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Title 20 of the California Code of Regulations Section requires an applicant to consider “the range of reasonable alternatives to the project, including the ‘no project alternative,’ ... which will feasibly attain most of the basic objectives of the project, but will avoid or substantially lessen any of the significant effects of the project, and an evaluation of the comparative merits of the alternatives.” The basic objectives of the project were largely defined by the specifications contained in the San Diego Gas and Electric (SDG&E) Request for Offers (RFO). The Applicant determined feasible fuel, energy conversion technology, cooling technology, and interconnection aspects that best met the requirements of the RFO. Then the Applicant located available parcels in specific areas within the SDG&E service area, where there was existing infrastructure and peaking power demand that would satisfy both the California Independent System Operator (CAISO) and California Public Utilities Commission (CPUC). The Applicant studied six potential project sites, and narrowed the list to two sites that would avoid or lessen potential significant environmental impacts. The ‘No Project’ alternative was determined to be infeasible, and was dismissed from further detailed consideration in the Application for Certification (AFC). A detailed comparative analysis was conducted of the two feasible candidate sites. The Applicant’s evaluation of the comparative merits of the various alternative sites demonstrated that the proposed site would best meet the objectives of the project, while avoiding or lessening potential significant environmental impacts.

4.1 PROJECT OBJECTIVES AND SCOPE OF THE ALTERNATIVES ANALYSIS

Before establishing a range of reasonable project alternatives, the Applicant defined the basic objectives of the project. These objectives are outlined in Section 2.0 of the AFC. These basic objectives are derived from a need for new electric power generation as projected and authorized by the CPUC and CAISO and reflected in SDG&E’s RFO. SDG&E, as authorized by the CPUC, issued a RFO in June 2009 and negotiated a Power Purchase Agreement (PPA) with the Applicant under the RFO Product 2 category. Here is an excerpt from that offering:

Product 2 - New Local Generation Projects, Online in 2010 - 2014.

SDG&E seeks a minimum of 100 MW of peaking or intermediate-class resources as new construction or expansion projects within SDG&E's territory. Any resulting contract will be a tolling agreement with a term of 20 years and online dates of May 1 or October 1 in either 2010, 2011, 2012, 2013 or 2014. The generation must be located physically within SDG&E’s service territory (as more specifically described in the Addendum) or have its sole generator transmission system interconnection (gen-tie) directly interconnected to the electric network internal to SDG&E’s local area as currently defined by the California Independent System Operator (“CAISO”) such that the unit supports SDG&E’s Local RA requirement. ...Products offered in this category shall be capable of operating under all permits at annual capacity factors of a minimum of 30% with an availability of >98%. It is anticipated that heat rates will be no higher than 10,500 btu/kWh. For this product, SDG&E requires flexible resources that are capable of providing regulation during the morning and evening ramps and/or units that can be started and shut down as needed. In addition, SDG&E will include the additional value provided from projects that can provide quick start operations in

the ranking of Offers. SDG&E also requires that each Offer contain pricing for, and an option to provide, black start capability.

The principal RFO objectives can be summarized as follows:

- Project shall be online by end of 2014.
- Minimum of 100 megawatts (MW) of peaking and intermediate-class resources.
- Located in SDG&E service territory.
- Operate under a fuel tolling agreement over a 20-year contract.
- Capable of operating under all permits at annual capacity factors of a minimum of 30% with an availability of >98%.
- Heat rates will be no higher than 10,500 British thermal units per kilowatt hour (btu/kWh).
- Use flexible resources that can provide regulation during the morning and evening ramps and/or units that can be started and shut down as needed.
- Provide quick start operations.

To determine a general area within the SDG&E service territory that would best meet these eight RFO objectives, the Applicant considered the location of existing infrastructure. Having readily available fuel, water, wastewater, and electrical interconnections would make the proposed project economically feasible and lessen potential significant environmental impacts associated with the project. Also, with the South Bay Power Plant's loss of Reliability-Must-Run (RMR) status, and with the expansion of distributed solar power in the South Bay area, new peaking power in this region is greatly needed. With this in mind, the Applicant looked at the electrical grid in this area and determined that there was capacity for new power along the 230kV line from U.S.-Mexico border to Miguel Substation. The Applicant also determined that it would be feasible to tie into the high capacity natural gas line. The Otay Mountain/Otay River Valley/Otay Mesa area also has existing commercial/industrial uses and few sensitive receptors. Focusing on this area's infrastructure and load profile, the Applicant considered options to meet the eight RFO objectives:

1. *Project shall be online by end of 2014: The Power Purchase Agreement (PPA) COD date is May 27, 2014.* This COD will ensure that full project capacity is available before the 2014 peak electric demand season.
2. *Minimum of 100 megawatts (MW) of peaking and intermediate-class resources.* PPEC LLC decided on a 300MW peaking/intermediate class solution, one that it contracted with SDG&E for a 20-year PPA.

3. *Locate in SDG&E service territory.* As described above, the Applicant considered the entire SDG&E territory, and concluded that a proposal in the South Bay region was most likely to be chosen by SDG&E, given the region's high electrical demand and the known decommissioning of the South Bay Power Plant.
4. Operate under a fuel tolling agreement over a 20-year contract.
5. Capable of operating under all permits at annual capacity factors of a minimum of 30% with an availability of >98%. PPEC is designed to operate at up to a 46% capacity factor and at greater than 98% availability.
6. Heat rates will be no higher than 10,500 British thermal units per kilowatt hour (btu/kWh). PPEC units are rated below lower heating value (LHV).
7. Use flexible resources that can provide regulation during the morning and evening ramps and/or units that can be started and shut down as needed. The PPEC design, including General Electric (GE) LMS100 turbines, is best suited to meet this requirement.
8. *Provide quick start operations.* Again, the PPEC design, including GE LMS100 turbines, is best suited to meet this requirement.

The RFO is a technology-driven power solicitation based on electrical power delivery performance. Performance means high energy conversion efficiency, high reliability and low emissions. PPEC LLC responded with a three-unit gas-fired GE LMS100 design. This technology, applied to a 20-year PPA, is best suited at the proposed project site. The PPEC team chose this technology and the proposed site after evaluating comparative merits of the following alternatives:

- No Project Alternative
- Generation Technology Alternatives
- Water/Cooling/Wastewater Cycle Alternatives
- Site Location and Respective Linear Route Alternatives

The evaluation of each of these alternatives is presented below.

4.2 NO PROJECT ALTERNATIVE

CEQA Guidelines Section 15126.6 states that “the purpose of describing and analyzing a No Project Alternative is to allow decision makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project.” The Applicant assumed that the No Project Alternative prospect be based on prevailing conditions and new projects that will be reasonably forecast. PPEC LLC believes that the greater South Bay area will greatly benefit by having PPEC and its power contribution. Prevailing and near-term conditions along with the forecasted project benefits are described below.

The dominant present grid condition relates to the loss of RMR status at the South Bay Power Plant. As of December 31, 2010, this vintage power plant is no longer in operation. This loss of 307MWs in base-load power, along with a prior shut-down of 395MWs, leaves a considerable void in grid stability in the SDG&E service territory. Without a new peaking power source, like PPEC, the area grid stability will be significantly in peril.

The CPUC recognizes that load growth forecasts and greater reliance on renewable energy within the SDG&E electrical service territory cannot be met without new peaking generation capacity. As such, the CPUC authorized SDG&E to proceed with its 2009 RFO for new peaking generation with the goal of bringing new peaking generation online to meet reliability and load-growth needs.

PPEC LLC, as a successful bidder into the RFO, has finalized a PPA with SDG&E to design, construct, and operate a 300MW peaking facility. If PPEC is not approved by the California Energy Commission (CEC) and, hence, not built and placed into service, SDG&E will need to initiate a new RFO process to meet the CPUC Resource Adequacy requirements. Delays in new online generation capacity and load-following capacity will reduce renewable energy effectiveness and potentially lead to grid brown-outs, or worse, grid blackouts. Given the CPUC authorization and SDG&E's RFO response, the No Project Alternative option is not feasible.

In addition to overall load growth projections for San Diego County, there are two additional compelling reasons why a No Project Alternative is not plausible: (1) new conventional peaking capacity is needed to back up and augment the rapid increase in renewable energy generation facilities and (2) there was a successful drive by South Bay area agencies, local jurisdictions, and environmental organizations to decommission the South Bay Power Plant. Without additional back-up peaking power from conventional sources, natural downward swings in wind and solar power output will cause severe stress on the electrical grid (including power curtailments and black-outs). For these reasons, the No Project Alternative was dismissed as a viable alternative.

4.3 GENERATION TECHNOLOGY ALTERNATIVES

As noted above, the RFO is a technology-driven solicitation that seeks power delivery performance with high energy efficiency and low emissions. With regard to technology selection, all of the above-noted objectives in the SDG&E RFO Product 2 request were evaluated in determining PPEC's technology choice. Comparative evaluation of the available power generation technologies revealed that PPEC will best meet the RFO objectives by employing GE LMS100 combustion turbines fueled by natural gas. To illustrate PPEC LLC's analysis, each RFO objective is addressed separately below with comments on the alternative technologies and the Applicant's technology selection for each objective.

Be online by 2014: The equipment/technology of choice must be able to be designed, permitted, built, and commissioned by May 27, 2014 to meet this RFO objective and the terms of the PPA. This calendar constraint effectively rules out any unproven, difficult to permit, difficult to finance, and/or lengthy construction technologies. LMS100 technology is well-suited to meet the 2014 commissioning date objective.

Be a minimum of 100MW and up to 400MW of peaking and intermediate-class resources: Many generating technologies can be effectively scaled up to meet this range of power output. However, assuming that new hydroelectric power and nuclear generation is unavailable in San Diego County, the nature and scale of this power output objective can only reasonably be met by combustion of fossil fuels. Thus, this was PPEC LLC's assumption when considering the objectives that follow.

Locate in SDG&E service territory: San Diego County anticipates significant solar and wind resources via SDG&E's new Sunrise Powerlink transmission line that will bring these resources into San Diego County from Imperial County. To adequately backup these varying resource outputs, peaking power is most effective when located near customer demand/grid deficit centers. These centers are generally located in coastal and other eastern portions of the County. The proposed generation technology can be feasibly sited in the SDG&E service territory and will be located near customer demand/grid deficient in San Diego County.

Operate under a fuel tolling agreement over a 20-year contract: SDG&E has specified natural gas as the fuel source. Commerce aside, natural gas provides the best environmental performance compared to that of other fossil fuels.

Be capable of operating under all permits at annual capacity factors of a minimum of 30% with an availability of >98%: Few power generating technologies can meet this objective. Effectively, this class of performance can only be met with combustion turbine (CT) technology, Rankin-cycle steam systems (STs), and reciprocating engines (REs).

Heat rates will be no higher than 10,500 btu/kWh: The CT, ST, and RE technologies can meet this efficiency level, but STs can do so only when operated in a base-load/steady-state dispatch condition.

Use flexible resources that can provide regulation during the morning and evening ramps and/or units that can be started and shut down as needed: STs do not work well as fast-start/multiple daily start machines. REs cannot easily be economically scaled up for a suitable 300MW project. CTs can be reliably started several times per day and follow grid load swings attentively.

Provide quick start operations: CTs best meet this objective with their 10-minute starts, prompt emission compliance, and quick load-following characteristics.

Several proven CT configurations exist. Principal among these are (1) simple-cycle, (2) combined cycle, and (3) cogeneration. Cogeneration requires a compatible steam host, which does not work within the realm of the RFO because the generation equipment must serve the steam host first. With this physical constraint, power would not be reliably or sufficiently dispatchable to the grid. Combined-cycle facilities are efficient, but they cannot meet the multiple-fast startups required. SDG&E specifically asked for peaking generation in the RFO, and combined-cycle units will not meet this defined need. Simple-cycle CTs can meet these demands, and do so relatively cleanly and reliably. Simple-cycle machines, however, are not as efficient as combined-cycle machines. Thus, a trade-off is made for quick startups and load following capability versus base-load efficiencies of combined-cycle.

To partially offset the lower energy efficiency of conventional simple-cycle CTs, in 2005 GE introduced its latest evolution CT, called the LMS100. The LMS100 incorporates an internal cooling device called an “intercooler” that promotes higher energy efficiencies than those of conventional simple-cycle CTs, especially in hot ambient conditions when electric demand can be greatest.

Despite the lower energy conversion efficiencies of simple-cycle CTs as compared to combined-cycle CTs, projected emissions from simple-cycle machines can be less than those of combined – cycle CTs on an electrical energy output basis if the combined-cycle CTs are assumed to operate in a multiple start-up/shut-down manner.

4.4 WATER/COOLING/WASTEWATER CYCLE ALTERNATIVES

To improve energy efficiency and to lower oxides of nitrogen (NO_x) emissions, water is injected into the CT inlets. Another effective use of water in a climate such as this is evaporative inlet cooling. This is common practice for most large-scale CTs, regardless of type and configuration. PPEC LLC believes that water use for this valuable purpose is justified, especially in light of the fact that dry low-NO_x controls are not commercially available for the GE LMS100 turbines. Without water use for NO_x control, this machine will not be capable of meeting California and federal NO_x emission limits.

Cooling is an important feature of any power generation technology. When applying inter-cooling to CTs, significant energy conversion efficiencies are realized. The intercooler separates the LMS100 from conventional CTs by promoting up to 10% higher energy conversion efficiency compared to previous-class machines. This added efficiency comes at the expense of added equipment and more auxiliary loads. To prevent the impacts of added equipment and auxiliaries from negating the LMS100’s efficiency – especially in warmer climates – water cooling was evaluated against air cooling medium and hybrid approaches. A hybrid air/recycled water cooling system presents the best balance of water use and performance.

The use of water for NO_x control in CTs is required as no other option for NO_x control is commercially available or proven. The PPEC design optimizes the water needed in the air/water cooling system via our partially dry cooling system design.

The Applicant evaluated cooling options including dry ones. These cooling alternatives and analytical results are shown in the following table: The GE LMS100 can be cooled by air technologies, water technologies, or hybrid technologies. The following table lists the alternatives and their comparative merits:

**TABLE 4.4-1
WATER ALTERNATIVES – POLICY & COSTS**

Viable Alternatives	Source Type	Meets State Water Policy?	Capital Requirements/ Costs	O&M Requirements/ Costs
Local Reservoirs	Untreated surface water	No	Low	Low
Potable Water	State water policy or other surface source	Interim	Medium	Low
Groundwater (on-site wells)	Upper aquifer (not available)	Not without mitigation	Medium	High
Recycled Water	Otay Water District recycled water	Yes	Medium	Medium
Dry Cooling	Air	Yes	High	High
Hybrid Air/Water Cooling	Otay Water District recycled water	Yes	Medium	Medium

To avoid conflicts with water policy, a reliable source of recycled water was sought. As described in Section 5.5, Water Resources, PPEC will utilize recycled water from Otay Water District (OWD) once it becomes available. Until such time as OWD completes its planned recycled water system expansion, PPEC will rely on potable water supplied by OWD's existing system.

PPEC's wastewater will discharge to a County of San Diego sewer interceptor that is served by an existing sewer main along Calzada de la Fuente along the north proposed project site boundary, or an existing sewer main along Alta Road along the west proposed project site boundary. This sewer flows to the City of San Diego's Point Loma treatment facility, which discharges to the ocean. This arrangement will allow PPEC to cycle its process water to higher levels, thereby conserving recycled water use. To further reduce recycled water use on an energy output basis, PPEC will employ a partially dry-cooling system (PDCS) technology, which relies on a dry element in its cooling system. Additional discussions of alternative water and wastewater options are in Section 5.5, Water Resources.

To summarize, the Applicant chose the use of natural gas-fired simple-cycle combustion turbines from among the various power generation technology and configuration alternatives. Further, the Applicant chose the use of a hybrid dry/wet cooling system that will use recycled water at a reduced rate. With these underlying technology, fuel and water choices, the Applicant then screened and evaluated potentially feasible alternative project sites and their associated linears as described below.

4.5 SITE LOCATION AND LINEAR ROUTE ALTERNATIVES - SCREENING AND COMPARATIVE ANALYSIS

In response to the RFO, the Applicant established the fuel, power conversion technology, cooling and other major design factors. Then the Applicant sought feasible project sites that could meet the project's engineering, economic and environmental goals and RFO/PPA objectives. The Applicant used a screening methodology described below to establish feasible alternative sites/linears. Of the several sites considered, only two were deemed feasible. A comparative analysis of these two feasible sites was then done to establish the better and final site. As

described below, the proposed site had the least potential environmental impacts and allowed the Applicant to accomplish the Project Objectives.

The criteria used to determine the comparative feasibility of each site (and associated linears) were as follows:

1. Site shall be located in areas with suitable existing 230kV electrical infrastructure.
2. Site shall be a minimum of nine usable acres
3. Site shall minimize the need for and extent of linears
4. Site shall have no current sensitive receptors within 1,000 feet of the project site
5. Site shall promote less than significant environmental impacts
6. Site shall have, or be reasonably capable of meeting all laws, ordinances, regulations and standards (LORS), particularly zoning requirements
7. Site shall be reasonably available for development

Each of these seven criteria and how it was applied is described below:

Electrical Infrastructure –The Applicant focused the site search on the 230kV transmission lines between the Miguel Substation and the Otay Mesa Switchyard where it is believed there is electrical capacity for a 300MW project based on some initial screening studies. The Applicant believes that the PPEC’s connection to this existing 230kV transmission line will result in an acceptable Large Generator Interconnection Agreement with CAISO. Hence, all of the alternative sites were assumed to connect to this 230 KV line between the Miguel Substation and Otay Mesa Switchyard. Of the six sites considered, only the Alta Road site (Preferred Site), the Lower Otay Reservoir Mesa site (Site D) and the Otay Mesa Road site (Site E) provided a reasonably close interconnection to this 230 kV line.

Site Size and Usability – The Applicant determined that a minimum of nine acres will be required for the operating facility, and about six acres will be needed for construction phase laydown area. To the extent the facility site and laydown area are contiguous, the better from environmental, engineering and economic perspectives. Consideration was also be given to site and laydown area topography and geology, with preference going to sites that will not require much disturbance of native soils and one that will require little, if any imported or exported soil or fill.

Linears – Linears associated with a project site alternative shall have few linear types, minimize linear distances, and have a favorable LORS setting, all to minimize environmental impacts, engineering and costs. The Applicant evaluated each alternative project site for their respective linear impacts for the following resource types:

- Natural gas main that has sufficient volume and pressure capacity

- 230kV electrical interconnection that meets CAISO requirements
- Water source that has sufficient physical and contractual capacity
- Sewer line of sufficient physical and contractual capacity
- Site access and construction laydown area

Nearby Receptors – As generally prescribed by local ordinances, the project site shall be at least 1,000 feet from the nearest sensitive receptor. The greater the distance from the site to the nearest receptor, the better. Additionally, the fewer receptors and receptor population density to the project site, the better, given that more distance and less density generally reduces environmental impacts to those receptors.

Environmental Impacts – All project-related environmental impacts will have to be mitigated to the point that impacts are “less than significant.” Knowing all the environmental impacts of numerous sites is impossible to do without conducting thorough analysis (as required by CEQA and the WAA). However, many, if not most, of the impacts associated with a site and planned project on that site, can be readily known for screening purposes. This analysis, therefore, considers the engineering, economic and environmental consequences, estimated impacts and associated mitigation measures for each alternative site, and then compares them to those of the project site.

Land Use LORS – To be considered a feasible alternative, an alternative site must have, or reasonably be able to attain, compatible zoning and General Plan designations and provisions.

Site Control – To be considered feasible, a prospective project site and associated linears must present a reasonable path for the Applicant to gain site control. This means that a site must be commercially available for sale or lease in a timely manner, and not be unduly encumbered by conflicting easement(s), lack of access, and excessive costs.

4.5.1 Alternative Site Locations

Guided by the PPA-driven technology choices and the portion of the SDG&E grid that will support CAISO interconnection approval, the Applicant searched for potential project sites in the unincorporated area of San Diego County known as Otay Mesa, the southeastern portion of the City of San Diego, and in eastern portion of the City of Chula Vista. Many potential sites were considered in these general areas, but most were rejected due to obvious fatal flaws when considering the seven site selection criteria described above. Fatal flaws generally included close proximity to receptors, zoning conflicts, and long distances for linears. In the end, the Applicant identified six potential project sites. Following is a brief description of each of these six sites:

- Preferred Site – Alta Road
- Site A - North Main Street
- Site B – South Main Street

- Site C - Maxwell Road
- Site D - Lower Otay Reservoir Mesa
- Site E – Otay Mesa Road

Please see Figure 4.5-1, Alternative Site Locations.

Each of these six sites and associated linears are described below in context of the seven site selection criteria noted above. Highly favorable attributes are also identified, as are qualities that render a site infeasible.

Preferred Site

The Preferred Site is in the southeast quadrangle of Alta Road and Calzada de la Fuente. This site is adjacent to the operating Otay Mesa Generating Project (OMGP) and was used by that project for a temporary laydown area. At the Preferred Site, PPEC will consist of the project site, linears, and a temporary laydown area (Figure 3.3-1, Facility Plot Plan). The Preferred Site is located in an unincorporated area of San Diego County known as Otay Mesa. It is comprised of a 9.99 acre parcel located in the southeast quadrant of the Alta Road and Calzada de la Fuente intersection. At the Preferred Site, PPEC will comprise the entire parcel, Assessor's Parcel Number (APN) 648-040-45, and the laydown area would be 6.00 acres of the adjacent parcel to the south, APN 648-040-46 (Figure 3.3-2, Project Location). The project affects the following areas:

- Plant site – 9.99 acres.
- Temporary laydown and parking area – 6.00 acres, on an adjacent parcel that is contiguous to the project site.
- Natural Gas pipeline – There are two possible routes for the gas supply pipeline. Both routes would connect to an existing SDG&E natural gas pipeline, but at different locations. Route A would extend approximately 8,000 feet south along Alta Road to near the U.S.–Mexico border, at which point it would connect to the existing SDG&E natural gas pipeline. Route B would extend approximately 2,375 feet south along Alta Road, turn west on Otay Mesa Road, and continue approximately 7,920 feet to Harvest Road at which point it would connect to the existing SDG&E natural gas pipeline (Figure 3.3-3, Potential Linears) for a total of approximately 10,300 feet. The pipeline will be constructed, owned, and operated by SDG&E.
- Sewer pipeline – A short connection will be made to an existing 12-inch sewer main along Calzada de la Fuente along the north project site boundary or to an existing 15-inch sewer main along Alta Road, along the west project site boundary.
- Stormwater pipeline – A short connection will be made from a detention pond located at the northwest corner of the project site to an existing 30-inch stormwater pipeline located along Calzada de la Fuente, adjacent to the project site.

- Power line – Two possible routes are provided for a 230kV transmission line that will connect the project into the existing 230kV Otay Mesa switchyard. Route A would begin as an overhead power line along Calzada de la Fuente, extend approximately 1,700 feet east where it would then be routed underground for approximately 400 feet into the Otay Mesa switchyard (total length of Route A would be approximately 2,100 feet). Route B would begin as an overhead power line from the eastern edge of the project site, run south approximately 550 feet, then turn east along the northern border of the parcels with APN 648-040-48 and APN 648-040-43 for 1,400 feet, and finally turn north for approximately 700 feet into the Otay Mesa switchyard (total length of Route B would be approximately 2,650 feet). The power line will be owned and maintained by the Applicant.
- Water supply pipelines – The project will make a short connection to the potable service system, either at an existing 12-inch main along Calzada de la Fuente, or at an existing 24-inch main along Alta Road. Upon the Otay Water District (OWD)'s completion of the planned Otay Mesa area recycled water system, the project will make a connection to an existing 8-inch recycled water main along Calzada de la Fuente or a new recycled water main to be constructed in Alta Road.

These features are illustrated on Figure 3.3-1, Facility Plot Plan and Figure 3.3-3, Potential Linears.

At the Preferred Site, the 9.99 acre project site and adjacent 6.00 acre laydown area parcel are ideal in size. This site affords a minimal set of linears. Water supply, sewer and stormwater from the proposed PPEC will connect to existing infrastructure with short offsite linears. The natural gas linear will be along one of two routes, and the new connecting electrical lines will be along one of two routes. All linear alternatives are shown in Figure 3.3-3, Potential Linears. This site is about 1,800 feet from the Otay Mesa switchyard, so either transmission linear alternative presents minimal potential impacts. Similarly, the existing natural gas trunk line presents relatively short gas connection linears.

The nearest receptors are three clustered residences along Otay Mesa Road between Harvest Road and Enrico Fermi Road. These residences are located about 4,700 feet southwest of the Preferred Site. This distance meets the Applicant's receptor criteria.

All associated environmental impacts presented by this site and associated linears can be mitigated using air emissions offsets, engineering design and operational practices.

This site and all the surrounding land is zoned "Heavy Industrial" which is consistent with the project's use.

PPEC LLC has site control of the project and laydown site at the Preferred Site. Site access is easily afforded from Calzada de la Fuente.

Site A

Site A is located on the north side of Main Street between Nirvana and Heritage Roads. This site is surrounded by recycling complexes to the north and west, and undeveloped, mostly undisturbed land to the east and south. This site is part of APN 6440500600. Site A land is approximately 18 acres, and meets the minimal nine acre requirement. However, this site is hilly and is bifurcated by a deep natural ravine through the center of the site. This approximately 400 x 2,000 feet oblong site is positioned between Main street to the south and a plateau to the north, with an elevation ranging from about 160 to 200 feet above mean sea level (AMSL) along the north site line and about 130 feet AMSL along Main Street. Given this irregular topography, the Applicant determined that this is the least feasible site of the alternative sites considered. However, for completeness, and despite the added engineering, costs and environmental impacts associated with site excavation as compared to that of the Preferred Site, further site selection screening was conducted.

The nearest receptors to Site A are residences along Quarterdeck Lane located about 1,500 feet southwest of the site. Numerous residences have substantial views of this area and could create a significant visual impact that is difficult, if not impossible to mitigate due to the high local elevation. This distance, however, meets the Applicant's minimal 1,000 foot receptor distance criteria.

This site and all the surrounding land is zoned "Industrial" which is consistent with the project's use.

A thorough CEQA study was not conducted on this area, but this site, with designed mitigation, is believed to likely satisfy the "less than significant environmental impact" test.

With the assumption that the topography challenges could be overcome during facility construction, Site A meets the Applicants' basic site screening criteria. Attention then was given to evaluation of the four required linears. Analysis of the engineering, costs and environmental impacts associated with the four linears was essentially the same as the analysis for Site C, the Maxwell Road site, given the proximity of the two sites. Therefore, the results of Site A's linear analysis are the same as those for Site C. The results of this analysis follow.

The nearest natural gas trunk line of sufficient capacity and reserve is located about 5 miles from this site. (This is the same main trunk line that will serve the Preferred Site.) Compared to the Preferred Site's 8,000 to 10,300-foot natural gas linear, this site alternative will introduce significant engineering, capital costs, land mitigation and other mitigation impacts.

The nearest feasible 230kV electrical interconnection is located near the natural gas line described above, and will be approximately five miles in length. As such, the impacts of the transmission interconnection for this alternative project site location are similar to those of the natural gas line linear, that is, that this alternative site presents significantly greater engineering, costs, and other environmental impacts than the Preferred Site

Recycled water needs could be served by OWD via a new supply line that is estimated to be 4,800 feet long. This new underground pipeline linear will increase the engineering, capital costs, and construction impacts significantly beyond the Preferred Site's water linear, given that the Preferred Site water pipeline already exists through the site.

The sewer infrastructure in the area of this alternative site has not been fully evaluated, but for purposes of feasibility analysis, sewer interconnection costs and environmental impacts are assumed to be similar to those of the Preferred Site.

In summary, Site A offers potentially feasible land size, receptor distance, zoning and comparable overall environmental impacts that will marginally meet the main project needs. However, this site introduces significant additional environmental, costs and engineering impacts as compared to the Preferred Site. Key among these increased impacts are the five mile gas pipeline and electrical interconnect line, where the Preferred Site's linears are 3,350 and 1,500 feet in distance, respectively. Given that the natural gas and electrical linears are considerably longer than those of the Preferred Site (five miles versus 8,000 to 10,300 feet), and given the topography of this site, Site A is not considered to be as feasible as the Preferred Site in terms of environmental impacts during construction, engineering & design costs, and overall capital costs.

Site B

Site B is located on south side of Main Street between Nirvana Road and Bradywine Avenue. This site is surrounded by auto dealerships to the west and northwest, vacant disturbed lot to the north, warehouse facilities to the northeast, disturbed/undeveloped lot to the east and undisturbed open space to the south. This site is part of APN 6440408000. Site B land is located in the same local area as the Site A and Site C alternatives. It consists of approximately ten acres. It is approximately 400 feet by 1,100 feet, and ranges from 150 to 170 feet AMSL along Main Street and slopes to the south toward the Otay River valley to about 110 feet AMSL. The entire site has been disturbed and is essentially a barren lot with no structures. The Applicant determined that from a size and topography perspective, Site B is feasible.

The nearest receptors to Site B are residences along Topside Lane located about 1,300 feet southeast of Site B. Other nearby residential receptors located about 1,600 feet north of the site on Jeremy Point Court and about 1,500 feet southwest on Dennery Road. These nearest receptor locations meet the Applicant's minimal 1,000 foot receptor distance criteria.

This site is zoned "Industrial," which is consistent with the project's use.

Site B meets the Applicants' basic site screening criteria. Attention then was given to evaluation of the four required linears. Analysis of the engineering, costs and environmental impacts associated with the four linears was essentially the same as the analysis for Site C, the Maxwell Road site, given the proximity of the two sites. Therefore, the results of Site B's linear analysis are similar to those of Site C. The results of this analysis follow.

The nearest natural gas trunk line of sufficient capacity and reserve is located about five miles from this site. This is the same main trunk line that will serve the Preferred Site. Compared to the Preferred Site's 8,000 to 10,300-foot natural gas linear, this site alternative will introduce significant engineering, capital costs, land mitigation and other mitigation impacts.

The nearest feasible 230kV electrical interconnection is located near the natural gas line described above, and will be approximately five miles in length. As such, the impacts of the transmission interconnection for this alternative project site location are similar to those of the natural gas line linear, that is, that this alternative site present significantly greater engineering, costs, and other environmental impacts than the Preferred Site.

Recycled water needs could be served by OWD via a new 1,700 feet supply line. This new underground pipeline linear will increase the engineering, capital costs, and construction impacts significantly beyond the Preferred Site's water linear, given that the Preferred Site water pipeline already exists through the site.

The sewer infrastructure in the area of this alternative site has not been fully evaluated, but for purposes of feasibility analysis, sewer interconnection costs and environmental impacts are assumed to be similar to those of the Preferred Site.

Given that the natural gas and electrical linears are considerably longer than those of the Preferred Site, Site B is not considered to be as feasible as the Preferred Site in terms of environmental impacts during construction, engineering & design, and capital costs.

Site C

Site C is located on Maxwell Road about 1,000 feet north of Main Street and on the east side of Maxwell Road. It is surrounded by a municipal landfill to the north, auto recycling complex to the east, commercial buildings and parking to the west, and vacant disturbed undeveloped land to the south. This site is part of APN 6440406100. At about two acres in size, this site did not meet the project's basic land size requirement.

Site D

The Lower Otay Reservoir Mesa site is located adjacent to the Otay Lakes Water Treatment Plant, and adjacent to and to the west of the Otay Lakes County Park. To the south and west of the site is partially disturbed open space preserve. Site D is on a 15-acre mesa that is perched midway between the ridge lines to the north and the Otay River valley to the south. The mesa is located within the Multiple Species Conservation Program (MSCP) which would require that the specific site be removed from the MSCP and additional adjacent and biologically comparable land be added to the MSCP.

Site D is within the City of Chula Vista jurisdictional boundary and is owned by the city. This parcel is zoned "Planned Community."

The nearest receptor to this site is a county park ranger house that is located about 1,200 feet away. With the exception of a park ranger house, the nearest receptors to this site are in the community of Otay Ranch, about one mile to the northwest.

Site D was initially favored for its proximity to a sufficiently large natural gas main and a potentially favorable 230kV electrical line corridor. At 3,350 feet and 1,200 feet, respectively, these nearby gas and electric interconnection points greatly reduce the engineering, economic and environmental impacts of the linears. In addition, the recycled water line is part of the OWD's capital project plan that will run a main recycled water supply line at the edge of the site. The

nearest sewer connection is in about the same area as the gas main connection point, which is about 3,400 feet long. Site D access would require improvements to an existing road that is partially on San Diego County Park land, but primarily is on the City of San Diego water treatment facility land.

Required mitigation would include landscape screening of the facility, BACT air emission controls and ERC surrender, significant preserve offset land and other biological preservation and enhancement, and noise containment structures. Because of the significant biological impacts, the U.S. Fish & Wildlife Service and the California Department of Fish & Game have formally opposed the use of this site for a power plant. The preserve offset and biology enhancements are a mitigation type that is not shared by the other alternative sites.

Site E

Site E actually consists of a suite of three independent prospect parcels. They are all located along Otay Mesa Road between Harvest Road and Enrico Fermi Road. (These parcels are similar to each other in regard to the site selection criteria, so they have been considered as a group to simplify presentation.) Individual parcels are shown on Figure 4.5-1. These parcels are part of the unincorporated Otay Mesa area of the County of San Diego. These three parcels are not as fully described here because they presented two glaring fatal flaws: (1) FAA LORS associated with Brown Field and (2) proximity to existing residential receptors. Otherwise, any of these parcels would have presented feasible prospects for a final project site.

4.5.2 Comparative Summary of Alternative Sites' Ability to Meet Screening Criteria

Electrical Infrastructure – As noted above all alternative sites were assumed to connect into the existing 230kV line between the Miguel Substation and the U.S.-Mexico border. With this assumption there are two factors that will differentiate the sites on an electrical grid-basis: (1) length of new connecting conductors, and (2) the need, or not, for a new substation to accommodate the new load. Sites A, B and C will require considerable length of new transmission lines (approximately five miles). Sites A, B, C and D will require a new substation. Only the Preferred Site and Site E will not require significant linears or a new substation. This makes the Preferred Site and Site E more feasible from a CAISO perspective.

Site	New Substation Required?	Relative Feasibility
Preferred Site	No	More Feasible
A	Yes	Less Feasible
B	Yes	Less Feasible
C	Yes	Less Feasible
D	Yes	Less Feasible
E	No	More Feasible

Site Size and Usability – The Applicant determined that a minimum of nine acres for the project and six acres for the laydown area would be required for any alternative site. Site A did not meet the minimal acreage requirement, while Site B is marginal when considering the added laydown area. Sites D, E and the Preferred Site afford ample project and laydown acreage.

Further, we sought land that would minimize site excavation and soil import and export. We dismissed Site A and C due to small size. Sites B, D, E and the Preferred Site could perhaps be excavated to a balanced cut/fill arrangement.

The overall size and usability criteria favor Sites D and the Preferred Site about the same. The following table summarizes the site size and usability ratings:

Site	Comments	Size and Utility Feasibility
Preferred Site	Adequate size and grade	Feasible
A	Requires extensive grading	Marginal
B	Marginal size and grading	Feasible
C	Not enough acreage and requires extensive grading	Infeasible
D	Adequate size and but much grading	Feasible
E	Adequate size and grade	Feasible

Linears – Due to their lengthy natural gas and electrical line connections, Sites A, B, and C were deemed infeasible from a linears cost and engineering perspective. At less than two miles in length, the gas and electric linears for Site E and the Preferred Site are comparatively more moderate. Site D presented the shortest gas and electric linear, but these linears are through MSCP preserve, which significantly increases costs and increases environmental impacts.

Regarding water and sewer connection linears, the Preferred Site presents the best site because water and sewer trunk lines exist along this site's boundaries.

Overall, the Applicant believes that the Preferred Site is the most feasible project site alternative in terms of minimizing impacts and costs associated with project linears.

Site	Relative Impacts and Costs	Feasibility
Preferred Site	Low	Feasible
A	High	Infeasible
B	High	Infeasible
C	High	Infeasible
D	Low	Feasible
E	Low	Feasible

Nearby Receptors – Clearly, more distance of separation between the site and receptors is preferred to reduce potential impacts to these receptors. Based solely on distance, all the alternative sites appear to meet minimum distance requirements. Following is a table that shows the distance between each site and its nearest receptor. Based solely on distance, the Preferred Site offers the best receptor option.

Site	Distance to Nearest Receptor	Comments	Feasibility
Preferred Site	4,700 feet	Three residences along Otay Mesa Rd.	Feasible
A	1,500 feet	Small residential cluster to the NW	Feasible
B	1,300 feet	Small residential cluster to the SE	Feasible
C	1,600 feet	Small residential cluster to the NW	Feasible
D	1,200 feet	Park Ranger Residence	Feasible
E	2,500 feet	Three residences along Otay Mesa Rd.	Feasible

4.5.3 Environmental Impacts

Project-related environmental impacts will have to be mitigated to a point whereby all resulting impacts will be “less than significant.” Full knowledge of all the environmental impacts is not knowable without conducting thorough analysis (as required by CEQA and the WAA). The Applicant evaluated each site on the basis of the AFC environmental areas, and estimated engineering and economic costs associated with the various perceived mitigation measures. The environmental impacts table that follows summarizes relative costs, areas of concern, and whether a site is feasible or not from an environmental impacts perspective.

Site	Relative Environmental Impacts and Costs	Areas of Concern	Environmental Feasibility
Preferred Site	Low	Air	Feasible
A	High	Gas and electric linears; soils; visuals; noise; air	Marginal
B	High	Gas and electric linears; visuals; noise; air	Marginal
C	High	Gas and electric linears; soils; visuals; noise; air	Marginal
D	High	Visuals, noise, biology, soils; air	Infeasible
E	Low	Air	Feasible

The Applicant determined that Site E and the Preferred Site were feasible from an environmental impacts perspective.

Land Use LORS – To be considered a feasible alternative, an alternative site must have, or reasonably be able to attain, compatible zoning and General Plan designations and provisions. Current and planned zoning designations are described above and summarized in the following table:

Site	Current Zoning	Required Zoning	Relative Impacts and Costs
Preferred Site	Heavy Industrial	(same)	Low
A	Industrial	(same)	Low
B	Industrial	(same)	Low
C	Industrial	(same)	Low
D	Planned Community	Public-Quasi Public	High
E	Technology Business Park	Heavy Industrial (or get MUP for current zoning)	Medium

Site Control – The following site control table shows the project sites’ and the associated linears’ overall site control feasibility rating:

Site	Project Site	Linears	Feasibility
Preferred Site	Available	Available	High
A	Available	Unavailable	Low
B	Available	Unavailable	Low
C	Available	Unavailable	Low
D	Requires Council approval after CEQA	Requires Council approval after CEQA	Low
E	Available	Available	High

The selection criteria analysis described above for each criterion is compiled into the following summary table:

**TABLE 4.5-1
ALTERNATIVE SITE COMPARISON OF SCREENING CRITERIA**

Alternative Site vs. Screening Criteria	Preferred Site (Alta Road)	Site A (N. Main St)	Site B (S. Main St)	Site C (Maxwell Rd)	Site D (Lower Otay Reservoir)	Site E (Otay Mesa Rd)
CAISO and Grid Compatible	More feasible	Less feasible	Less feasible	Less feasible	Feasible	More feasible
Site Size and Physical Characteristics	More feasible	Less feasible	Feasible	Not feasible	Feasible	More feasible
Linears	Feasible	Not feasible	Not feasible	Not feasible	Feasible	Feasible
Proximity to Receptors	Feasible	Less feasible	Less feasible	Less feasible	Feasible	Less feasible
Consistency with Zoning & GP	More feasible	Feasible	Feasible	Feasible	Less feasible	Feasible
Less-than-significant Environmental Impacts with mitigation	More feasible	Not feasible	Not feasible	Not feasible	Less feasible	Feasible
Site Control	Feasible ¹	Feasible	Feasible	Feasible	Less feasible	Feasible

1. A Land Lease Agreement has been signed that secures PPEC’s use of the project site parcel and temporary laydown parcel.

4.5.4 Detailed Comparison of Two Feasible Alternatives

The site selection screening analysis determined that of the six alternative sites, only the Preferred Site (Alta Road Site) and Site D (Lower Otay Reservoir Site) are feasible. The Applicant then chose to compare each of the two feasible sites according to impacts to each of the various AFC study areas. This comparison is shown in the following table:

Alternative Site vs. Relative Environmental Impact	Preferred Site - Alta Road	Site D- Lower Otay Reservoir
Air Quality	Similar	Similar
Geological Hazards	Similar	Similar
Soils	Less	More
Water Resources	Similar	Similar
Biological Resources	Much Less	Much More
Cultural Resources	Similar	Similar
Paleontological Resources	Similar	Similar
Land Use	Much Less	Much More
Socioeconomics	Similar	Similar
Traffic & Transportation	Similar	Similar
Noise	Much Less	Much More
Visual Resources	Much Less	Much More
Waste Management	Same	Same
Hazardous Materials	Same	Same
Public Health	Same	Same
Worker Safety	Same	Same

When considering the overall environmental impacts of the two alternative sites, Site D has more impacts than the Preferred Site, mainly due to construction-related impacts. Each environmental area is discussed below.

Air Quality – Both Alternative Sites are within the same local air shed and topographical setting, and therefore will be expected to have similar air quality impacts. The sites are separated by about two miles and are both located along the western hills of the San Ysidro Mountains. This, along with prevailing westerly winds, presents both sites with similar geophysical characteristics. For purposes of the siting analysis, the Applicant assumed that Air Quality impacts, and the mitigation thereof, would be about the same for each site.

Geologic Hazards – Each of the two Alternative Sites would present similar potential geologic hazards, which are believed to generally be low in the Otay Mesa-Otay River Valley area.

Soils – Soils impacts would mainly arise at each of the sites during the early construction phase as the site is brought to proper grade. The Preferred Site, having been disturbed by prior projects, will require little site grading. By contrast, Site D will require considerable laydown area, access road, and site grading. Thus, Site D would have more soils impacts than those of the Preferred Site.

Water Resources – Both sites would rely on the same recycled/potable water supplier, Otay Water District (OWD). OWD has infrastructure that already serves both sites with potable water, and has capital projects ready to build that would provide recycled water to the PPEC project and

surrounding area. Both sites share similar circumstances in this regard. Further, both sites are adjacent to existing OWD potable lines for nearby hookup, and both sites will be adjacent to the new OWD recycled water lines. With this planned water supply, each site presents about the same water connection and use impacts.

Similarly with waste water, there is existing sewer capacity and infrastructure to serve either site. Site D, however, would require a 3,500 foot sewer linear through the MSCP preserve, while the Preferred Site can hookup at the site boundary.

Biological Resources – The mitigation of biological impacts associated with Site D are extensive, to say the least. Positioning a project and its linears in a MSCP preserve requires significant offsetting, conservation and restoration. In contrast, the Preferred Site is expected to have very little biological impacts. Even if all other factors were assumed to be equal, the biological impacts and the associated difficulty of mitigating those impacts is the single most notable environmental factor why the Proposed Site is superior to Site D.

Cultural Resources – The Applicant believes that cultural resources impacts for each site are less than significant, and do not require mitigation.

Paleontological Resources – The Applicant believes that paleontological resources impacts for each site are less than significant, and do not require mitigation.

Land Use – Site D is zoned ‘Planned Community.’ Per direction from the City of Chula Vista, the Site D parcel would need to be rezoned (‘public-quasi public’) via city council discretion once the AFC was approved by the CEC. The nature and timing of city discretionary zoning approval presents the project with significant risk. By contrast, the Preferred Site is zoned “heavy industrial” and will not require discretionary approvals outside of the CEC process. Clearly, the Preferred Site offers a much better Land Use setting.

Socioeconomics – The Applicant determined that the project’s socioeconomic impacts would be about the same for either site, and that those potential impacts are less than significant. Hence, neither site would require mitigation for socioeconomic impacts

Traffic & Transportation – The Applicant determined that the traffic and transportation impacts for both sites are less than significant, provided that suitable traffic management plans are designed and implemented during the construction phase. Each site would carry the same amount of materials, workers and services. The Preferred Site would introduce added construction phase traffic flow issues due to the natural gas line being constructed in public roads. However, this construction activity is relatively short compared to the overall construction phase and the life of the project. So, traffic and transportation impacts will be similar for both sites.

Noise – Site D is surrounded by open space preserve that has a very low night-time dB level standard. By contrast, the Preferred Site is subject to industrial-zone sound levels that are much higher. As a result, Site D would require high sound walls totally surrounding the site, whereas, the Preferred Site will not require perimeter sound walls. As such, the noise impacts, after mitigation, are much less for the Preferred Site compared to Site D.

Visual Resources – With its setting in the MSCP, Site D would require significant visual resources mitigation. This is especially true due to the need for extensive sound walls at this site. While the Applicant believes that with mitigation (equipment colors, lighting control, and landscaping), the visual impacts of the Project at Site D could be mitigated to less than significant levels - however, not without great expense. By contrast, the Preferred Site will require minimal landscaping, lighting design and other visual resource mitigation to become less than significant in this regard. Therefore, the Preferred Site presents much less visual resource impacts than its alternative site.

Waste Management – The Applicant determined that waste management scenarios are about the same for both alternative sites and present less than significant environmental impacts.

Hazardous Materials – The Applicant determined that hazardous materials use, storage and disposal are about the same for both alternative sites, and each presents less than significant environmental impacts.

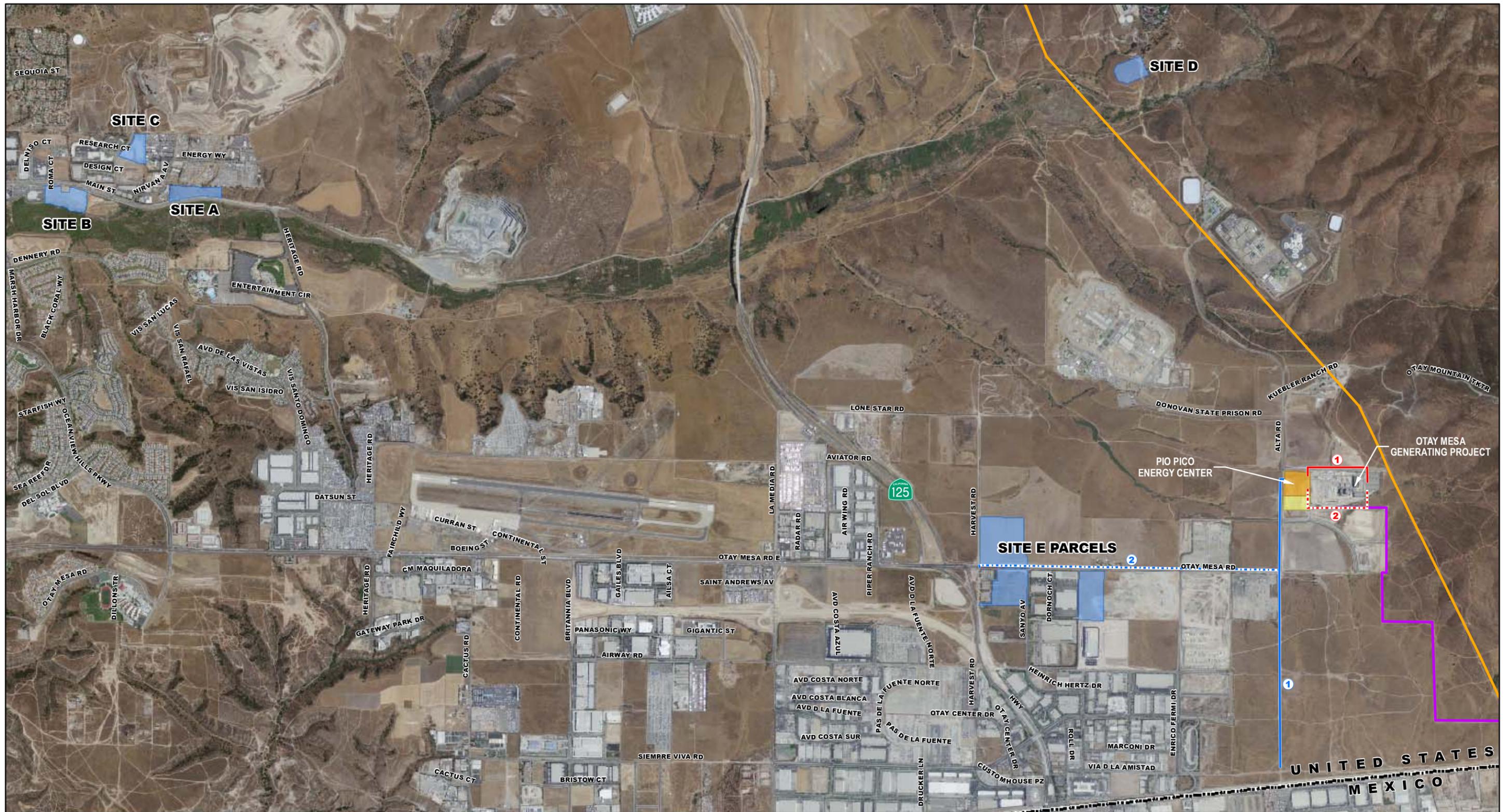
Public Health – The Applicant determined that potential public health impacts are about the same for both alternative sites, and each presents less than significant environmental impacts.

Worker Safety – The Applicant determined that worker safety considerations are about the same for both alternative sites, and each presents less than significant environmental impacts.

4.5.5 Environmental, Engineering and Economic Merits Summary

Based on the objectives described in AFC Section 2.0, Project Objectives, and as summarized above in Section 4.1, the Applicant determined that the No Project Alternative is not feasible when considering the environmental, engineering and economic merits of the project. Also considering the project objectives, the Applicant determined that the GE LMS100 combustion turbines operating in simple-cycle mode offer the best energy conversion technology. Further refinement of technology choices show that the use of a partial dry/wet cooling technology offers the best cooling choice when balancing environmental, engineering and economic concerns. Also driving this balance is resolving the question of where to connect to the electrical grid. The Applicant chose the lines between the Miguel Substation and the Otay Mesa Switchyard because it is believed that area load demand versus area grid capacity would be well-matched with the onset of 300MWs that PPEC will afford.

Once the Applicant targeted specific technology and grid connection, six potential project sites were identified. After a screening process, only two of the six sites were deemed to be feasible from environmental, engineering and economic perspectives. Results of further evaluation of the two feasible sites clearly show that the Preferred Site offers the best feasibility.



LEGEND		
■ Alternative Site	— Existing 230 kV Transmission Line	— Route A 230 kV Transmission Line
■ Project Site	— Existing Natural Gas Line	- - - Route B 230 kV Transmission Line
■ Laydown Area	— Route A Natural Gas Line	- - - Route B Natural Gas Line
 United States/Mexico Border		

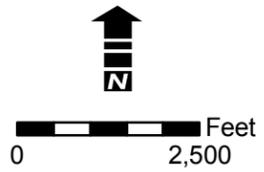


FIGURE 4.5-1
ALTERNATIVE SITE LOCATIONS

PIO PICO
ENERGY CENTER

PROJECT NO.: 29874827	
DATE: NOVEMBER 2010	

Adequacy Issue: Adequate _____ Inadequate _____ **DATA ADEQUACY WORKSHEET** Revision No.: 0 Date: _____

Technical Area: **ALTERNATIVES** Project: Pio Pico Energy Center Technical Staff: _____

Project Manager: _____ Docket: _____ Technical Senior: _____

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (b) (1) (D)	A description of how the site and related facilities were selected and the consideration given to engineering constraints, site geology, environmental impacts, water, waste and fuel constraints, electric transmission constraints, and any other factors considered by the applicant.	Section 4.1 through Section 4.5		
Appendix B (f) (1)	A discussion of the range of reasonable alternatives to the project, or to the location of the project, including the no project alternative, 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 an evaluation of the comparative merits of the alternatives. In accordance with Public Resources Code section 25540.6(b), a discussion of the applicant's site selection criteria, any alternative sites considered for the project and the reasons why the applicant chose the proposed site.	Section 4-2 through Section 4-5		
Appendix B (f) (2)	An evaluation of the comparative engineering, economic, and environmental merits of the alternatives discussed in subsection (f)(1).	Section 4.5.2 through Section 4.5.5		