Chapter 4
Alternatives Analysis

4.1 Introduction

Section 15126.6 of the State CEQA Guidelines requires that an EIR describe a reasonable range of feasible alternatives to the project or project location that could substantially reduce one or more of a project's significant environmental impacts while meeting most or all of its objectives. As such, alternatives that do not avoid or substantially lessen significant impacts of the project do not need to be analyzed in an EIR. An EIR is not required to present the alternatives analysis at the same level of detail as the project analysis or to consider every conceivable alternative to a project. Rather, an EIR must consider a reasonable range of potentially feasible alternatives that will foster informed decision making. As such, there must be sufficient detail to allow comparison of the respective merits of the alternatives. Further, if the No Project Alternative is the environmentally superior alternative, an EIR must also identify an environmentally superior alternative among the remaining action alternatives.

Key provisions of State CEQA Guidelines Section 15126.6 that pertain to alternatives analyses are summarized below.

- The discussion of alternatives shall focus on alternatives to the project or project location that are feasible, would meet most or all of the project objectives, and would substantially reduce one or more of its significant impacts.
- The range of alternatives must include the No Project Alternative. The No Project analysis will discuss the existing conditions at the time the NOP was published, as well as conditions that would reasonably be expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services (State CEQA Guidelines Section 15126.6[e]). The No Project Alternative is not required to be feasible, meet any of the project objectives, or reduce the project's expected impacts to any degree.
- The range of alternatives required is governed by a *rule of reason*. An EIR must evaluate only those alternatives necessary to permit a reasoned choice. An EIR is not required to analyze every conceivable alternative to a project.
- An EIR does not need to consider an alternative that would not achieve the basic project objectives, for which effects cannot be reasonably ascertained, and for which implementation is remote and speculative.

This chapter includes the following sections.

- *Alternatives Development* includes the methods and screening criteria, project objectives, and significant impacts used in identifying the alternatives.
- *Alternatives Analysis* includes a qualitative analysis that compares the alternatives with the proposed Initial and Full Repower.
- *Environmentally Superior Alternative* uses the results of the analysis to identify the environmentally superior alternative.

4.2 Alternatives Development

The alternatives development process was focused and specific for the Sand Hill Wind Project. The specific methods and screening criteria, and alternatives considered but dismissed, are described below.

4.2.1 Methods and Screening Criteria

Alternative screening criteria included the following.

- **Adherence to project objectives** – the extent to which an alternative fulfills the project's objectives.
- **Impact avoidance** – the extent to which an alternative substantially avoids, minimizes, reduces or eliminates an impact.
- **Feasibility** – the extent to which an alternative is potentially capable of being accomplished given economic, environmental, legal, social, and technological factors.

Through this screening process, alternatives were either considered and rejected or analyzed further. Those alternatives that meet the project objectives, that are probably feasible, and that would reduce one or more project impact are discussed in greater detail in Section 4.3, *Alternatives Analysis*.

Adherence to Project Objectives

The underlying purpose of the project is to repower the wind energy production facilities owned by the Applicant with shrouded turbines, a new wind energy generation technology, in two phases, beginning with a test project of a sufficient number of the shrouded turbines to support an Avian Validation Study, and subsequently, if that study demonstrates that the shrouded turbine technology is sufficiently compatible with avian use and behavior in the project area, complete the repowering of the facilities with shrouded turbines to produce an equal or greater amount of energy compared to existing production levels. The project goal is to develop an economically viable wind energy project in a proven wind resource area. As described in Chapter 2, *Project Description*, Sand Hill Wind's fundamental objectives for this project are interrelated to the extent that all must be met by the alternatives selected for analysis in the EIR and are as follows.

- Through a phased permitting and development process, test and demonstrate a new wind energy generation technology in a proven wind resource area with a strong research record on wind-avian impacts in order to establish a scientifically-supported avian impact research record for this new technology.
- By March 2015, complete a Before-After-Control-Impact (BACI) Avian Validation Study primarily funded by a PIER grant from the CEC. The study would test whether 40 FloDesign shrouded wind turbines on the project parcels are safer to birds than existing open-blade turbines on the same parcels, and would help to develop predictive turbine siting tools for shrouded and open-blade turbines, with the following study objectives.
    - Compare avian wind turbine interactions between FloDesign shrouded turbines and multiple types of existing 1980s–'90s-era conventional wind turbines at sites with known high avian fatality rates during day and night and various wind and terrain conditions.

  - Compare avian fatality rates between FloDesign shrouded turbines and existing turbines at known high fatality sites, using a short search interval and a BACI design.
  - Explain variation in fatality rates by turbine design, flight patterns, and avian interactions with wind turbines (e.g., avoidance behaviors).
  - Develop field-tested behavior survey methods and data that inform avoidance rates for use in collision risk models and map-based collision hazard models, with the eventual goal of using model results to assist with wind turbine siting.
- Use information derived from the Avian Validation Study to evaluate potential refinements to the FloDesign shrouded turbine design and to inform FloDesign's repowering plans for the entire project area.
- Use information derived from the Avian Validation Study and project operations to inform a long-term solution for repowering the APWRA that reduces impacts on avian species and potentially reduces costs to ratepayers by using surplus transmission capacity at the Tesla substation and locating wind energy facilities close to Bay Area load centers.
- Develop an economically viable wind energy project through commercially available financing that would maximize renewable energy production and economic viability by initially replacing 4 MW of aging wind energy assets with newer and more efficient shrouded turbines placed in service no later than March 2015 to substantiate the Avian Validation Study, with subsequent repowering phases of up to an additional 30 MW anticipated in later years.

The following are secondary objectives of the proposed project. An alternative need not include all of these objectives in order to qualify for analysis in the EIR.

- Provide a comparison between the shrouded turbine design and current-generation, large-scale wind turbines, to determine if shrouded turbines would have a lower rate of avian mortality per MW of energy produced, as well as achieve greater energy efficiency and output.
- Minimize environmental impacts by using existing power transmission, access infrastructure and other existing ancillary facilities to the maximum extent feasible.
- Develop a viable source of clean energy to help California achieve its Renewables Portfolio Standard (RPS) with a low MW-to-acre disturbance ratio and without the need for large amounts of water.
- Offset the need for additional electricity generated from fossil fuels, and thereby assist the state in meeting its air quality goals and reducing greenhouse gas emissions.
- Contribute positively to economic activity during construction and operation.
- Increase local short-term and long-term employment opportunities.

Impact Avoidance

Alternatives should provide a means of reducing the level of impacts that would otherwise result from implementation of the project. The environmental issues associated with the proposed Initial and Full Repower phases are analyzed in Chapter 3, *Environmental Analysis*. The Initial Repower phase is evaluated in detail and the Full Repower phase is evaluated programmatically, because site-specific information regarding ultimate design and placement of facilities is unknown. The following significant impacts would be associated with the Initial and Full Repower phases. The list below identifies instances in which the proposed project—specifically both the Initial and Full Repower

phases—would result in a significant and unavoidable impact, or result in a significant impact that could be reduced to a less-than-significant level through mitigation. Because this EIR is a combined project-level and program-level EIR, for the purpose of the following analyses and discussion, the project is understood to include the Initial and Full Repower phases.

Significant and Unavoidable Impacts

Aesthetics (initial Repower)

- Impact AESTH-2: Have a substantial adverse effect on a scenic vista
- Impact AESTH-3: Substantially damage scenic resources, including but not limited to trees, rock outcroppings, and historic buildings along a scenic highway
- Impact AESTH-4: Substantially degrade the existing visual character or quality of the site and its surroundings

Aesthetics (Full Repower)

- Impact AESTH-2: Have a substantial adverse effect on a scenic vista
- Impact AESTH-3: Substantially damage scenic resources, including but not limited to trees, rock outcroppings, and historic buildings along a scenic highway
- Impact AESTH-4: Substantially degrade the existing visual character or quality of the site and its surroundings

Air Quality (Initial Repower)

- Impact AQ-3: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a nonattainment area for an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors), due to high levels of NOx emissions during the construction period

Air Quality (Full Repower)

- Impact AQ-3[F]: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a nonattainment area for an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors), due to high levels of NOx emissions during the construction period

Biological Resources (Initial Repower)

- Impact BIO-11: Operation of the proposed project could have direct impacts on special-status avian species

Biological Resources (Full Repower)

- Impact BIO-11[F]: Operation of the proposed project could have direct impacts on special-status avian species

Greenhouse Gas Emissions (Initial Repower)

- Impact GHG-1: Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, due to construction-related vehicle emissions

Greenhouse Gas Emissions (Full Repower)

- Impact GHG-1[F]: Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, due to construction-related vehicle emissions

Transportation/Traffic (Initial Repower)

- Impact TRA-1: Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation, including mass transit and non-motorized travel and relevant components of the circulation system, including, but not limited to, intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit, due to construction traffic on local routes

Transportation/Traffic (Full Repower)

- Impact TRA-1[F]: Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation, including mass transit and non-motorized travel and relevant components of the circulation system, including, but not limited to, intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit, due to construction traffic on regional route I-580/I-205 in project vicinity and construction traffic on local routes
- Impact TRA-2[F]: Conflict with an applicable congestion management program, including, but not limited to, level-of-service standards and travel demand measures or other standards established by the county congestion management agency for designated roads or highways, during construction
- Impact TRA-4[F]: Substantially increase hazards because of a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment), due to construction-related traffic
- Impact TRA-6[F]: Conflict with adopted policies, plans, or programs regarding public transit, bicycle or pedestrian facilities, or otherwise decrease the performance or safety of such facilities, during construction

Less than Significant with Mitigation

Aesthetics (Initial Repower)

- Impact AESTH-1: Temporary visual impacts caused by construction activities

Aesthetics (Full Repower)

- Impact AESTH-1[F]: Temporary visual impacts caused by construction activities
- Impact AESTH-5[F]: Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area

Air Quality (Initial Repower)

Impact AQ-2: Violate any air quality standard or contribute substantially to an existing or projected air quality violation for construction-related local fugitive dust emissionsAir Quality (Full Repower)

- Impact AQ-2[F]: Violate any air quality standard or contribute substantially to an existing or projected air quality violation for construction-related local fugitive dust emissions

Biological Resources (Initial Repower)

- Impact BIO-1: Project construction could have direct or indirect impacts on special-status plants
- Impact BIO-2: Construction of the proposed project has the potential to directly or indirectly affect sensitive natural communities
- Impact BIO-3: Construction of the proposed project has the potential to affect wetlands and other waters of the United States
- Impact BIO-4: Potential loss or disturbance of vernal pool fairy shrimp, longhorn fairy shrimp, and vernal pool tadpole shrimp and their habitat
- Impact BIO-5: Potential disturbance or mortality of and loss of suitable habitat for California tiger salamander and California red-legged frog
- Impact BIO-6: Potential disturbance or mortality of and loss of suitable habitat for Pacific pond turtle
- Impact BIO-7: Potential disturbance or mortality of and loss of suitable habitat for Blainville's horned lizard, Alameda whipsnake, and San Joaquin coachwhip
- Impact BIO-8: Potential construction-related disturbance or mortality of special-status and non-special-status migratory birds
- Impact BIO-9: Permanent and temporary loss of foraging habitat for Swainson's hawk, western burrowing owl, and other special-status and non-special-status birds
- Impact BIO-10: Potential injury or mortality of and loss of habitat for San Joaquin kit fox and American badger

Biological Resources (Full Repower)

- Impact BIO-1[F]: Project construction could have direct or indirect impacts on special-status plants
- Impact BIO-2[F]: Construction of the proposed project has the potential to directly or indirectly affect sensitive natural communities
- Impact BIO-3[F]: Construction of the proposed project has the potential to affect wetlands and other waters of the United States
- Impact BIO-4[F]: Potential loss or disturbance of vernal pool fairy shrimp, longhorn fairy shrimp, and vernal pool tadpole shrimp and their habitat
- Impact BIO-5[F]: Potential disturbance or mortality of and loss of suitable habitat for California tiger salamander and California red-legged frog
- Impact BIO-6[F]: Potential disturbance or mortality of and loss of suitable habitat for Pacific pond turtle
- Impact BIO-7[F]: Potential disturbance or mortality of and loss of suitable habitat for Blainville's horned lizard, Alameda whipsnake, and San Joaquin coachwhip
- Impact BIO-8[F]: Potential construction-related disturbance or mortality of special-status and non-special-status migratory birds
- Impact BIO-9[F]: Permanent and temporary loss of foraging habitat for Swainson's hawk, western burrowing owl, and other special-status and non-special-status birds

- Impact BIO-10: Potential injury or mortality of and loss of habitat for San Joaquin kit fox and American badger

Cultural Resources (Initial Repower)

- Impact CUL-2: Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5
- Impact CUL-3: Disturb any human remains, including those interred outside of formal cemeteries

Cultural Resources (Full Repower)

- Impact CUL-2[F]: Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5
- Impact CUL-3[F]: Disturb any human remains, including those interred outside of formal cemeteries

Geology, Soils, and Paleontological Resources (Initial Repower)

- Impact GEO-1: Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death as a result of rupture of a known fault
- Impact GEO-2: Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death as a result of strong seismic ground shaking
- Impact GEO-3: Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death as a result of seismic-related ground failure, including liquefaction and landslides
- Impact GEO-5: Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property
- Impact GEO-6: Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature

Geology, Soils, and Paleontological Resources (Full Repower)

- Impact GEO-1[F]: Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death as a result of rupture of a known fault
- Impact GEO-2[F]: Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death as a result of strong seismic ground shaking
- Impact GEO-3[F]: Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death as a result of seismic-related ground failure, including liquefaction and landslides
- Impact GEO-5[F]: Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property
- Impact GEO-6[F]: Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature

Hydrology and Water Quality (Initial Repower)

- Impact WQ-1: Violate any water quality standards or waste discharge requirements, due to earth disturbing activities during construction
- Impact WQ-3: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation onsite or offsite
- Impact WQ-4: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite
- Impact WQ-5: Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff
- Impact WQ-6: Otherwise substantially degrade water quality during construction

Hydrology and Water Quality (Full Repower)

- Impact WQ-1[F]: Violate any water quality standards or waste discharge requirements, due to earth disturbing activities during construction
- Impact WQ-3[F]: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation onsite or offsite
- Impact WQ-4[F]: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite
- Impact WQ-5[F]: Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff
- Impact WQ-6[F]: Otherwise substantially degrade water quality during construction

Noise (Initial Repower)

- Impact NOI-4: Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project, due to construction activities

Noise (Full Repower)

- Impact NOI-1[F]: Expose persons to or generate noise levels in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies, due to wind turbine noise
- Impact NOI-3[F]: Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project, due to wind turbine noise
- Impact NOI-4[F]: Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project, due to construction activities

Transportation/Traffic (Initial Repower)

- Impact TRA-1: Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation, including mass transit and non-motorized travel and relevant components of the circulation system, including, but not limited to, intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit, due to construction traffic on regional routes
- Impact TRA-2: Conflict with an applicable congestion management program, including, but not limited to, level-of-service standards and travel demand measures or other standards established by the county congestion management agency for designated roads or highways, due to construction-related truck trips
- Impact TRA-4: Substantially increase hazards because of a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment), due to the presence of slow-moving trucks during construction
- Impact TRA-5: Result in inadequate emergency access, due to the presence of slow-moving trucks during construction
- Impact TRA-6: Conflict with adopted policies, plans, or programs regarding public transit, bicycle or pedestrian facilities, or otherwise decrease the performance or safety of such facilities, due to short-term disruption of proposed bicycle routes and safety concerns for bicyclists during construction

Transportation/Traffic (Full Repower)

- Impact TRA-5[F]: Result in inadequate emergency access, due to the presence of slow-moving trucks during construction

These significant impacts were used to identify alternatives that could reduce one or more impacts to a less-than-significant level.

Because it would replace existing turbines and would for the most part continue to use existing ancillary infrastructure (access roads, collector lines, substation, O&M building, etc.) the proposed Initial Repower already incorporates design features intended to achieve an optimal balance between project objectives and environmental protection. This approach does not eliminate the need to discuss alternatives in the EIR. However, it does necessarily narrow the range of available alternatives offering environmental advantages in comparison with the proposed Initial and Full Repower. (See *Mira Mar Mobile Community v. City of Oceanside* (2004) 119 Cal.App.4th 477). This is particularly the case with regard to alternatives to the 40-turbine Initial Repower phase; in part because it is already limited to the minimum number of turbines required to generate a statistically robust Avian Validation Study of the shrouded turbines, but also because studies like the Avian Validation Study are themselves a common form of mitigation. Similarly, the replacement of existing turbines with new turbine designs is itself a recognized *Advanced Conservation Practice* for the potential minimization and avoidance of risk to bald and golden eagles.

Feasibility

Based on the State CEQA Guidelines, *feasible* is defined as "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors" (State CEQA Guidelines Section 15364). CEQA does not

require that an EIR determine the ultimate feasibility of a selected alternative, but rather that an alternative be probably feasible. Accordingly, no economic studies have been prepared regarding the economic feasibility of the selected alternatives. For this project, factors considered when addressing the feasibility of an alternative included, among others, site suitability, availability of supporting infrastructure, general plan consistency, consistency with other plans and regulatory limitations, jurisdictional boundaries, economic viability, and whether an alternate site could reasonably be acquired, controlled or otherwise accessed.

4.2.2 Alternatives Considered but Dismissed

The following potential alternatives were considered using the process described in Section 4.2.1, *Methods and Screening Criteria*, but were dismissed from evaluation for the individual reasons stated for each potential alternative.

Single Phase, Full Repower with Shrouded FloDesign Turbines

The alternative would consist of a single, 34 MW repowering phase that would replace all existing turbines with 340 shrouded FloDesign turbines. Installing this number of turbines would preclude comparison to existing turbines and would therefore not allow FloDesign to conduct the Avian Validation Study. The County has rejected this alternative because it would not meet the fundamental objectives of the proposed project. In addition, repowering the entire site in a single phase rather than in two or more phases would not reduce any significant environmental impacts of the proposed Initial and Full Repower.

Single Phase, Full Repower with Open Blade, Utility-Scale Turbines

A full 34 MW repower could also be developed in a single phase using conventional open-blade, utility-scale wind turbines (such as commercially available 1.5 MW General Electric (GE) turbines or 2.3 MW Siemens turbines or other utility-scale open-blade turbines within this range). Under this alternative FloDesign would not be able to test and demonstrate the shrouded turbine it manufactures or conduct the Avian Validation Study, both of which are fundamental objectives of the proposed Initial and Full Repower phases. For these reasons, the County decided not to give the alternative further consideration.

Off-Site Alternatives

FloDesign considered but dismissed the following off-site alternatives for the reasons discussed below.

Alternative Site in Tehachapi Wind Resource Area

A project of similar scale could potentially be developed in the Tehachapi Wind Resource Area (WRA). The Tehachapi WRA exhibits lower levels of avian use than the APWRA. The County decided against sites in the Tehachapi WRA because the proposed Sand Hill project area has higher levels of avian use and a deeper survey base to draw from than sites in the Tehachapi WRA. Locating the facility in the Tehachapi WRA would not meet the fundamental objectives of the project.

In addition, the project sites in the Tehachapi WRA do not have a research record on avian-wind impacts as deep and detailed as that of the proposed project area, which has been surveyed for avian impacts for 10 years out of the past 13 at more frequent search intervals of 30–70 days, rather than

the 90-day intervals of prior research in the Tehachapi WRA. Unlike sites in the Tehachapi WRA, the proposed project area has also been subjected to utilization and behavioral surveys and site-wide mapping of burrowing owl nest sites and prey base burrow systems for the past 10 years.

Alternative Site in San Gorgonio Pass Wind Resource Area

A project of similar scale could potentially be developed in the San Gorgonio Pass WRA. The San Gorgonio Pass WRA exhibits lower levels of avian use than the APWRA. The County decided against sites in the San Gorgonio Pass WRA because the proposed Sand Hill project area has higher levels of avian use and a deeper survey base to draw from than other sites in the Tehachapi WRA. Locating the facility in the San Gorgonio Pass WRA would not meet the fundamental objectives of the project.

In addition, the project sites in the San Gorgonio Pass WRA do not have a research record on avian-wind impacts as deep and detailed as that of the proposed project area, which has been surveyed for avian impacts for 10 years out of the past 13 at more frequent search intervals of 30–70 days, rather than the 90-day intervals of prior research in the San Gorgonio WRA. Unlike sites in the San Gorgonio WRA, the proposed project area has also been subjected to utilization and behavioral surveys and site-wide mapping of burrowing owl nest sites and prey base burrow systems for the past 10 years.

Alternative Site within APWRA

The Applicant considered alternate sites within the APWRA. However, only the project area could meet the necessary requirements to carry out the Avian Validation Study. Of primary consideration were the APWRA's known avian impacts. Within that context, the Avian Validation Study required a site with diverse terrain, that contained operational 1980s-'90s era turbines, that could support enough shrouded turbines as well as a variety of existing conventional turbines, and that was available for purchase. The County rejected alternative sites within the APWRA because only the project area was large enough to support 40 shrouded turbines while continuing to provide a large sample size of existing turbines and varied turbine types, including a large number of turbines determined to be high risk to avian species, resulting in a wider range of data to support the Avian Validation Study.

4.3 Alternatives Analysis

As described in Section 4.2.2, *Alternatives Considered but Dismissed*, several of the alternatives initially considered do not meet the CEQA criteria for analysis. The following alternatives meet most of the project objectives, as required by State CEQA Guidelines Section 15126.6, as well as the CEQA requirements for feasibility, and reduce or eliminate project impacts. The following alternatives are therefore evaluated in comparison with the proposed Initial and Full Repower in this EIR.

- No Project Alternative
- Alternative 1 – Reduced Avian Validation Study
- Alternative 2 – Conventional Turbines
- Alternative 3 – High Risk Avoidance
- Alternative 4 – Seasonal Avoidance

4.3.1 No Project Alternative

CEQA requires every EIR to include an analysis of the No Project Alternative. The project area currently includes approximately 400 wind energy turbines. The project area also includes associated electricity collection and transmission infrastructure, access roads, and support facilities. Under the No Project Alternative, the proposed Initial and Full Repower phases would not be built. The existing wind turbines are assumed to continue to operate, under the conditions of the 2007 Settlement Agreement, until the existing use permits expire in 2018. At that point, the existing project would be decommissioned. The area would presumably be repowered—using conventional, open-blade, utility-scale wind turbines and no shrouded turbines—by another wind project in the near future. Such repowering is foreseeable because the site is located within one of the most significant resource areas for wind energy development in California and the applicable Alameda County general plan and zoning designations allow wind development on the site.

Aesthetics

Under the No Project Alternative, the approximately 400 existing turbines would remain through 2018, so there would be no changes to visual conditions in the near term in the project area associated with construction activities or installation of new turbines. However, after the existing land use permits expire in 2018, the project area is expected to be repowered by another wind project with conventional open-blade turbines. When the area is repowered, depending on the type or size of turbine installed, the visual appearance would be considerably different from the proposed Initial and Full Repower due to the use of open-blade rather than shrouded turbines; the impacts related to effects on scenic vistas, designated scenic routes and resources, and visual character and quality are likely to be significant and unavoidable; temporary construction effects could be mitigated to less than significant; and new light or glare sources would likely be significant because each open-blade turbine would require aircraft-warning lighting at the typical height of new turbine nacelles, over 200 feet above ground. In most respects, the potential impacts of the No Project Alternative on aesthetics would be similar to the proposed Initial and Full Repower phases.

Agricultural Resources

Under the No Project Alternative, as with the Initial Repower and Full Repower, there would be no impacts on agricultural or forest resources. Although existing wind power facilities would continue to operate until decommissioning in 2018 and a repower would likely occur thereafter, the fundamental agriculture-related site conditions would not change. As with the proposed Initial and Full Repower, there would be no impact on prime farmland, because no prime farmland, farmland of statewide importance, or farmland of local importance exists within the project area. Furthermore, because the existing wind facilities are a conditionally permitted use on non-prime farmland within Alameda County's A District, and no prime farmland is present within or near the project area, the No Project Alternative (with repowering of conventional, current-generation turbines) would continue a conditionally permitted use. The No Project Alternative would not cause any substantial change to the existing agricultural use on either contracted or non-contracted lands in or near the project area, nor result in the cancellation or non-renewal of Williamson Act contracts on parcels under lease for the proposed Initial and Full Repower. As with the proposed project, there would be no impact on existing agricultural zoning or Williamson Act contracts. As no forest land, or land zoned as forest land or timberland, is located within or near the project area, the No Project Alternative, like the proposed Initial and Full Repower, would not conflict with existing zoning, or

cause rezoning, of forest land or timberland, or result in the loss or conversion of any forest land to non-forest use. Although grazing land would be temporarily used for wind generation facilities, no Farmland, as defined by the FMMP, is present in the project area. Therefore, the No Project Alternative would not result in the conversion of Farmland to non-agricultural use. Overall, the potential impacts of the No Project Alternative on agricultural and forestry resources would be similar to the proposed Initial and Full Repower phases.

Air Quality

Under the No Project Alternative, there would be no air quality impacts associated with initial repowering, as there wouldn't be any construction activity occurring in the near term (through 2018). Air quality impacts associated with future repowering under the No Project Alternative would be similar to the impacts discussed for the proposed Initial and Future Repower phases, such as major grading and construction activities and transport of materials. These impacts would include impacts associated with air pollutant emissions that would result from turbine decommissioning and replacement. However, because there would be substantially fewer individual turbines that conventional repowering would require (with a ratio of as high as 1:15 for conventional to shrouded turbines), construction would most likely be considerably shorter in duration and result in lower emissions. The construction activity associated with the No Project Alternative would still result in significant air quality impacts related to potential conflict with applicable air quality plans and potential to result in construction-related NO_x emissions that exceed the BAAQMD thresholds. Mitigation could reduce potentially significant emission of PM10 and PM2.5 to less than significant. The No Project Alternative, similar to the proposed project, would have a less-than-significant impacts related to exposing sensitive receptors to substantial pollutant concentrations or to creation of objectionable odors. Overall, the potential impacts of the No Project Alternative on air quality would be similar to the proposed Initial and Full Repower phases.

Biological Resources

Under the No Project Alternative, there would be no immediate impacts related to biological resources. Existing wind turbines would continue to operate until decommissioning in 2018 at which point it is expected they would be repowered by another wind project. A future repowering project could result in similar types of impacts on terrestrial biological resources from ground disturbing activities, although substantially fewer new foundations would be expected to be required for conventional repowering. However, markedly wider roads would be needed for construction of the larger turbines, which could offset the reduction in impacts due to fewer new foundations. The type and number of turbines constructed would dictate the magnitude and extent of the impacts. The Initial Repower is being tested in the Initial Repower to see if the new turbine design reduces avian impacts. A future repowering project would likely use other conventional wind turbines which could have a higher level of biological resource impacts than the proposed turbines, but the Avian Validation Study may also indicate lower levels, and a comparison of the two technologies on avian safety is an objective of the Initial Repower. Overall, the potential impacts of the No Project Alternative would be similar to the proposed Initial and Full Repower phases.

Cultural Resources

Impacts on cultural resources would remain the same under the No Project Alternative. Existing wind turbines would continue to operate until decommissioning in 2018 at which point it is expected they would be repowered by another wind project. Ground disturbing activities and the

location of facilities would likely be substantially different due to the lower number of new foundations required, although wider roads required for construction of the larger turbines and installation equipment may offset and balance out such comparative reductions. Operation of existing wind turbines and future repowering activities would not affect previously identified historical resources any more than the proposed Initial and Full Repower. For the same reason, ground-disturbing activities associated with repowering, could disturb or destroy buried archaeological resources or previously unknown human remains. Overall, the potential impacts of the No Project Alternative on cultural resources would be similar to the proposed Initial and Full Repower phases.

Geology, Soils, Paleontological Resources

Under the No Project Alternative, there would be no immediate impacts related to geologic hazards, such as those associated with fault rupture, strong ground shaking, landsliding, and soil erosion, because the project would not be built. However, another wind project is expected to be built in the future (after expiration of the use permits or perhaps sooner), and would likely result in the same construction-related geotechnical, soil and resource impacts as those for the project.

The same would be true for paleontological resources. Although there would be no immediate construction-related impacts, construction of another wind project would result in the same impacts as those for the project because all geologic units in the area are sensitive for paleontological resources. However there could be differences in the scale of impacts due to reduced foundation construction activities for conventional repowering. Overall, the potential impacts of the No Project Alternative on geology, soils, and paleontological resources would be similar to the proposed Initial and Full Repower phases.

Greenhouse Gases

Under the No Project Alternative, there would be no near-term GHG impacts associated with the Initial Repower phase, as there presumably would not be any construction activity occurring before 2018. Impacts associated with future repowering under the No Project Alternative would be similar to the impacts discussed for the proposed Initial and Full Repower phases. These impacts would include impacts associated with construction-related GHG emissions that would result from turbine decommissioning and replacement. However, depending on the type of conventional repowered turbine used, there could be substantially lower levels of emissions than under the proposed project. It would be expected that BAAQMD would require implementation of the construction BMPs to reduce emissions. In addition, the No Project Alternative would produce renewable energy and, consequently, result in offset GHG emissions. The No Project Alternative would not be expected to conflict with plans, policies or regulations related to the reduction of GHGs. Overall, the potential impacts of the No Project Alternative on GHG conditions would be similar to the proposed Initial and Full Repower phases.

Hazards and Hazardous Materials

Under the No Project Alternative, operations would continue to 2018 when existing land permits expire at which time the wind turbines would be decommissioned. . Since the shrouded design of turbines in the proposed project help reduce the impacts of blade throw, the installation of conventional turbines under the No Project Alternative would increase the potential for blade throw. However, setback requirements would be required which would keep turbines from

sensitive receptors. Also, access to most of the project area is restricted, further reducing the potential of harm. Although there is a slightly higher potential for blade throw, the impact would still be considered less than significant. Also, under this alternative fire protection facilities to support the existing operations are already in place. No new fire department facilities or resources would be needed to serve existing wind farm operations in the event of wildland fire. The danger of exposure to hazardous materials and wildland fires as compared to the proposed Initial and Full Repower phases would neither increase nor decrease. Therefore, the potential for exposure to hazardous materials and wildland fires would be similar to the proposed project, and there would not be a substantial adverse physical impact. Overall, the potential impacts of the No Project Alternative on hazards and hazardous materials would be similar to the proposed Initial and Full Repower phases.

Hydrology and Water Quality

Under the No Project Alternative, no construction activities would be likely to occur before 2018, and operation of the approximately 400 wind turbines would remain the same as existing conditions. Impacts on water resources would be associated with the decommissioning of the turbines once they expire in 2018. These impacts would result from ground disturbing and other construction activities associated the decommissioning and removal of existing turbines. It is expected that a new wind project would be built within the project area once the existing turbines are decommissioned. In this longer-term case, the associated impacts on the hydrology and water quality conditions from a future repowering project in the project area would be similar to those of the proposed project.

Noise

Under the No Project Alternative, there would be no immediate impacts related to noise, as no construction activity or additional turbine operation would occur. Future repowering would likely occur under the No Project Alternative, however, and the associated noise impacts would be similar to the impacts discussed for the proposed project. Future repowering under the No Project Alternative could result in increases in noise levels and potentially significant impacts, but these impacts could be reduced through mitigation identified for the proposed project. The construction of conventional repowered turbines may also result in a lower proportion of noise impacts due to the considerably lower number of individual turbines that would be constructed. Overall, the potential impacts of the No Project Alternative on noise would be similar to the proposed Initial and Full Repower phases.

Transportation/Traffic

Under the No Project Alternative, there would be no near-term change in traffic conditions on local county roads or the interstate highways (regional routes) in the project vicinity because presumably no construction activity or additional turbine operations would occur before 2018. However, the existing CUPs would expire in 2018, and after that time, the project area is expected to be repowered by another wind project. When the area is repowered, depending on the type of turbines installed and the associated level of construction activity and duration, impacts are likely to be similar to impacts discussed for the Initial Repower phase of the proposed project. While the total number of construction-related trips for the proposed project may be more because more turbines would be installed, the No Project Alternative's use of conventional turbines would result in potentially greater wear-and-tear and safety hazard effects on local roads because of the need to use larger transport vehicles, possibly with escort cars before and after any oversized loads. Overall, it

would be likely that construction-related trips generated under the No Action Alternative would have similarly significant impacts on most of the local county roads because of the already low traffic volume on these roads. If larger transport vehicles are needed, oversize transport permits would be required from Caltrans. As for the Initial and Full Repower phases, significant effects on local roads and on regional routes during peak travel periods would be significantThese impacts could be addressed through mitigation similar to that discussed for the Initial Repower. Overall, the potential impacts of the No Project Alternative on transportation and traffic would be similar to the proposed Initial and Full Repower phases.

Utilities and Service Systems

Under the No Project Alternative, impacts on utilities and service systems would neither increase nor decrease. Existing wind power facilities would continue to operate until 2018, after which a repower is expected to occur. No construction or expansion of wastewater systems would be required because connection to a public sewer system would not be necessary—wastewater would continue to be managed through use of an existing septic tank and portable toilets. The No Project Alternative would not alter stormwater runoff. As with the proposed project, runoff would drain primarily through natural drainage swales, ditches, and watercourses. The majority of water consumption under the No Project Alternative would take place during construction related to repowering. Water trucks would be used primarily for dust control and would not be a significant amount. Existing facilities and operations would not require use of a public wastewater treatment facility or result in the construction of a new public water or wastewater treatment facility. The majority of solid waste generated under the No Project Alternative would occur during repowering-related construction. However the amount of solid waste generated would not be substantial because turbines and components are generally sold or recycled, thereby reducing the amount of solid waste taken to landfills. Therefore, it is not anticipated that this alternative would affect the capacity of any landfill. Compliance with existing County review procedures for elimination of construction waste would still be required under the No Project Alternative which would ensure compliance with statutes and regulations related to solid waste. Overall, the potential impacts of the No Project Alternative on utilities and service systems would be similar to the proposed Initial and Full Repower phases.

4.3.2 Alternative 1 – Reduced Avian Validation Study

Under this alternative, the Initial Repower would consist of only 10 shrouded turbines instead of 40 (representing 1 MW total capacity, rather than 4 MW). The Full Repower would repower to the full 34 MW of capacity at the project site with shrouded FloDesign turbines through subsequent development phases. Alternative 1 would meet the fundamental project objective of conducting the Avian Validation Study, but to a lesser degree than the Initial Repower because, while the smaller sample size of 10 shrouded turbines would serve to indicate the avian effects of the shrouded turbines, it would not be large enough to provide robust, conclusive statistical results.

Aesthetics

Under Alternative 1, the duration of Initial Repower construction activities would likely be shorter, thereby limiting the visibility of these activities to sensitive receptors. Depending on the placement of the turbines, and with Mitigation Measure AESTH-1 incorporated, impacts on scenic vistas, designated scenic routes, and new sources of glare could be somewhat reduced over the short term

as compared to the proposed project because only 10 turbines would be installed under the Initial Repower. As compared to the project, this alternative would have reduced aesthetic impacts, but the impacts of the Initial Repower on scenic vistas, designated scenic routes or resources, and visual character and quality would be expected to remain significant and unavoidable. Similarly, the level of effects associated with construction could be mitigated to less than significant, and sources of new light or glare would be anticipated to be less than significant.

Under Alternative 1, the Full Repower would eventually proceed as for the proposed project. Therefore, impacts would be similar to those of the proposed project in its buildout phase, and the effects on scenic vistas, scenic vistas, designated scenic routes or resources, and visual character and quality would be significant and unavoidable. It would be expected that construction effects of the full buildout under this alternative could be mitigated to less than significant, and that new sources of light and glare would be less than significant, as discussed for the proposed project Full Repower phase.

Agricultural Resources

Alternative 1, similar to both the Initial Repower and Full Repower, would have no impacts on agricultural or forest resources. Because the fundamental agriculture-related site conditions, such as the lack of Farmland as defined by the FMMP, are not subject to change, the construction of fewer shrouded turbines under Alternative 1 would have no impact on prime farmland or on the conversion of Farmland to nonagricultural use, because no Farmland (prime farmland, farmland of statewide importance, or farmland of local importance) is present. Wind power facilities are a conditionally permitted use on non-prime farmland within Alameda County's A District and no prime farmland is present within or near the project area. Therefore, the Reduced Avian Validation Study Alternative would, like the proposed project, be a conditionally permitted use. Alternative 1 would be comparable to the proposed project in that it would not cause any substantial change to the existing agricultural use on either contracted or non-contracted lands in or near the project area, nor result in the cancellation or non-renewal of Williamson Act contracts on parcels under lease for the proposed project. As with the proposed project, there would be no impact on existing agricultural zoning or Williamson Act contracts. As no forest land, or land zoned as forest land or timberland, is located within or near the project area, the Reduced Avian Validation Study Alternative, like the proposed project, would not conflict with existing zoning, or cause rezoning, of forest land or timberland, or result in the loss or conversion of any forest land to non-forest use.

Air Quality

Air quality impacts associated with the Initial Repower phase under Alternative 1 would be less severe than the impacts associated with the proposed project. Daily construction emissions that would result from the turbines would likely be less than the daily construction emissions from the proposed project, as constructing 10 new turbines would require less construction activity than constructing 40 new turbines. The construction activity associated with Alternative 1 would still result in potentially significant air quality impacts related to potential conflict with applicable air quality plans and potential to result in construction-related NO_x emissions that exceed the BAAQMD thresholds. Mitigation could reduce potentially significant emission of PM10 and PM2.5 to less than significant. Alternative 1, similar to the proposed project, would have a less-than-significant impact related to exposing sensitive receptors to substantial pollutant concentrations or to creation of objectionable odors.

Impacts associated with full repowering under Alternative 1 would be generally similar to the impacts associated with the proposed Full Repower, because both alternatives would involve the same total number of turbines in the project area. The potential conflict with air quality plans and exceedance of BAAQMD thresholds for construction-related NOx emissions would be significant and unavoidable. Mitigation using standard construction BMPs could reduce potentially significant emission of PM10 andPM2.5 to less than significant. And, as under the proposed project, the full repowering under Alternative 1 would have less-than-significant impacts related to exposing sensitive receptors to substantial pollutant concentrations or to creation of objectionable odors.

Biological Resources

Impacts on biological resources would generally be similar, but less severe under the Alternative 1 Initial Repower than the impacts associated with the proposed project in the near term. Construction of fewer turbines would result in less ground disturbance and therefore the corresponding impacts on terrestrial species would be less severe. Potential impacts on avian species would also be less severe than the proposed project as each proposed turbine would have some level of impact.

Because buildout of this alternative would be comparable to that of the proposed project Full Repower, impacts on biological resources under the Alternative 1 Full Repower would generally be similar to the impacts associated with the proposed Full Repower for both terrestrial and avian species.

Cultural Resources

Under Alternative 1, the Initial Repower would consist of only 10 shrouded turbines, rather than 40. Installing fewer turbines would result in less potential ground disturbance. Therefore, potential impacts on cultural resources and the need for related mitigation measures could be reduced under Alternative 1 compared to the proposed project.

Under Alternative 1, the Full Repower would eventually proceed as for the proposed project. Therefore, impacts of full repowering on cultural resources would be similar to those of the proposed project's Full Repower phase.

Geology, Soils, Paleontological Resources

Under Alternative 1, the Initial Repower impacts related to geologic hazards would be the same as under the proposed project but, initially, of reduced magnitude because only 10 new turbines would be built. Impacts on paleontological resources would also be of a lesser magnitude.

As further development occurs and the full 34 MW of capacity are built under Alternative 1 full repowering, the impacts on these resources would be similar to the proposed project Full Repower phase, because the same number of turbines would be repowered. The same would be true for impacts on paleontological resources.

Greenhouse Gases

Initial repower GHG impacts and the resulting emissions associated with construction of the turbines under Alternative 1 would be less in the near term than the impacts and emissions under the proposed Initial Repower, as Alternative 1 would result in construction of 10 turbines instead of 40.

Implementation of BAAQMD construction BMPs would further reduce GHG emission levels. The GHG offset during operation of the initial repower phase for Alternative 1 would be less than for the proposed project, but impacts would be less than significant.

Impacts associated with the Full Repower under Alternative 1 would be generally similar to the impacts associated with the proposed Full Repower, because both alternatives would eventually use the full capacity of the area's wind resources by constructing turbines. Operational impacts during both the initial and full repowering phases of Alternative 1 would have generally beneficial impacts on climate change, as the turbines would provide a renewable energy source that would not result in GHG emissions.

Hazards and Hazardous Materials

Because there would be fewer new turbines installed under the Initial Repower of this alternative, the area of ground disturbance during installation would be less. Also, with a lower number of turbines the potential for wildland fire hazards would be reduced. However, construction workers and operation and maintenance workers would be exposed to the same types of hazards and hazardous materials as under the proposed project and wildland fire hazards would remain the same. Overall, 30 fewer turbines would reduce some hazards by a negligible amount. Therefore, impacts on hazards and hazardous materials under this alternative would be similar but slightly less than project in than the short term proposed Initial Repower.

Under the Full Repower, this alternative would be similar to the proposed project because the full repowering scenario would not change under this alternative. Impacts on hazards and hazardous materials under this alternative would be very similar to the proposed project.

Hydrology and Water Quality

Under Alternative 1, Initial Repower impacts on existing hydrological and water quality conditions within the project area would be similar in nature to the proposed Initial Repower, but to a lesser degree because the initial phase would consist of only 10 shrouded turbines, rather than 40, which are part of the proposed project. Therefore, the area of land disturbance would be smaller, and the potential for impacts on water resources would be reduced, but the type of impacts on hydrological and water quality conditions would be the same as for the proposed project.

Under Alternative 1, the Full Repower would eventually be repowered with shrouded FloDesign turbines through subsequent development phases. Therefore, impacts on existing hydrological and water quality conditions within the project area would be the same as the proposed project.

Noise

Noise impacts associated with the Initial Repower of Alternative 1 would likely result in less noise than the proposed Initial Repower, as Alternative 1 would only involve the immediate construction of 10 turbines instead of 40 turbines. Fewer turbines would result in less noise.

Noise impacts associated with the Full Repower phase of Alternative 1 would be similar to the noise impacts discussed for the proposed project Full Repower phase, as both alternatives would eventually utilize the full capacity of the project area's wind resources. Future repowering under Alternative 1 could result in increases in noise levels and potentially significant impacts, but these impacts could be reduced through the mitigation discussed for the proposed project.

Transportation/Traffic

Construction activities and effects on transportation systems and traffic would be similar to the proposed project. The primary difference would be that the number of truck trips generated by workers, vendors, and hauling, and the related increase of vehicles on local roads would be reduced during the Initial Repower because in the short term only 10 turbines would be installed instead of 40. The number of truck trips and potential to increase roadway hazards for motorists and bicyclists or to affect emergency vehicle access, would be reduced relative to the proposed Initial Repower. However, although the overall number of construction-related vehicles on local roads would be reduced, similar conditions—large, slow-moving vehicles—would be introduced to the project area for the duration of construction. Under Alternative 1, the duration of Initial Repower construction likely would also be reduced, and the areas where these potential hazards would be introduced could be fewer. It would still be recommended that a TCP be prepared and implemented during construction to address transportation performance standards on the local roadways, protect motorist and bicyclist safety, and ensure adequate emergency vehicle access in the project area. As for the proposed project, the potential increase in traffic on regional routes (I-580, I-238, I-880, I-205, and I-5) (CMP-designated roadways) could result in significant impacts during peak travel periods. To the extent that construction-related truck trips on regional routes could be timed to avoid peak travel periods, this impact would be lessened. The Initial Repower under this alternative also would not result in substantial safety risks associated with airport operations because the proposed turbines would less than 200 feet tall and would therefore not result in airspace concerns and the alternative is expected to have no impact on existing air traffic patterns. As under the proposed project, the effect of the Initial Repower phase operations under this alternative would be less than significant.

Alterative 1 differs from the proposed project only in that 30 of the 40 turbines proposed by the Initial Repower would be moved to the Full Repower phase. This reallocation would result in a higher number of construction-related trips that would be generated during the Full Repower phase than under the proposed project. Overall, the level of significance of impacts on local roads and regional routes would most likely be the same – and for the most part would be significant and unavoidable during construction. Implementation of a TCP would reduce concerns related to emergency road access to less than significant; but overall, road congestion and the related transportation system performance and safety concerns would be significant and unavoidable during construction.

Utilities and Service Systems

Because under Alternative 1 there would be fewer new turbines installed under the Initial Repower, the area of ground disturbance during installation would be less in the short term. As a result, slightly less water would be needed for dust control and impervious surfaces constructed would be fewer in number. The differences however would be negligible. Stormwater drainage and wastewater would not change under this alternative. The amount of solid waste generated would not be significantly different and regardless of alternative, the project would be required to comply with local, state, and federal solid waste regulations. Impacts on utilities and service systems would be similar to the proposed project.

Alternative 1 differs from the proposed project only in that 30 of the 40 turbines proposed by the Initial Repower would be moved to the Full Repower Phase. This reallocation would not substantially change the impacts on utilities and service systems under the proposed Full Repower scenario and would be less than significant.

4.3.3 Alternative 2 – Conventional Turbines

Under this alternative, the initial development phase of the project would proceed as proposed, with a repower of 4 MW with 40 shrouded FloDesign turbines. However, potential future repowering of the remainder of the project area would use up to 15 conventional, open-blade, utility-scale wind turbines instead of shrouded FloDesign turbines. Potential turbine options for the subsequent development phases could include commercially available 1.5 MW GE turbines or 2.3 MW Siemens turbines or other utility-scale open-blade turbines within this range. Based on established agreements with USFWS and CDFW, the maximum nameplate generation capacity is assumed to be limited to the same capacity as exists in the project area, 25.5 MW. Because Initial Repower impacts would be the same as the proposed project, the following analysis focuses solely on the Full Repower.

Aesthetics

For the Full Repower under Alternative 2, conventional, open-blade, utility-scale wind turbines would be installed, instead of shrouded FloDesign turbines. Construction of Alternative 2 would create temporary changes in views of and from the project area. Construction impacts would be the same as under the proposed project and would be temporary and short-term. Decommissioning and construction activities would occur in a manner consistent with Alameda County requirements for work days and hours. However, viewers in the project area (residents and recreationists) could perceive impacts from the use of high-voltage lighting used for nighttime construction as significant. Mitigation Measure AESTH-1, *Limit construction to daylight hours*, would result in less-than-significant impacts on scenic vistas, designated scenic routes, visual character and quality, light and glare resulting from construction.

While the new, more efficient turbines would be larger than existing turbines, fewer would be required to produce the same amount of power. Fewer turbines would result in a more spaced out configuration rather than being placed in strings (existing configuration). As a result, the visual impact on the natural landscape would be reduced. The new, less-cluttered configuration would allow for views of the rolling, grassy terrain to become more prominent, back-dropped against the sky, and less interrupted by anthropogenic features. While the larger turbines would draw viewers' attention toward them, the eye is also able to follow the ridgeline of the hills in a more cohesive manner than existing conditions. With existing conditions, the eye is drawn to and focused on the numerous turbines sticking up and across the hillsides and ridgelines that clutter the view. The shrouded turbines associated with the Initial Repower draw the eye to the large shrouds, which detract from views of the skyline against the rolling hills. In addition, conventional turbines are more compatible with the rural feel of the project area than the space-age design of the shrouded turbines. Also, Policies 170 and 215 of the ECAP serve to protect and enhance the scenic values of scenic streets and highways and to protect nearby existing uses from wind visual impacts associated with wind farm facilities. Finally, the Color Treatment standard condition of the *Alameda County Windfarm Standard Conditions* would reduce the visual prominence of the turbines by allowing the turbines to be treated and colored so that they blend with the surroundings. For these reasons, impacts on scenic vistas, designated scenic routes, visual character and quality, and glare associated with the Full Repower under Alternative 2 would be expected to be , similar to the proposed project.

The proposed conventional turbines would be over 200 feet, making FAA marking necessary; therefore, aesthetics impacts for lighting issues under this alternative would be greater than for the proposed project.

Agricultural Resources

Under Alternative 2, the development of conventional turbines rather than shrouded turbines for the Full Repower phase would not affect the existing agriculture-related site conditions. As with the proposed project there would be no impact on prime farmland, because no prime farmland, farmland of statewide importance, or farmland of local importance exists within the project area. Furthermore, because the existing wind facilities are a conditionally permitted use on non-prime farmland within Alameda County's A District and no prime farmland is present within or near the project area, as with the proposed project, Alternative 2 would represent a conditionally permitted use. The Conventional Turbines Alternative would not cause any substantial change to the existing agricultural use on either contracted or non-contracted lands in or near the project area, nor result in the cancellation or non-renewal of Williamson Act contracts on parcels under lease for the proposed project. As with the proposed project, there would be no impact on existing agricultural zoning or Williamson Act contracts. As no forest land, or land zoned as forest land or timberland, is located within or near the project area, Alternative 2, like the proposed project, would not conflict with existing zoning, or cause rezoning, of forest land or timberland, or result in the loss or conversion of any Farmland, as defined by the FMMP, to nonagricultural use, or any forest land to non-forest use. Overall, potential impacts on agricultural and forestry resources from full repowering under Alternative 1 would be similar to the proposed project.

Air Quality

For the Full Repower, there would be moderately reduced construction air quality impacts associated with Alternative 2 compared to the proposed project. Conventional types of repowered turbines are larger and would require larger construction equipment for installation that would generate more air pollutant emissions than the smaller construction equipment that would be needed to install the shrouded turbines. However, the installation of conventional turbines under the Full Repower of Alternative 2 would require fewer construction equipment pieces than the proposed project, because one conventional turbine can provide the same nameplate capacity as 15 or more shrouded turbines. Consequently, these types of turbines would noticeably reduce the construction activities associated with construction. The construction activity associated with Alternative 2 would still result in potentially significant air quality impacts related to potential conflict with applicable air quality plans and potential to result in construction-related NO_x emissions that exceed the BAAQMD thresholds—resulting in significant and unavoidable impacts. Mitigation could reduce potentially significant emission of PM10 and PM2.5 to less than significant. Alternative 2, similar to the proposed project, would have a less-than-significant impact related to exposing sensitive receptors to substantial pollutant concentrations or to creation of objectionable odors. Operational impacts between the two types of turbines (shrouded vs. conventional) would be nearly identical.

Biological Resources

Under Alternative 2, the Full Repower would use conventional turbine types. The type and number of turbines constructed would dictate the magnitude and extent of the impacts. In general, the amount of total ground disturbance necessary to construct the Full Repower would be similar to the proposed project. Although there would be fewer turbines, each one would have a larger disturbance area than individual turbines under the proposed project. The resulting amount of disturbance under either alternative would therefore be similar. Effects on terrestrial species would therefore be approximately

the same as the proposed project. At this time, it is hypothesized, but unknown, whether the use of conventional turbines could have a higher impact on avian species when compared to the impacts of the FloDesign shrouded turbine. Current evidence from monitoring activities at other recently repowered projects, such as the Buena Vista project and the Diablo Winds project, indicates that repowered projects using larger, modern turbines may result in a reduction in fatality rates for most species when compared to the existing turbine models; however, additional monitoring is necessary to confirm the effects. Although the proposed project turbines are also expected to have significantly reduced effects on most avian species, the magnitude of the difference between the use of conventional turbines and the proposed turbine models will not be known until after the Initial Repower is complete, and monitoring for the Avian Validation Study has been completed.

Cultural Resources

For the Full Repower under Alternative 2, conventional, open-blade, utility-scale wind turbines would be installed, instead of shrouded FloDesign turbines. Impacts on cultural resources for Alternative 2 would be very similar to those for the proposed project, but due to considerably fewer foundations that would be required for the smaller number of individual turbines, the scale of impacts could be noticeably reduced, though still potentially significant. Implementation of mitigation as recommended for the proposed project could be used to address these effects under Alternative 2.

Geology, Soils, Paleontological Resources

The impacts related to geologic hazards would be the same under Alternative 2 as under the proposed project because the type of turbine used would not affect impacts related to geologic hazards. Under Alternative 2, the County would require similar, detailed geotechnical reporting, as described in Mitigation Measure Geo-1, and turbine foundations would be sited and designed accordingly. Therefore impacts would be the same as under the proposed project.

For paleontological resources, impacts under Alternative 2 would be similar to the proposed project; however, because the number of individual foundations needed for conventional turbines would be very substantially reduced for Alternative 2, the exposure of sensitive units of paleontological resources that would be disturbed would be greatly and proportionally reduced.

Greenhouse Gases

For the Full Repower, there would be moderately reduced construction impacts for Alternative 2 compared to the proposed project. Conventional types of repowered turbines are larger and would require larger construction equipment for installation that would generate higher levels of GHG emissions than the smaller construction equipment that would be needed to install the shrouded turbines. However, the installation of conventional turbines under the Full Repower of Alternative 2 would require fewer construction equipment pieces than the proposed project, because one conventional turbine can provide the same nameplate capacity as 15 or more shrouded turbines. Consequently, the conventional turbines would noticeably reduce the GHG emissions associated with construction. As indicated in the GHG section of this EIR (Section 3.7), the construction-related impacts of the project on GHG concerns would be less than significant; the impacts of Alternative 2 would also be less than significant. Operational impacts between the two types of turbines (shrouded vs. conventional) would be nearly identical and would have generally beneficial impacts on climate change, as both types of turbines would produce renewable energy that would not result in GHG emissions.

Hazards and Hazardous Materials

Under the Full Repower phase, this alternative would be less similar to the proposed project. If the conventional turbines installed over 200 feet in height, FAA-required lighting may be necessary to reduce potential aircraft hazards. Since the shrouded design of turbines in the proposed project help reduce the impacts of blade throw, the installation of conventional turbines under this alternative would increase the potential for blade throw. However, setback requirements would be required which would keep turbines from sensitive receptors. Also, access to most of the project area is restricted, further reducing the potential of harm. Although there is a slightly higher potential for blade throw, the impact would still be considered less than significant. The type of turbine would not substantially change the potential for wildland fire, and although the characteristics of blade throw risk could be considerably different (especially greater due to the greater height of the nacelles, lack of a shroud and a larger throwing distance), the setback requirements would serve to avoid significant impact hazards. Construction workers and operation and maintenance workers would be exposed to the same types of hazards and hazardous materials regardless of the type of wind turbine installed. Therefore, impacts related to hazards and hazardous materials under this alternative would be slightly increased as compared to the project.

Hydrology and Water Quality

Under Alternative 2, the Full Repower would involve the installation of conventional, open-blade, utility-scale wind turbines instead of shrouded FloDesign turbines. The difference in conventional versus shrouded turbines would result in different degrees of impacts on hydrological and water quality conditions. For example, although the conventional turbines would be larger, substantially fewer conventional turbines would be required to produce the same amount of power due to the smaller size and generating capacity of each of the shrouded turbines. Therefore the total area of land disturbance would be less than that required for shrouded turbines and the potential for erosion and sediment transport would be reduced. However, the conventional new generation turbines require the use of oversized vehicles for delivery, which could increase the potential for land disturbance and pollutant discharge associated with vehicle operation and storage. Overall, impacts on hydrological and water quality conditions would likely be reduced compared to the proposed project due to the fewer number of turbines required.

Noise

Construction impacts associated with the Full Repower phase of Alternative 2 would be less severe than those associated with the Full Repower of the proposed project, because fewer conventional turbines would be required to produce an equal amount of power than for shrouded turbines. Conventional turbines such as the GE 1.5sl/sle, Vestas V80-1.8 MW Class II, and Siemens 2.3 MW produce overall A-weighted sound power levels in the range of 102 to 104 dBA (Illingworth & Rodkin 2006). As indicated in Section 3.10.14 the shrouded turbine produces an overall A-weighted sound level of about 102 dBA which indicates that the shrouded turbine is slightly quieter than the conventional turbines. Although conventional turbines would be slightly louder than the shrouded turbine fewer conventional turbines would be needed. Accordingly operational impacts associated with the Full Repower phase of Alternative 2 are expected to be similar to those of the proposed project. As a result, future repowering under both the proposed project and Alternative 2 could result in increases in noise levels and potentially significant impacts, but these impacts would be reduced through the mitigation discussed for the proposed project.

Transportation/Traffic

For the Full Repower, Alternative 2 would have some similarities in its construction-related transportation system and traffic effects to the proposed project. However, because the conventional turbines would be much larger, additional large equipment and delivery vehicles would be required. It is likely oversized vehicles would be needed and the potential for road damage and other safety concerns would increase. Like the Initial and Full Repower, these effects would be significant and unavoidable on local roads and for the I-580/I205 regional route segment in the project vicinity, especially during peak travel periods. Implementation of a TCP during construction could substantially reduce adverse effects and address transportation performance standards on the local roadways, protect motorist and bicyclist safety, and ensure adequate emergency vehicle access in the project area, but due to the scale of the construction activities required and relatively low levels of existing traffic volumes, the impacts would not be reduced to a less than significant level. Similarly, construction-related truck trips on regional routes (CMP-designated interstates, I-580, I-238, I-880, I-205, and I-5) would result in significant and unavoidable impacts during construction. It would be essential that project proponents facilitate coordination among affected parties—the County, Caltrans, local businesses, residents, as well as recreation and/or bicycle advocacy groups. Overall, the impact on transportation and traffic under Alternative 2 would be similar in nature to that which would occur under the proposed project.

Utilities and Service Systems

The installation of conventional turbines rather than shrouded turbines for the Full Repower would not affect utilities or service systems. The area of ground disturbance during installation would be roughly the same as for the proposed project, due to the level of turbine decommissioning required under either the project or Alternative 2. Therefore, water needed for dust control would be the same regardless of what type of wind turbine is installed. Stormwater drainage and wastewater would not change under this alternative. The amount of solid waste generated would not be significantly different and the project would be required to comply with local, state, and federal solid waste regulations. Wastewater generation, stormwater runoff patterns, water consumption, and solid waste would be the same as under the proposed project. Under this alternative, impacts on utilities and service systems during the initial repowering would be the same as for the proposed project.

4.3.4 Alternative 3 – High Risk Avoidance

Under this alternative, the first 40 turbines would be developed as proposed, in an Initial Repower phase in the same manner as the project. Additional future repowering phases would locate up to 300 shrouded FloDesign turbines to avoid existing turbine locations exhibiting a high risk of avian impacts at a rating of 8 or higher by the APWRA SRC consistent with the "Hazardous Rating Scale of the SRC." SRC document P69 (Final 2-1-08). Because Initial Repower impacts would be the same for this alternative as for the proposed project's Initial Repower phase, the following analysis focuses solely on the Full Repower.

Aesthetics

Regardless of the siting of individual turbines within the project area, visual impacts from construction activities, potential impacts on scenic vistas, designated scenic routes, and the visual character and quality of the site, would be significant and unavoidable, under Alternative 3, the same

as for the proposed project. In addition, as for the proposed project, under Alternative 3, temporary construction effects could be mitigated to less than significant, and new light or glare sources would likely be less than significant.

Shrouded turbine installation for Full Repower under Alternative 3 would avoid existing turbine locations that exhibit a high risk of avian impacts. Assuming the same number of new, shrouded turbines would be installed in the area but in a different configuration, it would be expected that impacts would be similar to those of the proposed project in its buildout (operations) phase, and the effects on scenic vistas, scenic vistas, designated scenic routes or resources, and visual character and quality would be significant and unavoidable. It would be expected that construction effects of the full buildout under this alternative could be mitigated to less than significant, and that new sources of light and glare would be less than significant, as discussed for the proposed project Full Repower phase.

Agricultural Resources

As with the proposed Full Repower, Alternative 3 would have no impact on agricultural or forest resources because the existing agriculture-related site conditions would not change. Because no prime farmland, farmland of statewide importance, or farmland of local importance exists within the Sand Hill Wind Project boundary, Alternative 3, like the proposed project, would have no impact on prime farmland, or on the conversion of Farmland, as defined by the FMMP, to nonagricultural use. Furthermore, because the existing wind facilities are a conditionally permitted use on non-prime farmland within Alameda County's A District and no prime farmland is present within or near the project area, as with the proposed project, Alternative 3 would constitute a conditionally permitted use. The High Risk Avoidance Alternative would not cause any substantial change to the existing agricultural use on either contracted or non-contracted lands in or near the project area, nor result in the cancellation or non-renewal of Williamson Act contracts on parcels under lease for the proposed project. As with the proposed project, there would be no impact on existing agricultural zoning or Williamson Act contracts. As no forest land, or land zoned as forest land or timberland, is located within or near the project area, Alternative 3, like the proposed project, would not conflict with existing zoning, or cause rezoning, of forest land or timberland, or result in the loss or conversion of any forest land to non-forest use.

Air Quality

For the Full Repower, there would be minimal differences in impacts on air quality between Alternative 3 and the proposed project. The location of the turbines to be constructed would not substantially affect the construction activities and resulting air pollutant emissions associated with the turbine construction. In addition, no additional sensitive receptors would be exposed to pollutant concentrations under Alternative 3, as the entire area of consideration is not heavily populated with sensitive receptors.

Biological Resources

Because the Initial Repower activities would be part of this alternative, the Initial Repower impacts on biological resources under Alternative 3 would be identical to those under the Initial Repower. The benefit of Alternative 3 regarding avian mortality would take place after the Initial Repower phase.

Under Alternative 3, *high-risk* sites would be avoided for the Full Repower. Since Alternative 3 would still include construction of the number of turbines necessary for a 34 MW project, the amount of ground disturbance, and the corresponding impacts on terrestrial biological resources, would be similar to those expected under the Full Repower. Alternative 3 could have the effect of reducing impacts on avian species, by avoiding the construction of turbines at high-risk sites, if the new turbine technology does not reduce effects to avian species as expected. High-risk turbines are generally considered such because they are located in areas with high bird use, or because they have been found to have disproportionately high fatality rates when compared to other nearby turbines. Avoiding these sites as part of this alternative should therefore reduce impacts on avian species.

Cultural Resources

Under Alternative 3, shrouded turbine installation for the Full Repower would avoid existing turbine locations that exhibit a high risk of avian impacts. Assuming the same number of new, shrouded turbines would be installed, impacts on cultural resources for Alternative 3 would be similar to those for the proposed project's Full Repower phase.

Geology, Soils, Paleontological Resources

The impacts related to geologic hazards under the Full Repower phase of Alternative 3 would be the similar to those under the proposed project's Full Repower, because the County would not allow turbines to be sited in locations unsafe for construction. In addition, as with the proposed project, the County would require detailed geotechnical reporting, as described in Mitigation Measure GEO-1, and turbine foundations would be sited and designed accordingly.

For paleontological resources, the impacts under Alternative 3 would be similar to the proposed project because all geologic units in the project area are sensitive for paleontological resources.

Greenhouse Gases

For the Full Repower, there would be minimal differences in impacts between Alternative 3 and the proposed project. The location of the turbines to be constructed would not substantially affect the construction activities and resulting GHG emissions associated with construction. Operational impacts after the future repowering would be nearly identical between the proposed project and Alternative 3 and would have generally beneficial impacts on climate change, as the turbines are a renewable energy source that would not result in GHG emissions.

Hazards and Hazardous Materials

Under the Full Repower, this alternative would be similar to the proposed project. Wind turbine siting within the project area would not change the potential for aircraft hazards and wildland fire because facilities would still be over 2 miles from an airport. In addition, fire prevention measures would still apply throughout the project area as would County setback requirements for wind turbine siting. Siting would not affect the types of hazards and hazardous materials construction workers and operation and maintenance workers would be exposed to. Therefore, impacts related to hazards and hazardous materials under this alternative would be similar to those of the proposed project under the Full Repower.

Hydrology and Water Quality

Under Alternative 3, shrouded turbine installation for the Full Repower would avoid existing turbine locations that exhibit a high risk of avian impacts. Assuming the same number of new, shrouded turbines would be installed, construction activities would be comparable to those of the proposed project's Full Repower. Impacts on hydrological and water quality conditions within the project area would therefore be similar to those for the proposed project's Full Repower phase.

Noise

For the Full Repower, turbines would not be constructed in areas of high-risk for avian impacts. This change in turbine location distribution from the proposed project would affect localized noise levels, but the overall noise impacts from Alternative 3 would not be substantially different from the proposed project. Under future repowering both the proposed project and Alternative 3 could result in increases in noise levels and potentially significant impacts, but these impacts would be reduced through the mitigation discussed for the proposed project.

Transportation/Traffic

This alternative generally would be the same as the proposed project with regard to the number of turbines and the type of construction-related effects on transportation systems and traffic in the project area for the Full Repower phase. Under this alternative, the layout of the turbines would be modified relative to the proposed project to avoid areas of high avian risk. Although this modification could shift the number of vehicles on one or more of the local roads, the overall nature of the effects on the performance of the roads, access for motorists, bicyclists, and emergency vehicle access would be the same. Construction-related effects on local roads at all times, on affected regional routes (CMP-designated routes: I-580, I-238, I-880, I-205, I-5) during peak travel periods, and on I-580/I-205 in the project vicinity, would be significant and unavoidable. Implementation of a TCP during construction would reduce the effects on transportation performance standards on the local roadways, protect motorist and bicyclist safety, and ensure adequate emergency vehicle access in the project area. Overall, these effects under Alternative 3 would be similar to the proposed project Full Repower phase.

Utilities and Service Systems

Under this alternative, impacts on utilities and service systems would be the same as for the proposed Full Repower phase. The number and scope of turbines would remain the same regardless of siting. The area of ground disturbance during installation would be the same as for the proposed project. Water needed for dust control would be the same regardless of where within the project area wind turbines are sited. Stormwater drainage and wastewater would also not change under this alternative. The amount of solid waste generated would not be significantly different and the project would be required to comply with local, state, and federal solid waste regulations. Therefore, overall, wastewater generation, stormwater runoff patterns, water consumption, and solid waste under Alternative 3 would be similar to the proposed project Full Repower phase.

4.3.5 Alternative 4 – Seasonal Avoidance

Under this alternative, the first 40 turbines would be developed as proposed and, along with additional future repowering phases with shrouded FloDesign turbines, would be shut down annually from November 1 through February 15.

Aesthetics

Seasonal shutdown of the shrouded turbines annually would not affect visual impacts from construction activities, or scenic vistas or designated scenic routes. Seasonal shutdown of wind turbines would also not affect the visual character of the area as compared to the proposed project. Therefore, with Mitigation Measure AESTH-1 incorporated, impacts on visual resources would be similar to those of the proposed project. Effects on scenic vistas, scenic vistas, designated scenic routes or resources, and visual character and quality would be significant and unavoidable. Construction effects of the full buildout under this alternative could be mitigated to less than significant, and new sources of light and glare would be less than significant, as discussed for the proposed project Full Repower phase.

Agricultural Resources

Under the Seasonal Avoidance Alternative, as with the Initial Repower and Full Repower, there would be no impacts on agricultural or forest resources. Seasonal shutdown of wind facilities would not affect existing agriculture-related site conditions. Impacts would be the same as those associated with the proposed project. As with the proposed project, including both the Initial Repower and Full Repower, there would be no impact on prime farmland or conversion of Farmland to non-agricultural use, because no prime farmland, farmland of statewide importance, or farmland of local importance (Farmland, as defined by the FMMP) exists within the project area. Furthermore, because wind facilities are a conditionally permitted use on non-prime farmland within Alameda County's A District and no prime farmland is present within or near the project area, Alternative 4 would constitute a conditionally permitted use with or without seasonal shutdown. The Seasonal Avoidance Alternative would not cause any substantial change to the existing agricultural use on either contracted or non-contracted lands in or near the project area, nor result in the cancellation or non-renewal of Williamson Act contracts on parcels under lease for the proposed project. As with the proposed project, there would be no impact on existing agricultural zoning or Williamson Act contracts. Because no forest land, or land zoned as forest land or timberland, is located within or near the project area, Alternative 4, like the proposed project, would not conflict with existing zoning, or cause rezoning, of forest land or timberland, or result in the loss or conversion of any forest land to non-forest use.

Air Quality

Air quality impacts associated with Alternative 4 would be identical to the impacts associated with the Initial and Future Repower phases of the proposed project because the annual seasonal shutdown of the turbines would have no substantial change on the nature of air quality effects.

Biological Resources

Under Alternative 4, impacts on terrestrial biological resources for the Initial Repower would be identical to those expected under the proposed project's Initial Repower. While the new turbines are

expected to reduce avian impacts as a function of their design, they are still expected to have some level of impact. Bird use is known to be higher during the winter months, which is thought to provide additional risk to avian species. Because birds are present in greater numbers, it is hypothesized that they may have a higher potential for turbine related fatalities during this time. Seasonal shutdowns implemented under Alternative 4 would therefore be expected to reduce the risk to most avian species during that season and would therefore generally result in less impact when compared to the proposed project.

Under Alternative 4, impacts on terrestrial biological resources for the Full Repower would be identical to those expected under the proposed project. Similar to the effects of the Initial Repower, the Full Repower, with seasonal shutdowns, would be expected to reduce the risk to most avian species during that season and would therefore generally result in less impact when compared to the proposed project.

Cultural Resources

Cultural resources impacts associated with Alternative 4 would be identical to the impacts associated with the Initial and Future Repower phases of the proposed project because the operational schedule of the turbines would not affect cultural resources. Shutting down the shrouded turbines annually would not affect cultural resources. Therefore, impacts resulting from Alternative 4 would be the same as for the proposed project.

Geology, Soils, Paleontological Resources

The impacts related to geologic hazards under Alternative 4 would be the same as under the proposed project because operation of the turbines does not affect geologic hazards. The same is true for paleontological resources because nonoperation of the turbines would not affect paleontological resources.

Greenhouse Gases

Construction activities, and the resulting GHG emissions, to construct the turbines would be identical for both the Initial and Future Repower phases between Alternative 4 and the proposed project. The operational schedule of the turbines would affect the amount of electricity that is produced by the turbines but would not modify the construction activity that would occur to install the turbines. Operational impacts (during the Initial and Full Repower) would have generally beneficial impacts on climate change, as the turbines are a renewable energy source that would not result in GHG emissions.

Hazards and Hazardous Materials

As compared to the proposed project, the Initial Repower under this alternative would be the same. As such, impacts would be similar in terms of hazards and hazardous materials. The danger of exposure to hazardous materials as compared to the proposed project would neither increase nor decrease. Under the Full Repower phase, the seasonal shut down of 3.5 months could result in a reduced potential for fire hazards. As such, impacts relating to hazards and hazardous materials under Alternative 4 would be slightly reduced.

Hydrology and Water Quality

Under Alternative 4, the initial development phase of the project would proceed as proposed with 40 shrouded FloDesign turbines. However, the turbines would be shut down annually from November 1 through February 15. Because the majority of impacts on hydrological and water quality conditions would be associated with construction, this alternative would only result in a negligible decrease in the potential for impacts during operation and maintenance of the turbines relative to the proposed project. Therefore, impacts on hydrological and water quality conditions within the project area would be similar to those under the proposed project.

Under Alternative 4, shrouded turbine installation for Full Repower would be the same as for the proposed project, but operationally they would be shut down annually from November 1 through February 15. Assuming the same number of new, shrouded turbines would be installed; impacts on hydrological and water quality conditions within the project area would be very similar to those for the proposed project.

Noise

Construction noise impacts associated with Alternative 4 would be identical to the impacts of the proposed project. Alternative 4 would follow a seasonal shutdown schedule, however, which would result in no turbine operation for 3.5 months of each year. As a result, there would be no operational noise on days when turbines are shutdown. Noise on days when turbines are running would be the same as with the proposed project. These differences in effects on noise in the project area would be the same for the Initial and Full Repower phases. Therefore, overall, Alternative 4 would have reduced operational noise levels because of the shutdown period when compared to the proposed project that would operate year-round.

Transportation/Traffic

The seasonal shutdown of the turbines would not affect the construction-related effects on transportation/traffic in the project area and the operational changes would not substantially reduce associated traffic for operations or maintenance under either the Initial or Full Repower phases. The impacts under this alternative generally would be the similar to those under the proposed project. Construction-related effects on local roads and regional routes (CMP-designated interstates: I-580, I-238, I-880, I-205, and I-5)could be reduced by preparation and implementation of a TCP, but because of the large number of construction-related trips, effects on transportation system performance, congested roadway conditions and potential safety hazards would remain significant and unavoidable during construction.

Utilities and Service Systems

Impacts on utilities and service systems associated with Alternative 4 would be identical to the impacts associated with the proposed project. Despite a yearly seasonal shutdown, the number and scope of turbines would remain the same as would the area of ground disturbance during installation of wind turbines. Therefore, water for dust control, stormwater drainage and wastewater needs would be the same as for the proposed project. The amount of solid waste generated would not be significantly different with a seasonal shutdown requirement and the project would still be required to comply with local, state, and federal solid waste regulations. Wastewater generation, stormwater runoff patterns, water consumption, and solid waste would be the same as under the proposed project for both the Initial and Full Repower scenarios.

4.4 Environmentally Superior Alternative

CEQA requires an EIR to examine a range of feasible alternatives to a proposed project. State CEQA Guidelines Section 15126.6(e)(2) requires that an EIR identify which of those alternatives is the environmentally superior alternative. If, in the course of identifying the environmentally superior alternative, the No Project Alternative is found to be the environmentally superior alternative, then Section 15126.6(e)(2) of the State CEQA Guidelines further requires that an EIR identify which among the other alternatives is the environmentally superior alternative. Consequently, although the No Project Alternative is evaluated and presented for comparison purposes, determination of the environmentally superior alternative in this chapter primarily reflects the differences in impacts among the remaining alternatives.

In the case of the proposed project and alternatives, the No Project Alternative was not determined to be environmentally superior. Alternative 1 was found to be the environmentally superior alternative. Alternative 1 differs from the proposed project and other alternatives primarily because the Initial Repower phase of this alternative would consist of only 10 shrouded turbines instead of 40. The reduced scale and duration of construction activities associated with Alternative 1 compared to the proposed project and other alternatives, all of which would entail installation of 40 turbines in the Initial Repower, lessens the potential for significant effects on a number of resources (Table 4-1).

Impacts on Aesthetics; Air Quality; Geology, Soils, Paleontology; Greenhouse Gases; Noise; and Transportation/Traffic would all be reduced for the Initial Repower phase under Alternative 1. Aesthetic effects on sensitive receptors would be reduced because of the shorter construction duration and placement of fewer turbines would result in a reduced effect on the visual character and quality as viewed relative to scenic vistas and designated scenic routes as well as decreasing new sources of glare that would be introduced to the project area. The amount of air quality and GHG emissions generated by construction of Alternative 1 would be reduced because of the smaller scale and associated shorter construction period of the Initial Repower phase relative to the proposed project and other alternatives.

The potential for geological hazards to occur due to construction activity would be of a lesser magnitude because of the smaller project area associated with installing only 10 turbines rather than 40 for the Initial Repower. Similarly, the potential to disturb paleontological resources during this phase would be less for Alternative 1 than for the proposed project and other alternatives.

Noise associated with construction activities and operation of the proposed new turbines would be reduced under Alternative 1 relative to the proposed project and other alternatives. Finally, the generation of construction-related truck, vendor, and worker trips could be substantially less for installation of 10 turbines relative to 40 turbines and, depending on where the turbines would be placed, the effect on performance, and access for motorists, bicyclists, and emergency providers on one or more of the local county roads could be substantially reduced.

As shown in Table 4-1, the effects of the Full Repower on these resources under Alternative 1 would be similar to the proposed project and other alternatives.

Table 4-1 provides an overview of the potential differences in the level of impacts under the alternatives considered in this EIR. In many instances, the potential effects would be similar, meaning that the overall outcome of implementing the proposed project compared to any one of the alternatives would generally result in the same type and magnitude of effects on the resource topic,

even though the alternative approach differs in some way from the proposed project. For Alternatives 2 and 3, the Initial Repower phase would be identical to the proposed project; therefore, the comparison notes that they are the same. This is true for several resource topics under Alternative 4, wherein the operational change to include seasonal shutdown of the turbines would not alter the effects when compared to the proposed project. The table also indicates if the overall level of impact on a resource topic would be reduced or increased by implementation of an alternative relative to the proposed project. These differences are highlighted in bold font in the table.

Table 4-1. Comparison of Alternative Impacts to the Proposed Project

	No Project Impacts Would Be	Scenarios	Alternative 1 Impacts Would Be	Alternative 2 Impacts Would Be	Alternative 3 Impacts Would Be	Alternative 4 Impacts Would Be
Aesthetics	Similar	Initial Repower	**Reduced**	*Same*	*Same*	*Same*
		Full Repower	Similar	Similar **Increased** *for lighting*	Similar	*Same*
Agricultural and Forestry Resources	Similar	Initial Repower	Similar	*Same*	*Same*	*Same*
		Full Repower	Similar	Similar	Similar	*Same*
Air Quality	Similar	Initial Repower	**Reduced**	*Same*	*Same*	*Same*
		Full Repower	Similar	Similar	Similar	*Same*
Biological Resources	Increased	Initial Repower	**Reduced**	*Same*	*Same*	**Reduced**
		Full Repower	Similar	*Same*	**Reduced**	**Reduced**
Cultural Resources	Similar	Initial Repower	**Reduced**	*Same*	*Same*	*Same*
		Full Repower	Similar	**Reduced**	Similar	*Same*
Geology, Soils, Paleontological Resources	Similar	Initial Repower	**Reduced**	*Same*	*Same*	*Same*
		Full Repower	Similar	Similar (geology and soils) **Reduced** (paleontological resources)	Similar	*Same*
Greenhouse Gas	Similar	Initial Repower	**Reduced**	*Same*	*Same*	*Same*
		Full Repower	Similar	**Reduced**	Similar	**Increased** by way of *less benefit*
Hazards and Hazardous Materials	Similar	Initial Repower	Similar, *slightly less*	*Same*	*Same*	*Same*
		Full Repower	Similar	Similar **Increased** (blade-throw)	Similar	**Reduced** (wildland fire hazard)
Hydrology and Water Quality	Similar	Initial Repower	**Reduced**	*Same*	*Same*	Similar
		Full Repower	Similar	**Reduced**	Similar	Similar

	No Project Impacts Would Be	Scenarios	Alternative 1 Impacts Would Be	Alternative 2 Impacts Would Be	Alternative 3 Impacts Would Be	Alternative 4 Impacts Would Be
Noise	Similar	Initial Repower	**Reduced**	*Same*	*Same*	**Reduced** (operational noise)
		Full Repower	Similar	Similar	Similar	**Reduced** (operational noise)
Transportation/ Traffic	Similar	Initial Repower	**Reduced**	*Same*	*Same*	Similar
		Full Repower	Similar	Similar	Similar	Similar
Utilities and Service Systems	Similar	Initial Repower	Similar	*Same*	*Same*	*Same*
		Full Repower	Similar	Similar	Similar	*Same*
Summary						
Increased	1 resource area	Initial Repower	None	None	None	None
		Full Repower	None	2 resource areas	None	1 resource area
Reduced	None	Initial Repower	9 resource areas	None	None	2 resource areas
		Full Repower	None	4 resource areas	1 resource area	3 resource areas

4.5 References Cited

Illingworth & Rodkin. 2006. *Montezuma Wind Project-Noise Technical Report*. Petaluma, CA.