Cesar Chavez sites are further from residential receptors and would hence have lesser impacts on residential receptors. However, considering the noise attenuation/screening provided by existing and planned buildings in the area, ambient noise levels are not expected to increase significantly due to operation of the SFERP. Therefore, the proposed project site and the alternative sites are expected to have comparable noise impacts.

The No Project Alternative would not result in further development in these areas and ambient noise levels would remain unaffected. However, the potential to reduce noise from existing in-City generation at Potrero power plant would be lost.

9.4.3.6 Public Health

All of the alternative sites are located in an industrial area of San Francisco, with nearby commercial/residential uses. Public health impacts are generally related to air quality, which is not expected to result in significant impacts. At a screening level, the sites appear equivalent with respect to this environmental resource.

Under the No Project Alternative, the Potrero power plant would continue to operate, resulting in more severe air quality impacts and associated Public Health impacts.

9.4.3.7 Worker Health and Safety

Potential impacts on worker health and safety are activity-specific rather than site-specific. Regardless of the location, the City will prepare appropriate health and safety plans to protect workers and reduce the potential for injuries. For the proposed site, the City's offsite consequence analysis has confirmed that releases of aqueous ammonia to residential/commercial areas (to the north, south and east of the proposed site) would be at a concentration of less than 5 ppm. Although concentrations to the west of the proposed site would be higher than 5 ppm, because the property to the west is owned by the City, the City can and will take steps to minimize the risk of exposure by City workers.

Under the No Project Alternative, there would be no construction and, therefore, no impacts to workers.

9.4.3.8 Socioeconomics

All sites are located in San Francisco. In the case of all the site alternatives, most local purchases for construction and operation would be made in the greater Bay Area and would be the same regardless of the plant's location.

For all site alternatives, the workforce would likely come from San Francisco and the greater San Francisco Bay Area with its large, highly skilled construction work force.

Because SFERP would be City-owned, no property taxes would be collected. Therefore, no jurisdiction would receive property taxes from this plant and there would be no difference from alternate sites.

Thus, the socioeconomic impacts would be similar among the alternatives since they are located near each other in San Francisco.

All of the alternative project sites are located within Southeast San Francisco. Therefore, the environmental justice issues would be substantially similar for all of the sites, although maximum distance from residential neighborhoods would be an advantage.

With the No Project Alternative, no economic benefits would be realized within the region of influence.

9.4.3.9 Agriculture and Soils

The proposed and alternative project sites are located in urban, developed areas with no agricultural resources. Furthermore, due to the proximity of these sites to each other, the soil conditions are expected to be comparable. Therefore, impacts to agricultural and soil resources are expected to be comparable among these sites.

Under the No Project Alternative, agricultural and soils resources will not be affected.

9.4.3.10 Traffic and Transportation

Major freeways in proximity to the alternative site include Interstate 280 (I-280) and U.S. Highway 101 (U.S. 101). From I-280 southbound, access to the alternative sites is via the 25th Street exit. From I-280 northbound, access is provided by the Cesar Chavez Street exit. From U.S. 101, access to and from the alternative sites is via the Cesar Chavez Street interchange for both northbound and southbound traffic. Major and secondary arterial roadways within alternative site vicinity include Third Street, Bayshore Boulevard, Cesar Chavez Street, 23rd Street, and 25th Street.

Third Street, extending north from its interchange with U.S. 101 and Bayshore Boulevard to its intersection with Market Street, functions as the principal north–south arterial within the area. It serves as the main commercial street, as well as a primary access route to industrial development along San Francisco's southern waterfront.

Cesar Chavez Street is a 4-lane major arterial and a Citywide Bicycle Route that extends to the west, traversing the Mission District and terminating at Guerrero Avenue. Cesar Chavez Street provides direct access to both I-280 and U.S. 101. Direct access to the Mirant site and other alternative sites is provided by 23rd Street. This roadway is undivided and provides one lane of travel in each direction.

Illinois Street is a wide two-lane undivided roadway west of the alternative sites and provided access to all of the sites. Traffic is controlled at the intersections of Illinois Street and 23rd and 25th streets.

Bayshore Boulevard is designated as a Neighborhood Commercial Street and a Citywide Bicycle Route. This 4-lane arterial parallels U.S. 101, running from Third Street north to Cesar Chavez Street. Bayshore Boulevard is divided with a raised median, except for openings at intersections with exclusive left-turn lanes.

Since the alternative project sites all use the same system of roads and highways, the impacts due to construction and operation of a power plant at these sites are considered similar. Furthermore, traffic and transportation impacts associated with the construction and operation of the power plant at the MUNI site are considered less than significant.

The No Project Alternative would allow traffic to be maintained at current levels.

9.4.3.11 Visual Resources

The character of the alternative sites is heavily industrialized, with Port of San Francisco, Mirant's Potrero power plant, and the Port's container terminal. To the west of the alternative sites is an area of commercial/light industrial uses, with residential uses interspersed. The City of San Francisco is allowing live/work development to occur in the area, which allows encroachment of non-conforming residential uses to occur in an area zoned industrial. The City considers these live/work units to be industrial uses.

The proposed power plant will require exhaust stacks approximately 85 feet tall, which will blend into the industrial nature of the existing environment. Views from residential areas will be screened for the Mirant, Illinois, and Port of San Francisco's Pier 70 sites by existing commercial and industrial facilities. Additionally, these sites would have significant industrial facilities in the background, which will result in a power plant sited at these locations to blend into the environment, to some extent.

The MUNI, Cesar Chavez, and Western Pacific sites will also have significant industrial facilities in the backgrounds, but do not have the same level of commercial/industrial buildings screening these sites. However, MUNI is planning to build a new streetcar maintenance facility which when constructed may obstruct views of these sites.

From the standpoint of residential neighborhoods, the visual impact of the Mirant, Illinois and Pier 70 sites is similar and currently slightly better than the MUNI, Cesar Chavez, and Western Pacific sites. When the new MUNI streetcar maintenance facility is constructed, the visual impact of all sites on residential neighborhoods is likely to be substantially similar.

The No Project Alternative would avoid visual impacts from the development of a power plant. However, it would foreclose or delay closure of the Potrero Power Plant.

9.4.3.12 Hazardous Materials Handling

The same quantity of hazardous materials would be stored and used at the proposed and alternative project sites. Further, as stated earlier, the proposed and the alternatives sites are in relative proximity. Thus, the impacts from hazardous materials handling would not be substantially different among the sites. The City's offsite consequence analysis has confirmed

that releases of aqueous ammonia to residential/commercial areas (to the north, south, and east of the proposed site) would be at a concentration of less than 5 ppm. Although concentrations to the west of the proposed site would be higher than 5 ppm, because the property to the west is owned by the City, the City can and will take steps to minimize the risk of exposure by City workers. Potential impacts would be further reduced in the case of the proposed site and alternative sites with additional distance from residences such as the MUNI, Western Pacific, and Cesar Chavez sites. However, because the potential impact on residences is already minimal, the additional benefit of further distance is not significant.

The No Project Alternative would avoid the transportation, use, and storage of hazardous materials from construction and operation of the SFERP. However, if as a result of the No Project Alternative, Potrero power plant operates significantly longer, the use of additional hazardous materials would result, particularly given the installation of SCR on the plant.

9.4.3.13 Waste Management

The same quantity of waste will be generated at the proposed site as at all alternative sites. The environmental impact of waste disposal would not differ significantly between the alternative sites.

The No Project Alternative would eliminate the need to dispose of liquid and solid waste from the construction and operation of the SFERP but would maintain the need to dispose of liquid and solid waste from existing in-City generation.

9.4.3.14 Water Resources

The City is proposing to use recycled water for most plant uses and potable water for domestic uses. Once the project is operational, wastewater and stormwater from the proposed and alternative sites will be directed to the City's combined sewer system. Therefore, the water resources impacts will be similar for all of the alternative sites, except the Cesar Chavez site, which would be too small for a water treatment plant to be located onsite.

The No Project Alternative would require sewage to be discharged in its current manner. While salt loadings would not change, this would avoid the additional salt concentrations that would occur from the plant's liquid waste stream being returned to the treatment plant. However, the No Project Alternative would not assist in reuse and disposal of wastewater from the City's SEWPCP. Moreover, with the No Project Alternative, existing water and sewer use by in-City generation would continue.

9.4.3.15 Geologic Hazards and Resources

Due to the screening level of this analysis and proximity of the sites to each other, no site-specific seismic analysis was performed. The potential for seismic impacts would be essentially the same for all plants and can be addressed in plant design.

The No Project Alternative would not affect geological hazards or resources.

9.4.3.16 Paleontological Resources

All of these sites are located primarily on artificial fill overlying either rocks of the Franciscan Complex or late Pleistocene to Holocene alluvium of the Temescal Formation.

Each of the stratigraphic units, other than the artificial fill, has produced significant and scientifically important fossils in the San Francisco area. In addition, fossil sites were documented as occurring near the alternative project sites, and one known site is located near the Cesar Chavez site. Therefore, all sites are considered to have an equal potential for paleontological impacts.

9.5 Selection of the Proposed Site

Table 9-3 compares the potential environmental impacts of the proposed MUNI site with the other alternatives. As shown in the table, no alternative site would feasibly attain most of the basic objectives of the project while also avoiding or substantially lessening any potentially significant effects of the project.

TABLE 9-3
Comparison of the Proposed Site and Alternative Site Locations

Characteristic	MUNI Site	Mirant Site	Western Pacific Site	Port of San Francisco's Pier 70 Site	Cesar Chavez Site	Illinois Street Site
Potential Presence of T&E Species/Habitat	Low	Low	Low	Low	Low	Low
Potential Cultural/ Historic Sensitivity	Moderate	Moderate to High	Moderate	High	Moderate	Moderate
Appropriate Zoning	Yes	Yes	Yes	Yes	Yes	Yes
Proximity to Nearest Receptors	Within 1,600 feet	Within 600 feet	Within 2,000 feet	Within 900 feet	Within 1,400 feet	Within 600 feet
Risk to Humans from Deposition of Air Pollutants	Low	Low	Low	Low	Low	Low
Removal of Prime Agricultural Land	No	No	No	No	No	No
Traffic & Transportation	Low	Low	Low	Low	Low	Low
Potential Visual Sensitivity	Low to Moderate	Low	Low to Moderate	Low	Low to Moderate	Low
Risk to Humans from Off-site Migration of Hazardous Materials	Low	Low	Low	Low	Low	Low
Ability to Use Water Consistent with SWRCB Policy	Yes	Yes	Yes	Yes	Uncertain	Yes

TABLE 9-3
Comparison of the Proposed Site and Alternative Site Locations

Characteristic	MUNI Site	Mirant Site	Western Pacific Site	Port of San Francisco's Pier 70 Site	Cesar Chavez Site	Illinois Street Site
Potential Paleontological Sensitivity	Low	Low	Low	Low	Low	Low
Availability of Property	City-owned	Land purchase could not be completed	City-owned; Subject to Trust	City-owned; limited by Burton Act	No interest in selling	Uncertain, complex ownership

The proposed MUNI site and two of the four alternatives, Illinois Street and Cesar Chavez sites, would avoid the cultural impact of demolishing a potentially historic building without creating similar associated impacts. The Mirant site would have a cultural impact caused by the demolition of the Compressor House and Station A, which the project could attempt to mitigate through restoration of the Meter House. The Pier 70 location includes significantly more historic structures than the Mirant site, which would have to be either incorporated into the plant design, substantially increasing the cost of the project, or demolished.

The Mirant and Illinois sites are similar, being adjacent, as they are near tall industrial structures (PG&E's substation and Mirant's Potrero Power Plant) in a heavily industrialized area, and are adjacent to the PG&E Substation and natural gas pipelines. Although both sites would require the demolition of existing structures currently onsite, an advantage of the Illinois site is that demolition of historic buildings could largely be eliminated whereas use of the Mirant site requires demolition of the Compressor House and Station A. There are a number of uncertainties associated with the Mirant site due to Mirant's bankruptcy, legal actions brought by the City related to Mirant's conduct during the State's energy crisis and delinquent taxes owed by Mirant to the City. Thus, a timely land purchase that could support the SFERP development is unlikely. Timely purchase of the Illinois site was also deemed unlikely. The Illinois site involves a complex land ownership structure and there has been a general lack of interest in a sale on the part of the owners. A further disadvantage of the Illinois property is that it would likely have required the City to acquire substantially more property than needed to site the SFERP with the attendant additional costs.

The Port of San Francisco's Pier 70 site is also close to the required infrastructure (natural gas and the PG&E Substation). However, the site is part of a potential historic district and would require either the alteration of historic buildings or their removal.

The MUNI site is a 4-acre, undeveloped parcel owned by the City. It is close to the required infrastructure and is located further away from residential use area than some of the other proposed sites. After MUNI constructs its maintenance facility to the west, this new facility would tend to screen most of the proposed power plant's features from views.

The Western Pacific 9-acre site may not be compatible with the Port's plans to enhance its marine terminal capabilities at Pier 80. In addition, given the uncertainty as to consistency of the proposed use under the trust doctrine, the entitlement process for the project use at this

location would be lengthy, and the outcome uncertain. The City has therefore determined that the MUNI site is preferable.

The Cesar Chavez site is located west of the Western Pacific site and is private property. The site does not contain historic buildings. However, the MUNI site was determined by the City to be preferable in light of the lack of interest in a sale by the owner. Moreover, the small size could create construction challenges, increased operation costs, and uncertainty regarding the use of recycled water for cooling because a water treatment plant would need to be located elsewhere.

9.6 Alternative Air Pollution Emission Control Analysis

The proposed project is required to comply with the requirements of the Bay Area Air Quality Management District's (BAAQMD's) permit regulations requiring the application of the Best Available Control Technology (BACT) to control air emissions. To comply with the BAAQMD's BACT requirements for oxides of nitrogen (NO_x), the project's design includes water injection and selective catalytic reduction (SCR) to control NO_x emissions. The SCR technology proposed for the SFERP uses a 29 percent solution of ammonia to reduce NO_x emissions to elemental nitrogen, water, and a small quantity of unreacted ammonia. However, the use and storage of ammonia—even the less toxic 29 percent aqueous ammonia proposed for the SFERP project— represents a potential risk to the public in the event of a catastrophic breach of the storage tank. The offsite consequence analysis (presented in Subsection 8.12, Hazardous Materials Handling, of the AFC) shows that if the SFERP's ammonia storage tank were breached, the resulting ammonia concentrations (at publicly accessible areas along the project's eastern, northern, and southern fence lines would be below the olfactory level for most people (less than 5 parts per million). Therefore, the potential impacts associated with the project's use and storage of ammonia would not result in a significant public health impact. However, to provide a comprehensive analysis of the alternative project configuration, the remainder of this section presents alternative NO_x emission control technologies considered for the project. The information presented below is based on the air quality analysis presented in Appendix 8.1B of the AFC.

Potential NO_x control technologies for combustion gas turbines include the following:

- **Combustion controls**
  - Water injection
  - Steam injection
  - Dry combustion controls
  - Dry low-NO_x combustor design
  - Catalytic combustors (e.g., XONON)
- **Post-combustion controls**
  - Selective non-catalytic reduction (SNCR)
  - Non-selective catalytic reduction (NSCR)
  - Selective catalytic reduction (SCR)
  - $SCONO_x$™

The technical feasibility of available NO_x control technologies are presented below.

9.6.1 Combustion Modifications

9.6.1.1 Wet Combustion Controls

Steam or water injection directly into the turbine combustor is one of the most common NO_x control techniques. These wet injection techniques lower the peak flame temperature in the combustor, reducing the formation of thermal NO_x. The injected water or steam exits the turbine as part of the exhaust.

Although the lower peak flame temperature has a beneficial effect on NO_x emissions, it can also reduce combustion efficiency and prevent complete combustion. As a result, carbon monoxide (CO) and volatile organic compounds (VOCs) emissions increase as water/steam injection rates increase.

Water and steam injection have been in use on both oil- and gas-fired combustion turbines in all size ranges for many years, so these NO_x control technologies are clearly technologically feasible and widely available. The proposed SFERP's LM6000 combustion turbines employ water injection to control NO_x emissions.

9.6.1.2 Dry Combustion Controls

Combustion modifications that lower NO_x emissions without wet injection include lean combustion, reduced combustor residence time, lean premixed combustion, and two-stage rich/lean combustion. Lean combustion uses excess air (greater than stoichiometric air-to-fuel ratio) in the combustor primary combustion zone to cool the flame; thereby, reducing the rate of thermal NO_x formation. Reduced combustor residence times are achieved by introducing dilution air between the combustor and the turbine sooner than with standard combustors. The combustion gases are at high temperatures for a shorter time, which also has the effect of reducing the rate of thermal NO_x formation.

The most advanced combination of combustion controls for NO_x is referred to as dry low-NO_x (DLN) combustors. DLN technology uses lean, premixed combustion air to keep peak combustion temperatures low, thus reducing the formation of thermal NO_x. This technology is effective in achieving NO_x emission levels comparable to levels achieved using wet injection without the need for large volumes of purified water and without the increases in CO and VOC emissions that result from wet injection. However, this control technology does not result in lower NO_x emissions than can be achieved using water injection on the LM6000 combustion turbine.

Catalytic combustors use a catalytic reactor bed mounted within the combustor to burn a very lean fuel-air mixture. This technology has been commercially demonstrated under the trade name XONON in a 1.5-MW natural gas-fired combustion turbine in Santa Clara, California. The technology has not been announced commercially for the engines used at SFPUC. No turbine vendor, other than Kawasaki, has indicated the commercial availability of catalytic combustion systems at the present time; therefore, catalytic combustion controls are not available for this specific project and are not discussed further.

9.6.1.3 Post-Combustion Controls

SCR is a post-combustion technique that controls both thermal and fuel-bound NO_x emissions by reducing NO_x with a reagent (generally ammonia or urea) in the presence of a catalyst to form water and nitrogen. NO_x conversion is sensitive to exhaust gas temperature, and performance can be limited by contaminants in the exhaust gas that may mask the catalyst (sulfur compounds, particulates, heavy metals, and silica). SCR is used in numerous gas turbine installations throughout the United States, almost exclusively in conjunction with other wet or dry NO_x combustion controls. SCR requires the consumption of a reagent (ammonia or urea) and requires periodic catalyst replacement. Estimated levels of NO_x control are in excess of 90 percent.

Selective non-catalytic reduction (SNCR) involves injection of ammonia or urea with proprietary conditioners into the exhaust gas stream without a catalyst. SNCR technology requires gas temperatures in the range of 1,200 to 2,000° F and is most commonly used in boilers. The exhaust temperatures for the SFERP gas turbines are in the 800° F range, which is well below the minimum SNCR operating temperature. Some method of exhaust gas reheat, such as additional fuel combustion, would be required to achieve exhaust temperatures compatible with SNCR operations, and this requirement makes SNCR technologically infeasible for the SFERP.

Nonselective catalytic reduction (NSCR) uses a catalyst without injected reagents to reduce NO_x emissions in an exhaust gas stream. NSCR is typically used in automobile exhaust and rich-burn stationary internal combustion (IC) engines, and employs a platinum/rhodium catalyst. NSCR is effective only in a stoichiometric or fuel-rich environment where the combustion gas is nearly depleted of oxygen, and this condition does not occur in turbine exhaust where the oxygen concentrations are typically between 14 and 16 percent. For this reason, NSCR is not technologically feasible for the SFERP.

$SCONO_x$™ is a proprietary catalytic oxidation and adsorption technology that uses a single catalyst for the control of NO_x, CO, and VOC emissions. The catalyst is a monolithic design, made from a ceramic substrate with both a proprietary platinum-based oxidation catalyst and a potassium carbonate adsorption coating. The catalyst simultaneously oxidizes NO to NO_2, CO to CO_2, and VOCs to CO_2 and water, while NO_2 is adsorbed onto the catalyst surface where it is chemically converted to and stored as potassium nitrates and nitrites. The $SCONO_x$ potassium carbonate layer has a limited adsorption capability and requires regeneration approximately every 12 to 15 minutes in normal service (see Appendix 8.1B for details). Each regeneration cycle requires approximately 3 to 5 minutes. At any point in time, approximately 20 percent of the compartments in a $SCONO_x$ system would be in regeneration mode, and the remaining 80 percent of the compartments would be in oxidation/absorption mode.

There are serious questions about the probability of a successful commercial demonstration and the commercial availability of the $SCONO_x$ technology for application to SFERP, as well as the levels of emission control that can be consistently achieved. Therefore, this technology is not considered feasible for the SFERP.

9.6.2 Alternatives to Ammonia-based Emission Control Systems

Over the last few years, several vendors have designed urea-based systems to generate ammonia onsite, thereby eliminating the need to transport and store ammonia. These units are referred to Ammonia on Demand (Environmental Elements Corporation) and Urea to Ammonia (EC&C Technologies Incorporated). However, on September 9, 2003, a permanent injunction was issued against Environmental Elements Corporation, barring the company from selling or manufacturing the Ammonia on Demand system due to patent infringement on EC&C Technologies Inc. Therefore, only EC&C's Urea to Ammonia (U2A) system is commercially available.

The U2A system generates ammonia from solid dry urea. The process starts by dissolving urea in deionized water to produce an aqueous urea solution. Steam is used in the U2A reactor to convert the urea solution into a gaseous mixture of ammonia, carbon dioxide, and water for use in the SCR system.

The U2A technology was first commercially installed on AES's Alamitos Generating Station (AGS) Unit 6, in Long Beach California, as a demonstration project. Unit 6 is a utility boiler that had an existing SCR system that used and stored ammonia. The U2A technology replaced the ammonia storage tank. Based on a successful demonstration of the U2A at AGS, AES contracted for the permanent installation of two U2A systems at its Huntington Beach Generating Station (HBGS) in Huntington Beach, California.

Based on the success of these projects, the U2A technology has been selected for a number of utility retrofit projects. However, as stated above, the U2A technology requires steam for the process to work and the SFERP project will not be generating steam. Therefore, this technology is not feasible for the SFERP. Furthermore, there is some concern regarding the applicability of the U2A technology for use on a peaking combustion turbine that is not expected to operate continuously.

9.7 Alternative Technologies

Section 3.0, Purpose and Need, addresses why the SFERP is needed to meet the City's objectives of shutting down existing dirty in-City generation while maintaining local reliability. That section discusses why transmission, energy efficiency improvements, renewable resources and distributed generation are insufficient to accomplish the City's objectives. This section discusses alternatives for generating technologies according to the fuel used.

- Oil and natural gas
- Coal
- Nuclear
- Hydroelectric
- Geothermal
- Biomass
- Solar
- Wind

Alternative technologies were evaluated with respect to commercial availability, implementability, and cost-effectiveness.

9.7.1 Oil; Natural Gas; Coal; Conventional and Supercritical Boiler/ Steam Turbine, or Combined-Cycle Combustion Turbine

These technologies are commercially available, and could be implemented. However, oil and coal technologies were eliminated from consideration because of their environmental impacts. Combined-cycle combustion turbines were eliminated from consideration because of timing considerations, the need for water and long unit startup times.

9.7.2 Nuclear

California law prohibits new nuclear plants until the scientific and engineering feasibility of disposal of high-level radioactive waste has been demonstrated. To date, the CEC is unable to make the findings of disposal feasibility required by law for this alternative to be viable in California. The technology, therefore, is not implementable.

9.7.3 Hydroelectric

No significant hydroelectric resource is available within San Francisco and thus would not facilitate the shutdown of within City generation in the near term, nor would it provide added reliability to the electrical system in San Francisco.

9.7.4 Geothermal

Geothermal development is not viable within San Francisco because suitable thermal vents and strata are not present. It was, therefore, eliminated from consideration.

9.7.5 Biomass

Major biomass fuels include forestry and mill wastes, agricultural field crop and food processing waste, and construction and urban wood wastes. Their cost tends to be high relative to simple-cycle units burning natural gas and fuel supply reliability can be problematic in urban settings. Furthermore, this technology typically results in higher air emissions, water consumption/discharge, and waste generation over the proposed project. Finally, this technology is typically used in baseload (continuous) operations and is not readily useful for peaking situations.

9.7.6 Solar

Most of these technologies collect solar radiation, heat water to create steam, and use the steam to power a steam turbine/generator. Power is only available while the sun shines so the units do not supply power that can be cycled up or down to follow demand. Given the objectives of this proposed project to improve the reliability of San Francisco's electrical system, this technology is not considered to be a feasible project alternative due to the limited size of the individual projects (less than a megawatt), and the sheer number of projects that would be required to generate 145 megawatts.

9.7.7 Wind Generation

In California, the average wind generation capacity factor has been 25 to 30 percent and, like solar, cannot be cycled up and down to track demand. There are no significant wind generation sites located in San Francisco. Furthermore, this technology would not increase the reliability of the electrical infrastructure sufficiently to facilitate the shutdown of within City generation.

9.8 References

California Energy Commission (CEC). 1995. 1994 Biennial Electricity Report (ER94), P300-95-002. November.

San Francisco Public Utilities Commission (SFPUC). 2002. The Electricity Resource Plan. Revised December 2002.

TABLE 9-2
Summary Comparison of Environmental Effects of Alternative Project Sites

Resource	MUNI Site (Proposed)	Mirant Site	Western Pacific Site	Port of San Francisco's Pier 70	Illinois	Cesar Chavez
Air Quality	Emissions from the plant would be the same at every location. Given the design of the project, air impacts would be expected to be less than significant.	No difference.	No difference.	No difference.	No difference.	No difference.
Biological Resources	This industrial site is developed with no habitat value. No biological impacts are expected. Alternative sites are similar in nature.	No difference.	No difference.	No difference.	No difference.	No difference.
Cultural Resources	The Potrero Point area, due to the long history of industrial activity in the area, has a moderate potential for encountering buried historic resources during construction. The shoreline of the San Francisco Bay was heavily used by prehistoric Native American populations.	The Potrero Point area, due to the long history of industrial activity in the area, has a moderate potential for encountering buried historic resources during construction. In addition, the site includes several historic buildings one of which can be included in the project's design. The shoreline of the San Francisco Bay was heavily used by prehistoric Native American populations.	No difference.	The Port of San Francisco's Pier 70 site is located on the Union Iron Works Pier 70 Historic District, with 23 eligible historic buildings. The development of a power plant on this site would require the demolition or modification of a historic structure in a potentially eligible historic district. It is possible that the power plant could be developed to minimize impacts to historic structures, but in any event it would alter the feel and setting of the potentially eligible historic district.	The Potrero Point area, due to the long history of industrial activity in the vicinity, has a moderate potential for encountering buried historic resources during construction. The shoreline of the San Francisco Bay was heavily used by prehistoric Native American populations. The site includes potentially historic buildings, in particular sugar wear-houses; but a power plant could likely be constructed without demolition of these buildings.	No difference.

TABLE 9-2
Summary Comparison of Environmental Effects of Alternative Project Sites

Resource	MUNI Site (Proposed)	Mirant Site	Western Pacific Site	Port of San Francisco's Pier 70	Illinois	Cesar Chavez
Land Use	The site is zoned Industrial.	No difference from proposed site.	The site is zoned Industrial. The Port Commission plans to develop and integrate this site into its adjacent Pier 80 marine terminal. The property is subject to the public trust for navigation, waterborne commerce and fisheries. There is uncertainty as to the compatibility of the project with the planned use of the site, and the consistency of the project with the public trust doctrine. The entitlement process would be lengthy, and the outcome uncertain.	The site is zoned Industrial. The Port Commission plans to preserve the complex of historic structures located on and around this site, and is commencing a master planning process for the area to develop a mix of maritime, commercial, educational and recreational uses. This site is subject to the Burton Act.	No difference from proposed site.	No difference from proposed site.
Noise	The plant's noise output would be approximately the same at all sites. The nearest residence is located within 1,600 feet from the site.	The plant's noise output would be approximately the same at all sites. The nearest residence is located within 600 feet from the site.	The plant's noise output would be approximately the same at all sites. However, the nearest residence is located within 2,000 feet from the site.	The plant's noise output would be approximately the same at all sites. However, the nearest residence is located within 900 feet from the site.	The plant's noise output would be approximately the same at all sites. However, the nearest residence is located within 600 feet from the site.	The plant's noise output would be approximately the same at all sites. However, the nearest residence is located within 1,400 feet from the site.
Public Health	The impacts are directly related to air quality impacts described above, considered to be less than to be significant.	No difference.	No difference.	No difference.	No difference.	No difference.

TABLE 9-2
Summary Comparison of Environmental Effects of Alternative Project Sites

Resource	MUNI Site (Proposed)	Mirant Site	Western Pacific Site	Port of San Francisco's Pier 70	Illinois	Cesar Chavez
Worker Health and Safety	Safety training programs and general health and safety programs will be the same for all alternatives.	No difference.	No difference.	No difference.	No difference.	No difference.
Socioeconomics	Potential impact to schools and public services is anticipated to be less than significant and given the proximity of the sites to each other, impacts are expected to be similar at all locations. Because all the properties are located in Southeast San Francisco, the environmental justice impacts for all sites would be similar.	No difference.	No difference.	No difference.	No difference.	No difference.
Agriculture and Soils	The Potrero Point area has a long history of industrial activity that does not include agricultural uses. No impacts to agriculture and soils are expected.	No difference.	No difference.	No difference.	No difference.	No difference.
Traffic and Transportation	No hazardous intersections apparent. No significant impacts on traffic and transportation are expected.	No difference.	No difference.	No difference.	No difference.	No difference.

TABLE 9-2
Summary Comparison of Environmental Effects of Alternative Project Sites

Resource	MUNI Site (Proposed)	Mirant Site	Western Pacific Site	Port of San Francisco's Pier 70	Illinois	Cesar Chavez
Visual Resources	Currently, the plant would be visible from views on Potrero Hill. However, after MUNI constructs its maintenance facility west of the site, the views will be partially screened by this facility. With mitigation measures, impacts would be less than significant.	The plant would be surrounded by other industrial/commercial structures that would partially screen most of the facility from the views of most viewers. With mitigation measures, impacts would be less than significant.	No difference from proposed site.	No difference from proposed site.	The plant would be surrounded by other industrial/commercial structures that would partially screen most of the facility from the views of most viewers. The plant would be located adjacent to a street and would require screening from travelers along the street. With mitigation measures, impacts would be less than significant.	Currently, the plant would be visible from views on Potrero Hill. However, if MUNI constructs its maintenance facility west of the site, then views will be partially screened by this facility. The plant would be located adjacent to a street and would require screening from travelers along the street. With mitigation measures, impacts would be less than significant.

TABLE 9-2
Summary Comparison of Environmental Effects of Alternative Project Sites

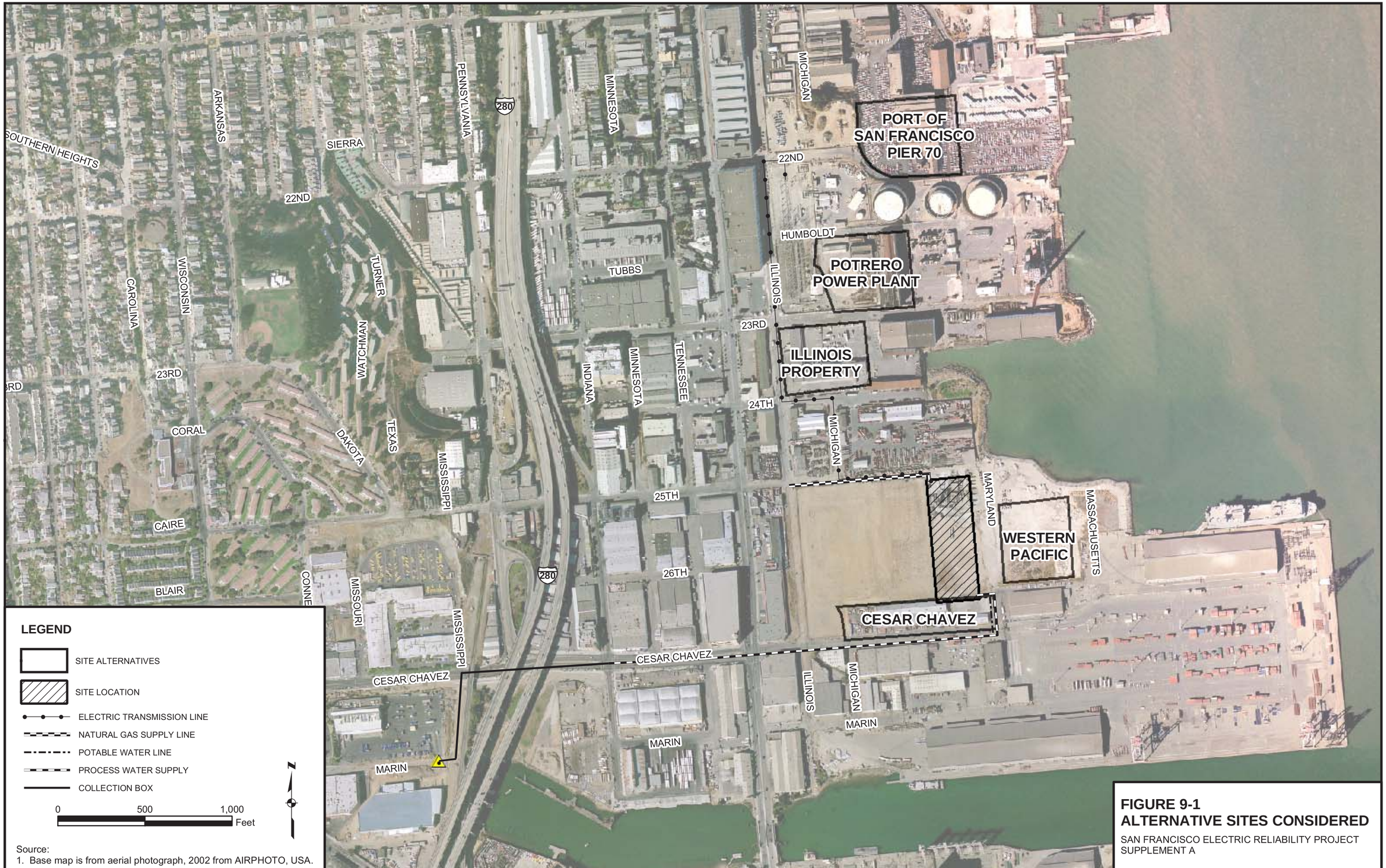
Resource	MUNI Site (Proposed)	Mirant Site	Western Pacific Site	Port of San Francisco's Pier 70	Illinois	Cesar Chavez
Hazardous Material Handling	Aqueous ammonia shipments would likely be delivered using US 101, exiting on Cesar Chavez, which is a designated truck route. The off-site consequences analysis shows that the ammonia concentrations from the worst case release would not result in a significant impact in publicly accessible areas due to a catastrophic release of ammonia. Moreover, the City will work with MUNI to address any potential risk to workers on the adjacent site. Because the sites are relatively close to each other, it is expected that impacts from hazardous waste handling would be similar.	Aqueous ammonia shipments would likely be delivered using US 101, exiting on Cesar Chavez, which is a designated truck route. The off-site consequences analysis shows that the ammonia concentrations from the worst case release would not result in a significant impact in publicly accessible areas due to a catastrophic release of ammonia. Because the sites are relatively close to each other, it is expected that impacts from hazardous waste handling would be similar, although impacts could be more problematic in the case of the Illinois Street and Cesar Chavez locations where the plant would be located close to the street.	No difference from proposed site.	No difference from proposed site.	Aqueous ammonia shipments would likely be delivered using US 101, exiting on Cesar Chavez, which is a designated truck route. Because the plant would be located close to the street, the plant would have to be designed such that publicly accessible areas are not impacted in the event of a catastrophic release of ammonia.	Aqueous ammonia shipments would likely be delivered using US 101, exiting on Cesar Chavez, which is a designated truck route. Because the plant would be located close to the street, the plant would have to be designed such that publicly accessible areas are not impacted in the event of a catastrophic release of ammonia.

TABLE 9-2
Summary Comparison of Environmental Effects of Alternative Project Sites

Resource	MUNI Site (Proposed)	Mirant Site	Western Pacific Site	Port of San Francisco's Pier 70	Illinois	Cesar Chavez
Waste Management	The City will implement measures to comply with San Francisco's recycling goals and with these measures the project's contribution to total waste generated in the county will be minimal. Hazardous waste treatment and disposal capacity in California is more than adequate. Accordingly, waste management will not create a significant impact. Impacts at all sites is expected to be similar.	No difference.	No difference.	No difference.	No difference.	No difference.
Water Resources	Would use recycled wastewater, a potential beneficial impact. Recycled wastewater would be used at all of the alternatives sites.	No difference from proposed site.	No difference from proposed site.	No difference from proposed site.	No difference from proposed site.	Use of recycled water is uncertain because site is not large enough to put onsite and the SEWPCP does not currently provide recycled water.

TABLE 9-2
Summary Comparison of Environmental Effects of Alternative Project Sites

Resource	MUNI Site (Proposed)	Mirant Site	Western Pacific Site	Port of San Francisco's Pier 70	Illinois	Cesar Chavez
Geologic Hazards	No known natural resources occur in the site and the project will be designed and constructed to withstand ground-shaking. Thus, geologic impacts are expected to be less than significant. Because of their proximity, alternatives sites are expected to have similar geologic impacts.	No difference.	No difference.	No difference.	No difference.	No difference.
Paleontological Resources	The stratigraphic units underlying the site have produced significant and scientifically important fossils in the San Francisco area. Nonetheless, with mitigation, the impact on paleontological resources is expected to be less than significant. Because of their proximity, alternative sites are generally expected to have similar impacts on paleontological resources.	No difference from proposed site.	No difference.	No difference from proposed site.	No difference from proposed site.	No difference.



Source:
1. Base map is from aerial photograph, 2002 from AIRPHOTO, USA.

FIGURE 9-1
ALTERNATIVE SITES CONSIDERED

SAN FRANCISCO ELECTRIC RELIABILITY PROJECT
SUPPLEMENT A

CH2MHILL

RDD \\LOKI\PROJECTS\RDDGIS\SFPUC\MXDS\9-1_ALTERNATIVES_SUPPLEMENTA.MXD 2/23/2005 16:05:32