COUNTY OF SANTA BARBARA

Planning and Development

www.countyofsb.org/plndev

Appeal to the Board of Supervisors or Planning Commission (County or Montecito)

APPEAL TO THE BOARD OF SUPERVISORS OR PLANNING COMMISSION (APL) on the issuance, revocation, or modification of:

- **All Discretionary projects heard by one of the Planning Commissions**
- **Board of Architectural Review decisions**
- **Coastal Development Permit decisions**
- **Land Use Permit decisions**
- **Planning & Development Director's decisions**
- **Zoning Administrator's decisions**

THIS PACKAGE CONTAINS

✓ **APPLICATION FORM**

✓ **SUBMITTAL REQUIREMENTS**

AND, IF ✓'D, ALSO CONTAINS

South County Office	North County Office	Clerk of the Board
123 E. Anapamu Street Santa Barbara, CA 93101 Phone: (805) 568-2000 Fax: (805) 568-2030	624 W. Foster Road, Suite C Santa Maria, CA 93455 Phone: (805) 934-6250 Fax: (805) 934-6258	105 E. Anapamu Street Santa Barbara, CA 93101 Phone: (805) 568-2240 Fax : (805) 568-2249

SUBMITTAL REQUIREMENTS

x 8 Copies of the attached application.

x 8 Copies of a written explanation of the appeal including:

- If you are not the applicant, an explanation of how you are an "**aggrieved party**" ("Any person who in person, or through a representative, appeared at a public hearing in connection with the decision or action appealed, or who, by the other nature of his concerns or who for good cause was unable to do either.");
- A clear, complete and concise statement of the **reasons or grounds for appeal**:
  - Why the decision or determination is consistent with the provisions and purposes of the County's Zoning Ordinances or other applicable law; or
  - There was error or abuse of discretion;
  - The decision is not supported by the evidence presented for consideration;
  - There was a lack of a fair and impartial hearing; or
  - There is significant new evidence relevant to the decision which could not have been presented at the time the decision was made.

x 1 Check payable to County of Santa Barbara.

Note: There are additional requirements for certain appeals including:

a. **Appeals regarding a previously approved discretionary permit** – If the approval of a Land use permit required by a previously approved discretionary permit is appealed, the applicant shall identify: 1) How the Land Use Permit is inconsistent with the previously approved discretionary permit; 2) How the discretionary permit's conditions of approval that are required to be completed prior to the approval of a Land Use Permit have not been completed; 3) How the approval is inconsistent with Section 35.106 (Noticing).

b. **Appeals regarding Residential Second Units (RSUs)** – The grounds for an appeal of the approval of a Land Use Permit for a RSU in compliance with Section 35.42.230 (Residential Second Units) shall be limited to whether the approved project is in compliance with development standards for RSUs provided in Section 35.42.230.F (Development Standards).

PLANNING & DEVELOPMENT
APPEAL FORM

SITE ADDRESS: Strauss Wind Energy Project

ASSESSOR PARCEL NUMBER: 083-100-008, 083-250-011, 083-250-016, 083-250-019, 083-090-001, 083-090-002, 083-090-003, 083-080-004, 083-100-007, 083-100-004, 083-090-014, 093-140-016, 083-060-013, 083-030-031, 083-030-005, 083-030-006, 083-110-012, 083-110-007, 083-110-008, 083-060-017, and 083-110-002, 099-131-034.

Are there previous permits/applications? ☒no ☐yes numbers: _____
(include permit# & lot # if tract)

Is this appeal (potentially) related to cannabis activities? ☒no ☐yes

Are there previous environmental (CEQA) documents? ☒no ☐yes numbers: _____

1. **Appellant:** California Native Plant Society Phone: 916-447-2677 FAX: _____

Mailing Address: 2707 K Street, Ste. 1, Sacramento, CA 95816 E-mail: njensen@cnps.org
Street City State Zip

2. **Owner:** _____ Phone: _____ FAX: _____

Mailing Address: _____ E-mail: _____
Street City State Zip

3. **Agent:** Nick Jensen Phone: 530-368-7839 FAX: _____

Mailing Address: 1953 Third St La Verne 91750 E-mail: njensen@cnps.org
Street City State Zip

4. **Attorney:** _____ Phone: _____ FAX: _____

Mailing Address: _____ E-mail _____
Street City State Zip

COUNTY USE ONLY

Case Number: _____ *Companion Case Number:* _____
Supervisorial District: _____ *Submittal Date:* _____
Applicable Zoning Ordinance: _____ *Receipt Number:* _____
Project Planner: _____ *Accepted for Processing* _____
Zoning Designation: _____ *Comp. Plan Designation* _____

COUNTY OF SANTA BARBARA APPEAL TO THE:

x **BOARD OF SUPERVISORS**

_____ **PLANNING COMMISSION:** _____**COUNTY** _____ **MONTECITO**

RE: Project Title Strauss Wind Energy Project

Case No. 16CUP-00000-00031,18VAR-00000-00002

Date of Action November 20, 2019

I hereby appeal the x approval _____approval w/conditions _____denial of the:

_____Board of Architectural Review – Which Board? _____

_____Coastal Development Permit decision

_____Land Use Permit decision

x Planning Commission decision – Which Commission? Santa Barbara County Planning Commission

_____Planning & Development Director decision

_____Zoning Administrator decision

Is the appellant the applicant or an aggrieved party?

_____ Applicant

x
_____ Aggrieved party – if you are not the applicant, provide an explanation of how you are and "aggrieved party" as defined on page two of this appeal form:

The California Native Plant Society (CNPS) is an environmental organization with more than 10,000 members statewide. A primary focus of our efforts is to conserve our state's plant diversity. As approved, the Strauss Wind Energy Project (SWEP) would directly impact approximately 20% of the total population of Gaviot tarplant, a state and federal endangered species. With indirect project impacts the ramifications of SWEP would be greater. Our concerns are detailed in our comment letter, submitted on November 15, 2019 and our grounds for appeal (below).

Reason of grounds for the appeal – Write the reason for the appeal below or submit 8 copies of your appeal letter that addresses the appeal requirements listed on page two of this appeal form:

- A clear, complete and concise statement of the reasons why the decision or determination is inconsistent with the provisions and purposes of the County's Zoning Ordinances or other applicable law; and
- Grounds shall be specifically stated if it is claimed that there was error or abuse of discretion, or lack of a fair and impartial hearing, or that the decision is not supported by the evidence presented for consideration, or that there is significant new evidence relevant to the decision which could not have been presented at the time the decision was made.

Please see Attachment 1, which details our grounds for the appeal.

Specific conditions imposed which I wish to appeal are (if applicable):

a. Approved conditions of mitigation (MM-BIO-6) are insufficient as these measures cannot ensure the continue

b. existence of Gaviota tarplant once it is subjected to the direct and indirect impacts from the project (see 14 CCI § 783.4(b)).

c.

d.

Please include any other information you feel is relevant to this application.

CERTIFICATION OF ACCURACY AND COMPLETENESS Signatures must be completed for each line. If one or more of the parties are the same, please re-sign the applicable line.

Applicant's signature authorizes County staff to enter the property described above for the purposes of inspection.

I hereby declare under penalty of perjury that the information contained in this application and all attached materials are correct, true and complete. I acknowledge and agree that the County of Santa Barbara is relying on the accuracy of this information and my representations in order to process this application and that any permits issued by the County may be rescinded if it is determined that the information and materials submitted are not true and correct. I further acknowledge that I may be liable for any costs associated with rescission of such permits.

Print name and sign – Firm — Date

Nicholas Jensen — December 1, 2019

Print name and sign – Preparer of this form — Date

California Native Plant Society — December 1, 2019

Print name and sign – Applicant — Date

Print name and sign – Agent — Date

Print name and sign – Landowner — Date

G:\GROUP\P&D\Digital Library\Applications & Forms\Planning Applications and Forms\AppealSubReqAPP.doc

CALIFORNIA
NATIVE PLANT SOCIETY

December 1, 2019

Santa Barbara County Board of Supervisors
105 E. Anapamu Street, Room 407
Santa Barbara CA, 93101

Attachment 1: Reason for Appeal, Strauss Wind Energy Project Decision

Dear Santa Barbara County Board of Supervisors,

The decision by the Santa Barbara County Planning Commission to approve the Strauss Wind Energy Project (SWEP) is not supported by the evidence presented for consideration. In our comment letter, the California Native Plant Society, Santa Barbara Audubon Society, and Defenders of Wildlife raised concerns about the EIR's assessment of environmental impacts, adequacy of mitigation, lack of suitable project alternatives, and the need for a full project review under the National Environmental Policy Act (see Attachment 2). Many of our concerns have been raised previously in comments submitted by the California Department of Fish and Wildlife (CDFW) on the Draft Supplemental EIR (see Attachment 3). Our concerns, and those raised by CDFW, are not fully addressed in the certified EIR.

The California Environmental Quality Act (CEQA) requires public agencies to "avoid or minimize environmental damage where feasible" (14 CCR § 15021a) for projects under their jurisdiction. The ability of an EIR to avoid and minimize damage requires that the "direct and indirect significant effects of the project on the environment shall be clearly identified and described, giving due consideration to both the short-term and long-term effects" (14 CCR § 15126.2a). Because the EIR failed to adequately disclose direct and indirect impacts to biological resources including Gaviota tarplant, this renders the description of "feasible measures which could minimize significant adverse impacts" in the EIR inadequate (14 CCR § 15126.4 (a)(1)). Further, the EIR fails to present a project alternative "which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects" to Gaviota tarplant, as is required under CEQA (14 CCR § 15126.6). The EIR also fails to adequately address and mitigate for impacts to other rare plant species and Crotch's bumblebee. Because, the planning commission failed to take into account evidence presented on the Project's environmental impacts, the decision to grant a Conditional Use Permit and two Variances, and to certify the EIR must be reconsidered. The board of supervisors must address these issues:

1. The FSEIR fails to adequately disclose and analyze direct and indirect impacts to Gaviota tarplant. As a result of this inadequacy, the determination of the significance of impact to this species, and the proposed minimization measures are flawed.

The FSEIR makes the determination that impacts to Gaviota tarplant are Class II and can be mitigated to less-than-significant levels. The lack of an accurate description of direct and indirect

impacts to Gaviota tarplant makes the determination of the impacts as Class II irrelevant. Specifically, the EIR does not address the occupied acreage of Gaviota tarplant that would be indirectly impacted by the Project, as is required by CEQA. Additionally, the EIR relies heavily on the acreage of direct impact to Gaviota tarplant and fails to account for the direct impact to as many as 1.2 million individuals. While population numbers for this taxon vary on an annual basis, habitat for approximately 20% of all individuals of Gaviota tarplant would be destroyed by SWEP, and more than 80% of the total population of the species would be indirectly impacted. These effects will have extreme and negative consequences for Gaviota tarplant. The quality of habitat, as indicated by the number of Gaviota tarplant on SWEP indicates that this population plays an important role in the continued existence of the species. The EIR does not adequately analyze the gravity of the threat that the Project poses to Gaviota tarplant. Specifically, demographic and genetic studies focusing on the population dynamics (e.g. gene flow, genetic diversity, structure, etc.) within and between populations of Gaviota tarplant could provide vital that would enable scientists to interpret if the species is able to survive a loss of this scale. Unfortunately, the EIR only provides a rudimentary interpretation of impacts, relying almost completely on the acreage of direct impact. The magnitude of direct and indirect impacts caused by SWEP could very well place Gaviota tarplant in jeopardy of extinction in the near future.

The analysis of impacts to Gaviota tarplant renders the proposed mitigation measures inadequate and flawed. Specifically, the Project's impacts to this species are likely to require offsite mitigation. As little occupied acreage for Gaviota tarplant exists on private lands outside of the Project footprint, the Project cannot rely on offsite mitigation to fully compensate for project impacts, even at the proposed mitigation ratio of 3:1. SWEP threatens the largest and most important population of Gaviota tarplant, and, as a result, the Project represents an existential threat to the species. The direct loss of habitat for 1.2 million plants necessitates a ratio higher than 3:1, especially given that population numbers of Gaviota tarplant at locations outside of the Project site are comparatively small. The quality and quantity of habitat that will be lost on SWEP indicates the need for a mitigation ratio of 5:1 or higher. This is necessary to compensate for the quality of habitat lost, the acreage destroyed, and the number of individuals that will be eliminated.

The ability of the County to grant the Project the permits necessary for the initiation of construction is contingent upon obtaining permits from CDFW. To receive a permit under the California Endangered Species Act (CESA), CDFW will have to find that (1) the project will not jeopardize the continued existence of this species and (2) the project has fully mitigated its impacts. The level of impacts caused by SWEP will jeopardize the continued existence of this species even with the 3:1 mitigation ratio because, as discussed above, there is insufficient habitat available for mitigation. The unfortunate fact is that this species has already lost so much of its original habitat that any further loss is significant. CDFW will require the project to commit to effective mitigation measures before the agency can issue the appropriate permits under the California Endangered Species Act through either a consistency determination or Section 2081 permit. As noted above and extensively in CDFW's CEQA comments, current Project conditions fail to meet the standard, based on best available scientific information. The project proponent must ensure the continued existence of Gaviota tarplant once this species is subject to Project impacts (see CCR 14 Sec. 783.4(b)).

In addition, the EIR fails to include an adaptive management and monitoring plan for onsite lands that would be used for mitigation as would be required by CDFW for the issuance of an incidental take permit.

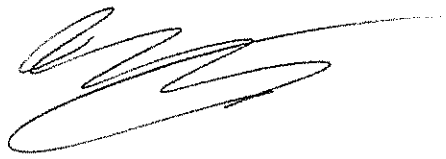
2. The EIR fails to provide a project alternative that minimizes impacts to Gaviota tarplant. The gravity of the impacts to Gaviota tarplant necessitates the preparation of a project alternative that reduces impacts to this species while still achieving Project goals. The EIR must be revised to include a project alternative that includes a design (e.g. altered siting of wind turbines) that reduces impacts to Gaviota tarplant.

3. The EIR does not adequately account for impacts to other rare plants present on the Project site including four species that are on California Rare Plant Rank 1B (plants rare, threatened or endangered in California, and elsewhere). Mitigation measures for impacts to these species are inadequate. The EIR must be revised to account for and minimize impacts to all rare plant species.

4. The conservation of plant pollinators represents a vital nexus to conservation of native plant species. The EIR does not require pre-construction surveys for Crotch's bumblebee, a candidate for listing under the California Endangered Species Act. Concurrently, no mitigation measures are presented for the minimization of take for this species. The EIR must be revised to account for potential impacts to Crotch's bumblebee and to detail measures that avoid/minimize take of this species.

5. The Project will require a Section 404 permit issued by the U.S. Army Corps of Engineers for impacts to waters of the U.S. We fully expect that the project developer will obtain the appropriate federal permitting under the Endangered Species Act and the Clean Water Act prior to construction, and that the Project will receive full review under the National Environmental Policy Act. In particular, we expect the County to ensure that the project developer obtains coverage for take of endangered and threatened species for the entire project footprint, including and beyond any impacted federal jurisdictional waters.

Sincerely,



Nicholas Jensen, PhD
Southern California Conservation Analyst
California Native Plant Society
(530) 368-7839
njensen@cnps.org

Attachment 2

CALIFORNIA NATIVE PLANT SOCIETY

SANTA BARBARA AUDUBON SOCIETY

RECEIVED

NOV 18 2019

S.B. COUNTY
PLANNING & DEVELOPMENT
HEARING SUPPORT

EXHIBIT 1

11/20/19

November 15, 2018

Santa Barbara County Planning Commission
123 East Anapamu Street
Santa Barbara, CA 93101
Sent electronically to: dvillalo@co.santa-barbara.ca.us, kathypm@co.santa-barbara.ca.us
CC: Kelly.Schmoker@wildlife.ca.gov, Randy.Rodriguez@wildlife.ca.gov, Erinn.Wilson@wildlife.ca.gov, mark_elvin@fws.gov, katherine.emery@lifesci.ucsb.edu, kdelfino@cnps.org, kipp.callahan@gmail.com, gsuba@cnps.org

Dear Santa Barbara County Planning Commission,

Thank you for the opportunity to provide comments on the Final Supplemental Environmental Impact Report (FSEIR) for the Strauss Wind Energy Project (SWEP or Project, hereafter). SWEP is located along the Gaviota Coast east of Vandenberg Airforce Base and northwest of the newly-created Jack and Laura Dangermond Preserve. SWEP is a de novo iteration of the previously-approved Lompoc Wind Energy Project (LWEP) and occupies the same project site. The Gaviota Coast is a 76-mile long undeveloped stretch of coastline and adjacent upland habitat that continues to be valued for its sensitive ecological resources, scenic beauty, and cultural resources. SWEP proposes to install 30 wind turbines on 5,887 acres of undeveloped land. The installation of wind turbines and associated infrastructure (e.g. roads, transmission lines) will have direct and indirect impacts to the biological resources on the Project site.

One purpose of the California Environmental Quality Act (CEQA) is to disclose to the public the potential impacts of discretionary projects like SWEP. Further, CEQA provides a means to identify how these impacts can be mitigated and an explanation why decision makers choose to allow certain projects to go forward even if impacts cannot be avoided. The public plays a central role in helping to ensure that the negative effects of projects, such as SWEP, do not outweigh their benefits. In this context, the following comments are provided on behalf of the California Native Plant Society (CNPS), Santa Barbara Audubon Society (SBAS), Defenders of Wildlife (Defenders), and Channel Islands Chapter of CNPS (Conservation Organizations, hereafter).

CNPS is a non-profit environmental organization with more than 10,000 members in 35 Chapters across California and Baja California, Mexico. CNPS's mission is to protect California's native plant heritage and preserve it for future generations through the application of science, research, education, and conservation. CNPS works closely with decision-makers, scientists, and local planners to advocate for well-informed policies, regulations, and land management practices.

SBAS is one of 460+ chapters of the National Audubon Society. Founded in 1963, SBAS serves to create a culture of conservation in our region through education and advocacy, focusing on the

conservation of birds and other wildlife and the ecological health of important habitats. We currently have ~1100 members.

Defenders is a non-profit environmental organization with more than 1.8 million members and supporters nationwide, including 279,000 members and supporters in California. Defenders works towards protection of wildlife, ecosystems, and landscapes while supporting the timely development of renewable energy resources in California. Achieving a low carbon energy future is critical for California – for our economy, our communities, and the environment. Achieving this future—and how we achieve it—is critical for protecting California's internationally treasured wildlife, landscapes, productive farmlands, and diverse habitats.

Over the past decade plus, the Conservation Organizations have participated actively in the discourse on renewable energy development on natural lands in California. We played a pivotal role in the development of the Desert Renewable Energy Conservation Plan and have engaged in advocacy on a wide variety of wind and solar energy projects statewide. We support renewable energy development where its siting does not cause significant impacts to sensitive biological resources. In the face of climate change, we support new wind and solar energy projects on previously-disturbed lands and within already urbanized areas. We recognize the need to consider a wide range of sites for renewable energy development. However, not all sites that have good potential to support renewable energy development are appropriate due to adverse environmental impacts. We are incredibly concerned about the gravity of the Project's impacts to Gaviota tarplant (*Deinandra increscens* subsp. *villosa*). Our comments below focus primarily on this taxon and other rare plants that will be affected by the Project. We steadfastly assert that Santa Barbara County can, and must, do better to minimize impacts to sensitive biological resources. The impacts to other biota including oaks and rare wildlife has been covered well by SBAS and California Department of Fish and Wildlife (CDFW) in comments submitted in response to the Draft SEIR. We recommend that the County and Project proponent fully address these comments before rendering a final decision on SWEP.

I. Impacts to Gaviota tarplant

Gaviota tarplant within SWEP

Gaviota tarplant is listed as an endangered species under the California and Federal Endangered Species Acts, and is included on Rank 1B.1 (Plants Rare, Threatened or Endangered in California and Elsewhere) of the CNPS Inventory of Rare and Endangered Plants[1]. Gaviota tarplant is endemic to California and has an extremely limited geographic range. The entire distribution of this taxon spans approximately 80 miles from north to south and 60 miles from west to east. The U.S. Fish and Wildlife Service (USFWS)[2] has designated three units of critical habitat, Sudden Peak, Conception-Gaviota, and the Santa Ynez Mountains, for the conservation of Gaviota tarplant. As defined by the USFWS, critical habitat units, "contain the physical or

[1] http://www.rareplants.cnps.org/

[2] https://www.govinfo.gov/content/pkg/FR-2002-11-07/pdf/02-27873.pdf#page=2

biological features that are essential to the conservation of endangered and threatened species and that may need special management or protection." The entirety of the Sudden Peak Unit is located within the Project site.

The California Natural Diversity Database (CNDDB)[3] currently tracks 22 occurrences of Gaviota tarplant. These occurrences are located within seven populations, as interpreted by the (USFWS) and CDFW. The numbers of Gaviota tarplant at a given location vary on a yearly basis given that it is an annual, but population sizes are generally small. The maximum population sizes at six of seven populations range from 700 at the Santa Ynez Mountains Population to 10,230 at the Point Conception Population. The largest population of Gaviota tarplant, Tranquillion Ridge/Sudden Peak has as many as six million plants, as observed in 2019. The entirety of this population would be impacted directly or indirectly by SWEP.

The FSEIR makes it difficult to determine the occupied acreage of Gaviota tarplant on the project site. Biological Resources Addendum 2 (Appendices at pdf pg. 721) documents 4,542,342 individuals over 192 acres of occupied habitat in 2018 surveys. Appendix C-9 (Appendices at pdf pg. 1154) notes that, "the 2019 surveys focused on areas that were not previously surveyed within the impact area or within 100 feet of the impact area. Additionally, potential mitigation areas were surveyed to ensure that active mitigation, such as native grasslands restoration, would not impact a special-status plant species. The 2019 survey area for Gaviota tarplant (*Deinandra increscens* ssp. *villosa*) was more expansive, in order to provide a better understanding of the extent of the population in the Project area." Later, Appendix C-9, Pre-construction Botanical Surveys in 2019, documents 6,039,777 plants over 56.6 acres of occupied habitat (Appendices at pg. 1164 in pdf). Yet, the FSEIR (pdf pgs. 250-1) reports 207 acres of occupied habitat of Gaviota tarplant on the project site. Please explain the discrepancy between the occupied acreage of Gaviota tarplant between 2018 and 2019.

The sum of the area occupied by all occurrences of Gaviota tarplant in the CNDDB is 1,356 acres. We provide the following table with observed abundance at each population to place the importance of the SWEP in its proper context. The Tranquillion Mountain/Sudden Peak Population (in bold) is contained almost entirely on the Project site.

Population Name	**Number of Plants**	**Environmental Setting**
Gaviota	1,200	Coastal terrace
Hollister Ranch	1,101	Coastal terrace
Lions Head	611	Coastal terrace
Point Arguello	750	Coastal terrace

[3] https://www.wildlife.ca.gov/Data/CNDDB/About

Point Conception	10,230	Coastal terrace
Santa Ynez Mountains	700	Higher elevation
Tranquillion Mountain/Sudden Peak	**6,038,777**	**Higher elevation**

From the perspective of population size, SWEP is the most important location for Gaviota tarplant. Remarkably, 99.7 percent of all known individuals of Gaviota tarplant occur on SWEP, and only 0.3 percent of the total population of this taxon occurs off the project site. To put this in perspective, the world's human population is 7.7 billion and 25 million people (0.33 percent) live in Australia. The small percentage represented by Australia's population, from a global perspective, is equivalent to the portion of Gaviota tarplant that occurs outside of SWEP. Furthermore, approximately 15 percent of the mapped acreage of Gaviota tarplant occurs on the project site. Consequently, any impacts to Gaviota tarplant on SWEP should be considered an impact to this taxon. The conservation of Gaviota tarplant depends on the conservation of the Tranquillion Ridge/Sudden Peak Population.

Direct Impacts

The FSEIR fails to report the magnitude of direct impacts to Gaviota tarplant in a transparent manner. First of all, the FSEIR relegates the discussion of the number of individuals that will be directly impacted by the Project to the Appendices. Instead, the FSEIR opts to report the number of acres that will be directly impacted by project actions. These include 10.3 acres of permanent and 22.3 acres of temporary impact for a total of 32.6 acres of direct impact. Has the FSEIR demonstrated that disturbed areas can be adequately restored to previous conditions? If not, all acreage of direct impact should be treated as a permanent loss.

The FSEIR makes it challenging to verify the acreage of Gaviota tarplant that will be directly impacted by the project. Specifically, 2019 surveys documented 6,039,777 plants over 56.6 acres. This amounts to a substantially larger number of plants over a significantly smaller area than was reported in 2018 surveys. The FSEIR notes that cumulatively there are 207 acres of occupied habitat for Gaviota tarplant on the site but it is unclear how this was calculated. Surveys in 2018 and 2019 documented plants over 192 acres and 56.6 acres, respectively. How much did these surveys overlap? Figure 3 in Appendix C-3 (Appendices pg. 1172 in pdf) appears to document a 2019 survey area that corresponds to the entire distribution of Gaviota tarplant on the project site, as is shown in FSEIR Figure 4-5-4a. Which map of occupied habitat was used to calculate the total amount of acreage of Gaviota tarplant that will be impacted by SWEP?

The amount of acreage that will be impacted by SWEP is important but is only one measure of the project's magnitude of impact. As stated previously, SWEP contains the vast majority of the overall population of Gaviota tarplant. The number of plants that will be directly impacted, 760,558, is only reported once, in the FSEIR Appendix, Biological Resources Addendum 2

(Appendices at pdf pg. 732). This calculation is based solely on the results of 2018 surveys. Has the number of plants that will be directly impacted by SWEP been calculated using the results of 2019 surveys? The comment letter submitted by CDFW indicates that 1,273,882 individuals of Gaviota tarplant will be directly impacted. Please clarify the number of plants that will lost if the Project is implemented. Regardless, either 760,558 or 1.2+ million plants, is a significant impact to the total population of Gaviota tarplant. Based on the number of plants reported by CDFW in their DSEIR comment letter (pdf at pg. 5), updated to account for the 6,039,777 plants documented on SWEP in 2019 surveys, 21% of the entire population of Gaviota tarplant, a state and federally endangered species, will be eliminated by this project. Also, the FSEIR fails to disclose where the largest numbers of Gaviota tarplant observed in 2019 surveys (as was reported in Biological Resources Addendum 2 in Appendices pdf pgs. 721-4) occur in relation to areas of direct impacts. This makes it challenging to identify where avoidable impacts to large numbers of Gaviota tarplant on SWEP are feasible.

Lastly, direct impact will result in the loss of 2.3 percent of the entire occupied acreage of Gaviota tarplant. Furthermore, 4.1 percent of the habitat in the Sudden Peak Unit of critical habitat will be lost as a result of the project.

Indirect impacts

The FSEIR does not adequately account for indirect impacts to Gaviota tarplant. CDFW, in their DSEIR comment letter, identifies a number of indirect impacts that could affect nearly the entire population of Gaviota tarplant on SWEP. The FSEIR states that "indirect impacts including but not limited to isolation, habitat fragmentation, pollinator impacts" will occur to Gaviota tarplant. However, it concludes that, "these indirect impacts cannot be quantified in terms of acreage but are far less important than direct impacts even immediately adjacent to the Project footprint, and decline in importance over relatively short distances." The failure to account for the acreage that will be affected by indirect impacts makes it impossible to determine full magnitude of impacts to Gaviota tarplant, which is required to assess if proposed mitigation measures are sufficient. A wealth of scientific literature emphasizes the importance of evaluating the indirect impacts associated with the disturbance of natural habitats. We offer the following comments on selected indirect impacts that are germane to the long-term persistence of Gaviota tarplant on SWEP:

Invasive Plants- Invasive plants compete with native species and this can lead to the loss of native plant populations over time (Cronk and Fuller 2001). Invasive plant species are implicated in the extirpation of rare plant species worldwide from *Lantana* spp., which threatens rare sunflowers in the Galapagos Islands to *Passiflora mollissima*, which threatens several rare endemic species in Hawaiian rainforests. Closer to home, invasive plants have been implicated as a cause in the extirpation of approximately 100 rare plant occurrences in California (Jensen and Still, manuscript in preparation). Grading for construction and linear disturbances including roads are frequently implicated in the spread of invasive plant species (Spellerberg 1998, Cronk and Fuller 2001, Harrison et al. 2002). Habitats that are closer to areas that have been disturbed are more likely to be invaded by non-native plants. This pattern has been observed worldwide,

from tropical India (Prasad 2009) to a variety of arid habitats in California (Knops et al. 1995, Picairn et al. 2006, Craig et al. 2010). For example, in one California study (Gelbard and Harrison 2003), the cover of native species and percentage of species that are native was greatest >1000 m from roads and was lowest 10 m from roads. Elsewhere, in the Glacier National Park, Tyser and Worley (1992) found, "unexpectedly high levels of alien species richness 100 m from the trailside." In any case, the conclusion is clear that disturbances like those that would be caused by SWEP usher in the spread of invasive plants, which compete with and can lead to the extirpation of rare species.

Microclimatic changes- A growing body of research measures the effect of wind energy sites on local climate. For example, Armstrong et al. (2016) found that overall nighttime temperature and humidity increased while variability in air, surface, and soil temperatures increased during the daytime at distances up to 200 m and greater from wind turbines. Another study (Cevarich et al. 2013) hypothesized that changes in nighttime temperature in wind farms is related to the fact that, "turbulence in wind turbine wakes increase downward transport of heat in the nocturnal stable environment." Research from San Gorgonio Pass, California concludes that wind farms may be beneficial in some agricultural settings in that increased nighttime temperatures "may prove to be beneficial, such as the nocturnal warming under stable conditions can protect crops from frosts" (Roy and Traiteu 2010). However, they conclude that as "wind farms become larger and more ubiquitous, it is essential that their possible environmental costs and benefits are assessed and properly addressed to ensure the long-term sustainability of wind power." Microclimatic change can have a strong effect of plant phenology (when a plant is reproductively active) and physiology (Jones 2013). The types of environmental change documented in wind farms and their effect on rare and common plant species is a central conservation. Researchers continue to model and document the effects that changes in local climatic conditions will have on the ranges of rare and common species (Anacker et al. 2013, Ackerly et al. 2010, Still et al. 2015). We recognize that how individual species will respond to microclimatic change is complicated. Nonetheless, the effect that microclimatic changes to the climate on SWEP may have on Gaviota tarplant and other species needs to be fully understood before this Project is allowed to proceed.

Effects on pollinators- Gaviota tarplant is self-incompatible and seed set requires pollen transferred mediated by insect pollinators (Bruce Baldwin, personal communication 2019). Consequently, any environmental changes on SWEP that affect pollinators may have an adverse effect on Gaviota tarplant. One recent study (Trieb 2018) documented the killing of large numbers of flying insects in a German wind farm. They concluded that over a 30-year operation period, "the large number of species throughout all taxa together with the high insect densities found at critical rotor heights, and visible evidence of an uncounted number of insects being killed by wind rotor blades… call for in-depth assessment of all possible interactions involved and for empirical verification of the theoretical estimate of about a trillion per year lost." Has SWEP taken into account the impact that the project will have on local insect populations and the effect that this will have on Gaviota tarplant? The scale of insect loss documented in (Trieb 2018) and the effect this likely has on pollinator services should potentially be considered a direct impact for outcrossing taxa such as Gaviota tarplant. Likewise, has SWEP evaluated the

potential direct and indirect impacts that turbines will have on the endangered El Segundo blue butterfly? Lastly, has the project considered the synergistic effect that microclimatic change and killing of insects will have on local populations of pollinators?

Hybridization- Natural hybridization can result in rapid evolutionary change, and can "occur over a short time due to the extreme genotypic and phenotypic novelty upon which natural selection can then act" (Todesco et al. 2016). However, hybridization as a source of evolutionary novelty can be a liability in systems that are affected by human action. The scientific literature is filled with examples of human-mediated plant dispersal causing effects on the genetic integrity of native species including *Cercocarpus traskiae* (Riesberg and Gerber 1995), *Acmispon scoparius* (Montalvo et al. 2001), and *Helianthus* spp. (Owens et al. 2016). According to Bruce Baldwin (personal communication, 2019) the presence of other, more common species of *Deinandra* in the proximity of SWEP poses a risk to Gaviota tarplant. Much like invasive, non-native plants, native plants are transported into newly-disturbed areas via roads and other forms of disturbance. Within 10 km of SWEP there are collections of three closely related taxa in the genus *Deinandra*, *Deinandra increscens* subsp. *increscens*, *Deinandra fasciculata*, and *Deinandra paniculata* (Consortium of California Herbaria 2019[4]). These taxa, if introduced onto SWEP could hybridize with Gaviota tarplant (Bruce Baldwin, personal communication 2019). Has the project accounted for the threat to Gaviota tarplant from hybridization and the subsequent negative effects of genetic introgression?

The points discussed above and those addressed in the CDFW's DSEIR comment letter lead us to conclude that indirect effects on Gaviota tarplant are significant, quantifiable and cannot be ignored in the FSEIR. Prior to approval, SWEP must provide a detailed study of indirect effects on Gaviota tarplant in order to identify setbacks that are necessary to avoid severe adverse effects (the 2001 report on San Fernando spineflower prepared by Conservation Biology Institute could serve as a model for this study, see Attachment 1). Unless otherwise supported, we recommend that at least 200 meters adjacent to all ground disturbance be set aside for indirect impacts and excluded from use as onsite mitigation.

Impacts to Gaviota tarplant must be considered significant and unavoidable

The FSEIR makes the determination that impacts to Gaviota tarplant are "Class II: Significant impact. A Class II impact is a significant adverse effect that can be reduced to a less-than-significant level through the application of feasible mitigation measures presented in this SEIR." We fail to see how directly impacting 21 percent of the total population of an endangered plant can possibly be mitigated to less-than-significant. The assertion that direct impacts to Gaviota tarplant can be adequately mitigated is speculative (see our discussion of mitigation measures below). The Class II determination ignores comments submitted by the CDFW that indirect impacts must also be accounted for in the EIR. What measurable thresholds did the County employ to determine that these impacts can be mitigated to less-than-significant?

[4] http://ucjeps.berkeley.edu/consortium/

Inadequate mitigation measures

The FSEIR identifies several measures to minimize impacts to Gaviota tarplant. The determination of Class II impacts to Gaviota tarplant rely upon mitigation measures that compensate for impacts. Mitigation Measure (MM) BIO-6 requires the issuance of an Incidental Take Permit (ITP) by CDFW. CDFW determined that, "when taking into account habitat fragmentation, edge effects, invasive species proliferation, and loss of pollinator ability, the impact acreage is substantially greater than that currently disclosed in the SEIR." They also note that the project "will directly or indirectly impact all but 5 percent of the Tranquillion/Sudden Peak Gaviota tarplant population." These points underscore our concerns about the interpretation of occupied acreage of Gaviota tarplant on the project site (see above). The County chose essentially to dismiss CDFW's comments about impacted acreage despite the fact that these comments were written by scientists employed by a trustee agency whose findings are supported by best available scientific literature. The County concludes that CDFW's, "estimate of indirect impact area, especially as to the implied severity and distance of these indirect effects from the actual project activities, may cause readers to misunderstand the environmental effects of the proposed Project." Clearly, the interpretation of how much acreage of Gaviota tarplant is to impacted by SWEP is central to the feasibility of the mitigation measures. How can the FSEIR claim to have mitigated the impacts to this taxon to less-than-significant if the amount of impacted acreage has not yet been agreed upon in consultation with responsible agencies?

Mitigation Measure BIO-6 requires that permanent impacts to Gaviota tarplant be mitigated at a 3:1 ratio. Additionally, areas of temporary impact must be restored to pre-project conditions and mitigated at a 3:1 ratio. These measures and others will be implemented in a Gaviota Tarplant Mitigation Plan in coordination with the County, CDFW, and USFWS. Once again, given the serious concerns raised by CDFW, we contend that the approval/adoption of such a plan is speculative. CDFW recommends, "conserving a buffer of 1,000 meters around any population that is proposed as mitigation or identified as 'avoided' until site-specific studies on Gaviota tarplant pollinators have been conducted." In response to this comment the FSEIR provides no evidence from scientific studies that assuages CDFW's concerns and makes no commitment to initiating any such studies. The statement in FSEIR response 4.8 that "proposed Project features (roads and turbine sites) are smaller than these pollinator flight distances and would not interrupt insect movement" is speculative and not supported by scientific studies. Additionally, in order to fully understand the meta-population dynamics of gene flow within Gaviota tarplant on SWEP the project owner should be required to commission population genetic studies for the entire taxon. This would enable an informed conservation reserve design that takes into account gene flow between and within populations of Gaviota tarplant. Studies such as this are necessary in order to understand how the size of patches and sub-populations within larger populations affects gene flow. This type of information is also crucial for informing restoration actions, including those listed in MM BIO-6.

The FSEIR assumes that a mitigating for the loss of 1,273,882 plants at a ratio of 3:1will be possible onsite. Does the Project proponent contend that habitat for 3,821,646 Gaviota tarplant can be created onsite, as would be required by the proposed ratio? What does this look like?

Onsite mitigation, as identified in MM BIO-6 should be considered speculative as it relies upon using occupied habitat that is subject to indirect impacts discussed herein and in CDFW's comment letter. MM BIO-6 indicates that this could also include "offsite preservation of existing occurrences." This platitude fails to mention if occurrences of Gaviota tarplant outside of SWEP are available for mitigation actions. Also, given that the project site represents the largest population of this taxon it is highly unlikely that offsite preservation can feasibly mitigate for the quality of habitat of this state and federally listed endangered species that will be lost on SWEP. Our concerns are echoed by CDFW's comment letter, which states that, "of the seven populations of Gaviota tarplant recognized [USFWS, 2011], five occur on coastal terraces, which are at risk of erosion due to predicted sea level rise from climate change. The population on the Project site is the largest of two known populations that are not subject to sea level rise and are located at the species' higher elevations." Offsite mitigation cannot be relied upon by this project.

If the project is required to apply a setback of 200 m (or greater) between areas of disturbance and areas that will be used for onsite mitigation is there enough occupied habitat on SWEP to achieve a mitigation ratio of 3:1? Has the Project proponent prepared an onsite mitigation reserve design that incorporates a setback distance to account for indirect impacts?

Mitigation Measure BIO-6 uses acres of impacts to Gaviota tarplant as the quantity that must be mitigated for at the proposed ratio of 3:1. MM BIO-6 makes no mention of the quality of habitat that can be used for mitigation. Area of occupancy is not necessarily an accurate measure of impact to a rare species. The number of plants that will be directly impacted should also be mitigated at a minimum ratio of 3:1. The project must compensate for acreage of occupancy, habitat quality, and number of plants that will be lost in its Gaviota Tarplant Mitigation Plan.

We would also like to contend that a mitigation ratio of 3:1 for impacts to Gaviota tarplant is insufficient. The FSEIR proposes a ratio of 10:1 for damage to oak trees on the project site. We support this mitigation ratio for the loss of oaks, but assert that Gaviota tarplant should also be mitigated at a higher level. Specifically, unlike Gaviota tarplant, the native oaks on the site are neither globally rare nor listed as endangered by the federal and state governments. If a ratio of 10:1 is appropriate for damage to oak trees an equivalent or even greater ratio (plant for plant, acre for acre) ought to be adopted for impacts to Gaviota tarplant. It is also essential that mitigation measures intended to compensate for the loss of other biota on the Project site not jeopardize conserved locations of Gaviota tarplant. For example, MM BIO-13 calls for the establishment of, "mature coast buckwheat plants with other Central coast scrub species on areas having sandy soils." While this action is reasonable, the FSEIR should ensure that actions to conserve one species do not adversely affect other species.

If implemented, the Project will result in the loss of approximately 1,273,882 individuals of Gaviota tarplant. This loss is more than 87 times the entire population of Gaviota tarplant that occurs outside of the Project site. As both a California and federally endangered species, Gaviotta tarplant has been recognized as requiring the highest level of conservation that both our state and federal governments can provide. The Project must do a better job of mitigating for this loss.

Need for better analysis of project alternatives/redesign

The FSEIR fails to provide a Project Alternative (excluding the No Project Alternative) that minimizes impacts to sensitive biological resources, specifically Gaviota tarplant. For example, the Modified Project Layout, while providing for reduced impacts to woodland and forest, only results in a "slightly reduced" impact to Gaviota tarplant. Why doesn't the FSEIR include a modified construction design that reduces impacts to this taxon? It seems reasonable that wind turbines and associated construction activities could be relocated with significantly reduced impacts to Gaviota tarplant. For example, an analysis that looks at construction impacts in relation to polygons of Gaviota tarplant could identify key areas of conflict that could be modified to avoid impacts to this taxon. The CDFW DSEIR comment letter identifies turbines W-8, W-7, N-7, and E-1 that if relocated would result in the direct avoidance of "entire occurrences" of Gaviota tarplant. The response that due to, "the complexity and multiple considerations involved in designing WTG layout design, the County's belief that a balance is needed between environmental impact and wind generation capacity, and the SEIR's focus on reducing significant environmental impacts through mitigation" is disappointing. The Project, as proposed will eliminate 21 percent of the entire population of a state and federally endangered species. The County and the Project proponent must do better to avoid impacts to Gaviota tarplant.

II. Impact to other rare plants

The following table details other rare plants present on the Project site and reported impacts:

Scientific name	Common Name	Rank	Acreage (2019)	Population (2019)	Acreage of Impact (2018)	Population Impact (2018)
Arctostaphylos purissima	La Purisima manzanita	1B.1	n/a	1	0	0
Horkelia cuneata var. *puberula*	mesa horkelia	1B.1	4.1	27859	0.02	84
Horkelia cuneata var. *sericea*	Kellogg's horkelia	1B.1	11.1	78123	0.74	4648
Juglans hindsii	Southern California black walnut	4.2	0.06	5	0.003	2
Lilium humboldtii subsp. *ocellatum*	ocellated Humboldt lily	4.2	0.8	75	not reported	not reported

Phacelia ramosissima var. *austrolitoralis*	South Coast branching phacelia	3.2	0.2	258	not reported	not reported
Scrophularia atrata	black-flowered figwort	1B.2	0.4	1552	0.003	61

Project impacts to rare plants extend well beyond Gaviota tarplant. The FSEIR makes it impossible to analyze the significance of impacts to the taxa in the above table. Specifically, the number of acres and individuals that will be directly impacted by the Project is only provided in the Appendices (pg. 732 in pdf) based on 2018 surveys. However, the FSEIR reports numbers of plants and occupied acreage that were observed in 2019, and these quantities differ significantly. Have impacts to these taxa been updated based on the latest survey efforts? Also, the indirect impacts to these other rare species are likely to be significant on the Project site. Has the FSEIR taken into account indirect impacts to these seven taxa? Indirect impacts to these species should be incorporated into assessments of project impacts and appropriate mitigation measures must be applied.

Furthermore, the FSEIR appears to provide no justification for the determination that impacts to these species will be mitigated to less-than-significant. Specifically, the FSEIR does not provide for an adequate mitigation ratio (e.g. a minimum of 3:1) for the impacts to taxa that are globally rare including mesa horkelia, Kellogg's horkelia, and black-flowered figwort.

MM BIO-7 calls for the use of salvage and restoration efforts to compensate for the loss of mesa horkelia and Kellogg's horkelia. Has the success of these proposed restoration methods been verified in published scientific studies? If not, they should be considered speculative. The presence of three varieties of *Horkelia cuneata* indicates that the Project site is incredibly important from an evolutionary context. Locations where the ranges of taxa come together create a fertile ground for processes like hybridization (Soltis and Soltis 2009). These processes can lead to the formation of new taxa via hybrid speciation, and can also be a crucial source of novel genetic variation that can help a species adapt to change. The importance of the Project site as a living laboratory of evolution in *Horkelia cuneata* must be adequately addressed in the EIR.

The FSEIR provides no meaningful mitigation measures for impacts to black-flowered figwort and Southern California black walnut. We do not consider MM BIO-1, BIO-2, BIO-3, and BIO-5 adequate to mitigate for the impacts to these species. At a minimum, restoration efforts similar to those proposed for Kellog's horkelia and mesa horkelia also be applied for Southern California black walnut and black-flowered figwort. Losses to these species should also be mitigated at a minimum ratio of 3:1.

Lastly, we are concerned that indirect impacts will affect locations of La Purisima manzanita, South Coast branching phacelia and ocellated Humboldt lily. Specifically, the single individual of La Purisima manzanita that occurs on the Project site is within feet of an area that will be directly impacted by grading (see Figure 4.5-4a). La Purisima manzanita is highly likely to be

directly or indirectly impacted by the Project and this needs to be taken into account in the assessment of impacts and subsequently-proposed mitigation measures.

III. Impacts to Crotch's bumble bee (*Bombus crotchii*)

The FSEIR identifies that there is a likelihood of the presence of Crotch's bumble bee on the site and provides a mitigation measure of planting of food plants for this species. However, the FSEIR provides for no preconstruction surveys to determine if there is direct take of this species and, if such take occurs, provides no measures to avoid, minimize or mitigate for that take. We propose that since this species is now a candidate for listing under the California Endangered Species Act, the level of measures in the FSEIR to avoid a significant impact to a special status species is inadequate.

IV. Additional Environmental Permitting

In its previous iteration, Pacific Renewable Energy Generation LLC, a subsidiary of the LWEP, completed the "Low Effect Habitat Conservation Plan for Geotechnical Borings" (see Attachment 2). This Habitat Conservation Plan (HCP) was submitted along with an ITP pursuant to Section 10 of the Federal ESA for impacts to Gaviota tarplant and El Segundo Blue Butterfly. According to this document, the HCP was required, "pursuant to the requirements of section 7, consider impacts on the Gaviota Tarplant." The application for the HCP states that, "the impacts and mitigation measures associated with the LWEP will be addressed in a subsequent application (Section 7 or HCP) with appropriate NEPA documentation. In this request for a Section 10(a) Take Permit, we intend to limit, differentiate, and define the 'Project' as only the specific boring activities for which this Take Permit is being sought, while the larger wind energy project as a whole, and for which another, separate request for a Take Permit will be sought, will be referred to as 'LWEP'." The permit was requested for October 2010 with a duration of 1 year for project completion. The SWEP FSEIR mentions the need for a Biological Opinion from the USFWS for the mitigation of impacts to Gaviota tarplant, and notes that the Project will require a Section 404 permit issued by the U.S. Army Corps of Engineers for impacts to waters of the U.S. We fully expect that the Project developer will obtain the appropriate federal permitting under the Endangered Species Act and Clean Water Act prior to construction, and the project will receive full review under the National Environmental Policy Act. In particular, we expect that the project developer obtain coverage for take of endangered and threatened species for the entire project footprint, including and beyond any impacted federal jurisdictional waters. Finally, as noted in the FSEIR, the Project developer must also obtain the appropriate permit under the California Endangered Species Act through either a consistency determination or Section 2081 permit.

Once again, thank you very much for the opportunity to provide comments on SWEP. Please feel free to contact me with any questions.

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Attachment 1

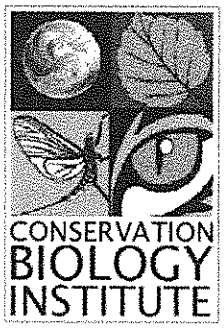
REVIEW OF POTENTIAL EDGE EFFECTS ON THE SAN FERNANDO VALLEY SPINEFLOWER (*Chorizanthe parryi* var. *fernandina*)

Prepared for:

Ahmanson Land Company
and
Beveridge & Diamond, LLP

Prepared by:

Conservation Biology Institute



January 2000

INTRODUCTION

The recent discovery of the San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*) on the Ahmanson Ranch project site in Ventura County, California prompted preliminary investigations into the biology of that taxon. The purpose of these studies is to develop a conservation strategy to protect, maintain, manage, and, possibly, reintroduce the spineflower into appropriate habitat. While the proposed development would remove a portion of the spineflower population, the majority of the known population is proposed to be conserved onsite. Residential development is planned adjacent to the proposed spineflower preserve area.

An effective conservation strategy should emphasize preserve design and habitat and species management. Accepted principles of preserve design include maximizing the width of the buffer between development and sensitive resources, minimizing habitat loss, fragmentation, and edge effects, maximizing genetic diversity and connectivity with other habitat patches, maintaining adequate habitat to allow for spatial and temporal population fluctuations, and maintaining a sustainable population size,[1] among others. Habitat and species management may be necessary to mitigate impacts from adjacent development and to maintain the functions and values of the population being conserved.

This paper assesses potential impacts to the conserved spineflower population from adjacent development based on a review of the scientific literature on edge effects (adverse effects of land uses on adjacent biological resource areas, such as weed invasions or changes in hydrology). A thorough literature search on edge effects has not been conducted for this paper due to time limitations. The summary presented herein is intended to (1) focus on potential impacts to sensitive plant species, and (2) address those risk factors associated with edge effects most likely to affect the spineflower, based on current knowledge of the species' biology. All identified risk factors have the potential to negatively impact some aspect of the species' biology or habitat; however, information is not yet available to definitively determine which factors pose the most serious threat to the species' persistence. This paper analyzes identified risk factors in relation to preserve design and proposes management actions and alternative scenarios to minimize or reduce the potential impacts of these risk factors.

SPINEFLOWER BIOLOGY

The biology of a species holds implications for preserve design and habitat management. Additional research is needed to assess the long-term viability of the spineflower population on Ahmanson Ranch and to identify specific management measures to ensure its persistence. This section summarizes our current knowledge of spineflower biology and limitations to our knowledge.

[1] Note that a sustainable population is not measured by species presence alone, but by the *effective* size of a population in contributing to future generations relative to an *ideal* population. The effective population size may be smaller than the census population number. Estimates of effective population size may be determined through demographic monitoring or genetic studies (Barrett and Kohn 1991).

San Fernando Valley spineflower is a small annual plant in the buckwheat family (Polygonaceae). This low-growing species is characterized by prostrate to ascending stems, small white flowers, and straight involucral awns (Hickman 1993). Historical habitat for the San Fernando Valley spineflower was apparently deep, low nutrient soils of sand benches, or soils with similar characteristics that occurred as mosaics within coastal sage scrub and, possibly, valley grassland (GLA 1999). Although soils on the property are generally well drained, acidic, and low in nitrogen and organics (GLA 1999), preliminary studies indicate that the spineflower population on Ahmanson Ranch occurs in open areas on compacted or recently disturbed soils that support few other plant species. It is unclear whether this association indicates that the spineflower prefers compacted soils, or if it is restricted to compacted soils by competition from other plant species that avoid the compacted soils. Also, it is not clear whether the density of spineflower plants differs between compacted and non-compacted soils. If spineflower densities are lower than normal on compacted soils, this may have long-term genetic consequences if spineflower populations are restricted to compacted areas in the future, either by preserve design or lack of effective management to reduce competition from other species. It has been suggested that lowered plant density has the same effect on reproductive success as small population size (Lamont et al. 1993; van Treuren et al. 1993; Groom 1998) for some insect-pollinated plants. Theoretical models that have included population density or size as input factors indicate that extinction rates increase dramatically as density declines, and extinction becomes almost inevitable below certain density thresholds (Dennis 1989 in Groom 1998; Kunin and Iwasa 1996 in Groom 1998). Groom (1998) documented that small patches of an annual herb suffered reproductive failure due to lack of effective pollination when critical thresholds of isolation were exceeded. In contrast, large patches attracted pollinators regardless of the level of isolation.

San Fernando Valley spineflower most likely forms a persistent seed bank in the soil, with seeds germinating under specific climatic conditions (e.g., appropriate temperature and amount and timing of rainfall). Seed banks typically contain multiple genotypes from various years, but years yielding large seed crops contribute disproportionately to the bank (Templeton and Levin 1979). In this respect, seed banks contain the "evolutionary memory" of a species (Del Castillo 1994). Seed banks buffer changes in population size, and help maintain genetic diversity and genetic spatial distribution (Del Castillo 1994). Seedling survival may depend on adequate rainfall, as well as light and nutrient conditions. These factors influence the degree of competition between the spineflower and other plant species.

Little is known about the reproductive biology of the spineflower (including whether the species is strictly outcrossing or can also self-pollinate). A wide range of insect visitors was observed on spineflower flowers during the 1999 field surveys (GLA 1999), but it has not yet been determined if any of these are effective pollinators. Insects observed on the spineflower included ants (mostly of the *Dorymyrex insanus* complex), ant-like spiders (possibly *Micaria* spp.), European honeybee (*Apis mellifera*), bee-flies (Bombyliidae), a small bumblebee (*Bombus* sp.), and tachnid flies (possibly *Archytas* spp.) (GLA 1999). Of these species, the ants appeared to be the most frequent flower

visitors. Determination of the reproductive strategy is necessary to assess whether pollinators are important in maintaining the spineflower population. Determining the specific pollinator(s) is important in identifying the range and type of habitat(s) required for maintaining an effective pollinator population(s). Based on his work with a related taxon (*Eriogonum*) and on the spineflowers' floral morphology, Dr. James Reveal (pers. comm.) suggests that the San Fernando Valley spineflower may be capable of both cross-pollination and self-pollination. Outcrossing would likely be the primary means of reproduction, because of (1) the presumed differential timing between pollen release and stigma receptivity and (2) the spatial separation between anthers and stigma. Late in the pollination cycle, however, the still-receptive stigma may roll back and pick up any remaining pollen, thereby resulting in self-pollination. Although self-pollination may result in production of viable seed and ensure short-term persistence, it may also lead to reduced genetic diversity over time (Reveal pers. comm.). Dr. Eugene Jones (pers. comm.) is in the process of determining some of these reproductive characteristics for the San Fernando Valley spineflower (e.g., whether the flowers are protandrous versus protogynous, whether self-pollination is autogamous versus geitonogamous, etc.).[2] Dr. Jones notes that related taxa having similar floral structures may function differently from one another.

Reveal (pers. comm.) has observed other spineflower species being effectively pollinated by ants, but indicates that, in those cases, ants are incidental (secondary) rather than primary pollinators. Jones (pers. comm.) observed high densities of ants in and out of spineflower corollas in the field, and suggests that ants may play an important role in pollination of this species. Hickman (1974) demonstrated ant pollination as a specialized mutualistic system in another annual species within the buckwheat family, *Polygonum cascadense*. *Polygonum cascadense* shares several similarities with the spineflower, including habit (e.g., low, erect annual), habitat (e.g., open, dry slopes), and possibly, reproductive characteristics (e.g., stamens maturing before the stigma).

The spineflower involucre (whorl of modified leaves adjoining each flower) is characterized by straight spines, which may be an adaptation for animal dispersal of seeds and may help anchor seeds to suitable substrate (GLA 1999). Seeds apparently remain in the involucre even after the plant disarticulates. Small mammals or even ants may play a role in seed dispersal; however, studies have not yet been conducted to determine whether any animals onsite effectively disperse spineflower seed. Reveal (pers. comm.) notes that gallinaceous birds that peck and scratch at the soil surface can be effective in planting seeds of chorizanthoid species as non-incidental dispersal agents, and that localized dispersal may also be accomplished by small mammals. The one season of data indicates relatively high seed production for the spineflower. It is not known whether seed predation by animals significantly affects the seed bank.

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[2] Protandry refers to the condition in which flowers shed their pollen before the stigma becomes receptive. Protogyny refers to the opposite condition, i.e., the stigma matures and becomes receptive before the anthers dehisce and shed pollen. Autogamy refers to self-pollination that occurs when a flower is pollinated by its own pollen, whereas geitonogamy is the condition in which a flower is pollinated by pollen from another flower on the same plant. The latter is, in effect, self-pollination because the results are genetically identical to pollination by autogamy (Proctor et al. 1996).

Fire has been suggested as a possible management tool for maintaining or enhancing spineflower habitat. The effects of fire on germination of the San Fernando Valley spineflower have not yet been established. Studies on a closely related taxon (*Chorizanthe parryi* var. *parryi*) that occurs in similar habitat indicate that fire has at least a short-term inhibitory effect on seed germination (Ellstrand 1994; Ogden 1999).

BACKGROUND ON EDGE EFFECTS

In the context of conservation biology and preserve design, edge effects are defined as adverse changes to natural communities as a result of their proximity to human-modified areas (Lovejoy et al. 1986; Yahner 1988; Sauvajot and Buechner 1993) or, more simply, the adverse effects of development on adjacent biological resources. Examples of edge effects include increases in invasive, weedy species, increased trampling and soil compaction from human recreation, or increases in nonnative animal species. Edge effects have been documented within specified distances of developed lands, although the impacts may be species- or resource-specific and tempered by a host of site-specific factors, including microtopography (McEvoy and Cox 1987; Andersen 1991), distribution and size of gaps (Bergelson et al. 1993), and intactness of the natural community (Sauvajot and Buechner 1993). A number of empirical studies have concluded that detrimental effects to biological resources can occur at distances ranging from 150 to 600 feet from the edge of the urban-wildland interface (e.g., Gates and Gysel 1978; Brittingham and Temple 1983; Andren et al. 1985; Wilcove 1985; Angelstam 1986; Wilcove et al. 1986; Temple 1987; Andren and Angelstam 1988; Santos and Telleria 1992; Alberts et al. 1993; Scott 1993; Vissman 1993). The majority of these studies focus on impacts to wildlife habitat. Few studies that we reviewed focus specifically on edge effects to plant species.

Buffer Considerations

Kelly and Rotenberry (1993) provide guidelines for effective buffers around urban reserves that are useful in recommending buffer widths and assessing potential edge effects on the San Fernando Valley spineflower resulting from the proposed preserve design. Kelly and Rotenberry (1993) note that the effective size of an ecological preserve is almost always smaller than the area within the preserve boundary, or the total preserve size. The effective size is generally referred to as the *core area*. The preserve boundary or *edge* surrounds the core area. The width of the edge is a function of the permeability of the boundary to negative external influences or risk factors. Edge effects can be particularly significant for small reserves because of their relatively large perimeter to core ratios (Soulé et al. 1988; Bolger et al. 1991; Saunders et al. 1991). An effective buffer width can be determined on a site-specific basis by (1) identifying risk factors and potential impacts to the species of concern within the preserve and (2) determining the permeability of the urban-wildland boundary to vectors of those risk factors. Altering the boundary permeability through habitat management is a potential method for mitigating identified impacts (Kelly and Rotenberry 1993). However, this method may not be effective for all types of risk factors (e.g., wind-blown seed of invasive plant species). Incorporating appropriate site design measures and land use restrictions into the

development abutting the preserve is an alternative method of avoiding and minimizing impacts to the preserve (i.e., designating a land use buffer outside the preserve).

RISK FACTORS AND POTENTIAL IMPACTS

Preliminary studies on the biology and ecology of the San Fernando Valley spineflower (GLA 1999) indicate that the following parameters may play a role in the persistence of this taxon on the Ahmanson Ranch and may be negatively influenced at the urban-wildland interface:

- gaps in vegetation cover (i.e., areas of bare soil)
- low nutrient soils
- pollinators
- seed dispersal agents
- extant seed bank

Risk factors at the urban-wildland boundary that may affect these parameters include the following:

- nonnative, invasive plant and animal species
- vegetation clearing for fuel management or creation of trails
- trampling
- increased water supply due to suburban irrigation and runoff
- chemicals (e.g., herbicides, pesticides, fertilizers)
- increased fire frequency

Some of these risk factors could affect more than one of the parameters. Potential effects of these risk factors on the spineflower population are discussed below.

Invasive Plant Species

San Fernando Valley spineflower appears to prefer open patches of bare ground, which are often invaded by exotic plant species, as well (Amor and Stevens 1976; Forcella and Harvey 1983; Bazzaz 1986; Alberts et al. 1993). Although the spineflower on the Ahmanson Ranch was noted on thin, compacted soils lacking nonnative grasses, it is not clear whether spineflower density is significantly lower on these soils versus on deeper soils or whether nonnative grasses may be more abundant in these areas in years with average or above-average rainfall. Brooks (1995) noted that with increased rainfall, annual grasses gradually gain dominance once they have colonized an area, regardless of management or other protective measures. Gordon-Reedy (pers. obs.) has also observed large fluctuations in nonnative grass density in open coastal sage scrub in Riverside County in years with variable rainfall amounts.

Direct competition between native and exotic plant species is well documented (Alberts et al. 1993). Furthermore, the successful invasion of exotic species may alter habitats and

lead to displacement or extinction of native species over time. For example, exotic invasions have been shown to alter hydrological and biochemical cycles and disrupt natural fire regimes (MacDonald et al. 1988; Usher 1988; Vitousek 1990; D'Antonio and Vitousek 1992; Alberts et al. 1993). Vitousek and Walker (1989) noted that aggressive nonnative species might displace native species by altering soil fertility.

MacDonald et al. (1988) reported that reserves surrounded by development areas supporting populations of exotic species are most subject to invasion. However, in studies on the effects of urban encroachment into natural areas in the Santa Monica Mountains, Sauvajot and Buechner (1993) found that direct habitat alteration or disturbance within natural areas is a more significant factor in the extension of edge effects into those areas than proximity to urban development alone. Several other studies have also correlated invasions by alien plants into nature reserves with elevated levels of disturbance, high light conditions, and, in some cases, increased water availability (McConnaughay and Bazzaz 1987; Laurance 1991; Tyser and Worley 1992; Brothers and Spingarn 1992; Matlack 1993).

In a review of biological invasions of 24 nature reserves, Usher (1988) reported a positive correlation between the number of human visitors and the number of introduced species. Further, he cited circumstantial evidence that invasive plant species are most common near paths through the reserves. Tyser and Worley (1992) provided data indicating that alien plant species extend up to about 325 feet into natural habitat from primary roads, secondary roads, and backcountry trails. They found a gradual decline in species richness with distance from the edge, and effects along trails were less prominent (but still evident) than along roads. Ghersa and Roush (1993) noted that the number of propagules available rarely limits the abundance of weeds in a given setting; rather, one needs to consider both the dispersal strategies of the invading species and potential vehicles for dispersal. Well-known dispersal agents include humans (Usher 1988; Ghersa and Roush 1993), vehicles, and road construction (Amor and Stevens 1976; Amor and Piggin 1977; Lonsdale and Lane 1991 in Hobbs and Humphries 1995; Hobbs and Humphries 1995). In addition to promoting biological invasions by acting as dispersal vectors, humans can impact spineflower habitat by disturbing the soil surface, trampling individual plants, and increasing the fire frequency within or adjacent to reserves.

Factors that affect the success of invasions include dispersal ability of the invasive species, in conjunction with size and distribution of gaps in the vegetation (McConnaughay and Bazzaz 1987; Bergelson et al. 1993) and the timing of seed dispersal relative to environmental conditions or "invasion windows'" (Johnstone 1986). Bergelson et al. (1993) documented an *average* dispersal distance for the ruderal, wind-dispersed annual plant, *Senecio vulgaris,* of 1.1 feet; however, they also noted dispersal events for this same species of over 50 feet. McEvoy and Cox (1987) reported that 89% of seeds of another wind-dispersed species (*Senecio jacobaea*) traveled 16 feet or less, while no seeds were observed >45 feet from the source in a mark-recapture study. They noted, however, that secondary dispersal and animal dispersal may increase initial dispersal distances under some conditions. For example, in dry, open habitats, seeds may be moved along the ground or swept into the air by wind (McEvoy and Cox 1987).

Laurance (1991), in a study of edge effects in tropical forest fragments, found a striking abundance of invasive plants within 650 feet of forest edges, and lower (but still elevated) levels of invasive plants 1,640 feet from the edges. Tyser and Worley (1992), in a study in the intermountain region of western North America, found invasive plants extending over 325 feet from road and trail edges, although there was a gradual decline in invasive species richness beyond about 80 feet. Amor and Stevens (1976) also found a general decline in invasive plants with increasing distances from roads into sclerophyll forests in Australia. They reported that at 100 feet from a road edge, the majority of invasive species either dropped out altogether or occurred in lower percentages than at the road shoulder, particularly in drier plant communities. In the presence of artificial sources of water, however, the occurrence of some invasive species remained high regardless of distance from the edge (Amor and Stevens 1976). Where there is a large perimeter between the preserve and urban interface, larger numbers of colonizing propagules can be expected to enter the preserve (Alberts et al. 1993). In general, Alberts et al. (1993) found that ruderals tend to invade reserves quickly, given appropriate site conditions, whereas ornamental species invade reserves over a longer period of time, and their presence is correlated with increased sources of water.

Invasive Animal Species

The effect of nonnative animal species on biological resources within reserves has been well documented (e.g., Gates and Gysel 1978; Brittingham and Temple 1983; Wilcove 1985; Andren and Angelstam 1988; Langen et al. 1991; Donovan et al. 1997); however, most of this literature pertains to effects on wildlife species. For example, both domestic dogs and cats are known to adversely impact native wildlife, with effects ranging from harassment to disturbance of breeding activities to predation (Kelly and Rotenberry 1993; Spencer and Goldsmith 1994). Domestic dogs have been observed within reserves at a distance of greater than 325 feet from the edge, while cats have been observed within reserves more than 1 mile from human dwellings in Riverside County (Kelly and Rotenberry 1993). An increase in nonnative predators as a result of development adjacent to the spineflower preserve could potentially affect populations of rodents (e.g., kangaroo rats, pocket mice, pocket gophers) that may act as seed dispersal agents or play a role in bioturbation.[3] In a study of two populations of house cats on a suburban-desert interface near Tucson, Arizona, Spencer and Goldsmith (1994) found that most prey were diurnal species of rodents, birds, and reptiles. Radio-tracking studies indicated that the cats spent over 90% of their time within 100 feet of houses, although this may have been related to an abundant coyote population. Spencer and Goldsmith (1994) suggested that impacts of cats on native wildlife are concentrated within 100-200 feet of the urban-wildland interface in the presence of predators (e.g., coyotes), but may extend further in their absence.

If rodents consume spineflower seeds, then a reduction in the rodent population may reduce seed dispersal into sites suitable for germination. Perry and Gonzalez-Andujar (1993) developed a model to assess the role of seed dispersal on metapopulation growth

[3] Bioturbation is the aeration and mixing of soil by organisms.

and persistence of an annual plant, like the spineflower, that forms a seed bank and occurs in drought-like and disturbed environmental conditions. This model predicts that a strongly dispersing metapopulation is hardly affected by temporal environmental heterogeneity, while metapopulations with moderate or no dispersal capabilities suffered extinction in every replication. However, granivorous rodents tend to selectively harvest large seeds (Brown and Lieberman 1973; Brown et al. 1979; Samson et al. 1992; Brown and Harney 1993). Spineflower seeds are relatively small (ca. 2 mm), and may only be used by smaller rodents (e.g., pocket mice) that clip clusters of involucres. Even if rodents do not play a significant role in spineflower seed dispersal through seed predation, they may still effect some localized dispersal when the awn-tipped involucres (and seeds) become temporarily attached to their bodies. In addition, rodents may indirectly benefit the spineflower by suppressing populations of larger-seeded annual plants that compete with the spineflower (Davidson et al. 1984; Samson et al. 1992; Brown and Harney 1993).

Decreases in the rodent population may also reduce the amount of potentially high quality habitat for spineflower establishment. Rodent activities that result in bioturbation and bare soil patches have been associated with spineflower plants on Ahmanson Ranch (GLA 1999). Long-term studies in the Southwest have demonstrated that selective removal of kangaroo rats, for example, resulted in much less disruption of the soil surface, higher densities of tall perennial and annual grasses, increased accumulation of litter, decreased foraging by granivorous birds, and differential colonization by rodents typical of grassland habitats (Brown and Heske 1990; Thompson et al. 1991; Brown and Harney 1993).

Conversely, Mills (1996) demonstrated that edges could have higher populations of certain mammalian seed predators (e.g., deer mice [*Peromyscus* spp.]) than core areas, which may result in reduced plant recruitment. Deer mice are good edge specialists, and can reach high densities under appropriate conditions. Because they are generalists that can switch among food resources, they often exert a heavier toll on a certain food resource (like seeds) than specialists whose populations track the specific resource more closely. Jules and Rathcke (1999) found reduced recruitment of a native herbaceous perennial plant species (*Trillium ovatum*) within about 200 feet of a forest/clearcut edge, and demonstrated that this was significantly correlated, in part, with seed predation by rodents (species unspecified). To date, no studies have been conducted that define the role of rodent populations (if any) in spineflower seed dispersal or predation. In light of these uncertainties, it therefore seems important to maintain as natural a mix of native seed dispersers/predators as possible, and to minimize ecological imbalances due to abundant nonnative species.

One invasive species that has been documented on the Ahmanson Ranch and may potentially increase in dominance over time is the Argentine ant. Ant surveys indicated that the Argentine ant is abundant in some areas of the project site, but currently occurs in very low numbers in or near spineflower habitat, presumably due to xeric conditions (Hovore pers. comm.).

Disturbed habitats are often considered vulnerable to Argentine ant invasions. There is evidence that this exotic species rapidly invades disturbed areas within stands of native habitat (Erickson 1971; Ducote 1977 in Suarez et al. 1998; Ward 1987; DeKock and Giliomee 1989; Knight and Rust 1990; Suarez et al. 1998). Suarez et al. (1998) found Argentine ants most abundant along the edge of urban preserve areas, with densities of ants in the preserve decreasing with distance from the edge. They found that ant activity was highest within about 325 feet of the nearest urban edge, whereas areas sampled beyond 650 feet contained few or no Argentine ants. However, Argentine ants have also been found at distances of approximately 1,300 feet and 3,280 feet from the edge, respectively, in other urban reserves in southern California (Suarez et al. 1998). DeKock and Giliomee (1989) documented extensive penetration of this species into natural areas in South Africa along roads. Recent studies indicate that the Argentine ant may be capable of invading undisturbed habitat, as well (Cole et al. 1992; Human and Gordon 1996).

Argentine ants appear to be confined to low elevation areas with permanent soil moisture (Erickson 1971; Tremper 1976 in Suarez et al. 1998; Ward 1987; Knight and Rust 1990; Holway 1995, 1998). Tremper (1976) reported that Argentine ants desiccate more easily and are less tolerant of high temperatures than native ants. Suarez et al. (1998) indicated that the presence of the Argentine ants in urban reserves might be dependent on water runoff from developed areas. Holway (1998) found that the rate of Argentine ant invasion is primarily dependent on abiotic conditions (e.g., soil moisture), rather than on disturbance. He suggested that disturbed areas are often a point of introduction, but encourage invasions only if they increase the availability of a limiting resource such as water. Blachly and Forschler (1996) found Argentine ants thriving in areas disturbed by human activity, but indicated that their presence is also related to added ground cover, permanent water supplies, and a simplified native ant fauna.

Although the reproductive strategy of the San Fernando Valley spineflower is not yet known, field studies indicate that flowers are visited by a number of invertebrate species. Presumably, one or more of these species function as effective pollinators of the spineflower. Invasive faunal species (e.g., Argentine ants, parasites) have the potential to negatively impact pollinator populations. Loss or limitation of pollinators may adversely affect the long-term survivability of the spineflower by reducing seed output (e.g., reproductive failure) if there is no selfing (Jennersten 1988; Bawa 1990) or decreasing the effective population size through reduced gene flow (Bawa 1990; Menges 1991; Aizen and Feinsinger 1994). Some studies have shown that pollinator limitation can reduce seed output by 50-60% (Jennersten 1988; Pavlik et al. 1993; Bond 1995). Jules and Rathcke (1999) demonstrated that pollinator limitation was significantly related to reduced recruitment of a native plant species within 200 feet of a forest/clearcut edge.

It has been hypothesized that native ants may be a primary or secondary pollinator of the San Fernando Valley spineflower (GLA 1999). The Argentine ant is known to displace native ant species (Erickson 1971; Tremper 1976 in Suarez et al. 1998; Ward 1987; Holway 1995; Human and Gordon 1996; Suarez et al. 1998), although this apparently has not yet occurred in spineflower habitat on the Ahmanson Ranch. Nonetheless, potential

negative interactions between native ant species or other insect pollinators and the Argentine ant would be a concern if the spineflower were insect-pollinated.

Ant pollination is considered relatively uncommon in plants (Proctor et al. 1996), although Jones (pers. comm.) indicates that ants may be a major pollinator of cushion plants in desert areas and Hickman (1974) has demonstrated effective ant pollination in a taxon related to the spineflower. Ant-pollinated plants tend to occur in hot, dry habitats and are further characterized by a prostrate or low-growing habit, small, inconspicuous flowers close to the stem, intertwining plants within a population, few seeds per flower, and small pollen volume and nectar quantity (Hickman 1974). The San Fernando Valley spineflower possesses many of these characteristics. In a study conducted in the South African fynbos,[4] Paton (1986 in Visser et al. 1996) correlated high densities of ants (species undetermined) in inflorescences of *Protea eximia* with lower numbers of other insects. Visser et al. (1996) investigated whether Argentine ants influenced the number of insect species and individuals present in the inflorescences of *Protea nitida*, and found that 10 of 11 insect taxa showed reduced numbers where Argentine ants were present and, in 5 cases, these reductions were highly significant. In addition, the total number of insects was significantly suppressed in inflorescences with high numbers of Argentine ants. Visser et al. (1996) speculated that a reduction in the diversity and abundance of insect visitors could result in reduced pollination and ultimately affect the reproductive capacity of the plant. In the species they studied, ants were not considered effective pollinators, and an increase in ant abundance was not expected to promote pollination.

Ants may also function as primary or secondary dispersers of seeds (Roberts and Heithaus 1986; Louda 1989). They have been reported to contribute to the spatial heterogeneity of seed distribution (Reichman 1984, 1979) and they decrease seed abundance of some numerically dominant ruderal species in relation to less dominant native annual species (Inouye et al. 1980). Displacement of native ant species by the Argentine ant could negatively affect spineflower persistence by reducing spineflower seed number and distribution. Bond and Slingsby (1984) investigated the effects of displacement of native ant species by the Argentine ant on a myrmecochorous plant[5] in South Africa, and found that the Argentine ant negatively affected seed dispersal and plant regeneration. Native ant species typically carry seeds to their nests, where they remain or are later discarded in nearby middens. While the ants derive nutritional benefits from the seeds, this process also increases seedling recruitment by minimizing competition near the parental plant, reducing seed predation at the soil surface, and enhancing plant growth in the nutrient-enriched soils of the nests or middens (Marshall et al. 1979; Heithaus et al. 1980; O'Dowd and Hay 1980; Bond and Slingsby 1984). In contrast, Argentine ants are slower to discover seeds, move them a shorter distance, and fail to store them in below-ground nests, thus resulting in decreased dispersal and increased seed predation (Bond and Slingsby 1984; Holway 1999). Bond and Slingsby (1984) reported significant decreases in seed germination and establishment in areas infested with Argentine ants compared with uninfested areas, and ascribed these differences primarily to increased seed

[4] Fynbos is a chaparral-like vegetation community found in mediterranean climate regions of South Africa and Australia. It is dominated by evergreen shrubs with sclerophyllous (hard) leaves (Dallman 1998).

[5] A myrmecochorous plant is dependent on ants for seed dispersal.

predation. They further suggested that the negative effects of Argentine ants on myrmecochorous species with a persistent seed bank will only become apparent over relatively long time periods (e.g., decades) as the seed bank becomes depleted.

DeKock (1990) found that the first native ant species to be driven off by Argentine ants are those that are most effective in seed dispersal. She suggested that the effects of Argentine ant invasions on native plants would be indirect and related to a depleted seed bank. It should be noted that many ant-dispersed seeds have structural adaptations such as oily seed coats or fat-bearing appendages (elaiosomes) that provide nutritional rewards for the dispersing ants (Stebbins 1974; Marshall et al. 1979). Hughes and Westoby (1992) demonstrated that seed dispersal by ants was, in general, significantly higher for seeds with elaiosomes, although this effect was ant species-specific, and some dispersal did occur in the absence of these structures. It is not known whether spineflower seeds have any adaptations that would predispose them to ant-dispersal.

Vegetation Clearing

Disturbance of native vegetation communities can produce appropriate site conditions for germination of weedy species (Bazzaz 1986; Westman 1990; Alberts et al. 1993; Hobbs and Humphries 1995). In general, ruderal weedy species possess a number of characteristics that allow them to rapidly colonize gaps or bare areas. These include the production of abundant, typically wind-dispersed seeds that are quick to germinate, establish, and grow (Frenkel 1970; Amor and Piggin 1977; Bazzaz 1986). Thus, weedy exotics often out-compete native species that utilize similar habitats. Clearing of vegetation along the urban-wildland interface (e.g., firebreaks, roads) or within a preserve system (roads, trails) may provide opportunities for such weedy species to gain a foothold in the preserve (Amor and Stevens 1976; Amor and Piggin 1977; Lonsdale and Lane 1991 in Hobbs and Humphries 1995).

Trampling

Trampling can affect the spineflower either by damaging individual plants or altering the ecosystem. Maschinski et al. (1997) demonstrated that the combination of trampling and poor climatic conditions resulted in an accelerated extinction probability for a native plant species. In this case, trampling directly affected plant fitness, resulting in significantly lower fruit production. Trampling can also create gaps in vegetation that provide opportunities for exotic plant establishment (Hobbs and Huenneke 1992). Cole (1987) reported that even low levels of trampling caused a substantial loss of vegetation cover and species diversity, and resulted in an increase in soil compaction, whereas soil erosion occurred with higher levels of trampling. In other studies (see Dale and Weaver 1974; Bright 1986), species diversity increased in areas subject to trampling, but species composition shifted to those plants that are resistant to trampling. In general, plants with tough, wiry leaves or thick leaves and a tufted growth form (e.g., grasses) are more resistant to trampling than herbaceous plants, such as the spineflower, whose branches or stems could be easily crushed or broken (Cole 1987; Hall and Kuss 1989). Refer to the

literature cited above (plant invasions, vegetation clearing) for discussions on invasion of gaps or vegetation disturbances by weedy versus native species.

Harrison (1981) found that the season or timing of trampling influences the effects on native species and their recovery. The ability to recover from trampling is also dependent on environmental conditions (temperature, moisture) and growth form characteristics (Cole 1987). Some adverse effects of trampling (soil compaction, erosion) are less easily reversed than others. For these factors, recovery may be difficult after only a few years of trampling at relatively high intensities (Cole 1987).

Increased Water Supply

Changes in surface and subsurface hydrological conditions at or near the urban-wildland boundary could occur as a result of removal of native vegetation, increased runoff from roads or other paved surfaces, and residential or commercial irrigation. Increased surface water flows may result in increased erosion and transport of particulate matter (Saunders et al. 1991). Altered patterns of erosion may deposit new substrates for plant colonization, although such areas are often quickly colonized by weedy species that require both disturbance and nutrient-rich substrates for establishment (Hobbs and Atkins 1988). Increased surface flows may also be a conduit for introducing invasive species into the preserve. Holway (1998) indicated that Argentine ant colonies are often dispersed into new areas by jump-dispersal events such as floods, and that these types of dispersal events are an important component of the large-scale dynamics of Argentine ant invasions.

Increased surface moisture or underground seepage that results in increased soil moisture levels may also promote the establishment of exotic plant species (Alberts et al. 1993; McIntyre and Lavorel 1994; Amor and Stevens 1976) or wetland-dependent native plant species, facilitate invasion by Argentine ants (Suarez et al. 1998), alter seed bank characteristics, and modify habitat for ground-dwelling fauna (Saunders et al. 1991). Seepage is expected to be minimal in most areas along the urban-wildland interface due to the underlying substrate. However, the current project design includes a few hundred feet of man-made slopes between two stands of the spineflower, and there is the potential for some seepage on these fill soils (Barker pers. comm.).

Chemicals (Herbicides, Insecticides, Fertilizers)

Chemical pollutants can adversely affect biological resource areas in many ways, including decreases in pollinators, increases in weedy exotic species, or damage to or direct killing of native plants. The use of herbicides to maintain open areas within or adjacent to the preserve can result in chemical habitat fragmentation and consequent reductions in pollinator populations (Buchmann and Nabhan 1996). Insecticide spraying in adjacent residential areas can result in pollution drift that kills pollinators in reserve areas (Kelly and Rotenberry 1993; Allen-Wardell et al. 1998). Boutin and Jobin (1998) reported that chemical pesticide drift using ground equipment has been estimated at 1-10% of the application rate within about 30 feet of the target. In a study on the effects of

various herbicides on native plant species in a nature reserve, Marrs et al. (1989) demonstrated that the maximum safe distance (i.e., no lethal effects) was about 20 feet from the spray source, although the average safe distance was 6.5 feet or less. They also found that adverse but non-lethal effects of spraying (e.g., plant damage, flower suppression) occurred at slightly greater distances than lethal effects, and showed seasonal variability. For example, no damage was detected beyond about 8 feet for most of the species they tested in fall. A few species, however, appeared to be particularly sensitive to herbicides during this time period, and showed damage between 33 and 65 feet from the spray source. In spring, the maximum distance at which damage effects were apparent was about 25 feet from the spray source. However, most damaged plants recovered completely by the end of the growing season. Based on these results, Marrs et al. (1989) advocated the use of a 16 to 33-foot buffer zone to minimize lethal effects to herbaceous plants from herbicide drift, and noted that wider buffers (e.g., 50 feet) would reduce risks even further.

Other chemicals, such as are included in fertilizers, may enhance growth of weedy species and, thus, should not be used adjacent to the preserve. For example, nitrogen is a limiting factor in plant growth, and the addition of nitrogen fertilizers enhances the growth of many plant species. Many native plant species, however, are adapted to low-nitrogen systems (Vitousek et al. 1997; Zink and Allen 1998). Vitousek et al. (1997) stated that the addition of nitrogen to such systems, through direct fertilization or runoff from adjacent areas, could cause shifts in species dominance and reduce overall species diversity. Furthermore, nitrogen-rich systems may promote exotic weedy species to the detriment of native species (Zink and Allen 1998).

Aerial fallout of nitrogenous compounds from automobiles may also contribute to increased nitrogen in the soil. Allen (1996) has observed high mortality of coastal sage scrub shrubs in areas with high soil nitrogen levels, and hypothesizes that nitrogen deposition from air pollution may be responsible for this mortality (Allen et al. 1996). Vegetation and soils are known to be important sinks for other atmospheric pollutants from automobiles, as well, although a number of biological and environmental factors may affect the actual absorption or accumulation of such compounds. The level of pollutants in roadside plants has been positively correlated with traffic density. Singh et al. (1995) reported the most significant effects where traffic volume was high (e.g., >4,000 vehicles per 2 hours).

Increased Fire Frequency

The effects of fire on the San Fernando Valley spineflower are not yet known. Seed germination of a closely related taxon, Parry's spineflower (*Chorizanthe parryi* var. *parryi*) appears to be inhibited by fire in both greenhouse and natural settings (Ellstrand 1994; Ogden 1999). Despite the inhibitory effect of direct scorching, fire may also prove beneficial to the spineflower by creating openings and temporarily reducing competition.

San Fernando Valley spineflower occurs primarily in openings in coastal sage scrub, although much of its habitat on the Ahmanson Ranch appears to have been invaded by

nonnative grasses. The coastal sage scrub community is adapted to fire, but not completely dependent on it for continued viability. In general, it is considered a relatively stable vegetation community over a broad range of fire frequencies, particularly if detrimental factors such as fragmentation and exotic weed species invasions are minimized. However, excessively long or short fire intervals may result in (1) shifts in the composition of the dominant species of this community (Westman 1987, 1981; Keeley 1991) or (2) displacement of native species by nonnative species, such as annual grasses. Nonnative grasses exert a number of undesirable effects on native plant communities, including altering fire regimes. Colonization of an area by nonnative grasses provides the fine fuel needed to start and maintain fires. This can lead to increased fire frequency, extent, and intensity. Nonnative grasses typically recover more quickly than native species following grass-fueled fires, thereby initiating a cycle of increasing fire susceptibility (D'Antonio and Vitousek 1992; Hobbs and Huenneke 1992). Changes in fire regimes due to invasive species can result in a wide range of ecosystem changes, including nutrient loss, altered local microclimate, and prevention of succession (D'Antonio and Vitousek 1992).

The use of fire has been suggested as one method for controlling nonnative grasses. Controlled burns have been used with some success to control nonnative grasses, particularly in grassland communities (Zavon 1982 in Pollack and Kan 1998; Ahmed 1983 in Pollack and Kan 1998; Keeley 1990; George et al. 1992; Pollack and Kan 1998). Pollack and Kan (1998) and others (see Menke 1992) found that late-spring fires were an effective method of controlling annual species that do not have well-developed seed banks, or of reducing the size of the seed bank in those alien species that do form a seed bank. Pollack and Kan (1998) suggested that knowledge of the target species' phenology is critical in effective timing of burns. In their study, late-spring burns were associated with more intense fire behavior and the need for fire suppression equipment (Pollack and Kan 1998). Controlled or prescribed burns are often suggested as a management tool to improve habitat characteristics, and a recent report of the Wildland/Urban Interface Task Force (1994) included a wildland fire management-planning model designed to facilitate prescribed burning and post-fire management. However, recent attempts to incorporate burns (or even "let-burn" policies) into habitat management plans in southern California have met with resistance from local fire control agencies, particularly near urban areas.

In addition to the fire-inducing effects of nonnative grasses, fire frequency near urban-wildland boundaries may increase due to other human-related activities (e.g., construction or utility maintenance activities, children playing with matches).

ANALYSIS OF RISK FACTORS

The objectives of this analysis are to (1) determine how risk factors can be reduced through buffers and management actions; (2) provide a relative ranking of risk factors that pose the greatest threat to spineflower persistence, based on boundary permeability; and (3) recommend buffer/management scenarios that effectively address risk factors. This analysis utilizes a step-wise approach by first considering buffer widths alone as a means of reducing risk factors, then overlaying buffers with proposed management

actions[6] to reduce potential negative effects from risk factors. Ranking of risk factors is based on the literature review, field observations, and professional judgment. Risk factors that can be least controlled by management are considered to present the highest risk to spineflower persistence.

Buffer Widths

Buffers are an important component of preserve design. Here, the buffer is defined as the distance between the edge of the current spineflower population within the preserve and the edge of the preserve. Various buffer widths were assessed to determine their effectiveness in minimizing identified risk factors. The five buffer widths included in this analysis range from a minimum width (15 feet) to greater widths shown to be effective in the edge effect literature for specific risk factors. Table 1 presents the relative assessment of varying buffer widths in minimizing risk factors.

Table 1
ESTIMATED BUFFER EFFECTIVENESS FOR MINIMIZING EDGE EFFECTS OF SELECTED RISK FACTORS ON THE SPINEFLOWER

RISK FACTORS	BUFFER WIDTHS (FEET) [1]				
	15	30-50	80-100	200	300
Invasive Animals	L	L	L	M	M
Increased Fire Frequency	L	L	L	M	M
Invasive Plants	L	L	M	H	H
Vegetation Clearing	L	L	M	H	H
Increased Water Supply	L	L	M	H	H
Trampling	L	L	M	H	H
Chemicals	L	M	H	H	H

[1] Estimated effectiveness rankings: Low (L) = Unlikely to be effective; Moderate (M) = moderately effective; High (H) = highly likely to be effective.

Table 1 indicates that ranking of risk factors (i.e., from highest risk to the spineflower to lowest risk), based on buffer widths, can be grouped as follows:

- **Invasive Animals and Increased Fire Frequency** -- Literature on invasive animals indicates that most impacts that could affect the spineflower are concentrated within about 100-325 feet of the edge. Nonetheless, both cats and dogs have the ability to disperse much further into preserve areas. Argentine ants also have the ability to disperse further into preserve areas, but apparently only in

[6] For the purpose of this analysis, other preserve design elements, land use restrictions, and engineering designs are included under management actions.

the presence of adequate water supplies. Buffer width alone is not expected to be highly effective in reducing fire frequency.

- **Invasive Plants, Vegetation Clearing, Increased Water Supply, and Trampling** --Invasive plant species and vegetation clearing are closely related risk factors. Literature reviewed on invasive plants in temperate systems indicates that they may extend up to 325 feet into preserve areas, with a gradual decline in invasive species beyond about 80-100 feet. Further, the effectiveness of invasions is related to suitable substrates (e.g., gaps or disturbances, which may be created by vegetation clearing) and dispersal ability of the invasive species, among other factors.

  Surface runoff on the project site will be controlled through engineering designs. There is the potential for underground seepage, however, which may have a zone of influence that extends up to about 200 feet, depending on the substrate. The effects of trampling are primarily direct and limited to the area of impact, although associated trespass by humans can be an effective means of introducing nonnative species into the preserve.

- **Chemicals** -- Literature indicates that the majority of pesticide drift from chemicals will extend less than 35 feet from the source. Although the effects of fertilizers are typically localized, these compounds may be more widely dispersed through surface runoff or seepage. Atmospheric pollutants from cars can adversely affect plants, particularly where traffic density is very high; however, this may not be a factor in a residential development.

Management Actions

Management actions are expected to have varying degrees of effectiveness in reducing negative effects of identified spineflower risk factors. For example, the project proposes to control alterations in surface and subsurface hydrology through engineering designs. Restrictions on landscaping palettes, irrigation, and habitat disturbance adjacent to the preserve will reduce the potential for ornamental, invasive species in the preserve by limiting both the source material and appropriate site conditions for colonization. However, these restrictions do not address nonnative, weedy species that are already present in the area, and which have also been identified as major risk factors to spineflower persistence.

Table 2 overlays various management measures and buffer widths for each risk factor to assess their combined effectiveness in controlling edge effects. This analysis considers a wide range of management measures, not just those considered to be the most effective in controlling edge effects. These recommendations may not be comprehensive, and their effectiveness can only be roughly estimated at this time, based on the known biology of the species and conditions on the Ahmanson Ranch. Ranking of these measures also does not consider implementation or enforcement feasibility for each measure.

Table 2
ESTIMATED MANAGEMENT AND BUFFER EFFECTIVENESS FOR REDUCING EDGE EFFECTS

RISK FACTORS/MANAGEMENT MEASURES	BUFFER WIDTHS (FEET)[1]				
	15	30-50	80-100	200	300
Invasive Animals					
• No Specific Management Measures[2]	L	L	L	M	M
• Restrict landscaping palettes adjacent to the preserve to exclude use of invasive exotic species	L	L	M	H	H
• Restrict irrigation in and adjacent to the preserve	L	L	M	H	H
• Maintain current surface and subsurface hydrological conditions within the preserve through engineering design of adjacent areas	M	M	M	M	H
• Utilize french drains to minimize seepage on fill slopes, as determined necessary	H	H	H	H	H
• Inspect plants used in revegetation efforts in or adjacent to the preserve for pest species (e.g., Argentine ants)	L	L	M	H	H
• Avoid use of barriers (e.g., walls) with subsurface footings within or adjacent to the preserve	H	H	H	H	H
• Implement a bait control program for Argentine ants, as determined necessary through monitoring	L	L	M	M	M
• Bell cats in residential areas adjacent to the preserve and educate homeowners on the danger of coyotes to free-roaming cats	L	L	M	M	M
• Maintain habitat connectivity between preserve areas to encourage native predators in the preserve (thereby reducing populations of nonnative predators) and allow for recolonization of edge areas by native mammals	L	M	M	H	H
• Minimize internal fragmentation (e.g., roads, trails) and close unnecessary existing dirt roads	M	H	H	H	H
• Construct barriers to exclude nonnative animals (e.g., dogs)	M	M	M	M	M
Increased Fire Frequency					
• No Specific Management Measures[2]	L	L	L	M	M
• Implement a weed control program to reduce fine fuel capacity in fire-susceptible habitats	L	L	M	M	M

Table 2 (continued)
ESTIMATED MANAGEMENT AND BUFFER EFFECTIVENESS FOR REDUCING EDGE EFFECTS

RISK FACTORS/MANAGEMENT MEASURES	BUFFER WIDTHS (FEET) [1]				
	15	30-50	80-100	200	300
Increased Fire Frequency (continued)					
• Implement prescribed burning if shown to be advantageous to spineflower persistence and if allowed within the preserve by fire control agencies	M	M	H	H	H
• Restrict the use of construction or utility maintenance equipment in or adjacent to the preserve to avoid or minimize potential fires due to sparking (e.g., metal blades from bulldozers or other construction equipment striking rocks) or downed electrical lines	M	M	M	M	M
Invasive Plants					
• No Specific Management Measures[2]	L	L	M	H	H
• Restrict landscaping palettes adjacent to the preserve to exclude use on invasive exotic species	L	L	M	H	H
• Restrict irrigation adjacent to the preserve	L	L	M	H	H
• Maintain fuel breaks outside preserve boundary	L	L/M	M	H	H
• Minimize or prohibit vegetation clearing within the preserve (e.g., roads, trails)	H	H	H	H	H
• Restrict vegetation clearing immediately adjacent to the preserve	L	L	M	H	H
• Restore cleared areas with native species as soon as possible, subject to other conservation objectives	M	M	H	H	H
• Maintain current surface and subsurface hydrological conditions within the preserve through engineering design of adjacent developed areas	M	M	M	H	H
• Utilize french drains to minimize seepage on fill slopes, as determined necessary	H	H	H	H	H
• Control invasive weeds within the preserve and adjacent to the preserve (most appropriate method[s] to be determined)	L	L	M	H	H
• Reduce potential for invasion by weedy species by restoring selected disturbed areas within the preserve and adjacent to the urban boundary to reduce disturbance gaps	M	M	H	H	H

Table 2 (continued)
ESTIMATED MANAGEMENT AND BUFFER EFFECTIVENESS FOR REDUCING EDGE EFFECTS

RISK FACTORS/MANAGEMENT MEASURES	BUFFER WIDTHS (FEET) [1]				
	15	30-50	80-100	200	300
Invasive Plants (continued)					
• Reduce potential for invasion by weedy species by selecting sites for habitat enhancement or species reintroduction that minimize the potential for weed invasion	M	M	M	H	H
Vegetation Clearing					
• No Specific Management Measures[2]	L	L	M	H	H
• Site fire or fuel breaks outside preserve boundaries	L	L	M	H	H
• Minimize or prohibit vegetation clearing within the preserve (e.g., roads, trails)	H	H	H	H	H
• Restore cleared areas with native species as soon as possible, subject to other conservation objectives	M	M	H	H	H
Increased Water Supply					
• No Specific Management Measures[2]	L	L	M	H	H
• Maintain current surface and subsurface hydrological conditions within the preserve through engineering design of adjacent developed areas	M	M	M	H	H
• Utilize french drains to minimize seepage on fill slopes, as determined necessary	H	H	H	H	H
• Divert runoff from roads away from the preserve	M	M	M	H	H
• Restrict irrigation adjacent to the preserve	L	L	M	H	H
Trampling					
• No Specific Management Measures[2]	L	L	M	H	H
• Construct solid barriers to exclude or restrict pedestrian traffic	H	H	H	H	H
• Prohibit motorized vehicles, bicycles, and equestrian uses within the preserve	H	H	H	H	H
• Eliminate or reroute trails through the preserve to avoid sensitive biological resources	M	M	H	H	H
• Erect signs denoting boundary of the preserve and permitted uses	M	M	H	H	H
• Initiate an educational program (kiosks, information brochures, school programs, docent program)	M	M	H	H	H

Table 2 (continued)
ESTIMATED MANAGEMENT AND BUFFER EFFECTIVENESS FOR REDUCING EDGE EFFECTS

RISK FACTORS/MANAGEMENT MEASURES	BUFFER WIDTHS (FEET) [1]				
	15	30-50	80-100	200	300
Chemicals					
• No Specific Management Measures[2]	L	M	H	H	H
• Restrict use of herbicides within the preserve, and avoid use of pesticides within and adjacent to the preserve; herbicides must have no toxic effects on invertebrates	M	H	H	H	H
• Avoid use of herbicides and pesticides under conditions that would promote pollution drift (e.g., windy conditions)	L	M	H	H	H
• Avoid use of fertilizers within and adjacent to the preserve	M	M	H	H	H

[1] Estimated effectiveness rankings: Low (L) = Unlikely to be effective; Moderate (M) = moderately effective; High (H) = highly likely to be effective.

[2] Rankings indicate buffer effectiveness only (see Table 1), and are provided for comparison purposes.

Depending on buffer width and proposed land uses adjacent to the preserve, many of the recommended land use restrictions will require cooperation from homeowners. In addition, management measures in Table 2 are not weighted. It may be that some measures ranked as low are highly effective when combined with other measures. Conversely, some measures ranked high may be less important in minimizing risk factors than other measures with lower rankings (e.g., inspecting plants used in revegetation efforts versus restricting irrigation adjacent to the preserve). In some cases, there may be conflicts between various management measures. For example, a solid barrier would be highly effective in restricting human access and associated trampling effects. However, if the barrier includes subsurface footings, it may encourage nesting of Argentine ants. Some of the measures presented below may conflict with other objectives of spineflower protection, as well (e.g., habitat restoration). It is presumed that these measures will be refined during development of a detailed conservation strategy and management program for the spineflower. Finally, rankings in Table 2 consider individual effects only, and do not address the potential benefits of cumulative management measures. Combinations of certain management actions may have an enhanced capacity to address certain risk factors, as discussed in a later section of this document.

Table 2 indicates that individual management measures do, in fact, vary in their effectiveness for a specific risk factor. This makes it difficult to easily discern which buffer width would be expected to reduce a given risk factor to an adequate or acceptable level. Using a lowest common denominator approach (i.e., grouping risk factors

according to the *least* effective management measure) results in the following ranking of risk factors, based on both management actions and buffer widths:

- **Invasive Animals and Increased Fire Frequency** -- Based on this analysis, invasive animals and fire frequency are considered the highest risk factors to the spineflower because they require the largest buffer width (>300 feet) in order for *all* management measures to be highly effective. Management measures for both risk factors are considered moderately effective at 80-100 feet.

- **Invasive Plants, Vegetation Clearing, and Increased Water Supply** -- Management measures for these three factors are all considered moderately effective at a buffer width of 80-100 feet and highly effective at widths of 200 feet or greater. Because control of these factors can presumably be achieved at narrower buffer widths than the factors above, they are given a lower ranking in terms of risk to the spineflower than either invasive animals or fire frequency.

- **Chemicals and Trampling** -- All management measures for these risk factors are considered moderately effective at buffer widths of 30-50 feet and highly effective at buffer widths of 80 feet or greater. Therefore, these factors are given the lowest ranking in terms of risk to the spineflower, assuming management measures are implemented.

DISCUSSION

The analyses above assume that (1) risk factors are equivalent in their potential detrimental effects on spineflower persistence and (2) management measures are equally effective in ameliorating edge effects to the spineflower. Neither of these assumptions is likely to be valid, although the information needed to verify this is not available. Ranking of risk factors as a result of the combined effect of buffer width and management actions focused on individual management measures, and did not consider the interaction between different measures. For example, different levels of effectiveness may be achieved when management measures are combined. Even though some measures may be ranked low in effectiveness, they could increase in value when combined with other measures. For this reason, measures with low rankings are generally still considered important. Some management measures may not be as effective as others. They could override the positive effects of more effective measures or at least result in situations where management measures are effective for one component of a risk factor and less effective for others. Finally, it should be noted that there is no descriptive model for the spineflower or related taxa to demonstrate how this species may respond to either the risk factors or management measures. Risk factors are discussed below with respect to expected management effectiveness as a result of either management measure interactions or shortcomings.

1. *Invasive Animals.* Eleven management actions have been recommended to reduce edge effects due to invasive animal species. Invasive animals have a high potential to adversely affect the spineflower, although no such effects have yet been documented.

Of particular concern are (a) changes in soil moisture conditions that could alter habitat for rodents (potential seed dispersers) or encourage invasion of spineflower habitat by Argentine ants; (b) introduction of nonnative animal species (e.g., Argentine ants) on plant materials or along roads; and (c) habitat fragmentation that could lead to reduced levels of native predators (e.g., coyotes) and concomitant increases in nonnative predators (e.g., cats) that could affect rodent populations. Controlling irrigation and maintaining habitat connectivity between the spineflower preserve and other open space areas in order to encourage native predators in the preserve will be key issues in management effectiveness for this risk factor. Despite the potential seriousness of invasive animals on spineflower persistence, it appears that management measures are available to control the most detrimental aspects of animal invasions, given adequate buffer widths and appropriate preserve design.

2. *Increased Fire Frequency.* None of the buffer widths considered in this analysis would be effective in stopping the spread of fire into the preserve from adjacent areas, but three management measures have been recommended to reduce the frequency and intensity of fires within the preserve. At this time, the effect of fire on the spineflower is not known. It can be assumed, however, that frequent or intense fires would be detrimental to individual spineflowers and spineflower habitat. Changes in natural fire cycles are related, in part, to the presence of fine fuels (especially nonnative grasses) within the preserve. While complete removal of grasses within the preserve is highly unlikely, a weed control program can potentially reduce nonnative grass cover and inhibit the spread of grasses into currently unoccupied areas of the preserve. Despite weed control measures within the preserve, reinvasions may occur from sources outside the preserve, and the probability of such reinvasions increases with narrow buffer widths (<80 feet).

3. *Invasive Plants.* Eleven management actions have been recommended to reduce edge effects due to invasive plant species. While some of these measures were ranked as having low effectiveness at narrow buffer widths, they are still important in reducing overall invasiveness, particularly in combination with other measures. For example, restrictions on landscaping and irrigation adjacent to the preserve, in conjunction with revegetation of disturbed areas, are expected to reduce opportunities for invasion of nonnative ornamental plant species. The same combination of measures is not expected to be as effective in reducing either the invasion or increasing dominance of nonnative weedy species already present in the area. Field studies have indicated that competition with these weedy species may already play a major role in limiting spineflower distribution. Because of the uncertainty of controlling additional weed invasions into the preserve, invasive plants may pose the highest risk factor to the spineflower.

4. *Vegetation Clearing.* Three management actions have been recommended to reduce edge effects from this risk factor, and two of these are expected to be moderately to highly effective even at relatively narrow buffer widths. Vegetation clearing is of concern because it provides gaps that facilitate invasions by nonnative plant species. This risk factor is considered relatively high because of its relationship to invasive

plants and the uncertainty of controlling this factor outside the preserve. For example, vegetation clearing will occur adjacent to the preserve during the development process, and may be a long-term condition, depending on fuel break requirements. While weed control will likely occur within the preserve, there is a lesser chance of effective controls outside the preserve; thus, cleared areas outside the preserve may provide a constant source of propagules (seeds) for invasions into the preserve. At narrower buffer widths (<80 feet), the potential for dispersal of invasive species into the preserve is relatively high.

5. *Increased Water Supply.* This risk factor plays a key role in the success of nonnative plant and animal species invasions. Control of surface and soil moisture alone may be adequate to reduce invasions of nonnative ornamental plant species and the Argentine ant into the spineflower preserve. The ranking of this risk factor assumes that all recommended management measures (including irrigation restrictions) would be implemented.

6. *Chemicals.* As with vegetation clearing, the greatest uncertainty in controlling this risk factor is expected to be the use of chemicals adjacent to the preserve. Edge effects from chemicals do not appear to have as wide a zone of influence as other risk factors, as evidenced by a high level of management/buffer effectiveness at 80-100 feet, and at least moderate levels at 30-50 feet. The effects of chemicals on the spineflower are not known; however, they may affect both vegetation and pollinator populations. Any application of herbicides within the preserve (e.g., for weed control purposes) should be experimental in nature to determine the effects on both vegetation and pollinator populations. Placement of heavily traveled roads adjacent to the preserve should be evaluated relative to contribution to increased nitrogen levels in the soil or atmospheric pollutants that could be detrimental to native plant species or enhance growth of weedy species.

7. *Trampling.* Trampling has the potential to directly damage spineflower plants, resulting in lowered reproductive success. Other potential trampling effects include the loss of vegetation cover and species diversity, and an increase in soil compaction or erosion. Some of these potential effects (loss of vegetation cover, soil compaction) might appear beneficial to the spineflower. However, they may also promote invasion of spineflower habitat by trampling-resistant plant species that may outcompete the spineflower and further alter site conditions. There is a high potential for effective control of this risk factor, however, with all recommended management measures having a moderate or high effectiveness at a buffer width of 30-50 feet. This effectiveness ranking assumes a solid barrier to inhibit trespass into the preserve. The use of subsurface footings for such a barrier should be discouraged, however, since they may provide suitable nesting habitat for Argentine ants.

CONCLUSIONS

In designing and managing effective buffers for preserves, it is useful to consider both potential risk factors to biological resources from urban areas and the permeability of the urban-wildland boundary to those factors (Stamps et al. 1987; Kelly and Rotenberry 1993). The analysis and discussion above focused on (1) identifying potential risk factors and the ways they may negatively influence the spineflower population, (2) assessing the permeability of the boundary to those risk factors, and (3) identifying methods of changing or managing the boundary permeability to reduce potential impacts. In cases where boundary permeability cannot be managed effectively, an increased setback or buffer between sensitive biological resources and the development boundary, coupled with intensive management efforts and land use restrictions near the preserve, may be required to conserve the spineflower population.

Table 3 summarizes the overall effectiveness of management measures for each risk factor (based on the lowest common denominator) at each buffer width. Ranking of risk factors in Table 3 reflects the increased effectiveness in controlling risk factors when all management measures are combined for a given factor. For example, it appears that management measures, if implemented, may be more effective in controlling invasive animals than invasive plants.

Table 3
SUMMARY OF COMBINED BUFFER WIDTH AND MANAGEMENT EFFECTIVENESS[1] FOR REDUCING RISK FACTORS FOR THE SPINEFLOWER ON THE AHMANSON RANCH PROJECT

RISK FACTORS[2]	BUFFER WIDTHS (FEET)[3]				
	15	30-50	80-100	200	300
Invasive Plants	L	L	M	H	H
Vegetation Clearing	L	L	M	H	H
Increased Fire Frequency	L	L	M	M	M
Invasive Animals	L	L	M	M	M
Increased Water Supply	L	L	M	H	H
Chemicals	L	M	H	H	H
Trampling	M	M	H	H	H

1 Effectiveness rankings in Table 3 reflect the lowest common denominator for each risk factor, or the least effective management measure.

2 Risk factors are listed according to the level of threat they present to the spineflower (i.e., highest threat to lowest threat), assuming all management measures in Table 2 are implemented.

3 Estimated effectiveness rankings: Low (L) = Unlikely to be effective; Moderate (M) = moderately effective; High (H) = highly likely to be effective.

Based on this analysis, it is estimated that a buffer width of 15 feet, in combination with specific management measures, would be moderately effectively in controlling 1 risk factor (trampling) and unlikely to be effective in controlling the remaining 6 factors. A buffer width of 30-50 feet, in combination with management, would be moderately effective in controlling 2 risk factors (trampling and chemicals) and unlikely to control 5 factors. A buffer width of 80-100 feet, in combination with management measures, would be moderately effective in reducing the 5 greatest risk factors to the spineflower and highly effective in reducing the remaining risk factors. There appear to be no detectable differences in buffer effectiveness between 200 and 300 feet based on the literature reviewed. At both distances, management measures would be highly effective for 5 risk factors and moderately effective for the remaining 2 risk factors. Selection of an appropriate buffer/management package should focus on achieving an acceptable level of effectiveness in reducing the highest risk factors.

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Attachment 2

Low Effect Habitat Conservation Plan
for
Geotechnical Borings
Santa Barbara County, California

Submitted to:

United States Fish and Wildlife Service
Ventura Office
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Ventura, CA 93003

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List of Acronyms and Abbreviations

Acciona = Acciona Energy North America
CDFG = California Department of Fish and Game
CEQA = California Environmental Quality Act
CESA = California Endangered Species Act
CNLM = Center for Natural Land Management
CSC = California Species of Concern
EQAP = Santa Barbara County Environmental Quality Assurance Program
ES = Electric Substation
ESBB = El Segundo Blue Butterfly
FESA = Federal Endangered Species Act
GPS = Global Positioning System
GTP = Gaviota Tarplant
HCP = Habitat Conservation Plan
LE = Low Effect
LUP = Land Use Permit
LWEP = Lompoc Wind Energy Project
MT = Meteorological Tower
NEPA = National Environmental Policy Act
O&M = Operation and Maintenance
P&D = Santa Barbara County Planning and Development Department
PREG = Pacific Renewable Energy Generation LLC
Project = Geotechnical Boring Project
SHPO = State Historic Preservation Office
UEI = UltraSystems Environmental Inc.
USACE = United States Army Corps of Engineers
USFWS = United States Fish and Wildlife Service
USFWS = United States Fish and Wildlife Service
VAFB = Vandenberg Air Force Base
WGT = Wind Generation Tower

1.0 INTRODUCTION AND BACKGROUND

1.1 Overview/Background

This application for an Incidental Take Permit, pursuant to Section 10(A)(1)(B) of the Federal Endangered Species Act (FESA) and the enclosed Habitat Conservation Plan (HCP), is submitted by Pacific Renewable Energy Generation LLC (PREG, the Applicant), a wholly-owned independent subsidiary of Acciona Energy North America Corporation (Acciona). The HCP covers the Geotechnical Boring Project (Project) on the site of the proposed Lompoc Wind Energy Project (LWEP), located about 8-miles NNW of Point Conception, near the west end of the Santa Ynez Mountains, and 7 miles south of Lompoc, Santa Barbara County, California (Figure 1). The Santa Barbara County Board of Supervisors certified the Final Environmental Impact Report and approved the Conditional Use Permit and Variance for the LWEP in Santa Maria on February 10, 2009.

The boring activities will provide the data necessary to develop and complete the engineering plans for the LWEP. A Land Use Permit (LUP) cannot be issued by the County until the grading plans for the LWEP are finalized. The grading plans cannot be completed for the LWEP until the geotechnical boring data are made available. Impacts and mitigation measures associated with the LWEP would be supported and analyzed subsequently within appropriate procedures and documentation during the application process, including a Act section 7 consultation. The proposed Project for the borehole operations is qualified to be covered under a Low Effect HCP and is limited to specific boring activities. It is differentiated from the larger wind energy project, which will be referred to as "LWEP". The LWEP is a proposed project to install 37 wind turbines for the purpose of generating renewable energy for public distribution and use.

This HCP has been prepared pursuant to the requirements of Section 10(a) of the FESA, and is intended to provide the basis for issuance of a Section 10(a)(1)(B) Permit to PREG to authorize incidental take of the El Segundo Blue Butterfly (ESBB, *Euphilotis battoides allyni* Lepidoptera, Lycaenidae), a federally listed endangered species. The HCP also will, pursuant to the requirements of section 7, consider impacts on the Gaviota Tarplant (GTP, *Deinandra increscens* ssp. *villosa*), a federally listed endangered species that may be affected by the Project. Both the ESBB and the GTP have been identified as present during surveys on the Project site by species specialists where geotechnical boring is to occur. ESBB surveys were conducted by Sapphos Environmental in 2008 and by Ultrasystems Environmental in 2010. Numerous GTP surveys were conducted by Sapphos Environmental and by Ultrasystems Environmental (UEI) from 2002 through 2010.

The subsurface characteristics of soils and bedrocks must be known before foundations for Wind Generation Towers (WGT's), access and maintenance roads, electrical substations (ES), meteorological towers (MT's), and operations and maintenance buildings can be planned, engineered, and completed. To acquire these engineering data, a total of 43 bore sites are proposed to be drilled at the locations depicted on Figure 2.

These proposed 43 bores include:

- 21 borings are located at WGT sites;
- 4 borings are located at the Operation and Maintenance Facility;
- 5 borings are located at the ES;
- 12 borings are located at road and retaining wall locations; and
- 1 boring is located at a MT.

Geotechnical boring consists of drilling test cores; collecting disturbed and undisturbed soil samples; recovering core specimens; logging existing rock exposures; and performing test pit excavations to identify existing subsurface conditions. Soil samples are obtained with a

mechanical augur to a predetermined cut-off depth or to the top of bedrock. Rock cores are taken to the predetermined depth, according to engineering requirements. Depths of the bore holes for this Project vary from 5 feet (potential access roads) to 50 feet (potential wind turbine foundations). During the auguring process, the rotation and down-feed rate of the auger will be controlled so that individual soil types and rock horizons/deposits can be accurately noted. Soil and rock from previous borings will be removed from the auger prior to initiation of new borings to prevent mixing of materials and the possible masking of horizons.

1.2 Permit Duration

The boring activities would occur in the final quarter of 2010 (from October through December), but as early as possible to avoid the rainy season. The Project will take approximately one month to complete. On this hilly Project site, it can be difficult or impossible to conduct the geotechnical borings in rain or muddy conditions because these conditions would pose a safety hazard for the bore drill operators and equipment. Many of the soils in the Project area have high clay content that are unsafe to climb or traverse when wet. In a typical year, muddy conditions at this site tend to last from the first rains through to the new year. For these reasons, we wish to conduct the bores as early as possible, and are planning for early October 2010. If the geotechnical bores are not conducted this year, progress on LWEP would be delayed for an additional year. A permit duration of one (1) year is requested to cover a possible unavoidable weather delay in the permitted activities during the term of the incidental take permit.

1.3 Regulatory/Legal Framework for the HCP

This Section indicates the federal, state, and local environmental laws and ordinances that this project has considered in anticipation of receiving necessary permits from these agencies.

- FESA
- The Section 10(a)(1)(B) Process
  HHCP Requirements and Guidelines
- National Environmental Policy Act
- National Historic Preservation Act
- California Endangered Species Act (CESA)
- California Environmental Quality Act (CEQA)
- Santa Barbara County Environmental Quality Assurance Program (EQAP)

The EQAP for the LWEP has been approved by the County of Santa Barbara Planning and Development Department (24 March 2010). This program and supporting documents is specifically tailored to the LWEP but is also relevant to the geotechnical boring Project and will, therefore, be used for both Project's. The EQAP is intended to mitigate or avoid significant effects on the environment during project construction and implementation (Public Resources Code §21081.6(a) and CEQA Guidelines §§ 15091(d) and 15097). Pursuant to CEQA, the program specifies detailed permit monitoring requirements. The monitoring program provides permitting and responsible agencies with the authority of requiring (a) document compliance with all the mitigation measures and regulatory requirements; (b) description of the procedures used to verify the implementation of the conditions and mitigation measures in the Conditional Use Permit; and (c) written records of compliance. County of Santa Barbara Planning and Development Department (P&D) staff are responsible for the implementation of mitigation monitoring as required in CEQA. The program provides a mechanism to ensure compliance with conditions developed through the CEQA process, applicants proposed conditions, .and agency permit conditions.

1.4 HCP Area

The HCP area is shown in Figure 1 and is located in Tranquillon Mountain and Lompoc Hills USGS 7.5-minute Topographic Quadrangles. The Project site is bounded by Vandenberg Air Force Base (VAFB) on three sides. The Project area and various features within the Project site have been surveyed by Blake Land Surveys in Buellton, California. The Project property includes 1,631 acres of which the proposed disturbance area is 0.96 acres. The Coast Buckwheat restoration sites (as shown on Figure 4) include 75.40 acres in which 536 Coast Buckwheat plants will be installed. The Project site, including both the disturbance areas and the identified Coast Buckwheat restoration sites totals 76.36 acres. The Project includes 43 boreholes where future WGT's will be located, mainly along the southern ridges of the Project site. The turbine layout is based on analysis of topographic, meteorological, and geotechnical modeling by PREG. The precise locations of the boreholes are subject to further, minor adjustments during the drilling activity, based on the maximum feasible protection of the ESSB habitat.

1.5 Species to be Covered by Permit

El Segundo Blue Butterfly (*Euphilotes battoides allyni*: Lepidoptera, Lycaenidae)

1.5.1 El Segundo Blue Butterfly

The ESBB (*Euphilotes battoides allyni*) was listed as an endangered species in 1976 by the U.S. Fish and Wildlife Service (41 Federal Register 22041). Throughout much of its geographic range, the primary threat to the butterfly is loss of habitat by urbanization, mining and agriculture. Individuals of the butterfly were first recorded from the Project area in 2005 (DOD 2007), and have been recorded in several locations on VAFB. In 2010, Dr. Richard Arnold observed the species within the Project vicinity in approximately 60 acres of habitat (pers comm., 2010).

1.6 Other Introductory or Background Topics

1.6.1 Gaviota Tarplant

A GTP Mitigation Plan was prepared to offset temporary impacts on GTP that would result from the Project. The GTP was listed as Endangered by the California Department of Fish and Game in 1990 and by the U.S. Fish and Wildlife Service (USFWS) in 2000. Impacts associated with the boring activities will be short-term temporary impacts.

After September most of the GTP seeds, if not all, will have dropped from post flowering annual plants and crushing plants without seeds would have a less adverse affect on the seed bank than if done earlier. Eighteen (18) bore sites are located within GTP habitat. Geotechnical boring at each site requires the use of one drill rig with mounted mechanical augur, two support vehicles, and approximately 4 personnel. Temporary GTP disturbances include exposure to: (1) tracked vehicles; (2) vehicles with rubber tread tires; (3) pedestrian trampling; and (4) the drilling of an 8-inch wide borehole.

Short-term temporary impacts on GTP for the boring activities are 0.64 acres and will be mitigated in accordance with specifications outlined within the GTP Mitigation Plan including avoidance, topsoil salvaging and replacement, and the enhancement 0.49 acre of GTP habitat.

2.0 PROJECT DESCRIPTION/ACTIVITIES COVERED BY PERMIT

2.1 Project Description

A total of 43 geotechnical boring sites need to be accessed and bored to acquire soil samples. Geotechnical data collected from the soil bores are critical to designing foundations for WGT's and other components, and are necessary to fully design the proposed LWEP. The geotechnical bores are urgently needed this year because progress in engineering the LWEP would be delayed for an additional year, which may threaten LWEP with elimination. It is intended that this application, its attachments and enclosures, and any resulting HCP and Take Permit, will be limited solely to the boring activities being undertaken to complete engineering for the LWEP. The impacts and mitigation measures associated with the LWEP will be addressed in a subsequent application (Section 7 or HCP) with appropriate NEPA documentation. In this request for a Section 10(a) Take Permit, we intend to limit, differentiate, and define the "Project" as only the specific boring activities for which this Take Permit is being sought, while the larger wind energy project as a whole, and for which another, separate request for a Take Permit will be sought, will be referred to as "LWEP".

Project Schedule

The boring activities would occur in the final quarter of 2010 (from October through December) and as early as possible. The Project will take approximately one month to complete. Because the project cannot be completed safely during the rainy season, the work needs to be permitted and completed before the rains return this winter.

Boring Sites

The subsurface characteristics of soils and bedrocks must be known before foundations for wind towers, access and maintenance roads, electrical substations, meteorological towers, and operations and maintenance buildings can be planned, engineered, and completed. To acquire these engineering data, a total of 43 bore sites need to be drilled during this project at proposed locations depicted on Figure 2.

These proposed 43 bores include:

21 geotechnical borings are located at Wind Generation Tower (WGT) sites;
4 borings are located at the Operation and Maintenance Facility;
5 borings are located at the Electrical Substation;
12 borings are located at road and retaining wall locations; and
1 bore site is located at a Meteorological Tower.

Geotechnical boring consists of drilling test cores; collecting disturbed and undisturbed soil samples; recovering core specimens; logging existing rock exposures; and performing test pit excavations to identify existing subsurface conductions. Soil samples are obtained with a mechanical augur to a predetermined cut-off depth or to the top of bedrock. Rock cores are taken to the predetermined depth, according to engineering requirements. Depths of the bore holes for this Project vary from 5 feet (potential access roads) to 50 feet (potential wind turbine foundations). During the auguring process, the rotation and down-feed rate of the auger will be controlled so that individual soil types and rock horizons/deposits can be accurately noted. Soil and rock from previous borings will be removed from the auger prior to initiation of new borings to prevent mixing of materials and the possible masking of horizons.

Construction Equipment and Crews

Three construction vehicles are used at each bore site. These vehicles include a rig that carries the drill, the vehicle that carries the soil cylinders; and the vehicle that carries the soil samples. Usually there will be three or four construction crew people to drive and operate the construction equipment and at least one (and sometimes two) construction supervisors at each bore site. A biological monitor will also be present at each bore site before and during the borehole operations. Each boring site, normally, is begun and completed the same day. Up to four sites may be drilled each day by one drill crew and one bore site can usually be completed within 3 hours.

Access to Bore Sites

Existing paved and dirt ranch roads on the Project will be used to come as close as possible to each bore site without having any impact on the adjacent habitat. The borehole access routes were surveyed by UltraSystems Environmental Inc. biologists (Joanna Kipper and Paul Brenner) on July 14 and 15, 2010 to determine the path that best avoids or minimizes impacts (i.e., crushing by vehicles) on the ESBB habitat (minimization efforts are described in detail below). These routes were mapped by Blake Land Surveys, Inc. that utilized Ashtech's survey-grade GPS receivers with a Z-Max rover and a Z-Extreme base. This GPS system is accurate to within plus or minus one centimeter. In August 2010, Entomological Consulting Services, Ltd. (Richard Arnold), surveyed and mapped the access routes and proposed facility locations (within 25 ft) for the presence of Coast Buckwheat), the obligatory foodplant of the ESBB.

2.2 Activities Covered by Permit

The impacts associated with the geotechnical borings consist of temporary impacts. Disturbances to soils, topography, and the ESBB habitat, will be avoided or minimized at each borehole site by the carefully pre-planned positioning of the boring vehicles, as shown in Figure 3. Contours and soils will be returned to their pre-existing condition. Consequently, there are no long-term impacts expected or associated with this Project.

A 100 ft to 1 in map is shown for each of the 20 bore sites that are located in areas within 100 ft of Coast Buckwheat habitat that may support ESBB (Table 1 and Figure 3). These maps depict the proposed access route and the bore locations, and identify the different types of temporary impacts associated with the boring activity. Table 1 below identifies key aspects of each of the bore sites located in areas known to support ESBB habitat. In subsequent sections the text that follows describes relevant details at each of these 20 bore sites.

Table 1: Bore Holes Located in Areas with ESBB Habitat (Coast Buckwheat) Mapped Within 100 ft of Borehole (20 Locations)

Bore Hole Number (as Depicted on Figure 2)	Type of Infrastructure Associated with Bore Hole	Driven with Tires Only	Driven with Tracked Vehicle	Map Number on Figures 4 and 5 (100 ft to 1 in)
A1	WTG		Yes	3A
A9	WTG		Yes	3B
A10	WTG		Yes	3B
A14	WTG		Yes	3C
A18	WTG	Yes		3H
A19	WTG	Yes		3H
A25	WTG		Yes	3G
E1	WTG		Yes	3D
E2	RW		Yes	3E
E3	RW		Yes	3F
R4	AR		Yes	3E
R5	AR	Yes		3I & 3J
B1, B2, B4	ES	Yes		3I
B6, B7, B8, B9	O&M	Yes		3J
R8	WTG		Yes	3D

WGT = Wind Generation Tower (Bore Holes 8 Inches Wide and 50 Feet Deep)
O&M = Operations and Maintenance Facility (Bore Holes 8 Inches Wide and 20 Feet Deep).
AR = Access Road (Bore Holes 8 Inches Wide and 5 Feet Deep).
RW = Retaining Wall (Bore Holes 8 Inches Wide and 30 Feet Deep).
ES = Electrical Substation (Bore Holes 8 Inches Wide and 20 Feet Deep).

3.0 ENVIRONMENTAL SETTING / BIOLOGICAL RESOURCES

3.1 Environmental Setting

The site is located about 8-miles NNW of Point Conception, near the west end of the Santa Ynez Mountains, and where the California coastline turns eastward. It is a semi-arid region where warm and cold ocean currents mix and where distributional ranges of a number of northern and southern plant species overlap. A high rate of biological endemism characterizes this region of varied topography, geology, and unusual soils.

The EIR prepared for the LWEP discusses numerous environmental and biological resources present on the leased lands entitled by the CUP for the wind farm project. The resource information in the EIR applies directly to the current borehole Project. The EIR was approved for three phases of LWEP development. The current Project encompasses only the lands that are designated as Phase I of the LWEP. The following discussion, however, is based largely upon the information in the EIR. The botanist producing most of the botanical information in the EIR and in many subsequent documents (Kathy Rindlaub) is currently a Project advisor, particularly for the federally listed GTP, and locally important *Horkelia* found on the project site. Entomological Consulting Services (Dr. Richard Arnold) also serves as the Project advisor for the federally listed ESBB, and for the Coast Buckwheat, which is the obligatory food plant for the ESBB.

3.1.1 Climate

The local climate is unique to the Southern Central Coast of California. Prevailing northwesterly winds frequently blow across the ridge systems. On calmer days, particularly in summer, a thick marine layer often covers the entire vicinity around Pt. Arguello and Tranquillon Mountain. Data reported in Keil and Holland (1998) state the average annual rainfall is 20-inches on the high elevations of south VAFB, which surrounds three sides of the site. Dense fog, frequent in summer months, condenses on vegetation and rains onto the ground beneath. This fog drip ameliorates effects of the summer drought and increases effective precipitation. Average annual maximum and minimum temperatures in the area are in the high 60s and low 40s, respectively, with only a few days or nights each year that reach into the 100s or drop to freezing (Keil and Holland 1998).

3.1.2 Topography / Geology

The project area is located within the Santa Ynez Mountain Range, west of the Lompoc Hills and bounded on the north by the Lompoc Valley. Primary physiographic features in the vicinity of the project site include mountains, hills, valleys, mesas, and terraces.

Soil Types in the project area range in texture from gently-sloped eroded clays to steeply-sloped rock outcrops. The wide range of rock types in the project area, their age, and physical characteristics allow for development of a variety of soils. Soils mapped include Gaviota Sandy Loams, Santa Lucia Shaley Loam, Loamy and Claypan San Andreas/Tierra Complex Soils, Los Osos Clay Loam, and Diablo Clay (USDA, 1981).

Sandy loams are presumably formed from erosion of Gaviota-Sacate, Matilija, and Vaqueros Sandstones, and clay soils from the Monterey and Cozy Dell Shales. Both shale and sandstone rock outcrops occur on the site. Loams and clays are developed on the more mature, gently sloping areas. Rock outcrops are less eroded consisting of more resistant rocks such as Tranquillon Volcanics and well cemented/consolidated sandstones, siltstones, and cherts.

Metamorphic rocks are exposed on Tranquillon Ridge beyond the western end of the project site, and in Sloans Canyon, which lies immediately to the north. These rocks are adjacent to marine sedimentary formations that continue eastward, forming the Santa Ynez Mountains. The Lompoc Hills, with their diatomite deposits, rise northeast of the project site to fill the gap between the Pleistocene dune sheets to the north and the east-west trending Santa Ynez Mountains. The site is underlain by marine shale and sandstone formations with patches of old conglomerates and recent landslide debris. Rock outcrops along the central section of the project site are composed mostly of marine Gaviota-Sacate bedded sandstone, bordered on the east and south by outcrops of Monterey Shale (Dibblee, 1988).

3.1.3 Hydrology/Streams, Rivers, Drainages

The project site is located approximately 3 miles east of the Pacific Ocean in both the South Coast and The Santa Ynez River hydrologic units. Honda, Espada, and San Miguelito Creeks are the three drainage features that occur within the project area. Several unnamed intermittent streams are present within the LWEP site. A number of isolated seeps and springs also scattered along hillsides and flatlands throughout the project site, forming variable sized sinks and drainage features. Most of these seeps contain non-potable water due to an elevated saline content. A few low-producing wells provide ranchers with a minimal amount of fresh water supply for domestic use and cattle grazing operations.

No California Department of Fish and Game (CDFG) or US Army Corp of Engineers (USACOE) jurisdictional waters will be affected by the boring activities.

3.1.4 Vegetation

Vegetation within the project action areas includes Annual Grassland, Native Grassland, Central Coast Scrub, and Mosaic (Coastal Scrub - Grassland Mix). The following descriptions follow Holland's (1986) vegetation classification system. Most of the exploratory boring will occur in grazed annual grassland habitat.

3.1.4.1 Non-native Annual Grassland

Non-Native Annual Grassland is the most widespread vegetation community within the project site. Annual grassland includes a high frequency of annual non-native plant species. Common non-native annuals include Wild Oats (*Avena* spp.), introduced brome grasses (*Brome* spp.), Foxtail Barley (*Hordeum leporinum*), Ryegrass (*lolium* sp.), Milk Thistle (*Silybum marianum*), Bur Clover (*Medicago polymorpha*), Storksbill (*Erodium botrys*), and Crete Weed (*Hedypnois cretica)*. Annual grassland occurs on gentler to moderately steep slopes on a variety of soil types from dark clay to sandy loam. Native annuals observed low frequency include Silver Puffs (*Uropappus*), Tidy Tips (*Layia platyglossa*), Goldfields (Lasthenia spp.), Lotus (*Lotus* spp.), and the Federal and Stated Endangered Gaviota Tarplant (*Deinandra* [*Hemizonia*] *increscens villosa*). Low statured shrubs such as Coast Golden Bush (*Isocoma menziesii*), Cudweed Aster (*Lessingia filaginifolia*), and Coyote Brush (*Baccharis pilularis*) occur in low frequency. Wind and grazing likely control shrub stature.

3.1.4.2 Central Coast Scrub

Central Coastal Scrub is composed of both summer deciduous and evergreen shrubs and has a higher frequency of native vegetation as opposed to annual grassland habitats. Dominant native shrub species include California Sagebrush (*Artemisa californica*), Black Sage (*Salvia mellifera*), Coast Buckwheat, Coyote Brush, Monkeyflower (*Mimulus aurantiacus*), and Coffee Berry (*Rhamnus californica*). Coast Live Oaks (*Quercus agrifolia*) and Tanbark Oak (*Lithocarpus*

densiflorus) occur in low densities. Coastal scrub in the project area is most common on the steeper sites where cattle are found less frequently. Grazing likely limits the extent of scrub vegetation on gentler terrain, although cattle do create access trails through the scrub vegetation. No oak trees will be affected by boring activities.

3.1.4.3 Native Perennial Grassland

Scattered patches of native perennial grassland are present within Annual Grassland and Central Coast Scrub vegetation. Native grasses include Needle Grass (*Nassella* spp.), Creeping Rye (*Leymus triticoides*), and Meadow Barley (*Hordeum brachyantherum*). Most of the native grassland patches observed on site are highly degraded due to over grazing. However, a few higher quality patches are present, primarily along the steeper slopes where cattle are found less frequently.

3.1.5 Wildlife

Numerous bird species utilize annual grassland and Coastal Scrub habitat for foraging including Golden Eagle (*Aquila chrysaetos*), Grasshopper Sparrows (*Ammodramus savannarum*), White-crowned Sparrows (*Zonotrichia leucophyrys*), and Red-tailed Hawks (*Buteo jamaicensis*). Ground nesting birds such as Horned Larks (*Eremophila alpestris*) and Western Meadowlarks (*Sturnella neglecta*) utilized the annual grassland habitat during spring and summer months for breeding.

Mammals reported in the Project EIR to be present on the project site include California Ground Squirrel (*Otospermophilus beecheyi*), Botta's Pocket Gopher (*Thomomys bottae*) Gray Fox (*Urocycon cinereoargenteus*), Coyote (*Canis latrans),* American Badger (*Taxidea taxus*), Mule Deer (*Odocoileus hemionus*), Mountain Lion (*Felis concolor*) and bats including California Myotis (*Myotis californicus*) and the Mexican Free-tailed Bat (*Tadarida brasiliensis).*

The federally Endangered El Segundo Blue Butterfly (ESBB) is also known to occur within the project area (see section 3.2.1 below).

Because boring activities are scheduled to occur in fall (outside of the bird nesting season - February 1 to August 31), nesting birds will be avoided. Regardless of time of year, a biological monitor will be present at the borehole sites during boring activities to assist in avoidance and minimization measures for sensitive species within the project area, such as the locally rare American Badger, San Diego Desert Woodrat (*Neotoma lepida intermedia*), (a California Species of Special Concern CSC), Two-striped Garter Snake (*Thamnophis hammondii*) (CSC), and nesting birds (Olsen, 2006).

3.1.6 Existing Land Use

The project site is located in an unincorporated portion of Santa Barbara County on rural, agricultural land used primarily for grazing cattle. Agricultural fields used for dry farming are also present on the western side of the project site. Because groundwater resources are limited, no irrigated agriculture occurs within the project site. Nine single-family residences or mobile homes are located within the project site. Most of the boring sites are located within relatively flat, disturbed annual grassland on, or closely adjacent to, maintained dirt roads, which are actively used by the landowners. Coastal Scrub vegetation occurs along steeper slopes where cattle are found less frequently. Limited off-road vehicle use and recreational hunting also occurs throughout the project site.

Vandenberg Air Force Base adjoins the site on the south and west. The Vandenberg Telemetry Receiving Station is located near the southern perimeter of the project site (at the terminus of

Station Road). The project is also within existing space launch hazard corridors (paved Sudden and San Miguelito Canyon Roads) that are under some control by VAFB.

3.2 Species of Concern in the Plan Area

3.2.1 Wildlife Species of Concern

The El Segundo Blue Butterfly (ESBB) is covered by this HCP, and occurs in scattered, limited areas within the plan area.

Covered Wildlife Species:

El Segundo Blue Butterfly (*Euphilotes battoides allyni*: Lepidoptera, Lycaenidae)

Conservation Status
The ESBB (*Euphilotes battoides allyni*) was listed as an endangered species in 1976 by the U.S. Fish and Wildlife Service (41 Federal Register 22041). Throughout much of its geographic range, the primary threat to the butterfly is loss of habitat via urbanization, mining and agriculture. Alteration of habitat due to planting of non-native ground covers (*Carpobrotus edulis* and *Mesembryanthenum* sp.) to stabilize sand dunes, or forage grasses for cattle grazing (notably, *Ehrharta calycina*), and invasive landscape or other non-native plants, have also threatened the butterfly by out-competing its food plant. Critical habitat was proposed (USFWS 1976b) but never finalized. A recovery plan, which describes conservation measures that should be achieved to down-list or de-list the ESBB, was published by the USFWS in 1998 (48 Federal Register 43098).

The state of California's Fish and Game Code does not currently allow insects to be recognized as endangered or threatened species. Nonetheless, the ESBB satisfies the definition of a rare species under the California Environmental Quality Act (CEQA); thus it must be addressed during the environmental review process of projects under CEQA.

Geographic Distribution
Historically, the ESBB was thought to be endemic to the El Segundo Dunes, which extended from the northern end of the Palos Verdes Peninsula to Playa del Rey (Arnold 1983, Mattoni 1990). Today the ESBB is known from a group of populations in Los Angeles County and another group in Santa Barbara County, California. The ESBB was originally described from the Chevron refinery in El Segundo by Shields (1975). At the time of its designation as an endangered species in 1976, it was known only from Chevron and another remnant of the El Segundo Dunes at the Los Angeles International Airport (USFWS 1976a). In the early 1980's it was discovered at Malaga Cove and other widely scattered coastal bluff locations on the Palos Verdes Peninsula (Arnold, personal observation). During the late 1980's a single ESBB adult was reported from the Ballona Creek area at the northern terminus of the El Segundo sand dunes, but today this site is no longer occupied (Arnold, personal observation). Formerly degraded dune habitat at Miramar Park and Beach in Redondo Beach and Dockweiler State Beach in Los Angeles were revegetated and the ESBB has been observed in these restoration sites annually since 2007 (Arnold, personal observation). All of the previously mentioned locations are in Los Angeles County, California.

More recent discoveries of the ESBB have all occurred in Santa Barbara County, California. In 2004 the ESBB was discovered at Vandenberg Air Force Base (VAFB). Surveys conducted at VAFB between 2004 and 2010 found the butterfly at various locations. During 2008, 2009, and 2010, the ESBB was also found at several additional locations in the hills surrounding Lompoc (Arnold, personal communication).

Taxonomy

The ESBB is one of 11 described subspecies of *Euphilotes battoides* (Behr), which is widely distributed throughout western North America (Pratt and Emmel 1998; Pratt and Emmel 2008), and is commonly known as the Square-spotted Blue butterfly. Like all *Euphilotes*, subpecific taxa of *E. battoides* are closely associated with their larval food plants and primary adult nectar plants, species of Coast Buckwheat (*Eriogonum*: Polygonaceae), a genus of approximately 200 species (Kartesz 1994) that occur primarily in western North America in habitats ranging from the ocean shore to mountain peaks. Most *Euphilotes* populations only use a single Coast Buckwheat species as their food plant even when other Coast Buckwheat species are also present.

Prior to 1975, the species *battoides* was a member of the genus *Philotes*. At that time, Shields (1975) realigned several genera of blues, resulting in the placement of the species *battoides* in the genus *Shijimiaeoides*. Thus, the scientific name of the ESBB, when it was first recognized as an endangered species (USFWS 1976a), was *Shijimiaeoides battoides allyni*. Mattoni (1977) subsequently made a number of nomenclatural rearrangements in several genera of the blue butterfly tribe Scolititandini, which resulted in the placement of *battoides* in the genus *Euphilotes*. Shields and Reveal (1988) and Mattoni (1990) also treated *allyni* as a subspecies of *Euphilotes bernardino*, but today the ESBB is now known scientifically by the name, *Euphilotes battoides allyni*; however, all of these scientific names may be encountered in the literature.

Description

Wingspans of adult ESBBs range from 17 to 32 mm. In males, the dorsal wings are characterized by a brilliant indigo-blue color, while in females they are brownish-grey. Ventral wings of both sexes have a light grey background color, bold black maculations, and the wing margins have a checkered pattern. The submarginal area of the hind wing has a bold orange aurora. This orange aurora is also prominent on the dorsal hindwing of females, but is faint or entirely absent on the dorsal hindwing of males.

Larvae are onisciform and exhibit color polymorphism, ranging from creamy white to pale yellow or rose with white or yellow dashes and chevrons. This color polymorphism matches the progression of colors exhibited by the flowerheads of the ESBB's food plant, from bud to seed dispersal stages.

Habitat Characteristics

At the Lompoc Wind Energy Project site ESBBs were associated with Central Coastal Scrub and Grassland-Central Coastal Scrub Mosaic. This scrub plant community is common on steeper slopes, where the intensity of cattle grazing is less. The winds that routinely blow across these hill tops also limits shrub stature. Dominant plant species include: *Salvia mellifera, Artemisia californica, Baccharis pilularis, Toxicodendron diversilobum*, and *Rhanmus californica*. On north-facing slopes, *Fragaria vesca, Pteridium aquilinum, Galium* spp, and *M. aurantiacus* are also common.

Elsewhere in the greater Lompoc area, ESBB populations have been observed in Central Coastal Scrub and Burton Mesa Chaparral communities, frequently on Monterey shale formations. At nearby VAFB, populations of the ESBB in the northern part of the base have generally been found in Coastal Dune Scrub habitat with varying degrees of *Ehrharta calycina* infestation. ESBBs were also observed along the ecotones of Coastal Dune Scrub and Central Coast Scrub and Coastal Dune scrub bordering Riparian habitats. In the southern part of VAFB, ESBB have been found in the mountains characterized by Central Coastal Scrub and Mixed Central Coastal Scrub-Grassland habitats at elevations that range from 320 to 603 m. These ESBB locations are dominated by *B. pilularis*, *A. californica*, and *M. aurantiacus*.

In the Los Angeles area, ESBB is generally found in association with Southern Foredune, Southern Foredune Scrub, and Valley Needlegrass Grassland habitats at remnants of the El Segundo Sand Dunes, which occur at the Los Angeles International Airport and the Chevron refinery in El Segundo as well as two recently restored dune areas at Dockweiler State Beach in the City of Los Angeles and Miramar Park and Beach in the City of Redondo Beach. The Malaga Cove and bluff area above Rat Beach (immediately north) is characterized by Southcoast Dune Scrub and Bluff Scrub plant communities. There *E. parvifolium* grows in the generally steep bluff portions of homeowners' yards. The USFWS (2003) approved a Safe Harbor Agreement to encourage private homeowners to undertake voluntary habitat restoration and enhancement activities to benefit the ESBB.

On the Palos Verdes Peninsula south of Malaga Cove, *E. parvifolium* is generally limited to the bluffs along the immediate coast, where it grows as part of the Coastal Bluff Scrub plant community at scattered locations as far east as the Smuggler's Cove-Portuguese Point area near the border of the communities of Rancho Palos Verdes and San Pedro. These are small sites with a few to several dozen food plants at each location.

Occurrences Within the Project Area

Dr. Richard Arnold observed 26 adults and 3 larvae in 25 locations on the LWEP leased lands in August 2008 (Sapphos Environmental, Inc. 2008). Additional surveys are being conducted during the ESBB's 2010 flight season. The distribution of Coast Buckwheat on the LWEP site is also being updated during its 2010 flowering period. Thus far, the ESBB has been observed on approximately 60 acres on the LWEP project site. The closest known occurrences for the ESBB occur on VAFB at Sudden Peak and its flanks, on portions of VAFB neighboring the known ESBB locations on LWEP. In addition, ESBB has been found at a few locations along Miguelito Road (Arnold, personal communication).

Life History

The ESBB is univoltine, i.e., it has only one generation per year. The adult emergence and seasonal activity period of mid-June to mid-September, is closely synchronized with the flowering period of *Eriogonum parvifolium*, the sole larval food plant and primary adult nectar plant (Arnold 1978, 1981, and 1983; Pratt and Ballmer 1993). Annual population monitoring since 1977 at the Chevron refinery in El Segundo indicates that the adult flight season is normally about 10 weeks in duration, but the starting and ending dates, peak date(s), and duration can vary by as much as a few weeks from year-to-year (Arnold, unpublished data).

Results of capture-recapture studies determined that individual adult males and females live a maximum of 12 days under field conditions (Arnold 1983 and 1986), although in the lab females lived an average of 16 days (Mattoni 1990). Both sexes spend the majority of their time on flowerheads of *Eriognonum parvifolium* (Arnold 1983 and 1986). There they perch, bask (i.e., thermoregulate), forage for nectar, search for mates, copulate, oviposit, and often die. Most adults are sedentary, with home ranges no more than a few hectares (Arnold 1983 and 1986); nonetheless, Arnold (1986) documented adult movements up to 2.24 km (Arnold 1986) and butterflies have naturally colonized aforementioned restoration sites.

Females lay eggs singly on the *E. parvifolium* flowers. Larvae hatch in about one week and feed in the flowerheads. There are 4 instars during the larval stage. Young larvae are concealed by the flowerheads and their cryptic colors as they feed on the buds and developing flower parts, while older larvae feed on the seeds. Larvae have honeydew-secreting glands and are myrmecophilous, which may provide some protection from parasites and predators. Upon maturing in about 3-4 weeks, the larvae pupate in the root zone within the soil or in the leaf litter at the base of the food plant, and much less frequently in the flowerheads. Pupae that form in the flowerheads later drop to the ground. Pupae remain in diapause until the following summer,

although rearing studies indicate that some pupae will hold over and emerge as adults in subsequent years (Pratt and Emmel 1993).

3.2.2 Plant Species Considered

The state and federally listed endangered Gaviota Tarplant (*Deinandra* [*Hemizonia*] *increscens villosa*) is present in scattered, limited areas within the project site. Surveys were conducted in 2008 (Sapphos Environmental) and 2010 (UltraSystems Environmental) to document the locations of GTP on the borehole sites. Subsequently, impacts on the GTP from the borehole project have been analyzed by the Applicant. An Incidental Take Permit has been prepared by the Applicant for submission to the California Department of Fish and Game, including a mitigation, restoration, and monitoring program pursuant to the California Fish and Game Code.

4.0 POTENTIAL BIOLOGICAL IMPACTS/TAKE ASSESSMENT

4.1 Direct Impacts

As described previously, the ESBB is the only Federally-listed wildlife species that may be affected by the proposed Project. This butterfly is obligatorily associated with its food plant, the Coast Buckwheat. This Coast Buckwheat is widely distributed in coastal California, including the Santa Barbara coastal area, VAFB, and on the Project site itself. Nevertheless, only a very small fraction of Coast Buckwheat is known to support the ESBB (DOD 2007).

With the existing presence of paved and dirt roads, the applicant can get very close to the bore sites without affecting listed species (ESBB and GTP) or their habitats (Coast Buckwheat). Consequently, the impacts on potential ESBB habitat are negligible. Dr. Arnold (2010) (local entomologist who is a specialist with this butterfly) suggests that the population of ESBB on the Project site represents less than approximately 1 percent of the total known populations of ESBB throughout the species' range. The total acreage of Coast Buckwheat currently mapped in the Project vicinity is 63.67 acres spread out in patches throughout the site (Figure 2). From the surveys conducted in 2010 by UltraSystems Environmental, a total of 268 Coast Buckwheat plants may be directly affected by the Project. The actual number will likely be less, depending upon how many may be crushed by the wheels or tracks of the drill rigs. Even if all the plants located in the Project's work areas were affected, the proposed activities would be limited to a small subset of the ESBB habitat (0.54 acres) on the project site, and to an even smaller subset of the ESBB population on the Project site. The area of Coast Buckwheat temporarily affected by the borehole Project is estimated to be less than 1 percent of the population on the Project site, according to Dr. Richard Arnold, who describes this level of impact as a "negligible" affect (personal communication). Furthermore, most of the affects on ESBB plants and habitat are associated with driving over the plants, many of which may not be disturbed. The root systems of many Coast Buckwheat plants will not be disturbed, and would likely stump-sprout during the next spring. Under this circumstance, there may be little to no adverse affect from driving over Coast Buckwheat since only the wheels or tracks of the drill rigs will be directly on the ground. Therefore, from this standpoint, implementation of the proposed geotechnical boring Project would result in negligible effects on ESBB habitat and ESBB populations.

Because the actual boring activities are limited in noise, duration, and ground disturbance, the amount of direct disturbances on biological resources for most boring sites are negligible; related only to being crushed by vehicle wheels and tracks or by foot traffic in the work area. Direct effects could include mortality of ESBB, non-sensitive subterranean wildlife (e.g., snakes and ground squirrels), mortality of perennial native vegetation (including Coast Buckwheat), disturbances of native seed banks (including GTP), and other disturbances of general biological resources. The larvae and pupae of the ESBB may be directly crushed by drilling equipment, drill crews, and environmental monitors. The extent of this potential impact would depend upon the actual number of Coast Buckwheat that are removed or crushed by the drill rigs. In its Biological Opinion for the Second Relocatable In-Flight Interceptor Communications System Data Terminal Project on VAFB (Department of Defense, Missile Defence Agency 2007), the USFWS assumed that the "average Coast Buckwheat contains about 300 flowerheads and may produce 30 ESBB adults." Generally, ESBB are not abundant anywhere they are observed, particularly in areas where Coast Buckwheat are in low densities (as is the case on the borehole project site as well as on VAFB). The USFWS concluded that Coast Buckwheat plants would provide up to 3 ESBB adults in the 20-acre site.

The remainder of this section describes and quantifies the anticipated impacts at each of the 17 bore sites that may affect ESBB habitat. The construction crews will keep boring equipment to the minimum area required, and the trips into ESBB habitat to the fewest possible.

The potential direct impacts related to Coast Buckwheat, and ESBB, are described in detail below.

4.1.1 Anticipated Take: Wildlife Species

The Project site was surveyed by Dr. Richard Arnold on July 22, 2010 and August 24, 2010 with RES and UEI Staff to conduct a survey to further map the distribution of Coast Buckwheat relative to the geotechnical boreholes. Previous Coast Buckwheat surveys identified the presence of Coast Buckwheat as polygons, but the number of plants were not recorded. The following are brief descriptions of the features at each borehole, and the sensitive biological resources that are present in each work area.

4.1.1.1 Anticipated Direct Impacts ESBB

As listed in Table 2, the boring activities at 8 bore sites are expected to result in direct affects to ESBB habitat (Coast Buckwheat). Each of the 8 bore sites within the area of anticipated effects on Coast Buckwheat are described below and is depicted in Figure 3. In addition, where ESBB pupae are in hibernation, duff and ground compaction by the drilling operations may prevent the newly emerged adults from burrowing their way up to the ground surface and to the host Coast Buckwheat plants.

Geotechnical Borehole A1: On July 14 and 22, 2010 UEI visited the Project site to determine the route that would affect the least ESBB Habitat (and would be safe for the bore drill operators and equipment). This route was digitized by Blake Land Surveys, Inc. to within centimeter accuracy (Figure 3A). Any spoil piles will be placed downslope, if feasible. An access road of about 130 feet must be graded to the borehole from and existing dirt road.

Geotechnical Borehole A10: On July 14 and 22, 2010 UEI visited the Project site to determine the route that would affect the least ESBB habitat (and would be safe for the bore drill operators and equipment). This route was digitized by Blake Land Surveys, Inc. to within centimeter accuracy and this route is depicted on Figure 3B.

Geotechnical Boreholes A18 and A19: On July 14 and 22, 2010 UEI visited the Project site to determine the route that would affect the least ESBB Habitat (and would be safe for the bore drill operators and equipment). This route was digitized by Blake Land Surveys, Inc. to within centimeter accuracy and this route is depicted on Figure 3H.

Boreholes A18 and A19 are located in a large area known to support ESBB habitat (UltraSystems Environmental 2010). A sighting of ESBB was recorded approximately 250 feet north of these boreholes in 2008. Because the terrain is relatively flat, these two sites will be accessed using vehicles with rubber tires only (Table 1). These two borehole sites will be accessed by an existing dirt road (Figure 3H). The effects associated with Bores A18 and A19 are listed in Tables 2 and 3. Twenty five Coast Buckwheat plants will be driven over with the construction vehicles, some of which will not be adversely affected. No grading will be required, and no water truck will be needed to provide dust control.

Geotechnical Bore A14: On July 14 and 22, 2010 UEI visited the Project site to determine the route that would affect the least ESBB habitat (and would be safe for the bore drill operators and equipment). This route was digitized by Blake Land Surveys, Inc. to within centimeter accuracy and this route is depicted on Figure 3C.

Borehole A14 is located in an area completely surrounded by high-quality Coast Buckwheat of varying sizes and ages. An ESBB was observed in this area in 2008. Because the terrain is relatively steep at the borehole sites, a tracked vehicle will be required (Table 1). Soil piles will be placed in areas that do not affect any Coast Buckwheat, if possible. This bore site will be accessed from an existing dirt road (Figure 3C), and the affect associated with Bores A14 is listed in Tables 2 and 3. No grading will be required, and no water truck will be necessary for dust control.

Geotechnical Bore A25: On July 14 and 22, 2010 UEI visited the Project site to determine the route that would affect the least ESBB habitat (and would be safe for the bore drill operators and equipment). This route was digitized by Blake Land Surveys, Inc. to within centimeter accuracy and this route is depicted on Figure 3G.

Borehole A25 is located in an area surrounded by patches of Coast Buckwheat within 100 feet of the borehole, but none of the plants are growing in the area that will be directly affected. This borehole site will be accessed from Sudden Road and an existing dirt road (Figure 3G), and the affect associated with Bore A25 is listed in Tables 2 and 3.

Geotechnical Bore E1: On July 15 and 22, 2010 UEI visited the Project site to determine the route that would affect the least ESBB habitat. This route was digitized by Blake Land Surveys, Inc. to within centimeter accuracy. The site supports annual grassland, but no Coast Buckwheat is present. A large polygon of Coast Buckwheat was previously mapped to the west of the site, with some plants potentially within 100 feet of the borehole (Figure 3D). Several sightings of ESBB were recorded in this area in 2008. No grading will be required at this site, and no water truck will be required for dust control.

Borehole E1 is located on an existing dirt road (Figure 3D). Because the terrain is steep enough, this site will be accessed using tracked vehicles (Table 1). The affect associated with Borehole E1 is listed in Tables 2 and 3.

Geotechnical Borehole E2: On July 15 and 22, 2010 UEI visited the Project site to determine the route that would affect the least ESBB habitat. This borehole is in an area surrounded by Coast Buckwheat (Figure 3E). Several ESBB were observed in this area in 2008. A tracked drill rig will be required (Table 1). The affect associated with drilling Bore E2 is listed in Tables 2 and 3.

Geotechnical Borehole E3: On July 14 and 22, 2010 UEI visited the Project site to determine the route that would affect the least ESBB habitat (and would be safe for the bore drill operators and equipment). This route was digitized by Blake Land Surveys, Inc. to within centimeter accuracy and this route is depicted on Figure 3F.

Borehole E3 is completely surrounded by a large stand of high-quality Coast Buckwheat. Several ESBB were observed in this area in 2008. Coast Buckwheat cannot be avoided at this site, and 213 plants will be affected by the earthwork here. Because the terrain is steep (this bore is located on the side of a ridgeline) this site will require a tracked vehicle (Table 1). This bore site will be accessed from an existing road on the ridgeline (Figure 3F). Affect associated with Bore E3 is listed in Tables 2 and 3.

Geotechnical Borehole R5: On July 15 and 22, 2010 UEI visited the Project site to determine the route that would affect the least ESBB habitat (and would be safe for the bore drill operators and equipment). The shortest route to Borehole R5 can be traversed by a rubber tired vehicle (Figures 3I and 3J).

A population of Coast Buckwheat is found about 80 feet to the east of this site along San Miguelito Canyon Road, and large polygons of Coast Buckwheat are located to the north and west of the site, where numerous observations of ESBB have been recorded. Because the terrain is relatively flat, this site will be accessed using vehicles with rubber tires only (Table 1). This bore site will be accessed via an existing dirt road (Figures 3I and 3J). The affect associated with Borehole R5 is listed in Tables 2 and 3. No grading will be required, and no water truck is necessary for dust control.

Geotechnical Bore R4: On July 14 and 22, 2010 UEI visited the Project site to determine the route that would affect the least ESBB habitat (and would be safe for the bore drill operators and equipment). This borehole is on the side of a ridgeline near the border of VAFB. Several ESBB were recorded in this area in 2008.

Borehole R4 is located in a large area previously mapped to support ESBB habitat (Figure 3E). Because the terrain is relatively steep this site will be accessed using vehicles with tracks (Table 1). No grading will be required. This bore site will be accessed from an existing dirt road upon which the borehole will be drilled. The affect to GTP that is associated with Bore R11 is listed in Table 3.

Geotechnical Bores B1 through B5: On July 15 and 22, 2010 UEI visited the Project site to determine the route that would affect the least ESBB habitat. This site is heavily grazed and trampled by cattle. However, while no Coast Buckwheat is mapped at the borehole locations, some plants are immediately adjacent to the work site, and access will swing around the site to avoid impacts on them. The site has been previously mapped with ESBB habitat in all directions around this site except to the southeast.

Bores B1, through B5 are located outside of areas known to support ESBB habitat; therefore no adverse affect is expected. Because the terrain is relatively flat, these boreholes will be accessed using vehicles with rubber tires only (Table 1). These bore sites will be accessed from an existing road that joins San Miguileto Canyon Road directly to the east (Figure 3I).

Geotechnical Bores R8: On July 15 and 22, 2010 UEI visited the Project site to determine the route that would affect the least ESBB habitat. This route was digitized by Blake Land Surveys, Inc. to within centimeter accuracy.

No Coast Buckwheat is present where the earthwork will occur, although a large polygon of Coast Buckwheat was previously mapped 100 feet to the west. Some Coast Buckwheat may be present within 100 feet of the borehole (Figure 3D). Several sightings of ESBB were recorded in this area in 2008. No grading will be required at this site, and no water truck will be required for dust control.

Table 2: Temporary Direct Effects on ESBB Habitat In 8 Locations (No Permanent Impacts)

	By Area of Mapped ESBB Habitat *		**By Number of Counted Coast Buckwheat ****	
Bore Hole Number	***Area of Mapped Coast Buckwheat Habitat Affected***		**Number of Coast**	**Number of Coast**

	Within Borehole Access Roads		**Buckwheat Plants Affected on Borehole Access Roads**	**Buckwheat Affected in Temporary Work Areas Around Borehole During Drilling (10 ft Diameter)**
A10	0.02 acres		17	
A14	0.07 acres		31	2
A18	0.09 acres		0	
A19	0.15 acres		32	
A25	0.04 acres		21	0
E2	0.07 acres		16	0
E3	0.09 acres		147	2
R5	0.004 acres		0	
Total	**0.54 acres**		**264 plants**	**4 plants**
	Total Area = 0.54 Acres		**Total Number of Plants = 268**	

* Area is calculated from polygons previously mapped in the EIR, but where individual plants were not counted. This area may or may not be occupied by ESBB.
** Plants mapped within area of direct affect by Dr. Arnold (26 August 2010) using GPS UTM coordinates. These plants may or may not be occupied by ESBB.

4.1.1.2 Indirect Impacts on ESBB

Potential Noise Affects:
While noises made by construction equipment and workers in close proximity to adults during their flight season could affect the butterflies mating behaviors, indirect noises affects, if any, on adult behaviors are unlikely to occur or be significant, particularly in 2010 because the borehole operations will occur after the adult flight season is finished. The late Spring and early Summer weather conditions in 2010 provided a more narrow flight season for adults than is generally considered to be normal (Arnold, pers. comm. 2010).

4.2 Cumulative Impacts

Impacts of the boring Project on the long term persistence of the ESBB are low because of the limited size of the boring operations and the care taken by the applicant to avoid and minimize impacts on the Coast Buckwheat. Avoidance and minimization was done by placing access roads outside of identified Coast Buckwheat populations and limiting grading areas to the smallest extent feasible. The loss of ESBB habitat is not expected to affect the range-wide survival of the ESBB and its habitat due to their occurrence in nearby areas of VAFB, and several other populations in the Santa Barbara area. The ESBB also persists in the Los Angeles area population. The foodplant of the ESBB is found in abundance throughout coastal California, and the ESBB may ultimately colonize other areas where sandy soils support Coast Buckwheat.

Development of the Project's leased lands will undergo further consultation with federal agencies, including the USFWS. Future development activities on VAFB are not publically disclosed, but are not expected to be substantial. The County of Santa Barbara County EQAP has specified that a

Decommissioning and Abandonment Plan be prepared for a 30 year project life (2040). The plan will be updated each five years. The plan specifies that the land contours and vegetation be returned to their original conditions when the project is terminated. Because the Coast Buckwheat persists throughout the Santa Barbara region and in many patches on the Project site, the ESBB may reoccupy any areas that would have been taken by the project's relatively small footprint on the site.

In summary, the direct impacts would be associated with running over plants, not boring activities, as the sites for boring will avoid the host plants With the existing presence of paved and dirt roads, the applicant can get very close to the bore sites without affecting listed species (ESBB and GTP) or their habitats (Coast Buckwheat). Consequently, the impacts on potential ESBB habitat are negligible. Dr. Arnold (2010) (local entomologist who is a specialist with this butterfly) suggests that the population of ESBB on the Project site represents less than approximately 1 percent of the total known populations of ESBB throughout the species' range.

No indirect impacts on ESBB due to noise or dust are associated with the proposed Geotechnical Boring Project because grading has been eliminated from the project description and activities will occur outside of the adult flight season.

In regards to cumulative impacts, development of the Project's leased lands will undergo further consultation with federal agencies, including the USFWS. Future development activities on VAFB are not publically disclosed, but are not expected to be substantial. Impacts from the boring Project on the long term persistence of ESBB are expected to be low due to the limited size of the boring operations and the care taken by the applicant to avoid and minimize impacts on the ESBB by placing access roads appropriately and limiting grading areas to the smallest extent feasible. The loss of ESBB habitat is not expected to affect the range-wide survival of the plant due to their occurrence in nearby areas of VAFB, and several other populations in the Gaviota and Santa Barbara areas. When the Project is terminated, the seed bank of the ESBB will likely persist in the top soils throughout the Project site, and will recolonize any land taken by the relatively small footprint of the Project on the site.

5.0 CONSERVATION PROGRAM/MEASURES TO MINIMIZE AND MITIGATE FOR IMPACTS

5.1 Biological Goals

The following section describes the broad guiding principles and biological goals for the covered species and their habitats by the implementation of the conservation program. They provide the rationale behind the minimization and mitigation strategies that have been implemented in the Project planning and in preparing this HCP.

El Segundo Blue Butterfly (ESBB) Biological Goals

These following are the overarching goals for conservation of the ESBB and its habitat.

Goal #1: Minimize mortality of the ESBB and damage to its habitat and food plant during preparation and implementation of the boring Project.

Objective 1a: To the maximum extent practical, locate access routes, vehicle parking, and materials laydown areas in portions of the Project site that do not support habitat for the ESBB (or Gaviota Tarplant).

Objective 1b: At boring site locations where disturbance of Coast Buckwheat is unavoidable, select access routes and work areas that reduce the amount of impact on the ESBB's food plant, Coast Buckwheat (and Gaviota Tarplant).

Goal #2: Mitigate unavoidable adverse effects on the ESBB from the boring Project, including loss of habitat, unless Goal #3 is implemented.

Objective 2a: Revegetate on-site areas with plants indigenous to the Central Coast Scrub, including Coast Buckwheat.

Objective 2b: Restore degraded habitat by controlling invasive plants, revegetating with native plants, and monitor to ensure that success criteria are achieved.

Goal #3: Unless #2 is implemented, contribute to regional conservation of the ESBB population and its habitat within the HCP area by improving/restoring habitat that has been adversely affected by past land use activities and preventing future adverse effects to the compensation lands.

5.1.1 Biological Objectives and Performance Success Criteria

Eriogonum parvifolium is a perennial shrub that may live 30 years or more. However, during its first few years of life, most growth occurs in the root system and the plant produces few if any flowers, which provides little or no benefit to the ESBB.

For this reason, a 10-year monitoring program (monitoring every other year) is necessary to determine if the restoration of Coast Buckwheat has reached a growth stage appropriate to benefit the ESBB. At the end of this 10-year period, Coast Buckwheat should comprise a minimum of 15% of the restored Central Coastal Scrub and Grassland habitats at the mitigation site(s) and 75% of these Coast Buckwheats should be mature individuals.

5.2 Measures Taken by the Project to Minimize Impacts on El Segundo Blue Butterfly

The flight period of the adult ESBB is generally from mid-June to mid-September. The boring operations will avoid this critical flight season by conducting the boring activities during October. While the larval and pupal phases of the ESBB are living in the soil, duff, and Coast Buckwheat plants during the entire year, construction activities conducted from mid-September to mid-June would be less adverse on the reproductive activities of the ESBB.

Avoidance Protocols Utilized to Determine the Access Routes

In July 2010, prior to the boring activities, the Applicant, UltraSystems, and the Project Engineer (RES Americas, Inc.) participated in a process to identify boring access routes that either avoid completely or minimize the amount of ESBB habitat (and GTP) affected and those routes that are safe for the construction contractor to implement. This was done by having RES prepare boring access routes based upon topography and other geographic considerations. Subsequently, UltraSystems would evaluate these plans and suggest alternate routes that would avoid or minimize impacts on ESBB Habitat and GTP. This process was repeated several times. Following this process, RES and UltraSystems met on the Project site to field verify the most beneficial routes that would affect the least ESBB habitat and GTP, and would be safe to implement. These routes were depicted on maps which are included in this HCP.

Avoidance Protocols on the Day of Boring

The following monitoring and avoidance protocols will be initiated pursuant to the EQAP. Prior to the construction crews arriving at a boring site, County approved biological monitors will survey the access route and the bore hole site (Figure 3). The monitors will survey for Coast Buckwheat (and GTP) and sensitive wildlife within a 300 foot radius of the bore site (pursuant to the EQAP requirements). Under the supervision of the biological monitors, the drill rig and other vehicles will be routed in order to avoid ESBB habitat to the maximum extent possible (and other sensitive resources). The monitors are approved by the County and at least one County person is overseeing the biological monitors (John Storrer, Tom Olson, and Peter Gaede).

Minimization of Ground Disturbance

Where feasible, parking, lay down, storage areas, and other sites of surface disturbance shall be located in previously disturbed areas or in annual grassland (but not in areas known to support ESSB or Gaviota Tarplant habitat). The Project Biologist shall conduct pre-construction surveys of staging area(s) prior to initial ground disturbance. Construction material and supplies used during construction shall be disposed offsite. Trash, debris, loose fill, and deleterious material shall also be removed and disposed appropriately off-site.

El Segundo Blue Butterfly Avoidance and Minimization

Dry Season

All boring-related activities will be completed during the dry season, usually April 15 to November 15, but some variation in this timing may occur in particular years. However, within this period, boring activities will not occur during the adult flight season of the ESBB, generally about June 15 to September 15, to avoid disrupting the reproductive behaviors of the ESBB.

Relocation of ESBB Life Stages

If any living life stages of the ESBB are encountered during the boring Project they will be relocated to adjacent habitat by an Applicant's USFWS-approved biologist. If the work crew find

any life stages of the ESBB in the boring project area, work will be halted in that location until the USFWS-approved biologist has relocated it to a safe location.

Delineate Boundaries of All Impact Areas
The USFWS-approved biologist will ensure that the boundaries of each boring work site, parking areas, equipment and materials areas are clearly marked with plastic barrier markers prior to commencement of any work and throughout the duration of the boring activities. Drill rig access routes will be delineated either with construction fencing or pin flags at locations where Coast Buckwheat is present. Signs will be erected to notify workers to stay out of sensitive areas.

Staging
All construction vehicles, equipment, and materials will be staged in designated locations within the project site. The locations of soil spoils piles at each boring site should be selected to minimize impacts on the Coast Buckwheat.

5.3 El Segundo Blue Butterfly Compensatory Mitigation

Habitat Restoration and Management

Degraded native Central Coastal Scrub habitat in patches of Coast Buckwheat affected by soil disturbance during the boring operations will be restored by removing invasive plant species and planting Coast Buckwheat. Seeds of Coast Buckwheat and associated native plants will be collected and either spread within the area, or propagated and out-planted.

Impacts on Coast Buckwheat will be mitigated at different mitigation ratios, depending on the severity of impact on the areas affected by the Project.

- Mitigate for impacts associated with the crushing or damaging of plants by vehicles in the access routes at a ratio of 2 to 1. As listed in Table 2, we expect to crush or damage up to 264 Coast Buckwheat plants. At a mitigation ratio of 2 to 1, we will compensate for this loss with the restoration and conservation of 528 plants.

- Mitigate for the temporary impacts associated within the 10-foot-diameter work area at the bore sites (includes the 8 inch bore hole) with a mitigation ratio of 2 to 1. As listed in Table 2, we expect to crush or damage 4 Coast Buckwheat plants and at a mitigation ratio of 2 to 1 we will compensate for this loss with the restoration of 8 plants.

Total compensatory mitigation for the boring Project is 536 plants within 0.54 acres. Dr. Arnold has identified several areas on the Project site that could benefit from ESBB habitat restoration. These sites are located outside of the proposed boring Project and the future proposed LWEP site and would therefore not be disturbed by these activities. Potential mitigation areas for Coast Buckwheat are identified in Figure 4, which is based on GIS studies and knowledge of the site by Dr. Richard Arnold using soil and geology data, and on areas of Coast Scrub habitat mapped since 2005 by project biologists. The entire area within these polygons has been disturbed by grazing and is in need of restoration. Within these areas, mapped annual grasslands were excluded, leaving 75.4 acres where Coast Buckwheat revegetation can occur. These polygons are strung over the entire width of the project property (see Figure 4), but outside the area that will be disturbed by the Project. At the time the mitigation planting will occur, the restoration biologist will select suitable sites considering edaphic factors, such as slope and wind effects, that would affect success of the plants. Restoration areas will also provide for flight connectivity to ensure that the ESBB habitat is not fragmented.

Adaptive Management Strategy

Adaptive management is a process by which the conservation program for the HCP may be adjusted over time to reflect new information on the life history or ecology of the Covered Species generated through research, or information on the effectiveness of the minimization and mitigation measures, especially enhancement and habitat management activities. The adaptive management provision addresses revising the overall HCP, minimization measures habitat management techniques, and monitoring protocols, as well as incorporating changes from recovery plans and new research. Depending on the nature of the change, it may be necessary that the HCP and/or permit be amended.

Adaptive Management Strategy for El Segundo Blue Butterfly Enhancement

Monitoring provides information for making adaptive management decisions. If the monitoring reports indicate the enhancement area is not in conformance with, or has failed to meet the performance criteria specified in this HCP, PREG will develop corrective measures to meet the performance criteria. PREG will coordinate with the USFWS prior to the implementation of any Adaptive Management Plan.

5.4 Monitoring and Reports

Monitoring aims to track compliance with the terms and conditions of the HCP and incidental take permit and the Santa Barbara County Planning and Development Department. There are three types of monitoring: a) compliance monitoring tracks the permit holder's compliance with the requirements specified in the HCP and permit; b) effects monitoring tracks the impacts of the covered activities on the covered species; and c) effectiveness monitoring tracks the progress of the conservation strategy in meeting the HCP's biological goals and objectives.

El Segundo Blue Butterfly

Compliance Monitoring

During the boring operations and any other covered activities, the project's USFWS-approved biologist will inspect the project site to ensure that the work remains within the perimeters shown on the project maps, that exposed soils are properly covered or moistened as needed to prevent dust problems, and to salvage and relocate any ESBB life stages.

Effects Monitoring

To quantify the amount of disturbed Coast Buckwheat at the end of the project, the USFWS-approved biologist will measure the area of soil disturbance and tally the number of damaged or killed Coast Buckwheat and total the number of ESBB life stages that were found and relocated during the Project's covered activities. This information will be summarized in the Compliance Monitoring Repot submitted to the Fish and Wildlife Service and the Santa Barbara County Planning and Development Department (see subsequent section of this HCP).

Compliance Report

By January 31st following the proposed Project , a USFWS-approved biologist will submit a report to the Ventura Fish and Wildlife Office of the USFWS and to the Santa Barbara County Planning Department to document the that the Project was completed in compliance with the requirements of the HCP. The report will provide the following information:

1. Brief summary or list of Project activities accomplished during the reporting year (e.g., this includes boring and other covered activities).

2. Project impacts (e.g., number of acres graded or otherwise damaged by habitat type).
3. Description of any take that occurred for the covered species (includes cause of take, form of take, amount of take, location of take and time of day, and deposition of dead or injured individuals).
4. Brief description of conservation strategy implemented to-date.
5. Monitoring results (compliance, effects, and effectiveness monitoring) and survey information (if applicable).
6. Description of circumstances that made adaptive management necessary and how it was implemented. Include a table listing the cumulative totals by reporting period, all adaptive management changes to the HCP, including a very brief summary of the actions.
7. Description of any changed or unforeseen circumstances that occurred and how they were dealt with.
8. A summary of funding expenditures, balance, and accrual.
9. Description of any minor or major amendments.

If the permit holder completes its project before the end of the 1-year permit duration, they will notify the Ventura Fish and Wildlife Office that they have completed all covered activities and mitigation measures; thus subsequent annual compliance reports will not be necessary.

Mitigation & Monitoring Reports

The applicant will provide assurance to the USFWS that effectiveness monitoring will continue 9 years following the permit term through a separate Memorandum of Agreement to ensure that the biological goals and objectives are reached. Over a period of 10 years from permit issuance, the permit holder must submit a monitoring report every other year to the Ventura Fish and Wildlife Office, describing activities performed to benefit the ESBB as part of the terms and conditions of its incidental take permit and this HCP. This report will be prepared by the permitted monitoring biologist and/or the land management entity. This report will be submitted to USFWS by December 31st of every monitoring year. This report shall include:

1. A general assessment of the condition of the habitat at the site.
2. A description of all management and restoration actions taken at the site along with an assessment of their effectiveness toward enhancing the biological goals and objectives of this HCP;
3. A description of any problems encountered in managing the site.
4. Results of monitoring studies for the endangered species and/or communities conducted during the year and an assessment of their implications for the biological goals and objectives of this HCP.
5. A description of any other activities that were conducted designed to enhance the site.

Reporting compliance with the Santa Barbara County Planning and Development Department will be implemented.

6.0 FUNDING

6.1 Funding for Minimization and Mitigation Measures

The avoidance and minimization measures and associated costs for the bore hole activities have been itemized in Table 3. Some of the activities and materials required to implement the conservation strategy of the borehole HCP, have, in some cases, already been implemented. The PREG will provide assurances that the conservation strategies are properly implemented.

Table 3. Estimated Costs to Implement Conservation Strategy Described in HCP

Item or Activity	Conservation Strategy	Materials and Labor Needed or Expended	Cost
El Segundo Blue Butterfly			
Dry Season	Avoid Construction During the Adult Flying Season (June 15 To September 15) of the ESBB	N/A	0
Relocation of ESBB Life Stages	USFWS-Approved Biologist to Move Life Stages of ESBB to Safe Area (Work Stopped Until Complete)	N/A	Covered under monitors below
Delineate Boundaries of All Impact Areas	Clearly Mark Boring Work Sites, Parking Areas, and Materials Areas with Plastic Barrier Markers	Plastic fencing, pin flags, 2 monitors	$6,000.00
Staging	Location of Parking, Equipment, and Material Selected and Enforced During Construction and Operations to Avoid Impacts on Listed Species and Coast Buckwheat	N/A	0
Identification of Best Access Routes to Bore Holes Prior to Construction	Biologist and engineers to Visit Project Site to Identify Access Routes that are Both Safe for the Drill Rig Operators and Reduces Impacts to Listed Species and Their Habitat to the Maximum Extent Practicable	Biologists to survey, GIS Mapping,	$25,000.00
Provide Monitors During All Construction Activities	Biological Monitors to Work with Construction Crews and County Monitors to Fine-tune Changes On The Day of Boring To Enhance Avoidance and Minimization Measures and Record Environmental Compliance in Monitoring Reports	monitors	$8,000.00
Provide Restoration Areas for Coast	Restoration Biologists to Prepare Soil, Install Coast		$32,000.00

Buckwheat on Project Lands & Monitoring for 9 years	Buckwheat in Areas Selected by Dr. Arnold, & monitor the sites		
Funding for Unexpected Repairs or Natural Disasters	Repair Damage	Unknown	$3,000.00
Grand Total			**$74,000**

6.2 Funding Source(s)

The applicants, PREG, will pay for all costs associated with implementing this HCP's conservation strategies, including minimization measures, conservation credits, plus effects and compliance monitoring as itemized in Table 3. In recognition of the fact that the costs for these activities in Table 3 are estimates, the actual incurred costs may be less or more than these estimates. However, if the actual costs for the minimization activities are higher than estimated in Table 3, PREG agrees to pay the actual costs.

6.3 Funding Mechanism and Management

PREG will provide all funds needed to implement the conservation program measures itemized in Table 3. The applicant has already funded the delineation of boundaries for all impact areas ($6,000) and the identification of best access routes to bore holes prior to construction ($25,000), and receipts are included in Appendix A. The applicants understand that failure to provide adequate funding and consequent failure to implement the terms of this HCP in full could result in temporary permit suspension or permit revocation. To demonstrate their ability to cover the remaining costs of $43,000, the applicants will provide an escrow account to the USFWS prior to the USFWS reaching a permit decision.

7.0 ALTERNATIVES

7.1 Summary

Section 10(a)(2)(A)(iii) of the Endangered Species Act of 1973, as amended, [and 50 CFR 17.22(b)(1)(iii) and 17.32(b)(1)(iii)] requires that alternatives to the taking of species be considered and reasons why such alternatives are not implemented be discussed. Two alternatives for the proposed project are discussed.

7.2 Alternative #1: No Action

Under the No Action Alternative, implementation of the boring project would not occur and Acciona would not request an incidental take permit, and an incidental take permit would not be issued by the USFWS for ESBB. The leased lands of project would continue to exist as ranchland for grazing cattle and some dryland farming. Furthermore, the conservation measures described in this HCP would not be implemented in a timely manner and the conservation of 2-acre of a Conservation Area for GTP would not occur. Thus, the No-Action Alternative is concluded to be of lesser conservation value to the covered species than the proposed project with the accompanying HCP, and, for these reasons, the No Action Alternative is rejected.

7.3 Alternative #2: Helicopter Access to the Site

Under this alternative driving drilling and sampling equipment to the 20 geotechnical boring locations would be eliminated. Equipment used for drilling and sampling soils would be lifted by helicopter from staging areas to the locations that sample borings would be required. By airlifting drilling equipment into the boring locations, impacts to ESB and Gaviota tar plant would be eliminated. However, helicopters large enough to lift the drilling equipment are not readily available. Drilling equipment is large and heavy and not designed to be lifted to remote locations by aircraft. Safety related to efficient transport of drilling equipment in the mountainous terrain, steep canyons and inaccessible areas where drilling equipment may be dropped pose significant uncertainty. For these reasons, the Helicopter Access to the Site Alternative has been rejected.

8.0 PLAN IMPLEMENTATION, CHANGED AND UNFORSEEN CIRCUMSTANCES

8.1 Plan Implementation

The proposed project described herein will be implemented by the applicant PREG, and their contractors. The schedule of implementation of the covered activities will depend on the timing of issuance of the incidental take permit from the USFWS and CDFG, as well as seasonal constraints. However, we plan to commence activities in mid-November and continue (weather permitting) for a month. In case weather does not allow the boring activities to occur this year, we request that the length of the HCP last for a period of one year.

8.2 Changed Circumstances

8.2.1 Summary of Circumstances

Section 10 regulations [(69 Federal Register 71723, December 10, 2004 as codified in 50 Code of Federal Regulations (C.F.R.), Sections 17.22(b)(2) and 17.32(b)(2))], require that an HCP specify the procedures to be used for dealing with changed and unforeseen circumstances that may arise

during the implementation of the HCP. In addition, the HCP No Surprises Rule [50 CFR 17.22 (b)(5) and 17.32 (b)(5)] describes the obligations of the permittee and the USFWS. The purpose of the No Surprises Rule is to provide assurance to the non-Federal landowners participating in habitat conservation planning under the Act that no additional land restrictions or financial compensation will be required for species adequately covered by a properly implemented HCP, in light of unforeseen circumstances, without the consent of the permittee.

Changed circumstances are defined in 50 CFR 17.3 as changes in circumstances affecting a species or geographic area covered by an HCP that can reasonably be anticipated by plan developers and the USFWS and for which contingency plans can be prepared (e.g., the new listing of species, a fire, or other natural catastrophic event in areas prone to such event). If additional conservation and mitigation measures are deemed necessary to respond to changed circumstances, and these additional measures were already provided for in the plan's operating conservation program (e.g., the conservation management activities or mitigation measures expressly agreed to in the HCP or IA), then the permittee will implement those measures as Habitat Conservation Plan for the Borehole Project Plan Implementation specified in the plan. However, if additional conservation management and mitigation measures are deemed necessary to respond to changed circumstances, and such measures were not provided for in the plan's operating conservation program, the USFWS will not require these additional measures absent the consent of the permittee, provided that the HCP is being "properly implemented" (properly implemented means the commitments and the provisions of the HCP and the Implementing Agreement have been or are fully implemented).

8.2.2 Listing of New Species

If a new species that is not covered by the HCP but that may be affected by activities covered by the HCP is listed under the Act during the term of the section 10(a)(1)(B) permit, the section 10 permit will be reevaluated by the USFWS and the HCP covered activities may be modified, as necessary, to establish that the activities covered under the HCP are not likely to jeopardize or result in the take of the newly listed species or adverse modification of any newly designated critical habitat. PREG, the land lessees, shall implement the modifications to the HCP covered activities identified by the USFWS as necessary to avoid the likelihood of jeopardy to or take of the newly listed species or adverse modification of newly designated critical habitat. The property lessees shall continue to implement such modifications until such time as the Permittee has applied for and the USFWS has approved an amendment of the Section 10(a)(1)(B) permit, in accordance with applicable statutory and regulatory requirements, to cover the newly listed species or until the USFWS notifies the Boring Project Permit in writing that the modifications to the HCP covered activities are no longer required to avoid the likelihood of jeopardy of the newly listed species or adverse modification of newly designated critical habitat. The occurrence of a newly listed species at the Boring Project site during the 1-year permit is unlikely due to the short time when the project will be completed and the short life of the incidental take.

Foreseeable changed circumstances within the Project area of this HCP including the following: the new listing of a species; the discovery of the Zayante Band-winged grasshopper, Santa Cruz wallflower, Ben Lomond spineflower, Ben Lomond Coast Buckwheat, Silversleaf Manzanita, or Santa Cruz cypress at the project site; or natural disasters.

8.2.3 Discovery of Other Currently Listed Species at the Project Site

In the unlikely event that one or more currently listed endangered or threatened species are found at the LWEP site, the applicant will cease project activities that would likely result in take of the newly-discovered listed species and apply for a permit amendment. Because of the short duration of the Project permit, this circumstance is unlikely to occur.

8.2.4 Natural Disasters

Wildfire, erosion, extended drought, earthquake or other natural disaster, may occur. However, the short duration of the permit (i.e., one year) lessens the likelihood that one of these phenomena may cause substantial changes to conservation during the permit period. Furthermore, some types of changed circumstances, for example a wildfire, may actually enhance habitat values for the GTP in the long term because these annual plants seem to thrive in disturbed areas, and can regenerate well after such fires. Winter storms or earthquakes could cause landslide or erosion problems in habitat areas that would require subsequent repairs, such as slope stabilization, repair of fencing, and revegetation. A portion of the fees encumbered for conservation of the covered species include contingency funds to cover the costs of unexpected repairs, or habitat restoration that may be required as a result of any natural disasters.

8.3 Unforeseen Circumstances

Unforeseen circumstances are defined in 50 CFR 17.3 as changes in circumstances that affect a species or geographic area covered by the HCP that could not reasonably be anticipated by plan developers and the USFWS at the time of the HCP's negotiation and development and that result in a substantial and adverse change in status of the covered species. The purpose of the No Surprises Rule is to provide assurances to non-Federal landowners participating in habitat conservation planning under the Act that no additional land restrictions or financial compensation will be required for species adequately covered by a properly implemented HCP, in light of unforeseen circumstances, without the consent of the permittee. In case of an unforeseen event, the permittee shall immediately notify the USFWS staff who have functioned as the principal contacts for the proposed action. In determining whether such an event constitutes an unforeseen circumstance, the USFWS will consider, but not be limited to, the following factors: size of the current range of the affected species; percentage of range adversely affected by the HCP; percentage of range conserved by the HCP; ecological significance of that portion of the range affected by the HCP; level of knowledge about the affected species and the degree of specificity of the species' conservation program under the HCP; and whether failure to adopt additional conservation measures would appreciably reduce the likelihood of survival and recovery of the affected species in the wild. If the USFWS determines that additional conservation and mitigation measures are necessary to respond to the unforeseen circumstances where the HCP is being properly implemented, the additional measures required of the permittee must be as close as possible to the terms of the original HCP and must be limited to modifications within any conserved habitat area or to adjustments within lands or waters that already set-aside in the HCP's operating conservation program. Additional conservation and mitigation measures shall involve the commitment of additional land or financial compensation or restrictions on the use of land or other natural resources otherwise available for development or use under original terms of the HCP only with the consent of the permittee. Thus, in the event that unforeseen circumstances adversely affecting the Borehole Project occur during the term of the requested incidental take permit, PREG would not be required to provide additional financial mitigation or implement additional land use restrictions above those measures specified in the HCP, provided that the HCP is being properly implemented. This HCP expressly incorporates by reference the permit assurances set forth in the revised (USFWS, 2004) Habitat Conservation Plan Assurances ("No Surprises") Rule (50 CFR Part 17).

8.4 Amendments

8.4.1 Minor Amendments

Minor amendments are changes that do not affect the scope of the HCP's impact and conservation strategy, change amount of take, add new species, and change significantly the boundaries of the HCP. Examples of minor amendments include correction of spelling errors or minor corrections in boundary descriptions. The minor amendment process is accomplished through an exchange of letters between the permit holder and the USFWS's Ventura Field Office.

8.4.2 Major Amendments

Major amendments to the HCP and permit are changes that do affect the scope of the HCP and conservation strategy, increase the amount of take, add new species, and change significantly the boundaries of the HCP. Major amendments often require amendments to the USFWS's decision documents, including the NEPA document, the biological opinion, and findings and recommendations document. Major amendments will often require additional public review and comment.

8.5 Suspension/Revocation

The USFWS may suspend or revoke their respective permits if Acciona North America (PREG) fails to implement the HCP in accordance with the terms and conditions of the permits or if suspension or revocation is otherwise required by law. Suspension or revocation of the Section 10(a)(1)(B) permit, in whole or in part, by the USFWS shall be in accordance with 50 CFR 13.27-29, 17.32 (b)(8).

8.6 Permit Renewal

The applicants request a permit duration of one (1) year. This period of time should provide that the covered activities associated with the proposed Project can be completed prior to permit expiration. Upon expiration, the Section 10(a)(1)(B) permit may be renewed without the issuance of a new permit, provided that the permit is renewable, and that biological circumstances and other pertinent factors affecting covered species are not significantly different than those described in the original HCP. To renew the permit, PREG shall submit to the USFWS, in writing: a request to renew the permit, along with reference to the original permit number; certification that all statements and information provided in the original HCP and permit application, a description of any take that has occurred under the existing permit; and a description of any portions of the project still to be completed, if applicable, or what activities under the original permit the renewal is intended to cover. If the USFWS concurs with the information provided in the request, it shall renew the permit consistent with permit renewal procedures required by Federal regulation (50 CFR 13.22). If PREG files a renewal request and the request is on file with the issuing USFWS office at least 30 days prior to the permits expiration date, the permit shall remain valid while the renewal is being processed, provided the existing permit is renewable. However, PREG may not take listed species beyond the quantity authorized by the original permit. If PREG fails to file a renewal request within 30 days prior to permit expiration, the permit shall become invalid upon expiration. PREG must have complied with all annual reporting requirements to qualify for a permit renewal.

8.7 Permit Transfer

In the event of a sale or transfer of ownership of the property during the life of the permit, the following will be submitted to the USFWS by the new owner(s): a new permit application, permit fee, and written documentation providing assurances pursuant to 50 CFR 13.25 (b)(2) that the new owner will provide sufficient funding for the HCP and will implement the relevant terms.

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APPENDIX A

Invoices for Minimization Measures Already Completed

Attachment 3

Comment Set 4: Erinn Wilson, Environmental Program Manager, California Department of Fish and Wildlife

State of California – Natural Resources Agency
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June 14, 2019

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Subject: **Comments on the Draft Supplement Environmental Impact Report for the Proposed Strauss Wind Energy Project (SCH#2018071002; 16CUP-00000-00031; 18CDP-00000-00001; 18VAR-00000-00002; 18EIR-00000-0001), County of Santa Barbara**

Dear Ms. Pfeifer:

The California Department of Fish and Wildlife (CDFW) received a Draft Supplement Environmental Impact Report (SEIR) from the County of Santa Barbara (County) as lead agency for the Proposed Strauss Wind Energy Project (Project) pursuant the California Environmental Quality Act (CEQA) and CEQA Guidelines.[1] CDFW also provided a comment letter on August 18, 2018, for the Notice of Preparation of this SEIR.

Thank you for the opportunity to provide comments and recommendations regarding those activities involved in the Project that may affect California fish and wildlife resources. We appreciate the opportunity to provide comments regarding those aspects of the Project that CDFW may be required to carry out or approve through the exercise of its own regulatory authority under the Fish and Game Code or through public trust.

CDFW's Role

CDFW is California's Trustee Agency for fish and wildlife resources and holds those resources in trust by statute for all the people of the State [Fish & Game Code, §§ 711.7, subdivision (a) & 1802; Public Resources Code, § 21070; CEQA Guidelines, § 15386, subdivision (a)]. CDFW, in its trustee capacity, has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species (Id., § 1802). Similarly, for purposes of CEQA, CDFW is directed to provide biological expertise (as available) during public agency environmental review efforts, focusing specifically on projects and related activities that have the potential to adversely affect state fish and wildlife resources.

CDFW is also submitting comments as a Responsible Agency under CEQA (Public Resources Code, § 21069; CEQA Guidelines, § 15381). Permit applications (1600-2018-0314-R5 and 2081-2018-0065-05) have been submitted for the Project, and CDFW will need to exercise

1 CEQA is codified in the California Public Resources Code in section 21000 et seq. The "CEQA Guidelines" are found in Title 14 of the California Code of Regulations, commencing with section 15000.

regulatory authority as provided by the Fish and Game Code, including (but not limited to) lake and streambed alteration (Fish & Game Code, § 1600 *et seq.*) and the California Endangered Species Act (CESA) (Fish & Game Code, § 2050 *et seq.*).

Project Description and Summary

Objective: Strauss Wind, LLC, an affiliate of BayWa r.e. Wind, LLC, proposes to construct and operate a 102 megawatt (MW) wind energy facility south of the City of Lompoc. The Project's Wind Site is located on 2,970 acres, consisting of 11 properties, and the Project's transmission line corridor would be located on 11 properties, starting at the Wind Site and running east and northeast to the City of Lompoc. The major components of the project include:

Major components of the Project include:

- Construction and operation of up to 30 Wind Turbine Generators (WTGs) up to 492 feet tall;
- Development of 14.3 miles of new access roads;
- Construction of an approximate 1.4-acre switchyard;
- Widening of 16.1 miles of existing non-County roads at the wind farm site and along the transmission line;
- Modifications to San Miguelito Road;
- Construction of communication system and meteorological towers;
- Construction and maintenance of on-site electrical lines, an approximate 1-acre substation, and an approximate 0.4-acre operations and maintenance building;
- Construction of a new 7.3-mile, 115-kilovolt (kV) transmission line to interconnect with the Pacific Gas and Electric (PG&E) electric grid;
- Installation of 8.6 miles of 115-kilovolt (kV) transmission line from the on-site substation to Pacific Gas & Electric (PG&E) Cabrillo Substation in Lompoc and upgrades to the PG&E substation for interconnection;
- Reconductor (replacing wires and possibly poles) for 0.6 miles along PG&E's existing Manville 115-kV power line from the proposed switchyard to PG&E's Cabrillo substation in the City of Lompoc; and,
- Upgrades to the Cabrillo substation.

Stauss Wind, LLC has long-term lease agreements with the property owners of the 2,988 acres. The Project would have an aggregate electrical generating capacity of 102 megawatts MW, which would supply approximately 44,700 homes with electricity per year.

Location: The Project is located on approximately 2,988 acres of rural land accessed via San Miguelito Road. The Project site is currently zoned for agriculture and situated on coastal ridges approximately 3 to 5 miles southwest of the City of Lompoc, Santa Barbara County. The proposed Project is located within the Santa Ynez Mountains along the coast between Jalama Beach and Point Arguello. The southern Project boundary is situated within the coastal zone. The Project area is bounded by Vandenberg Air Force Base (VAFB) to the south and west and private property to the north and east. Surrounding land uses include rangelands to the north, west, and south and a diatomite mine to the east.

Habitat types on-site with the potential to be impacted by the Project include coastal scrub, freshwater marsh, riparian scrub, eucalyptus woodland, live oak woodland, native and annual

grassland, native perennial grassland, and ruderal. Project impacts include an estimated permanent removal of 42.9 acres of habitats and temporary removal of 126.6 acres of habitats (for WTG and power pole installation and construction staging and underground lines).

Wildlife with the potential to be impacted by the Project from construction and/or operational activities include: the federal and state endangered and state fully protected unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*); the federal endangered El Segundo blue butterfly *(Euphilotes battoides allyni);* the federal threatened and state Special Species of Concern (SSC) California redlegged frog (*Rana aurora draytonii*); the federal and state endangered Gaviota tarplant (*Deinandra increscens* ssp. *villosa);* the California SSC San Diego desert woodrat (*Neotoma lepida intermedia),* coast horned lizard (*Phrynosoma coronatum frontale),* and silvery legless lizard (*Anniella pulchra pulchra);* and, the California Native Plant Society List 1B mesa horkelia (*Horkelia cuneata puberula),* black-flowered figwort (*Scrophularia atrata),* and Kellogg's horkelia (*Horkelia cuneata sericea).*

Wildlife with the potential to be impacted by the Project from construction and/or operational activities including WTG and power line strikes include: the state endangered and fully protected American peregrine falcon (*Falco peregrinus anatum*); the state fully protected and SSC golden eagle (*Aquila chrysaeto);* the state fully protected white-tailed kite (*Elanus caeruleus);* and 11 additional bird species and 5 bat species that are SSC.

Comments and Recommendations

CDFW is in the process of issuing the Incidental Take Permit (ITP) under CESA for this Project. In processing the ITP, we have had regular and ongoing meetings with Strauss Wind, LLC (Applicant) to resolve data gaps and complete the appropriate analysis for the Gaviota tarplant. While that process is ongoing, the ITP cannot be finalized until the SEIR is certified. CDFW appreciates the efforts taken to date by the Applicant to address our data needs and expect that many of the following comments regarding Gaviota tarplant will be addressed during the CESA process.

CDFW offers the comments and recommendations below to assist the County in adequately identifying, avoiding and/or mitigating the Project's significant, or potentially significant, direct and indirect impacts on fish and wildlife (biological) resources. Editorial comments or other suggestions may also be included to improve the document. 4.1

For impacts demonstrated to be unavoidable in the SEIR, CDFW recommends the measures or revisions below be included in a science-based monitoring program (with adaptive management strategies) as part of the Project's mitigation, monitoring, and reporting program (Public Resources Code, § 21081.6).

Comments Requesting Clarification

1) Leach Lines: Section 4.12 of the SEIR states that two 100-foot-long leach lines will be located "just north of the O&M facility in native soil." The Hydrology and Water Quality section of the SEIR, Table 4.12-1 states, "Groundwater. The Project would not substantially deplete groundwater supplies or interfere with groundwater recharge. Effluent from facility drains would be disposed of through a proposed leach line system." However, the Project Description in the Biological Resources section does not mention a 4.2

leach line as being a component of the Project or analyze potential biological effects.

The location of the leach lines is proximal to known populations of listed Gaviota tarplant and could potentially be impacted by leachate generated from the Project. Increased surface or shallow subsurface moisture would have an effect, either directly or indirectly, by facilitating invasive ant establishment, allowing competing plants/perennial plant to crowd out the annual Gaviota tarplant, and changing existing shallow, soil hydrology. CDFW recommends the SEIR identify and evaluate alternative locations and technologies to the proposed leach lines that would avoid or minimize potential impacts to Gaviota tarplant. **4.2** *cont.*

2) Vegetation Classification – Survey Season: The SEIR states "[t]he following minimum vegetation mapping units applied during vegetation mapping: 0.5–1.0 acre for inaccessible areas of the site due to steep terrain and poison oak (*Toxicodendron diversilobum*). Appendix C2. If vegetation observed did not meet the membership rules of the vegetation communities in these sources, a new name was recorded based on the dominant species observed, consistent with the MCV2 Veg mapping for the 100-foot wide Transmission line corridor, 60-foot wide vehicle access corridor was conducted on May 16, 29, 30, 31, 2018, and June 6, and 7, 2018."

   The dates indicated in the SEIR are late in the plant survey season. This could explain why the Manual of California Vegetation alliances could not be determined in some cases, resulting in many missed or misidentified herbaceous annuals. We recommend that these areas be re-mapped with the results included in the final SEIR. **4.3**

3) Mapping Effort: Appendix C3, Page 123 states "[i]t is highly likely that precise plant community mapping efforts would yield a greater number of more specific plant communities." The SEIR should clarify if the mapping effort used in the analysis is adequate to make a complete assessment of impacts to sensitive vegetation communities. CDFW is concerned if additional mapping prior to impacting habitat is needed to accurately determine project impacts and mitigation.

4) Gap Areas – December Surveys: Appendix C5 (Gap Area Survey Report) indicates that surveys, including vegetation mapping, for the Gap Areas (that were not included in previous biological surveys) were conducted in December of 2018. Annual plant species that could dominate many vegetation communities are typically dormant and easily misidentified during December. Therefore, CDFW is concerned that the December surveys result in less accurate mapping than if surveyed during the optimal time for detection.

5) Gap Areas – Native Stands: California's grasslands and flower fields vegetation types are among the most difficult to analyze and study. The greatest challenge comes from the variation in species composition and abundance from early to late season and between years. Researchers and consultants have tended to underestimate the significance of native herbaceous plants because they are frequently at their highest cover either very early or very late in the season and may have very low cover during the spring and summer, when non-native grasses dominate and when field work is often performed. Additionally, in some years, a given area may be characterized by an abundance of non-native forbs and grasses, while in other years native herbs may **4.4**

dominate. Given this inter-seasonal and inter-annual variance of cover between the diagnostic species and the less diagnostic species, identification of herbaceous vegetation should be more broadly inclusive for nativity. Specifically, relative cover as low as 10 percent natives could be considered as a native stand (CDFW, 2019).

Accurate mapping of vegetation communities during the optimal time of year is important for full disclosure. This allows the Project to adequately assess impacts and determine appropriate avoidance, minimization, and mitigation for sensitive vegetation communities. CDFW believes the 10 percent relative cover threshold would be more appropriate to determine native vegetation due to the timing of the gap surveys and the inter-seasonal and inter-annual variance of cover vegetation at the Project site. **4.4** *cont.*

6) Transmission Line Corridor: Plant communities in the proposed transmission line corridor appear to have not been mapped (SEIR Page 89). However, Appendix C states the transmission line corridor has been mapped. Please clarify this inconsistency. The omission of mapping and accurate determination of impacts in these areas may significantly underestimate the proposed impact to sensitive vegetation communities in the SEIR. **4.5**

7) White Lights: To minimize impacts to avian species, CDFW recommends (consistent with Federal Aviation Administration [FAA] requirements) that the minimum number pilot warning "white" lights be utilized for the Project. The white lights should use the longest permittable duration between flashes or strobes. White strobe lights have been shown to be comparatively less disruptive to night-migrating birds than red or non-strobe lighting (USFWS, 2007). **4.6**

Project Description

Comment #1: Gaviota Tarplant Analysis

Issue: There are seven identified populations of Gaviota tarplant: Lion's Head (near Point Sal), Point Arguello, Tranquillion Mountain/Sudden Peak, Point Conception, Hollister Ranch, Santa Ynez Mountains, and Gaviota (USFWS, 2011). The Project proposes impacts to the Tranquillion Mountain/Sudden Peak population of Gaviota tarplant. This population contains a substantially larger number of individuals – more than all of the other six recorded populations combined (Table 1).

Table 1. Gaviota Tarplant Populations **4.7**

Population	Maximum Number of Recorded Individual Plants*
Lion's Head (near Point Sal)	611
Point Arguello	750
Tranquillion Mountain/Sudden Peak	5,008,360
Point Conception	10,230
Hollister Ranch	1,101
Santa Ynez Mountains	700
Gaviota	1,200

*Data from CNDDB, corrected to only include *Dienandra increscens villosa*

As shown in the above table using data from the California Natural Diversity Database (CNDDB), the Project proposes to impact the entire Tranquillon Mountain/Sudden Peak population of Gaviota tarplant, except for approximately 12 acres and 202 plants outside of the Project footprint (Occurrences 24, 29, and 30; Table 2). The Tranquillion Mountain/Sudden Peak is a major core population for this species. To assess species impacts, CDFW evaluates both direct and indirect impacts to Gaviota tarplant that could affect the quality, health, and long-term outlook (viability) of an occurrence/population.

Table 2. Occurrences that Comprise the Tranquillion Mountain/Sudden Peak Population
(Grey Shading Denotes Project Impacts to Population)

Occurrence	Acreage	Number of Individuals	Project Impacts Acres / Percent		Project Impact Individual Tarplants	
18	149.2	3,729,112	24	16%	616,120	17%
24	10	~200				
25	9	1	*	*	*	*
26	24.3	10,391	1	4%	2,067	20%
27	7.6	230,975	1.7	22%	56,597	25%
28	9.5	492,660	0.4	4%	54,079	11%
"Estimated"	14.1	545,019	14.4	100%	545,019	100%
29	1	1				
30	1	1				
Total	232	5,008,360	41.4	18%	1,273,882	26%
* CNDDB maps Occurrence 25 on the Project site near turbine N-9, this occurrence is not included in the SEIR maps or data submitted to CDFW						
Data in Table is from CDFW and USFWS records						

4.7 *cont.*

Specific Impact:

1) The SEIR appears to limit the impact analysis for Gaviota tarplant to the acreage being directly graded. However, this approach can substantially underestimate the total impact to this species. Other potential impacts to Gaviota tarplant include altered surface hydrology, shading, vibration, reduced patch size, genetic viability as affected by small (or biologically isolated/fragmented) population size, loss of reproductive vigor in small populations or patch sizes, stochastic (random) extirpation/extinction events due to the small size and isolation of the species, increased fire risk, effects from invasive ants and plant species, effect on pollinators including from tower vibration, changes in wind speed from turbines, and night lighting.

   Isolation/Fragmentation – Turbines, roads, and other Project disturbances have the potential to impact every occurrence of Gaviota tarplant on the Project directly, overtime (indirectly), and cumulatively. One of CDFW's major concerns is that the Project has been designed to often bisect an occurrence, fragmenting it, and creating small islands of isolated individuals. Based on review of the SEIR (Section 4.5), it appears that the impact analysis and calculations only capture the soil disturbance limit. It is unclear how fragmentation, isolation, edge effects, reduced pollination and other such impacts that could occur to the remaining disturbed mosaic of Gaviota tarplant have been accounted. The many occurrences of Gaviota tarplant proposed for avoidance would be left in smaller, isolated patches surrounded by structures and edge disturbance.

Pollination – Studies indicate that if pollinator habitat within 1,000 m of host plants is eliminated, seed set of plant species may be decreased by as much as 50 percent. Additional studies suggest that the degradation of pollinator habitat is likely to adversely affect the abundance of pollinator species (Jennersten, 1988; Rathcke and Jules, 1993).

Surface Hydrology – Runoff from pads, roads, compacted edges of roads, buildings, and other facilities may significantly alter the surface hydrology that currently supports the Gaviota tarplant on the Project site. Collecting surface water from concrete pads and structures and diverting it to a basin would alter the local surface and subsurface soil moisture/hydrology in the drainage sub-basins that supports the Gaviota tarplant.

Heat Island Effect – The heat island effect from large developed concrete structures will modify the microclimate of the Gaviota tarplant occurrences.

4.7 *cont.*

2) CDFW is concerned that the Project, as designed, will directly and/or indirectly impact all but 5 percent of the Tranquillion/Sudden Peak Gaviota tarplant population. This would substantially reduce the species' resiliency to adapt and persist under climate change. Of the seven populations of Gaviota tarplant recognized (USWFS, 2011), five occur on coastal terraces, which are at risk of erosion due to predicted sea level rise from climate change. The population on the Project site is the largest one of two known populations that are not located on coastal terraces subject to sea level rise and are located at the species' higher elevations. The Project proposes to impact nearly the entire Tranquillion Mountain/Sudden Peak population, leaving the small Santa Ynez Mountains population of 700 plants as the only other high elevation population considered safe from sea level rise impacts.

Why Impact Would Occur: The Project initially appears to avoid roughly 80% of the tarplant acreage which is estimated to correlate to 74% of individual plants. However, when considering habitat fragmentation, edge effects, invasive species proliferation, and the loss of pollinator availability, the impact acreage is substantially greater than that currently disclosed in the SEIR.

Evidence Impact would be significant:
Isolation/Fragmentation – The conservation of Gaviota tarplant is dependent upon several factors that include (but are not limited to):

4.8.

- The protection and management of existing populations and the habitat which supports them;
- The maintenance of areas of sufficient size and configuration to sustain natural ecosystem components, functions, and processes (e.g., full sun exposure, natural fire and hydrologic regimes, adequate biotic balance to prevent excessive herbivory);
- Protection of existing substrate continuity and structure, connectivity among groups of plants within geographic proximity to facilitate gene flow among the sites through pollinator activity and seed dispersal; and,
- Sufficient adjacent suitable habitat for vegetative reproduction and population expansion.

Since the proposed on-site open space area would be surrounded by existing and potential future development, trails, and irrigated slopes, the value of the on-site open space will be dramatically reduced for native plants and animals. Studies have demonstrated that habitat patches that are road-less and inaccessible to humans serve to better conserve many target

species than do areas with roads and accessible habitat patches (National Research Council, 1995). Additionally, studies show that habitat remnants from 24 to 247 acres do not retain their complement of native vertebrate species for longer than a few decades, leading to collapse of the ecosystem (Soule, 1992).

A smaller patch size also becomes subject to greater influences of edge effect. These include Argentine ant invasions known to occur when irrigation is introduced, as well as competition from non-native species, heat island effect, shading, noise, lighting, human disturbance, fuel modification, and not having enough land to properly respond to climate pressures and/or carry out all parts of a lifecycle, including pollinator support (Menke, 2007; Mitrovich, 2010; Lach, 2008; Tanowitz, 1982; B. Baldwin, 2001).

Large concrete slabs, paving, trails, debris basins, housing structures, v-ditches, and irrigated areas retain moisture in the soil. Invasive Argentine ants thrive in this perennially moist zone. Invasion and establishment of Argentine ant colonies may occur due to soil disturbance, introduction of hardened surfaces (paving, cement, storm drains and structures), and irrigation (Menke, 2007). Sites within 200 meters (656 feet) of urban areas are more likely to have been invaded by Argentine ants (Mitrovich, 2010). This is significant because Argentine ants negatively impact and displace native ants, altering the ecosystem. Studies show native honeybees spend 75 percent less time foraging on inflorescences with Argentine ants, reducing seed production and long-term population viability of native plants (Lach, 2008).

Pollination – Gaviota tarplant depends on the successful transfer of pollen between plants in order to produce seeds. Gaviota tarplant are self-incompatible (Tanowitz, 1982; B. Baldwin, 2001), meaning that self-fertilization is impossible, and insects are necessary for the transfer of pollen. This type of incompatibility system that tarplant species possess (sporophytic) makes their ability to reproduce particularly vulnerable to loss of genetic variation within and between populations (B. Baldwin, 2001).

4.8
cont.

Tarplant pollinators observed on the flowers of Gaviota tarplant include several species of flies, bees, skippers, and butterflies (Tanowitz, 1982; Howald, 1989; Niehasus, 1971). Studies to quantify the distance that bees will fly to pollinate their host plants are limited in number, but the few that exist show that some bees will routinely fly 100 to 500 m (328 to 984 ft) to pollinate plants. Some bees have known to fly at least 1,000 m (3,280 ft) to pollinate flowers (Steffan-Dewenter and Tscharntke 2000).

Surface Hydrology – The removal of habitat can significantly change the local soil hydrology by altering the "soil hydraulics" or redistribution of moisture in the root zone (Meinzer, 2004).

Heat Island Effect – Thermal regimes affect habitat quality and biogeochemical processes. An increase in temperature of 1.5 degrees Celsius has been shown to induce earlier flowering time (Primack, 2004). This can be significant as blooming is timed to coincide with maximum pollinator availability, and Gaviota tarplant rely on successful pollination to produce viable seed.

Recommended Potentially Feasible Mitigation Measure(s):

CDFW recommends the SEIR include an analysis of how Project impacts would affect the status of Gaviota tarplant throughout its range. This includes geographic/geologic setting, spatial distribution from the coast, elevation ranges, and potential impacts to the species from

sea level rise. To provide an adequate analysis of the magnitude and extent of the proposed impact/taking to Gaviota tarplant, we recommend:

1) An evaluation of the Project's impacts on the long-term persistence of Gaviota tarplant as a species. This should include how proposed impacts would affect the ability to provide stable, healthy, higher elevation populations of the species that would not be at risk from climate change, including rising sea level estimates.

2) An assessment of impacts that will result from Project improvements and surface water flow to Gaviota tarplant occurrences/polygons. Both the pre- and post-surface drainage flow analysis and supporting exhibits should be disclosed to demonstrate how the Project could impact subsurface flows and related water availability for Gaviota tarplant.

3) An analysis with supporting evidence that Project roads, turbine pads, and other facilities have been located to avoid or minimize impacts to Gaviota tarplant to the maximum extent practicable. Section 15126.6(a) of the CEQA Guidelines states that an EIR should describe "alternatives to the Project, or to the location of the Project, which would feasibly attain most of the basic objectives of the Project but would avoid or substantially lessen any of the significant effects of the Project, and evaluate the comparative merits of the alternatives." Section 15126.6(f) of the CEQA Guidelines, the "Rule of reason", requires, "The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the Project. Of those alternatives, the EIR need examine in detail only the ones that the lead agency determines could feasibly attain most of the basic objectives of the Project." **4.8 cont.**

   CDFW believes there are feasible alternatives that would meet most of the Project objectives and significantly reduce impacts to the listed Gaviota tarplant. Such alternatives include engineering modifications to avoid bisecting/fragmenting occurrences of Gaviota tarplant (e.g., occurrences 18, 25, 26, 27 and 28), alternative wind energy technologies, alternative locations, undergrounding power lines to reduce fire risks, and Project phasing based on accuracy of tarplant surveys and mapping.

4) CDFW recommends conserving a buffer of 1,000 meters around any population that is proposed as mitigation or identified as "avoided" until site-specific studies on Gaviota tarplant pollinators have been conducted to demonstrate that less than 1,000 meters would be sufficient for the on-site populations.

5) For CESA compliance, it will be necessary to demonstrate Project design features that include measures taken to avoid and minimize the proposed taking of the species. Populations that will be impacted will need sufficient evidence to demonstrate/document impacts were minimized to the extent feasible. Areas proposed as conservation for unavoidable impacts will need to demonstrate long-term viability with adequate preserve design and buffer (i.e., large blocks of habitat with no or minimal edge effects).

Comment #2: Inconsistency and Reliability of Gaviota Tarplant Impact Acreage

Issue: **4.9**

1) Impacts disclosed in the SEIR do not appear consistent with the Incidental Take Permit (ITP) application data provided to CDFW on February 2, 2019.

2) It is unclear how the impacts disclosed in the SEIR correlate to the estimated individuals associated with a numbered occurrence.

3) Based on the surveys completed for Gaviota tarplant, it is unclear if the correct plant (*Dienandra increscens subsp. villosa*) was reliably identified, or if *Dienandra increscens subsp. increscens* or *Deinandra paniculata* were mistakenly identified as *D. increscens villosa.*

Specific Impact: The following information was provided for impacts to Gaviota tarplant and its habitat:

- Page 4.5-38 states that construction would result in 10.3 acres (8.1% of site total) of permanent and 22.3 acres (17.4% of site total) of temporary loss or disturbance to Gaviota tarplant and its habitat (total impact of 32.6 acres). Occasional disturbance to small areas of Gaviota tarplant habitat may occur as a result of operations or maintenance activities involving clearing or vehicle operation in occupied habitat.

- Page 4.5-63 of the SEIR states: "[a] total of 27.1 acres of permanent impacts to Gaviota tarplant occupied habitat would occur from construction of the SWEP [Strauss Wind Energy Project] (14.2 percent of site total), compared with 10.3 acres under the LWEP [Lompoc Wind Energy Project]."

- The SEIR, Appendix C, states (Page 5-84) "[t]he development and operation of the turbines and access roads would result in the conversion of 6.3 acres of permanent impacts, 12.93 acres of temporary impacts for a total of 19.23 acres of suitable habitat for Gaviota tarplant, outside of critical habitat. There would be 26.32 acres of permanent impact and 71.16 acres of temporary impacts within critical habitat associated with over widened roads to accommodate construction equipment. The total 97.48 acres of temporary and permanent impacts are located in the 791-acre Sudden Bench Unit of designated critical habitat for Gaviota tarplant (Sapphos, 2018). The entire 791-acre Sudden Peak Unit of critical habitat for Gaviota tarplant is located within the Project site."

- SEIR Page 4.5-65, BIO-5b states that impacts to Gaviota tarplant habitat during operations and maintenance would be the same as described in the LWEP EIR; however, the acreage is not provided in the SEIR.

- The information provided to CDFW by the Applicant includes an additional 14.4 acres and 545,019 individual Gaviota tarplants of "estimated impacts". However, these numbers were not included in the SEIR analysis.

- The ITP Application submitted to CDFW states that there will be 39.5 acres of permanent impacts and 1.9 acres temporary impacts (41.4 total) to Gaviota tarplant. In addition, the maps provided to CDFW appear to have several locations depicting Gaviota tarplant impacts that are not included in the SEIR impact analysis, or the Map on Page 98 of the SEIR.

4.9 *cont.*

The inconsistency of the impact acreage for Gaviota tarplant results in an unreliable baseline from which Project impacts are analyzed in the SEIR. This creates a potential situation where impacts to Gaviota tarplant in certain locations may be significantly underestimated while the areas proposed to be avoided or conserved overestimated.

Why Impact Would Occur: Grading, vegetation removal, and other ground disturbances could crush and bury listed plants, including Gaviota tarplant, resulting in direct mortality. Additionally, given the expertise necessary to ensure confidence in accurately identifying Gaviota tarplant and its complex genetic relationship, CDFW is concerned that accurate identification of Gaviota tarplant may not have occurred in all instances. The accurate identification of all the species and subspecies of Dienandra is vital to enable CDFW to determine the extent of impacts. This allows CDFW and the Lead Agency to fully analyze avoidance, minimization, and mitigation measures proposed. Accurate distribution and abundance data for Gaviota tarplant (baseline data) is critical for the analysis in the SEIR. Avoiding areas with higher densities of Gaviota tarplant is more biologically valuable than avoiding or preserving areas that contain other Dienandra species or higher percentage of non-Gaviota tarplant.

Evidence Impact would be significant: The SEIR does not provide adequate disclosure of the impacts for CDFW to conclude the proposed mitigation measures fully mitigate the impacts to Gaviota tarplant, which is required under CESA (Sections MM BIO-5a and MM BIO-6). This may create a consistency/adequacy issue where CDFW is acting as a Responsible Agency with related CEQA actions. CDFW considers any Project-related development activity (both direct and indirect) that would impact the ability of Gaviota Tarplant to persist long-term as "take" under CESA. 4.9 *cont.*

Recommended Potentially Feasible Mitigation Measure(s):

Mitigation Measure #1: CDFW recommends the SEIR include an updated baseline and impact analysis with supporting mapping to clarify the acreage and extent of impacts to Gaviota tarplant, including the estimated impact areas disclosed to CDFW as part of the ITP application. This analysis should include an account of the locations, accurate occurrence/polygon sizes, and the number of plants that would be impacted. This updated baseline and analysis is needed to allow the public and decision-makers a meaningful review and the ability to weigh the avoidance and mitigation measures and alternatives with the totality of the direct and indirect impacts (CEQA Guidelines, § 15088.5[a][4]).

Mitigation Measure #2: Surveys completed for Gaviota tarplant should be conducted by botanists with expertise in *Dienandra* identification. A documentation of voucher specimens collected, including the voucher identification number, should be provided so experts can verify the correct identification was made. The proper identification/verification of Gaviota tarplant is critical to establishing an accurate baseline from which impacts from the proposed Project can be analyzed in the SEIR.

Comment #3: Gaviota Tarplant Avoidance and Minimization

Issue: The Project impacts every occurrence of Gaviota tarplant on the Project site. Since all occurrences have some level of impact, the overall quality and viability of this core population of Gaviota tarplant would still incur some cumulative level of impact. 4.10

Specific Impact: The SEIR appears to only count impacts to Gaviota tarplant from direct grading. However, the Project also indirectly impacts the rest of the occurrences through edge effect and other impacts mentioned above (see Comment #1: Gaviota Tarplant Analysis). Impacting portions of an occurrence, especially bisecting a polygon down the middle, impacts the entire polygon.

Why Impact Would Occur: Without species verification and additional survey work, the long-term viability of the areas/acreage identified in the SEIR cannot be scientifically substantiated. In addition, avoidance/preservation of Gaviota tarplant without considering a suitable buffer (see Comment #1; Gaviota Tarplant Analysis – "Evidence Impact would be significant") also reduces the long-term viability of the ""avoided" occurrences of on-site Gaviota tarplant.

Evidence Impact would be significant: Inadequate avoidance, minimization, and mitigation measures for impacts to these listed species will result in the Project continuing to have a substantial adverse direct, indirect, and cumulative effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW or United States Fish and Wildlife Service (USFWS).

Recommended Potentially Feasible Mitigation Measure(s): 4.10 *cont.*

Mitigation Measure #1: There appears to be viable alternatives for turbine placements, which would result in complete avoidance of Occurrences 27 and 28. These alternatives would also avoid undisclosed "estimated impacts" to Occurrence 27 and 28, as described in the ITP Application for the Project. CDFW recommends the County evaluate these alternatives that would meet most of the Project objectives and significantly reduce impacts to the listed Gaviota tarplant.

Mitigation Measure #2: The SEIR should include alternatives that leave wholly intact occurrences of Gaviota Tarplant, surrounded on all sides by a suitable (1,000 m) buffer. Relocating turbines that are the last of a string, or that terminate in a spur that impact Gavoita ttarplant, such as W-8, W-7, N-7 and E-1, would allow whole occurrences of the species to be avoided. These turbines can potentially be added in other portions of the Project to mitigate the loss of energy production, using some of the locations included in the Lompoc Wind Project that are not located within occurrences of Gaviota tarplant. To help facilitate this analysis, Figure 2-2 (Comparison of LWEP and SWEP) of the SEIR should be updated to include accurate mapping of Gaviota tarplant with supporting calculations.

Comment #4: Incomplete Vegetation Mapping

Issue:

1) Parts of the Project, such as the transmission line, appear to be mapped at a larger scale or not included in vegetation mapping efforts at all. 4.11.

2) Appendix C-3 states "[i]n addition, sawtooth golden bush scrub areas were observed during 2016–2018 field surveys, but their precise area was not mapped" and "[f]urther plant community mapping efforts are needed to quantify the acreage of this vegetation type." CDFW considers *Hazardia squarrosa* Alliance, or sawtooth golden

bush scrub alliance, a sensitive vegetation community ranked S3.

Specific Impact: Some vegetation communities may be misidentified or unidentified, resulting in undisclosed impacts to sensitive habitats.

Why Impact Would Occur: The SEIR contains conflicting information on the completeness of vegetation mapping conducted for the Project. The Project may impact sensitive vegetation communities or wildlife species that depend on these communities due to misidentified or unidentified vegetation classification. Without appropriate disclosure, CDFW is unable to recommend appropriate avoidance, minimization, and/or mitigation measures. If a vegetation community in the Project area has not previously been described, it may be because it is a rare type in that location.

Evidence Impact would be significant: An S3 ranking indicates there are 21 to 80 occurrences of this community in existence in California, S2 has 6 to 20 occurrences, and S1 has less than 6 occurrences. CDFW considers natural communities with ranks of S1 to S3 to be sensitive natural communities that meet the CEQA definition and analyzed in during environmental review (CEQA Guidelines, §§ 15380, 15063, 15065, and § 15125[c]]). Without appropriate vegetation classification, the Project may underestimate or omit impacts to sensitive vegetation and result in substantial adverse direct and cumulative effect, either directly or through habitat modifications, on any sensitive natural communities and S1 to S3 ranked species in local or regional plans, policies, or regulations, or by CDFW or USFWS. **4.11** *cont.*

Recommended Potentially Feasible Mitigation Measure(s):

Mitigation Measure #1: The SEIR should contain an accurate and complete survey assessment of vegetation using verified MCV alliance/association community scientific names and ensure the alliances found on the Project are accurately described.
Mitigation for impacts to S2 ranked vegetation communities should be commensurate with the classification of only 6 to 20 occurrences in California. An list of recognized alliance/association names can be found at https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=153399.

Mitigation Measure #2: CDFW recommends any lands proposed as mitigation to offset impacts to sensitive vegetation communities be preserved and managed in perpetuity under a conservation easement and managed by a qualified entity. The proposed specific mitigation location should be identified in the SEIS to ensure that mitigation is not deferred until some future time; however, the CEQA document "may specify performance standards which would mitigate the significant effect of the project and which may be accomplished in more than one specified way" [[CEQA Guidelines, § 15126.4(a)(1)(B])].

Mitigation Measure #3: CDFW recommends the SEIR provide an analysis of how the proposed mitigation measure would reduce impacts to less than significant, including a discussion on the type of mitigation activity (e.g., creation, restoration, enhancement, preservation, monitoring), mitigation location, size of the mitigation area, management in perpetuity, mechanism for protection, and any other relevant information.

Comment #5: Mitigation Proposed for Gaviota Tarplant **4.12.**

Issue: The SEIR states on page 4.5-64 that "[c]ompensatory mitigation for Gaviota tarplant shall be implemented to offset take; compensation lands will be managed according to the Gaviota Tarplant Mitigation Plan prepared in support of the Incidental Take Permit and Biological Opinion. Permanent disturbance to Gaviota tarplant shall be mitigated at a minimum 3:1 ratio. Areas of temporary disturbance shall be restored to pre-disturbance conditions and compensated at a 3:1 ratio. Temporary impacts to Gaviota tarplant habitat will be mitigated as permanent impacts unless monitoring demonstrates full recovery of Gaviota tarplant occurrences (plant density and extent of occupied area) in the temporarily impacted areas. To account for annual variability, the final density and extent of the Gaviota tarplant occurrence in the restored area can be adjusted to compare to pre-disturbance levels using metrics obtained from a nearby reference population, to demonstrate full recovery has occurred".

Specific Impact: The SEIR does not identify the methodology or location to demonstrate how over 3,821,646 (3:1 ratio) Gaviota tarplant plants would be successfully established and conserved/managed in perpetuity to offset proposed impacts. To implement an experimental approach at the scale proposed on a species that has no documented research raises concerns regarding the ability for this approach to successfully offset project impacts and achieve full mitigation required under CESA [Fish & Game Code, § 2081(b)(2)].

4.12 *cont.*

Transplantation for listed plant species with limited distribution and specific habitat requirements typically results in a high rate of failure. Moving or translocating plants and attempting to reconstruct the community of rare plants that naturally grow is often unsuccessful because the full assemblage and of essential elements, including critical microbial components, is almost never known or reproducible in the field. Due to a currently limited understanding of phenology, reproduction, functional roles, interaction/dependence on microbes, cryptogams, and support plants, transplants [of Gaviota tarplant] may be placed into sites with both biological and physical insufficiencies. A decrease, or loss in genetic diversity may occur if genotypes from diverse sources are mixed, as well as potential outbreeding depression. Research indicates experimentation with vegetation under controlled conditions may have little relevance to natural ecosystems (Fahselt, 2007). For these reasons, transplantation is not considered to be a reliable means of conserving sensitive/listed species or reproducing functional characteristics of natural communities.

Why impact would occur: The analysis in the SEIR relies on future surveys to determine impacts, the preparation of future management plans to avoid/minimize impacts, and mitigation requirements through obtaining permits from other agencies. Without specific performance standards, such as a conceptual restoration plan with performance/success criteria, this is considered, to some degree, as deferred mitigation under CEQA (CEQA Guidelines, § 15126.4). CDFW acknowledges that the issuance of CESA take authorization for Gaviota tarplant would ultimately be implemented through state and federal permits and is under the jurisdiction of another agency to some extent (CEQA Guidelines, § 15091 [a][2]); however, the County has specific requirements for rare plants under its CEQA implementing regulations and land use requirements that necessitates the full disclosure of the above elements in the SEIR. CEQA requires the SEIR to analyze if the Project may have a significant effect on the environment as well as review if the Project will avoid the effect or mitigate to a point where clearly no significant effects would occur (CEQA Guidelines, § 15070 and § 15071).

Considering the body of scientific literature available on the long-term success of transplanting rare plant species (Fiedler, 1991), CDFW considers this practice for Gaviota tarplant at this

scale experimental in nature and not appropriate to meet CESA requirements for full mitigation [Fish and Game Code §2081(b) (2)]. In addition, the lack of knowledge on the specific pollinator of Gaviota tarplant further demonstrates that more research and information is needed before using this approach to offset substantial impacts to the species. However, CDFW does acknowledge that transplanting can be considered as a minimization measure in some instances.

Evidence impact would be significant: CDFW is concerned that the impacts to this important and major population of Gaviota tarplant will still result in a net loss of over 1,273,882 individual tarplant and 41 acres of occupied habitat within the Tranquillion Mountain/Sudden Peak population. The SEIR requirement of 3:1 ratio for mitigation does not specify any location of the mitigation to determine availability of essential components, describe how the proposed 3:1 ratio would be achieved and over what time period, or provide any scientific evidence supporting the basic premise that over 3,821,646 individuals could be successfully created in other locations. CDFW is concerned the extent and magnitude impacts to Gaviota tarplant currently proposed by the Project are potentially unmitigable under CEQA and may not meet the permit issuance criteria under CESA.

Recommended potentially feasible mitigation measure(s):

4.12 *cont.*

Mitigation Measure #1: To analyze if a Project may have a significant effect on the environment, the Project-related impacts, including survey results for species that occur in the Project footprint need to be disclosed in the SEIR. This information is necessary to allow CDFW to comment on alternatives to avoid impacts, as well as to assess the significance of the specific impact relative to the species (e.g., current range, distribution, population trends, and connectivity).

Mitigation Measure #2: CDFW recommends the SEIR look at further avoidance and minimization alternatives. Avoidance should consider leaving intact occurrences with a suitable buffer of at least 1000 meters. To adequately preserve, avoid, and meet the full mitigation standard under CESA [Fish and Game Code §2081(b)(2)], the SEIR should a) ensure a viable reserve that is protected from edge effects, b) include a suitable buffer, c) eliminate or minimize risks from Argentine ants, d) preserve surface and subsurface hydrology, e) provide adequate pollinator support habitat, f) allow for appropriate management activities, and g) allow lateral and elevational migration in response to climate change.

Mitigation Measure #3: Success criteria identified in the SEIR should demonstrate that any mitigation proposed is ultimately self-sustaining (i.e., no maintenance, planting, watering, or weeding required, as this is still considered the installation period) and the population has a positive population trend, for a minimum of 15 years. This recommendation for 15 years is based on the time needed to get a clear population trend for Gaviota tarplant, an annual plant species supported by a seed bank. With annual plant species, the number of individuals present above-ground from one year to the next varies dramatically, depending on factors such as the amount of rainfall, timing of rainfall, and temperature regimes during critical stages of germination and seedling growth. For example, Rindlaub (1998) reported that in 1995 and 1997, Gaviota tarplant was not abundant at the locations it was known to occur at the time (USFWS, 2011). There are some years when patches may contain few to no individuals (Howald 1989), but a seed bank likely persists in the soil.

Comment #6: Groundwater Assessment

Issue:

1) The SEIR indicates that the Project is underlain by a shallow, local aquifer, with average depth to water at 7 feet below ground surface. The SEIR indicates that "[l]ow producing wells in the Project area provide ranchers with a minimal amount of water supply for domestic use and cattle grazing operations. No irrigated agriculture occurs on the SWEF [Strauss Wind Energy Facility] site." The Project proposes to use 20 gallon per minute (GPM) of well water for operations with an estimated lowering of the water table (annual average) of 1 foot. The SEIR appear to only analyze groundwater drawdown in relation to existing 50-foot-deep well heads, without addressing how Project use of groundwater will affect habitat or how the seasonal variation may be affected during dry seasons with pumping.

2) The SEIR includes an alluvial well as an alternative to the proposed groundwater pumping location. This well is located in a broad drainage swale approximately 2,500 feet northeast of the San Miguelito Road and Sudden Road intersection (Figure 2 of the SEIR). The existing alluvial well is located in a channel, and the SEIR indicates there is surface water 1,000 feet upstream of the well and 500 feet downstream of the well. CDFW is concerned with the placement of a new well in a stream due to potential stream dewatering from the well's subsurface cone of depression.

3) The SEIR also indicates that "[t]he upper Gaviota-Sacate sandstone does feed a few springs in the project area. One spring visited during site reconnaissance had been developed for stock water with an EC measuring 620 µmhos/cm. A second spring visited was not flowing but there was vegetative evidence of seeps. These springs emanate from an indurated and locally coarser grained sandstone bed that is above the alluvial valley floor. To tap the spring zone, a well would need to be drilled on the ridge above the valley floor at a distance of roughly 4,000 feet from the O&M site". Based on the information presented in the SEIR, it is not clear if pipelines and/or transmission of water from wells to the Project were included in the impacts to biological resources.

4.13

Specific impacts: The presence of extremely shallow ground water at 7 feet indicates the local water table supports surface vegetation. Phreatophytes, plants with root systems that obtains water from near the water table, on the Project site could be affected by even the 1-foot average draw down predicted by operational use of well water. For example, local shrubs such as California sage (*Artemesia tridentata*) have been documented as having a maximum rooting depth of 9.84 feet and California buckwheat has been documented as having more than 4 feet (https://groundwaterresourcehub.org/gde-tools/gde-rooting-depths-database-for-gdes/).

Installing new wells or increasing the production (duration or volume) of pumping is known to create a subsurface cone of depression. The cone of depression is a local lowering of the water table in response to the pumping action. The land area above a cone of depression is called the area of influence. Groundwater flows towards the well into the cone of depression, which can change the natural direction of groundwater flow within the area of influence around the well. If the cones of depression for two or more wells overlap, there is said to be well interference. This interference reduces the water available to each of the wells. The cone of depression from a

well might extend to a nearby stream or lake. This lowers the water table below the stream or lake level. As a result, the stream or lake begins to lose water to the groundwater aquifer near the well. This is known as induced recharge.

Streams and wetlands can be completely dried up by induced recharge from well pumping. The Oregon Water Resources Department considers wells within 0.25 miles of a stream to have a potential effect on stream flow (Raymond, Jr., 1988). Other sources state streams within a few miles can be affected as well (Penn State University, https://www.e-education.psu.edu/earth111/node/929).

Why impacts would occur: Shallow groundwater directly supports plants whose roots grow to the water table depth. Higher concentrations (sub saturation) soils occur in the area above the saturation point in the vadose zone. Deeper rooted plant roots also serve as a conduit that redistributes water around the local soil (soil hydraulics) thereby increasing the general moisture content of the soil above the groundwater saturation zone, supporting shallower-rooted plants. Removing habitat or altering the groundwater levels can change the "soil hydraulics" or redistribution of moisture in the root zone (Meinzer, 2004).

As long as the stream is hydraulically connected to groundwater [whether gaining or losing], lowering of groundwater levels results in an increase in leakage from the stream (i.e., a depletion in surface flows). When a well or group of wells begins to pump, all pumped water comes from reduction of groundwater storage. As the cone of depression moves and intersects streams, lakes, and springs, the pumped water is increasingly supplied by streamflow depletion. This happens by reducing outflows from the aquifer to these surface water features and/or inducing inflows from these features to the aquifer. Near-stream pumping wells may be particularly problematic from the perspective of stream depletion management. Such wells may approach a nearly direct depletion of stream flow and may do so with relatively little drawdown. Such near stream wells require special analysis to determine what, if any, impacts habitat and stream surface and subsurface hydrology (Hall, 2018).

4.13
cont.

Evidence impacts would be significant: Pumping of groundwater wells often creates a cone of depression around the wellhead. This cone of depression can result in aquifers (that once contributed to surface waters) draining surface waters and reducing instream flows. It can also alter the "soil hydraulics" or redistribution of moisture in the root zone (Kibel, 2018; Meinzer, 2004). Groundwater diversions affecting groundwater dependent habitat not included in specially protected areas is covered by the Public Trust Doctrine (Fish & Game Code, §§ 711.7, subdivision [a] & 1802).

Project water use may result in impacts to vegetation density (e.g., reduced tree canopy, reduced understory) and plant composition (e.g., shifts in vegetation type, such as herbaceous species to shrub species) from changes in groundwater levels from Project wells. Habitat loss (e.g., downed trees) and habitat fragmentation may also be detectable and could result from Project-related changes in groundwater levels. Surface water at seeps and springs, rivers and streams, or wetlands can also decrease in surface area and extent in response to lower groundwater levels. Visually detectable declines in the health of terrestrial vegetation, such as reduced tree canopy, reduced understory, shifts in vegetation type, tree mortality, and habitat fragmentation, could also result from degraded water quality. Degraded water quality due to nutrient loading from groundwater discharge may result in visible algal blooms on surface water bodies. River or stream reaches may also become narrower or drier for longer periods due to

depletions of surface water. The ecosystem services provided by groundwater supported habitat include water purification, soil preservation, carbon sequestration, flood risk reduction, and recreational opportunities. When groundwater is unsustainably managed, ecosystems can suffer, compromising these public benefits and the economic opportunities they provide (Rohde, 2018).

Recommended Potentially Feasible Mitigation Measure(s):

4.13 *cont.*

Mitigation Measure #1: CDFW recommends the SEIR include a detailed analysis about the direct and cumulative effect of any proposed pumping of groundwater to the existing surface habitat. This should include seasonal/monthly data. Wells that do not lower groundwater levels that support stream, wetland, riparian, phreatophytic vegetation, listed plant species, or other habitat dependent on shallow groundwater should be incorporated into the Project. All wells should have a monitoring system including to track and management water withdrawal to avoid/minimize impacts to groundwater dependent vegetation.

Comment #7: Power Lines

Issue: California Public Utilities Commission (CPUC) Fire-Threat Map Adopted by CPUC January 19, 2018, identified the Project area as being in the "elevated risk" fire category. According to the CPUC website "[s]everal of the worst wildfires were reportedly ignited by overhead utility power lines and aerial communication facilities in close proximity to power lines" (https://www.cpuc.ca.gov/firethreatmaps/)

Specific impact: Fires resulting from power lines typically occur during Santa Ana wind events. High wind-driven fires tend to burn at a much higher intensity than non-wind driven fires. High intensity vegetation burn areas do not display good recovery of vegetation. Occurrences of Gaviota tarplant as well as all other sensitive plants, animals, and vegetation communities located on the Project site are at risk of impact from high intensity, wind driven fires potentially started by power lines associated with the Project.

Why impact would occur: The mitigation contained in the CPUC's analysis of recent power company started fires is to cut power delivery during high-wind events. CDFW is concerned that the Project's priority to generate electricity through high winds would prevent the shutting off power generation at the Project site during wind events deemed a moderate to high fire threat.

4.14

Evidence impact would be significant: Southern California shrubland habitats are resilient to specific fire frequencies and intensities. More frequent fires, higher intensity fires, and/or unnaturally short fire return intervals can result in the replacement (type conversion) of native communities. In many areas, fires are occurring more frequently or at a higher intensity than they would naturally, often leading to type conversion from native habitat to a vegetation community dominated by invasive weeds.

Recommended Potentially Feasible Mitigation Measure(s):

Mitigation Measure #1: CDFW recommends placing all power lines underground, following existing road right of ways where possible. The SEIR should also include an alternative that undergrounds all or portions of power lines to reduce the risk of fire created by the Project.

Comment #8: Impacts to Bats

Issue: A review of CNDDB indicates that multiple bat species that are SCC are found on the Project site, including the following: silver-haired bat (*Lasionycteris noctivagans*), western mastiff bat (*Eumops perotis californicas*), pallid bat (*Antrozous pallidus*), western red bat (*Lasiurus blossevillii*), and hoary bat (*Laruirus cinereus*). CDFW is concerned with potential impacts to both bird and bat species from utility-scale renewable energy, such as the proposed Project.

Specific impact: Utility-scale renewable energy presents a variety of potential effects to avian species such as bats including, but not limited to, direct and indirect effects of loss of foraging habitat, loss of breeding habitat, direct mortality, increased anthropogenic pressures, and navigational disruptions during migration.

Why impact would occur: The construction of towers, pad and road clearing, and staging of equipment along the Project alignment are likely to lead to loss of foraging and breeding habitat for bats, and direct mortality to bats resulting from direct strikes with WTGs.

Evidence impacts would be significant: Project impacts may result in substantial adverse effects, either directly or through habitat modifications, on a species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by CDFW or USFWS. Adverse impacts to bats may occur because the measures provided do not condition the Project to implement take avoidance surveys prior to operations, including, but not limited to, ground and vegetation disturbing activities. Take of special status bat species could require a mandatory finding of significance by the Lead Agency (CEQA Guidelines, § 15065). In addition, bats are considered non-game mammals and are afforded protection by state law from take and/or harassment (Fish and Game Code § 4150, California Code of Regulations § 251.1). 4.15

Recommended Potentially Feasible Mitigation Measure(s):

Mitigation Measure #1: CDFW concurs with SEIR mitigation measures BIO-10 and MM BIO-16 requiring the development of a bird and bat conservation strategy. CDFW recommends that CDFW staff are involved early in the strategy development in order to provide comments.

Mitigation Measure #2: For any Project activities that will result in the removal of trees, buildings, or other occupied habitat for any species of bat, CDFW recommends avoidance of these areas.

Mitigation Measure #3: If bats cannot be avoided by Project activities and a bat specialist determines that roosting bats may be present at any time of year, it is preferable to push any tree down using heavy machinery rather than felling the tree with a chainsaw. In order to ensure the optimum warning for any roosting bats that may still be present, the tree should be pushed lightly two to three times, with a pause of approximately 30 seconds between each nudge to allow bats to become active. The tree should then be pushed to the ground slowly. The bat specialist should determine the optimal time to disturb occupied bat habitat to maximize bats escaping during low light levels. Downed trees should remain in place until they are inspected by a bat specialist. Trees that are known to be bat roosts should not be sawn-up or mulched immediately. A period of at least 24 hours (preferably 48 hours) should elapse prior to such operations to allow bats to escape. Bats should be allowed to escape prior to demolition of

buildings. This may be accomplished by placing one-way exclusionary devices into areas where bats are entering a building that allow bats to exit but not enter the building.

Mitigation Measure #4: CDFW recommends that the Project include measures to ensure that bat habitat remains available for evicted bats or loss of bat habitat resulting from the Project, including information on the availability of other potential roosts that could be used by bats within protected open space on or near the project site.

4.15 *cont.*

Comment #9: Impacts to Tricolored Blackbird (*Agelaius tricolor*)

Issue: Based on an April 17, 2018 field meeting, the presence of wetlands and suitable habitat on the Project site indicates the need to conduct surveys for tricolored blackbirds (*Agelaius tricolor*), a state listed threatened species. As recommended in our August 18, 2018 NOP comment letter, CDFW recommended conducting focused surveys for tricolored blackbirds and incorporating the results into the SEIR. It appears that no current survey information for this species has been provided.

Specific impacts: Ground-disturbing activities from grading and filling, water diversions and dewatering would physically remove or otherwise alter existing streams or their function and associated riparian habitat on the Project site. Downstream areas and associated biological resources beyond the Project development footprint may also be impacted by Project-related releases of sediment and altered watershed effects resulting from Project activities. The Project will remove habitat and likely result in the loss of foraging and nesting habitat for sensitive bird species, including tricolored blackbirds. The placement of towers, access roads, and associated machinery could also lead to diminished habitat in both quantity and quality for tricolored blackbirds.

Why impact would occur: Impacts to tricolored blackbird could result from vegetation clearing and other ground disturbing activities. Project disturbance activities could result in mortality or injury to nestlings, as well temporary or long-term loss of suitable nesting and foraging habitats. Construction during the breeding season of nesting birds could result in the incidental loss of breeding success or otherwise lead to nest abandonment.

4.16

Evidence impact would be significant: Project impacts may result in substantial adverse effects, either directly or through habitat modifications, on a species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by CDFW or USFWS. Adverse impacts to tricolored blackbird may occur because the measures provided do not condition the Project to implement take avoidance surveys prior to operations, including, but not limited to, ground and vegetation disturbing activities.

Recommended Potentially Feasible Mitigation Measure(s):

Mitigation Measure #1: CDFW again recommends conducting focused surveys for tricolored blackbirds and incorporating the results into the SEIR. The omission of current survey information on tricolored blackbird may significantly underestimate the proposed impact to listed species in the SEIR and create a consistency/adequacy issue where CDFW is acting as a Responsible Agency with related CEQA actions. Prior to initiation of construction within or adjacent to suitable nesting habitat, a CDFW-approved biologist with experience surveying for and observing tricolored blackbird shall conduct preconstruction surveys in accordance with

established protocols to establish use of nesting habitat by tricolored blackbird colonies. Surveys will be conducted within and adjacent to suitable habitat, where access allows, during the nesting season (generally March 15 to July 31). If a nesting colony is found, no activity shall occur within a 500-foot buffer of the colony until a qualified biologist determines and CDFW confirms that all chicks have fledged and are no longer reliant on the nest site.

4.16 *cont.*

Mitigation Measure #2: If take of tricolored blackbird would occur from Project construction or operation, state incidental take authorization under CESA would be required for the Project. CDFW may consider the Lead Agency's CEQA documentation for its CESA-related actions if it adequately analyzes/discloses impacts and mitigation to state-listed species. Additional documentation may be required as part of an ITP application for the Project in order for CDFW to adequately develop an accurate take analysis and identify measures that would fully mitigate for take of state-listed species.

Comment #10: Impacts to El Segundo Blue Butterfly (*Euphilotes battoides allyni*)

Issue: The El Segundo blue butterfly (ESBB), a federally endangered species, was observed near the proposed Project site in 2005 (LWEP FEIR) around Tranquillon Peak and an adjacent ridge. The proposed Project has potential to impact this species through loss of habitat and/or direct mortality.

Specific Impacts: The host plant for El Segundo blue butterfly is sea cliff buckwheat (*Eriogonum parvifolium*), which is found in the middle of the south end of the Project site. According to the LWEP FEIR, there are an estimated 30.9 acres of habitat on the Project site containing the ESBB host plant. Grading for the access roads and construction of WTGs could lead to a loss of sea cliff buckwheat and other El Segundo blue associated habitat and/or direct impacts to the species.

Why impacts would occur: Impacts to El Segundo blue butterfly could result from vegetation clearing and other ground disturbing activities. Project disturbance activities could result in mortality or injury to larvae and adults, as well temporary or long-term loss of suitable nesting and foraging habitats.

4.17

Evidence impacts would be significant: Project impacts may result in substantial adverse effects, either directly or through habitat modifications, on a species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by CDFW or USFWS. Adverse impacts to El Segundo blue butterfly may occur because the measures provided in the SEIR (MM BIO-13) do not condition the Project to implement take avoidance surveys prior to operations, including, but not limited to, ground and vegetation disturbing activities.

Recommended Potentially Feasible Mitigation Measure(s):

Mitigation Measure #1: Prior to initiation of construction within or adjacent to suitable habitat, a CDFW-approved entomologist should conduct directed protocol surveys for the El Segundo blue butterfly during the flight season (approximately mid-June to August) within all areas of coast buckwheat known on the Project site, including areas that would be affected by construction, operation, or maintenance of the project. The surveys should include a description of methodology, description and maps of the surveyed areas, and identification of locations of

any el Segundo Blue butterflies observed within the proposed Project area (including maps and GPS coordinates). The sites where El Segundo blue butterflies are located should be described by the entomologist, including vegetation, soils, exposure, and other factors that may influence the occurrence of species at that site. If El Segundo blue butterfly is detected, occupied areas should be designated an ecologically sensitive area and protected (while occupied) by a minimum 500-foot radius during Project construction with USFWS and CDFW contacted immediately for further direction.

Mitigation Measure #2: All suitable habitat for the El Segundo blue butterfly that will be permanently or temporarily impacted by the Project should be replaced/restored in consultation with USFW and CDFW. Revegetation and restoration of suitable habitat should include the use of coast buckwheat that is salvaged from the site or native to the local area. All revegetation/restoration areas that will serve as mitigation should include preparation of a restoration plan, to be approved by USFWS and CDFW, prior to any ground disturbance. The restoration plan should include restoration and monitoring methods; annual success criteria; contingency actions should success criteria not be met; long-term management and maintenance goals; and, a funding mechanism to assure for in perpetuity management and reporting. Areas proposed as mitigation should have a recorded conservation easement and be dedicated to an entity which has been approved to hold/manage lands pursuant to Assembly Bill (AB) 1094 (2012), which amended Government Code sections 65965-65968. 4.17 *cont.*

Comment #11: Impacts to Raptors

Issue: Based on the location and habitats of the Project site, several raptors species are likely to occur on-site, including the state fully protected white-tailed kite. The Project site and surrounding areas are known habitat of the federally and state listed endangered and state fully protected California condor as well as the state fully protected golden eagle and American peregrine falcon. Also, State species of special concern burrowing owl has been observed using the Project site.

Specific impacts: The Project will likely result in the loss of foraging habitat for sensitive avian species. There is also high potential for bird mortality resulting from collisions with WTGs.

Why impacts would occur: Direct impacts include the loss of individual animals during construction and facility operation primarily as a result of (1) collisions by birds and bats with power line poles, lines, WTGs, and WTG blades and (2) vehicle strikes. The construction of towers, pad and road clearing, and staging of equipment along the Project alignment are likely to lead to loss of foraging and breeding habitat for raptors. Additionally, some tree trimming may be required in the vicinity of power lines. Indirect impacts during the operation and maintenance would be similar to those occurring during construction. 4.18

Evidence impacts would be significant: Project impacts may result in substantial adverse effects, either directly or through habitat modifications, on a species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by CDFW or USFWS. Adverse impacts to raptors may occur because the measures provided do not condition the Project to implement take avoidance surveys prior to operations, including, but not limited to, ground and vegetation disturbing activities.

Recommended Potentially Feasible Mitigation Measure(s):

Mitigation Measure #1: CDFW concurs with SEIR mitigation measure BIO-10 and MM BIO-16 for the need to prepare are bird and bat conservation strategy. CDFW recommends that CDFW staff are involved early in the strategy development in order to provide comments.
There may be some areas where raptors are more concentrated, particularly during migration. However, migratory flyways are not well understood. The following USFWS website provides guidelines to reduce risks to raptors and other birds that may be applicable to wind turbine projects: https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds/collisions/communication-towers.php.

Mitigation Measure #2: CDFW cannot authorize the take of any fully protected species as defined by state law. State fully protected species may not be taken or possessed at any time and no licenses or permits may be issued for its take except for collecting those species for necessary scientific research and relocation of the bird species for protection of livestock (Fish & G. Code, §§ 3511, 4700, 5050, 5515). CDFW has advised the Permittee that take of any species designated as fully protected under the Fish and Game Code is prohibited. **4.18** *cont.*

Mitigation Measure #3: CDFW concurs with SEIR mitigation measure MM BIO-12, which requires surveys for burrowing owls, a State species of special concern, within all suitable habitat in the Project area. The measure includes a buffer of 300 feet of all Project facilitates. CDFW recommends the buffer be changed to 500 feet of all Project facilities. CDFW also recommends following the protocol surveys outlined in CDFW's March 7, 2012, *Staff Report on Burrowing Owl Mitigation* (CDFW, 2012).

Comment #12: Impacts to Golden Eagle (*Aguila Chrysaetos*)

Issue: Based on Project location and habitat, the state fully protected golden eagle is highly likely to occur on the Project site. According to the LWEP FEIR, golden eagles are expected to be present on the site regularly. Nesting golden eagles have been reported in recent years in the vicinity of the Project, likely on Vandenberg Air Force Base. In addition, based on a December 20, 2018 field meeting, CDFW observed golden eagle within the Project site.

Specific impacts: The Project will likely result in the loss of foraging habitat for sensitive avian species. There is also high potential for bird mortality resulting from collisions with WTGs.

Why impacts would occur: Direct impacts include the loss of individual animals during construction and facility operation primarily as a result of (1) collisions by birds with power line poles, lines, WTGs, and WTG blades and (2) vehicle strives. The construction of towers, pad and road clearing, and staging of equipment along the Project alignment are likely to lead to loss of foraging and breeding habitat for raptors. Additionally, some tree trimming may be required in the vicinity of power lines. Indirect impacts during the operation and maintenance would be similar to those occurring during construction. **4.19**

Evidence impacts would be significant: Project impacts may result in substantial adverse effects, either directly or through habitat modifications, on a species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by CDFW or USFWS. Adverse impacts to golden eagle may occur because the measures provided do not condition the Project to implement take avoidance surveys prior to operations, including, but not limited to, ground and vegetation disturbing activities. CDFW cannot authorize the take

of any fully protected species as defined by state law. State fully protected species may not be taken or possessed at any time and no licenses or permits may be issued for its take except for collecting those species for necessary scientific research and relocation of the bird species for protection of livestock (Fish & Game Code, §§ 3511, 4700, 5050, 5515).

Recommended Potentially Feasible Mitigation Measure(s):

Mitigation Measure #1: The SEIR should demonstrate how impacts to golden eagle and other fully protected species would be avoided by the Project.

4.19 *cont.*

Mitigation Measure #2: CDFW recommends the County conduct individual eagle point count and 10-mile helicopter nest surveys for all areas known to support eagles (https://www.fws.gov/southwest/es/oklahoma/documents/te_species/wind%20power/usfws_interim_goea_monitoring_protocol_10march2010.pdf). CDFW further recommends a minimum one-mile buffer be established from each nest known to be active within the last five years to further minimize the potential for impacts and avoid take of the species. In addition, it is important the eagle nest data be comprehensive to the County and should be updated regularly to maximize avoidance to golden eagles.

Mitigation Measure #3: CDFW has advised the Permittee that take of any species designated as fully protected under the Fish and Game Code is prohibited.

Comment #13: Impacts to Passerine Birds

Issue: The *Biological Resources Report for the Antelope Expansion 1B Solar Project, Los Angeles County, California (SWCA, 2018)* indicates that loggerhead shrike (*Lanius ludovicianus*), a state SSC, was reported on site.

Specific impacts: Construction during the breeding season of nesting birds could result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment.

Why impacts would occur: Impacts to passerine birds could result from vegetation clearing and other ground-disturbing activities. Project disturbance activities could result in mortality or injury to nestlings, as well temporary or long-term loss of suitable nesting and foraging habitats. Construction during the breeding season of nesting birds could result in the incidental loss of breeding success or otherwise lead to nest abandonment.

4.20

Evidence impact would be significant: The loss of occupied habitat or reductions in the number of rare species, either directly or indirectly through nest abandonment or reproductive suppression, would constitute a significant impact absent appropriate mitigation. Furthermore, nests of all native bird species are protected under both federal and State laws and regulations, including the Migratory Bird Treaty Act and California Fish and Game Code sections 3503 and 3503.5, respectively.

Recommended Potentially Feasible Mitigation Measure(s):

Mitigation Measure #1: The SEIR includes mitigation measure BIO-8 and MM BIO-12 to reduce impacts to nesting birds. CDFW concurs with these measures and recommends consultation with CDFW staff if the 500 foot buffer is recommended to be reduced.

Comment #14: Impacts to Unarmored Threespine Stickleback (*Gasterosteus aculeatus williamsoni)*

Issue: As indicated in the Hydrology/Water Quality section of the SEIR, the Water Resources section of the LWEP EIR determined that the Project would result in significant impacts regarding flood hazards, water quality, groundwater, drainage, and stormwater runoff. Table G-6 (*Summary of Road Crossings and Culvert Sizes*) of the *Strauss Wind Energy Project Conditional Use Application Tab G: Project Description (Sapphos Env. Inc., April 2018)* provides a summary of 8 road crossings over drainage channels. CDFW is concerned that some of these crossings could damage the habitat and water quality found along Cañada Honda Creek, on the west end of the property. According to CNDDB, there are numerous historical records of unarmored threespine stickleback, a state fully protected species, in the Cañada Honda Creek. Except as provided in the Fish and Game Code (e.g., for necessary scientific research), take of any fully protected species is prohibited and cannot be authorized by the Department (Fish & Game Code, § 5515 and § 3511).

Specific impacts: The Project may result in the loss of streams, associated watershed function, and biological diversity that could directly or indirectly impact the local population of unarmored threespine stickleback. **4.21**

Why impacts would occur: Ground-disturbing activities from grading and filling, water diversions and dewatering would physically remove or otherwise alter existing streams or their function and associated riparian habitat on the Project site. Downstream areas and associated biological resources beyond the Project development footprint may also be impacted by Project related releases of sediment and altered watershed effects resulting from Project activities.

Evidence impacts would be significant: The Project may substantially adversely affect the existing stream pattern of the Project site through the alteration or diversion of a stream. Which absent specific mitigation, could result in substantial erosion or siltation on-site or off-site of the Project. CDFW cannot authorize the take of any fully protected species as defined by state law. State fully protected species may not be taken or possessed at any time, and no licenses or permits may be issued for its take except for collecting those species for necessary scientific research and relocation of the bird species for protection of livestock (Fish & G. Code, §§ 3511, 4700, 5050, 5515).

Recommended Potentially Feasible Mitigation Measure(s):

Mitigation Measure #1: CDFW has advised the Applicant that take of any species designated as fully protected under the Fish and Game Code is prohibited.

Filing Fees

The Project, as proposed, would have an impact on fish and/or wildlife, and assessment of filing fees is necessary. Fees are payable upon filing of the Notice of Determination by the Lead Agency and serve to help defray the cost of environmental review by CDFW. Payment of the fee is required in order for the underlying Project approval to be operative, vested, and final. (Cal. Code Regs, tit. 14, § 753.5; Fish & Game Code, § 711.4; Public Resources Code, § 21089). **4.22**

Conclusion

We appreciate the opportunity to comment on the Strauss Wind Energy Project to assist the County of Santa Barbara in adequately analyzing and minimizing/mitigating impacts to biological resources. CDFW requests an opportunity to review and comment on any response that the County has to our comments and to receive notification of any forthcoming hearing date(s) for the Project (CEQA Guidelines, §15073[e]). If you have any questions or comments regarding this letter, please contact Dan Blankenship, Senior Environmental Scientist (Specialist), at (661) 259-3750 or Daniel.Blankenship@wildlife.ca.gov.

4.23

Sincerely,

Erinn Wilson
Environmental Program Manager

ec: CDFW
Randy Rodriguez – Los Alamitos
Victoria Tang – Los Alamitos
Dan Blankenship – Santa Barbara
Kelly Schmoker – Los Alamitos
Sarah Rains – Los Alamitos

State Clearinghouse
Scott Morgan

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Response to Erinn Wilson

4.1 The County understands that the Applicant is currently consulting with the CDFW to obtain incidental take authorization pursuant to the California Endangered Species Act (CESA). Responses to specific comments including comments regarding Gaviota tarplant and recommended mitigation follow.

4.2 The Applicant provided further clarification on the proposed leach lines[6]. The O&M Facility waste would be disposed of through a proposed leach line septic system. Leach lines are subsurface wastewater disposal facilities used to remove contaminants and impurities from the liquid that emerges after anaerobic digestion in a septic tank. Organic materials in the liquid are catabolized by a microbial ecosystem. The drain field typically consists of an arrangement of trenches containing perforated pipes and porous material (often gravel) covered by a layer of soil to prevent animals and surface runoff from reaching the wastewater distributed within those trenches. The septic tank and leach lines would be located just north of the O&M building and would be identified on Project plans. The Applicant informed the County that no alternative or specific avoidance and minimization measures were discussed with CDFW for this Project component. According to the original Gaviota tarplant survey data incorporated in the Draft SEIR analysis, and new Gaviota tarplant location data from 2019 surveys provided to the County[7], the leach line location is not within or adjacent to any

[6] Email communication from Daniel Duke, BayWa r.e. to Kathy Pfeifer, Santa Barbara County Planning & Development dated July 18, 2019.

[7] Dudek. 2019. Pre-construction Botanical Surveys for the Strauss Wind Energy Project. Prepared for Strauss Wind, LLC. – see Appendix C-9

mapped occurrences of Gaviota tarplant. The nearest occupied Gaviota tarplant habitat is about 100 feet west of the proposed O&M site. The leach line would be about 100 to 200 feet from the Gaviota tarplant location. Therefore, the County concludes that the potential impacts to Gaviota tarplant suggested by CDFW, including invasive ant establishment, overgrowth of weeds, and changes to soil hydrology are unlikely and alternatives to the proposed leach lines are unnecessary.

4.3 The commenter believes that the field dates of the vegetation mapping indicated in Table 4.5-1 (Summary of Surveys Conducted on the Site) were late in the season and may have resulted in plant misidentifications and perhaps incorrect vegetation classification. Vegetation mapping and classification in shrublands and woodlands is based on conspicuous and common plants that may be identified at any time of year. The date of the field surveys would not affect its accuracy. Vegetation mapping in grassland or other herbaceous communities may rely on season due to the seasonal nature herbaceous plants. The only herbaceous vegetation types for which this comment is relevant are the grasslands and forb-dominated types. The 2018 mapping revision was based on detailed quantitative late spring field effort that followed earlier spring season identification of potential native grassland locations. These field surveys were conducted at the appropriate time of year for mapping and classifying all vegetation types on the Project site.

4.4 The comment addresses Gap Area Survey Results (Appendix C-5), where biological surveys were conducted late in 2018 to supplement prior field work. The comment expresses concern similar to Comment 4.3, regarding season of the field work and plant identification. Please see response to Comment 4.3. As recommended in the comment, the vegetation mapping used 10 percent or greater cover of native grass species as a lower threshold for mapping native grassland stands (summarized in SEIR Appendix C, Table 6, Native Grassland Assessment Results). Additionally, based on the detailed quantitative vegetation mapping approach taken by the applicant's consultant for herbaceous vegetation, the County is confident that the gap area surveys provide a suitable basis for evaluating Project impacts to these vegetation types. The 2018 surveys identified in the table and described in Section 4.5.1.2 (Vegetation and Habitats) were themselves updates and revisions to prior vegetation mapping first completed in 2008, then revised during spring 2017 and winter 2018 field work (please refer to Draft SEIR Appendix C-1, Biological Resources Technical Report [BRTR], page 4-21, Section 4.2.6 [Plant Community Mapping]). The purpose of the 2018 vegetation mapping (see Draft SEIR Appendix C-3, BRTR Addendum No. 2, Section 2.2.1 Vegetation Communities and Habitat Mapping) was to refine the prior maps. Much of the previously identified non-native grassland was remapped as native grassland (Final SEIR Table 4.5-3 and Figures 4.5-1a and 4.5-1b). The 2018 mapping revision was based on detailed quantitative late spring field effort that followed earlier spring season identification of potential native grassland locations. The field approach described in SEIR Appendix C-2 properly distinguished grassland types and provides a suitable basis for evaluating Project impacts to these vegetation types.

4.5 Vegetation mapping was conducted along the transmission line within a previous iteration of the route, and the current transmission line disturbance footprint has been mapped. Please see Figure 4.5-1b (Vegetation), Section 4.5.1.2 (Vegetation and Habitats), and Table 4.5-3 (Impacts to Vegetation and Landforms). Section 4.5.1.2 (Vegetation and Habitats) of the SEIR has been revised to clarify the vegetation mapping along the transmission line.

4.6 CDFW's recommendation to require white FAA lighting with longest possible duration has been added to MM BIO-15b.

4.7 The comment addresses Gaviota tarplant. It summarizes background information from online sources and USFWS and CDFW records. The comment states that "the Project proposes to impact the entire Tranquillon Mountain / Sudden Peak population of Gaviota tarplant except for approximately 12 acres and 202 plants outside of the Project's footprint" and later states that the CDFW's interpretation of impacts includes both direct and indirect impacts. While the entire Tranquillon Mountain / Sudden Peak population is within the SWEP site, only a small portion of the population would be directly impacted by the Project (including permanent direct impacts for new land uses and temporary impacts during Project construction, that would be subject to revegetation identified as mitigation in the Supplemental EIR). The SEIR describes indirect impacts but does not quantify them.

The comment emphasizes Gaviota tarplant counts (see response to comment 4.9 regarding numbers of annual plants) and it does not indicate how it arrived at its estimated acreage of indirect impacts. The comment goes on to name several potential indirect impacts, and briefly describe four of them: isolation/ fragmentation, pollination, surface hydrology, and heat island effect.

The comment's claim regarding extent of the Project's impacts does not distinguish between direct and indirect impacts and thus may leave the reader with a mistakenly exaggerated understanding of the actual impacts. In fact, more than 87 percent of the Gaviota tarplant habitat is outside the project footprint. The Project's impacts to Gaviota tarplant are described in SEIR Section 4.5.4.2 under Impacts BIO-5a (Construction Impacts to Gaviota Tarplant) and BIO-5b (O&M Impacts to Gaviota Tarplant). Impact acreages to Gaviota tarplant occupied habitat have been updated in the Final SEIR to include cumulative results of all field surveys reported, including Dudek's 2019 surveys (Appendix C-9), increasing the total occupied acreage on the Project site from 192 acres to 207 acres. In addition, Project impact acreage has been revised to incorporate the most recent Project disturbance area, slightly reducing the total impact area. The proposed Project would have 26.33 acres of permanent impacts to Gaviota tarplant occupied habitat, or 12.7 percent of the 207 acres of total known occupied habitat on the site. Additional temporary direct impacts to occupied habitat were calculated as 0.01 acres. Project facilities such as roads or turbines would be located within most of the mapped Gaviota tarplant polygons within the site (see Draft SEIR Figure 4.5-4a, Special-Status Plant Survey Results). The comment seems to include 100 percent of the area of each affected polygon, regardless of the distance from proposed Project facilities, in its estimate of total directly and indirectly affected habitat. The apparent assumptions within the comment's estimate of indirect impact area, especially as to the implied severity and distance of these indirect effects from the actual project activities, may cause readers to misunderstand the environmental effects of the proposed Project.

The SEIR properly addresses indirect impacts to Gaviota tarplant by summarizing the LWEP Final EIR assessment and incorporating it by reference. The LWEP Final EIR (Section 3.5.7.3 Project Impacts, under Impact Bio-5, Gaviota Tarplant) described the direct and indirect impacts of construction and O&M to Gaviota tarplant. That analysis addresses fragmentation and pollinators, and points out evidence of Gaviota tarplant's disturbance tolerance (see also Comment 10.77 footnote 52 and citations therein). By their nature, indirect impacts tend to be more substantial immediately adjacent to a work site or facility, and their importance declines with increasing distance. These impacts cannot be quantified in terms of acreage, but are far less important than direct impacts even immediately adjacent to the Project footprint and decline in importance over short distances. The great majority of Gaviota tarplant habitat on the site would be subject to little or no indirect Project disturbance.

Regarding isolation and fragmentation, the comment states that the project may affect "every occurrence of Gaviota tarplant on the Project [site] over time, (indirectly) and cumulatively. Direct, indirect, and cumulative impacts to Gaviota tarplant are properly addressed in the SEIR in the sections cited above and in Section 4.5.5 (Cumulative Effects). The comment notes that project facilities (mainly roads) often would bisect occupied Gaviota tarplant occurrences. The Gaviota tarplant distribution on the site as mapped in 2018 and presented in the Draft SEIR consists of 103 separate groupings or patches. About 34 of these patches are large enough to be depicted on Figure 4.5-4a. About 14 are contiguous patches of roughly one acre to several dozen acres, and about 20 are smaller, some only a few hundred square feet. Many other patches are smaller still and cannot be seen on the figure. In the existing patchy Gaviota tarplant distribution, gaps between occupied habitat patches are often several hundred feet and in one case about 2,000 feet. Project access roads crossing occupied Gaviota tarplant habitat would be 22 to 40 feet wide (SEIR Section 2.5.9, On-Site Access Roads). More recent Gaviota tarplant survey results are mapped at a finer scale (see Final SEIR Figure 4.5-4c) but the overall patchy distribution with gaps between occupied patches are commonly larger than gaps that would result proposed access roads or WTG sites. In the context of the plant's existing patchy distribution, these roads and pad sites would not cause significant isolation or fragmentation effects to Gaviota tarplant beyond those evaluated in the SEIR.

The comment states that Gaviota tarplant occurrences would be "surrounded by structures and edge disturbance." To the contrary, the proposed Project consists only of 30 wind turbines and a few other structures. A limited amount of "edge disturbance" would occur along roadways and adjacent to facilities, but would consist only of project O&M activities. Other than this, no land use change is proposed for the site. Existing open space and agricultural practices would remain and the edge effects that are caused by new residential/commercial land uses would not occur.

Regarding pollination, the comment cites research regarding effects of eliminating pollinator habitat within 1,000 meters of plants, and that habitat degradation may affect pollinator abundance. The proposed project would eliminate small patches of potential insect habitat, as shown by the proposed Project footprint on Figure 4.5-4a, but would leave the vast majority of surrounding habitat undisturbed. No Gaviota tarplant occurrences would be isolated from pollinator habitat and surrounding land uses would remain unchanged. Habitat isolation, fragmentation, or degradation on the scale of the cited literature would not occur, and these potential indirect impacts would not cause significant effects to Gaviota tarplant beyond those evaluated in the SEIR.

4.8 The comment states that "all but 5 percent of the Tranquillion / Suden Peak Gaviota tarplant population" would be affected. This statement reiterates the earlier evaluation by assuming indirect impacts would be more severe and extend further than supported by available information, including the citations in the earlier comment. Please see response to Comment 4.7. The comment addresses potential effects on Gaviota tarplant's adaptation or persistence in response to climate change, claiming that only the the Santa Ynez Mountains population would persist if the low-elevation coastal populations are lost. The comment concludes that the indirect effects discussed in Comment 4.7 would potentially cause the entire Tranquillon Mountain / Sudden Peak population to be extirpated. In fact, more than 87 percent of the Gaviota tarplant habitat is outside the Project footprint. No Gaviota tarplant occurrences would be significantly fragmented or isolated from pollinator habitat, and the surrounding land uses would remain unchanged. The comment presents no evidence that Tranquillon Mountain / Sudden Peak population would not persist under future climate change scenarios.

The comment names several conservation considerations for Gaviota tarplant, paraphrased and addressed individually below. The proposed Project and recommended mitigation are consistent with these considerations.

- Protection and management of existing populations. Mitigation Measures BIO-5 (Pre-construction Rare Plant Surveys and Restoration) and BIO-6 (Gaviota Tarplant Disturbance) specify on-site management, on-site or off-site compensation, as well as other measures that are consistent with protecting and managing existing Gaviota tarplant occurrences.
- Maintenance of sufficient habitat area size. As described above, extensive occupied habitat and surrounding open space would remain on the Project site, consistent with this consideration.
- Protection of substrate, connectivity, and gene flow. As described above, extensive occupied habitat and surrounding open space would remain on the Project site, leaving substrates unchanged, minimizing habitat fragmentation, and presenting little or no interruption to potential gene flow (pollinators or seed dispersal).
- Adjacent suitable habitat for vegetative reproduction and population expansion. Adjacent habitat would remain unchanged; it is unclear whether Gaviota tarplant can expand into these areas or, if so, why it would not currently occupy them. As an annual species, Gaviota tarplant does not reproduce vegetatively.

The comment describes a "future open space area that would be surrounded by future development, trails, and irrigated slopes" pointing out that such an area would be substantially compromised in terms of its habitat value. The comment goes on to cite edge effect research indicating that relatively small habitat patches suffer ecological degradation. The comment mentions a variety of adverse direct and indirect effects of residential and commercial development including non-native Argentine ants and irrigated slopes. This comment appears to be wholly unrelated to the proposed Project, instead referring to some other project involving small set-aside areas in an urban landscape. Instead, the proposed SWEP would affect only a small proportion of a large open space area, and the existing open space and agricultural practices would remain. The edge effects that are caused by new residential/commercial land uses would not occur.

Regarding pollination, the comments states that Gaviota tarplant is self-incompatible, names types of pollinators, and notes the flight distances of some pollinators (100 to 500 m [330 to 1,640 ft] for some flies and at least 1,000 m [3,280 ft] for some bees). The proposed Project features (roads and turbine sites) are smaller than these pollinator flight distances and would not interrupt insect movement. The comment presents no evidence that the proposed Project could adversely affect Gaviota tarplant pollination. Please also refer to response to Comments 10.77 and 10.78 regarding pollination.

The comment speculates that habitat impacts could affect surface hydrology, by altering moisture availability in the root zone. The applicant indicates that most sections of road that would impact Gaviota tarplant occupy ridgetops where runoff is expected to flow laterally away from both sides of the road. Thus, no effects to overland sheet flow are expected in these areas. The road design will allow for sheet flow across the road where the road occupies a mid-slope position to maintain sheet flow into and between Gaviota tarplant areas. The comment presents no evidence that surface water effects could affect Gaviota tarplant and no significant impacts are expected.

The comment indicates that heat island effects could affect pollination and flowering times for some plants and infers that Gaviota tarplant could be similarly affected. Heat island effect is an urban phenomenon resulting from dense concentration of rooftops, paved surfaces, and other development. The proposed Project is not expected to cause any heat island effect and the comment presents no evidence that it could.

The comment recommends a series of new analyses and conservation measures, addressed in the following bullets.

- Analysis of the proposed Project's impacts to Gaviota tarplant throughout its range, evaluation of potential Project impacts on its "long-term persistence as a species," including impacts to "stable, healthy, higher-elevation populations... that would not be at risk from climate change, including sea level rise...." The project's impacts to Gaviota tarplant would be limited to the impacts identified and described in the SEIR, including the direct, indirect, and cumulative effects described in responses to comments above and Comment Set 10. Long-term persistence of the species in light of global climate change is beyond the scope of the SEIR. It is not reasonable nor practical to expect a lead agency to engage in new scientific study, especially given the timeframe articulated in the State CEQA Guidelines for preparing an EIR. (State CEQA Guidelines § 15108). The commenter is referred to the USFWS 5-year review of Gaviota tarplant (2011) cited elsewhere in the comment letter for further detail. More than 87 percent of the Tranquillon Mountain / Sudden Peak Gaviota tarplant population would be unaffected or minimally affected by the proposed Project and is expected to persist into the long-term future. Mitigation Measures BIO-5a (Construction Impacts to Gaviota Tarplant) and BIO-5b (O&M Impacts to Gaviota Tarplant) would reduce the proposed Project's impacts to Gaviota tarplant below a level of significance.
- An assessment of surface water flow. The comment recommends that drainage analysis should be disclosed. Please refer to surface water impacts provided earlier in this response to Comment 4.8. Additionally, please refer to SEIR Section 4.12, *Hydrology*. The comment presents no evidence that surface water effects could affect Gaviota tarplant.
- An "analysis with supporting evidence that the Project... facilities have been located to avoid or minimize impacts to Gaviota tarplant to the maximum extent practicable," and quoting the CEQA Guidelines regarding project alternatives. The requested information is not required by CEQA. Instead, the lead agency's responsibility is to evaluate the proposed Project and a reasonable range of alternatives, as provided in the SEIR. The lead agency need not evaluate all possible alternatives. Please refer to General Response GR-1: Reasonable Range of Alternatives.
- The comment recommends "conserving a buffer of 1,000 meters" around Gaviota tarplant occurrences pending a future pollinator study. The recommended requirement would not mitigate any potential significant impact of the proposed Project and thus is not within the scope of CEQA. The Project would not affect most habitat or land use surrounding the Gaviota tarplant occurrences. Further, the recommendation does not define the intent, scope, or duration of the pollinator study. The Project is not expected to affect Gaviota tarplant pollination or reproduction and the comment presents no evidence that it would. Please refer to text of this response above and response to Comments 10.77 and 10.78. The proposed additional mitigation is not adopted.

- The comment identifies Project design and conservation considerations that CDFW may consider in its evaluation under the California Endangered Species Act (CESA). Thank you for providing this additional information.

4.9 The comment states that impacts disclosed in the SEIR do not appear consistent with the ITP application data provided to CDFW on February 2, 2019. The County has requested updated information from the Applicant, who replied as follows: "Strauss Wind, LLC has been working to continue to refine the project design largely to further reduce the impacts of the project on resources (e.g., Gaviota tarplant) and is currently conducting additional pre-construction surveys, including for Gaviota tarplant, both of which will be folded into final permit authorizations with CDFW and final approvals with the County. All of the impacts are within the context of the Project Description and Impact analysis in the DSEIR." Since then, the Applicant has provided updated Gaviota tarplant surveys data (Appendix C-9 and Final SEIR Figure 4.5-4c). Differences between CDFW's impact estimates and the acreages identified in the Draft and Final SEIR may in part result from CDFW's approach to quantifying indirect impacts.

The comment states that it is unclear how the impacts disclosed in the SEIR correlate to the estimated individuals associated with a numbered occurrence. The County did not base its evaluation on numbers of plants at individual mapped occurrences. Instead, the SEIR analyzes Gaviota tarplant impacts in terms of occupied habitat. During 2018, the Gaviota tarplant population on the site was estimated at more than 4.5 million plants. But for annual plants, numbers are a poor metric for project impacts. As an annual species, Gaviota tarplant numbers fluctuate by orders of magnitude from one growing season to another, dependent on rainfall or other environmental considerations. Please also refer to the final paragraph of Comment 4.12 and the commenter's citations therein. Outside the growing season, its numbers fall to zero living plants. Regardless of the number of plants that may be present in any given year, the Project's impacts are evaluated in terms of occupied habitat (including all occupied habitat mapped in any year, where the County assumes that a viable seed bank is present and expects the tarplant to be present in some, if not all future years).

The comment indicates that "it is unclear" if the botanical surveys conducted on the site properly identified Gaviota tarplant (as opposed to other tarplant species). The possibility for misidentification was resolved during the 2019 field surveys (Appendix C-9). All Gaviota tarplant occurrences mapped in the 2018 and 2019 surveys (Final SEIR Figure 4.5-4c) are confirmed as proper identifications[8].

The comment cites acreages of permanent and temporary direct impacts to Gaviota tarplant of the LWEP presented in Table 4.5-2 (Table 4.5-2. LWEP Impacts and Mitigation Measures – Biological Resources), page 38 of the Draft SEIR and notes correctly that these acreages differ from the proposed SWEP impacts. It also notes differing acreages presented in Appendix C. The impacts to Gaviota tarplant presented in SEIR Section 4.5.4.2 (Proposed Project Impacts and Mitigation Measures) under Impact BIO-5a (Construction Impacts to Gaviota Tarplant) are based on the proposed Project footprint provided by the Applicant and analyzed in the SEIR. Note that the Project has undergone several refinements to the proposed grading plan, and the impacts cited in appendices to the SEIR correspond to a previous iteration. The impact acreages listed in Section

[8] Telephone communication between Kelly Schmoker (CDFW Botanist) and Scott White (Aspen Environmental Group), September 13, 2019.

4.5.4.2 reflect the current proposed site plan and reflect the most up-to-date information that has been provided to the County. Regarding the statement that impacts during operations and maintenance (i.e., BIO-5b, O&M Impacts to Gaviota Tarplant) would be "the same," the comment indicates that the acreage of impacts is not provided. Please note there is no acreage associated with O&M impacts for either the LWEP or SWEP. Acreages are provided under Impact 5a (Construction Impacts to Gaviota Tarplant).

The comment indicates that data provided by the Applicant to CDFW differs from data analyzed in the SEIR, and that maps provided to CDFW "appear to have several locations depicting Gaviota tarplant impacts that are not included in the SEIR impact analysis." As above (first paragraph of response to Comment 4.9), analysis in the SEIR is based on field data and the proposed Project footprint provided by the Applicant. The comment points out that inconsistency in impact acreage may be an "unreliable baseline" from which SEIR impacts are analyzed. The County has received updated information from the Applicant (see Appendix C-9 and Final SEIR Figure 4.5-4c). These data have been incorporated into Section 4.5, *Biological Resources*, of the Final SEIR analysis of impacts to Gaviota tarplant.

The comment states that accurate baseline data is needed to analyze Project impacts, that the SEIR's disclosure of impacts would not support CDFW's CESA requirement to "fully mitigate" impacts to the Gaviota tarplant and provides a brief explanation of its interpretation of "take" for its CESA review. The County recognizes that CDFW's permitting role under CESA and as a responsible agency commenting on the SEIR differs from the County's role as a CEQA lead agency. The SEIR analyzes and discloses impacts to Gaviota tarplant and identifies feasible mitigation for those impacts, supporting its conclusion that the impact would be mitigated to less than significant (Class II) under CEQA. The SEIR properly analyzes indirect impacts of the Project. The SEIR does not quantify these impacts and the County believes that the CDFW's effort to do so (in Comments 4.7 and 4.8) largely overstates the extent and severity of indirect impacts (please refer to the discussion of indirect impacts throughout responses to Comments 4.7, 4.8, and 4.9). The SEIR does not (and must not) assume the CDFW's CESA permitting role, to evaluate whether or not the "fully mitigate" standard is met. Insofar as the SEIR evaluates take of any plant or animal, it implicitly adopts the California Fish and Game Code definition: to "...hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." In the County's analysis, this definition would apply to direct impacts to Gaviota tarplant.

The comment concludes by recommending a new analysis of Gaviota tarplant impacts, to be based on updated baseline data, and that new Gaviota tarplant surveys should be conducted. Section 4.5, *Biological Resources*, of the Final SEIR presents a revised analysis of impacts based on these new data.

4.10 The comment reiterates earlier comments regarding indirect impacts to Gaviota tarplant, long-term viability of the population, verification of species identification. Please see responses to Comments 4.7, 4.8, and 4.9 above. The comment states that "inadequate avoidance, minimization, and mitigation measures for impacts ... will result in [significant impacts, quoting from CEQA Guidelines checklist criterion IV.a.]" This determination is the responsibility of the CEQA Lead Agency, in this case, the County. The SEIR properly evaluates direct, indirect, and cumulative impacts to Gaviota tarplant, identifies feasible mitigation for those impacts, and concludes that these impacts would be less than significant with mitigation (Class II). The comment recommends an alternative project design to avoid certain Gaviota tarplant occurrences, referring to the Applicant's Incidental Take

Permit (ITP) application submitted to CDFW (pursuant to the California Endangered Species Act). The County has not been provided with the ITP application and cannot comment on that information. Regarding turbine siting as recommended in the comment, please refer to General Response GR-1 (Reasonable Range of Alternatives) which identifies multiple siting considerations and constraints including Gaviota tarplant occurrences. General Response GR-1 also discusses the complexity and multiple considerations involved in designing WTG layout design, the County's belief that a balance is needed between environmental impact and wind generation capacity, and the SEIR's focus on reducing significant environmental impacts through mitigation. In the case of Gaviota tarplant, potentially significant impacts are reduced to less than significant through Mitigation Measures identified in the Supplemental EIR and described in responses to comments 4.8 and 4.9. Finally, the comment recommends designating 1,000-meter (3,280 feet) buffer areas surrounding undisturbed Gaviota tarplant occurrences. The comment does not provide a basis for the recommended distance. However, newly recorded Gaviota tarplant occurrences at the northwestern Project site boundary near San Miguelito Road are roughly 1,000 meters from any proposed project disturbance areas (Final SEIR Figure 4.5-4c).

4.11 See the response to Comment 4.5 regarding vegetation mapping along the transmission line. Regarding sawtooth golden bush scrub, the Draft SEIR identifies this alliance as a sensitive community (see page 4.5-5: "California brittle bush scrub, Menzies's golden bush scrub, *sawtooth golden bush scrub*, and toyon chaparral are considered sensitive by CDFW." [Italics added for emphasis]). That same paragraph refers the reader to Appendix C-2, *Biological Resources Technical Report, Addendum No. 2,* in which communities and habitat mapping performed by the Applicant's previous consultant (Sapphos 2017 revised 2018) was updated to include the sensitive vegetation communities Menzies's golden bush scrub and sawtooth golden bush scrub. See also the response to Comments 4.3 and 4.4 regarding vegetation mapping. Therefore, the SEIR already includes an accurate and complete vegetation survey assessment and no revisions are required.

Regarding CDFW's recommendation that any lands proposed as mitigation to offset impacts to sensitive vegetation be preserved and managed in perpetuity under a conservation easement and managed by a qualified entity, this requirement has been added to MM BIO-3. The Applicant has not yet identified compensatory mitigation lands beyond the conceptual level, but are currently considering on-site locations that are outside of the development footprint. MM BIO-3 contains detailed requirements for restoration and compensatory mitigation. See Impact BIO-1a (Vegetation and Wildlife Habitat Impacts during Construction) for a discussion of how the proposed mitigation would reduce vegetation impacts to less-than-significant (Class II).

4.12 The comment addresses Mitigation Measure BIO-6 (Gaviota Tarplant Disturbance), stating that the measure does not identify compensation sites, restoration, or habitat management details. Please refer to response to Comment 10.106. These details need not be identified in the SEIR. Consistent with CEQA, Mitigation Measure BIO-6 specifies performance standards to objectively evaluate compliance with the measure. In some cases, the performance standards in the SEIR may be accomplished in more than one specified way (e.g., compensation or restoration). The Applicant has indicated that potential mitigation lands have not been identified to date "beyond the conceptual level" and that "all options considered to date are on-site."

Notwithstanding the commenter's view of rare plant restoration, nothing in the measure relies on an "experimental approach" to mitigate the identified impact because habitat compensation is feasible. Population restoration may be implemented in combination with compensation, or

compensation alone may be used to mitigate the impact. Regarding pollination, please refer to responses to Comments 10.76 through 10.78. The comment discusses translocating plants as a potentially infeasible approach; however, nothing in MM BIO-6 suggests translocation of Gaviota tarplant. Translocation is not a viable horticultural practice for an annual plant, although population restoration from seed is likely to be effective. The comment again emphasizes numerical measures of an annual plant population (please see response to Comment 4.9 and the commenter's closing paragraph in Comment 4.12 regarding the reasons for relying on acreage rather than numbers).

The comment incorrectly claims that the Draft SEIR analysis relies on future surveys to identify impacts and deferring the mitigation to future permits from other agencies. Instead, the impacts are identified and quantified in the Draft SEIR and updated in Section 4.5, *Biological Resources*, of the Final SEIR (see response to comments 4.7 through 4.9). Mitigation measures identified in the SEIR include consultation with the CDFW and USFWS to facilitate a complementary overall approach to mitigating the impact, but the significant impact itself would be mitigated through implementation of the identified mitigation. The measure, including consultation and permitting from other agencies, is fully consistent with CEQA requirements (please see response to Comment 10.106). The comment quotes from CEQA Guidelines regarding the lead agency's decision to prepare a negative or mitigated negative declaration. That citation is irrelevant to the SEIR; please refer to General Response GR-6 (Use of a Supplemental EIR). The comment mentions CESA standards; the County recognizes that CDFW's permitting role under CESA and as a responsible agency commenting on the SEIR differs from the County's role as a CEQA lead agency. The SEIR analyzes and discloses impacts to Gaviota tarplant and identifies feasible mitigation for those impacts, supporting its conclusion that the impact would be mitigated to less than significant (Class II) under CEQA.

The comment concludes with three "mitigation measures" (to be clear, these are not mitigation measures in the CEQA context). The first states that the SEIR must disclose impacts (it does) and assess their significance relative to its range, distribution, population trends, and connectivity. The broader assessment recommended by the comment is beyond the scope of the SEIR. It is not reasonable nor practical to expect a lead agency to engage in new scientific study, especially given the timeframe articulated in the State CEQA Guidelines for preparing an EIR. (State CEQA Guidelines § 15108). The commenter is referred to the USFWS 5-year review of Gaviota tarplant (2011) cited elsewhere in the comment letter for further detail. The second recommends analysis of additional Project alternatives, referring again to CESA standards. Please refer to General Response GR-1: Reasonable Range of Alternatives and to the distinct roles of the County as a CEQA lead agency as compared with the CDFW as a responsible agency. Please also refer to responses to Comments 4.7 through 4.10. The final point recommends revisions to Mitigation Measure BIO-6. These, as well as other revisions, have been incorporated into the Final SEIR.

4.13 The comment indicates that potential pipelines may not have been analyzed regarding Biological Resources impacts. The Biological Resources analysis addressed the proposed Project footprint as provided by the applicant, which included the proposed water pipeline.

The commenter is primarily concerned that groundwater drawdown could affect phreatophytes (i.e., groundwater dependent plants). The commenter cites two species (California sagebrush and California buckwheat), both of which are arid land upland shrubs and neither of which is groundwater dependent. The comment misidentifies California sagebrush as Artemisia tridentata, the Latin name of Great Basin sagebrush. Great Basin sagebrush is another arid land upland species

not dependent on groundwater. The comment speculates that groundwater use may affect vegetation, then goes on to speculate that groundwater quality also may be affected which may, in turn, affect vegetation. But there is no evidence that the proposed well would cause these effects. The groundwater level at the well to be used for water supply (See Appendix D) is more than 50 feet below the ground surface. The local aquifer contains approximately 1,000 acre feet of storage. Project construction would require about 12 to 46 acre feet of water, or about 1 to 5 percent of the total aquifer volume. This one-time withdrawal would be fully replenished naturally after construction (see Appendix E-2). O&M use will be approximately 250 gallons per day (roughly the amount of water used by one single-family residence). Over a period of 30 years, total O&M use would be approximately 8.4 acre feet, which would be less than 1 percent of total storage. Since there will be annual recharge of the aquifer from natural sources, this amount of use will be negligible in terms of aquifer storage. Long-term maximum depth of the cone of depression is estimated to be less than one foot (Appendix D). Since as shown in Figure 4-5-7b of the SEIR there are no riparian resources at the location of the proposed well, no adverse effect on riparian resources is expected. No mitigation would be required.

4.14 The County conferred with the Santa Barbara County Fire Department (SBCFD) regarding the suggestion to underground the transmission line to minimize risk of wildfire.[9] The SBCFD explained that there are pros and cons of building the transmission line underground. Above-ground transmission lines can be inspected more easily, and issues can be identified and corrected easier than with underground lines. The SBCFD stated that they rarely if ever see line slap, bird strike encounters, or pole failure in larger transmission lines such as the proposed SWEP transmission line; these events are the main contributors to wildland fires from power lines and most commonly occur on lower voltage lines. Lower-voltage power lines are lower to the ground and can be close enough to trees to make contact, and are usually located on wood poles. In addition, lower-voltage lines are located closer together allowing for line slap, cross connection in the event of contact with wind-blown debris, or birds being electrocuted by contacting two lines and dropping to the ground to start a fire. The vegetation below the SWEP transmission line would need to be properly managed, but this would only require trimming tall vegetation to maintain required clearance distances and would not require removing any tarplant or other low-growing vegetation.

The SBCFD stated that while undergrounding the line would eliminate potential line slap, the use of proper restraints, line separators, and structurally sound poles would adequately avoid this risk for overhead construction as well.

The SBCFD's primary concern regarding the transmission line and wildfire risk is the ability to shut down the wind farm in the event of a fire in the area. This ability is controlled by both local and remote computer-based systems, and the SBCFD understands from the Applicant that the shutdown can happen within minutes. SBCFD's dispatch would have direct contact with the wind farm operator, which is standard practice for other generating facilities. The SBCFD expressed confidence that this approach is the best way to avoid and minimize wildfire risk.

In addition, greater temporary impacts would occur to biological and cultural resources. Therefore, the County does not believe that undergrounding the transmission line is warranted.

[9] Email communication from Captain Glenn Fidler, Planning and Engineering Supervisor, Santa Barbara County Fire Department to Kathy Pfeifer, Santa Barbara County Planning & Development dated August 15, 2019.

4.15 MM BIO-14e requires focused surveys for roosting bats at all sites to be disturbed between February 1 and August 31 of each year of construction. However, in response to CDFW's recommendations, this measure has been revised to require roosting bat surveys prior to removal of trees, buildings, and other suitable habitat at any time of the year. Additional details provided by CDFW have also been added to the measure.

4.16 As described in the LWEP EIR, flocks of tricolored blackbirds (TCBL) were documented on site during surveys in 2002 and 2008. The Fish and Game Commission voted to list the TCBL as threatened under the CESA on April 19, 2018. As described in the DSEIR and appendices, a flock of approximately 12 individuals were observed in grasslands during avian surveys and another 66 were detected in 2009 in grasslands and agricultural fields. Potential suitable foraging habitat occurs within grasslands throughout the wind development site and transmission line route, but suitable nesting habitat is not present in Project impact areas and nesting is unlikely. In addition, avian surveys performed from October 2017 through 2019 have failed to detect any additional TCBL. Regardless, potential impacts to TCBL were generally discussed in the DSEIR related to nesting (Impact BIO-8) and collision (Impact BIO-10) and mitigated through implementation of MMs BIO-1, BIO-2, BIO-3, BIO-11c, and BIO-11d. The Applicant has indicated that it has not sought a take permit for TCBL because of the low potential to nest on site and minimal detections on site.[10] Therefore, additional focused surveys have not been performed and are not proposed to be performed. The SEIR analysis provides County decision makers with sufficient information to take intelligent account of environmental consequences of the proposed Project and alternatives.

4.17 The impacts to El Segundo blue butterfly (ESBB) described in CDFW's comments are disclosed in the Draft SEIR under Impacts BIO-9 (Special-Status Wildlife). CDFW's pre-construction survey recommendations have been incorporated into MM BIO-13. This measure also requires habitat restoration and/or enhancement on site.

4.18 Impacts to fully protected, listed, and other sensitive and common raptors, including habitat loss and impacts with wind turbines and power lines, are discussed in the SEIR under Impacts BIO-1a, BIO-1b, BIO-2a, BIO-2b, BIO-8, BIO-10, BIO-11, BIO-12, BIO-13a, and BIO-13b. MM BIO-16 already requires the Owner/Applicant to submit a Bird and Bat Conservation Strategy that incorporates the Monitoring and Adaptive Management Plan to USFWS and CDFW for review and approval. The County has reviewed the website provided in the comment, which discusses collision impacts from communication towers. Many of the suggested minimization measures are already incorporated into the mitigation strategy identified in the SEIR (e.g., unguyed communication towers, etc.). As requested, the buffer distance for burrowing owls identified in MM BIO-12 has been revised to 500 feet.

4.19 The comment addresses golden eagles, including potential loss of foraging habitat and mortality from collision with wind turbines. These potential impacts are identified and described in the LWEP Final EIR. Golden eagles are known to forage on the site, and some foraging habitat would be lost or altered by project facilities. In 2019, aerial surveys found a potential nest location approximately 500 feet north of the Project Area (approximately 1,000 feet north of WTG N-7) within oak woodlands. Subsequent ground observations documented an active nest in this location. There is also a known nest site approximately 4 miles northeast of the Project area, on a cliff along the Santa

[10] Email communication from Daniel Duke, BayWa r.e. to Kathy Pfeifer, Santa Barbara County Planning & Development dated July 18, 2019.

Ynez River. Appendix C-8 documents the results of surveys conducted in 2018 and 2019, and Section 4.5 of the SEIR has been revised to incorporate these new results. Impacts to potential raptor (including golden eagle) nesting and foraging are summarized and incorporated by reference, and mitigated as feasible in the SWEP SEIR. The comment notes that Project impacts to golden eagle may be significant, consistent with the SEIR analysis and conclusion (i.e., impacts would be significant and unavoidable with feasible mitigation applied, Class I; please refer to SEIR Section 4.5.4.2, Proposed Project Impacts and Mitigation Measures under Impact BIO-10, Avian and Bat Collisions with WTGs). The comment states that this impact would result "because the measures provided do not condition the Project to implement take avoidance surveys prior to operations..." The commenter's wording is unclear (surveys cannot avoid take). Nonetheless, the Applicant has implemented extensive golden eagle and other avian surveys as summarized in SEIR Section 4.5.1 (Environmental Setting) and Appendix C-8. The comment summarizes California law regarding fully protected species. This point has been added to Mitigation Measure MM BIO-16 (Monitoring and Adaptive Management Plan / Bird and Bat Conservation Strategy) in the Final SEIR.

The comment concludes by recommending that the SEIR "should demonstrate how impacts to golden eagle... would be avoided by the Project," and that the County should conduct additional on-site golden eagle point counts, helicopter-based nest surveys over a ten-mile radius surrounding the Project site, and a one-mile radius buffer surrounding known active and formerly active nest sites. Please see Appendix C-8 for the results of all surveys conducted to date, including aerial eagle nest surveys that were completed after the Draft SEIR publication. The SEIR concludes that impacts to golden eagle cannot be avoided or feasibly mitigated to less than significant (Class I). The analysis and conclusions in the SEIR are based on known likelihood that golden eagles nest in the project region and forage over the project site. The recommend point counts and 10-mile survey radius would not improve our understanding of golden eagle occurrence on the site, or potential Project impacts. However, MM BIO-12 (Avoidance Measures for Nesting Birds) has been revised in the SEIR to require nest surveys over a one-mile radius and to avoid Project-related impacts within one mile of active nests. In addition, MM BIO-15b requires active control technology such as IdentiFlight as part of the initial Project design to minimize collision risk to eagles and other large birds.

4.20 The issue identified in CDFW's comment appears to refer to a different project than SWEP (Antelope Expansion 1B Solar Project in the western portion of the City of Lancaster in Los Angeles County). However, the comment generally addresses nesting birds. See Impact BIO-8 in the SEIR for an analysis of impacts to nesting birds. CDFW requests to be consulted if the 500-foot buffer (for nesting raptors) is proposed to be reduced. However, MM BIO-12 already states "The prescribed buffers may be adjusted to reflect existing conditions, including but not limited to ambient noise, topography, and disturbance, with the approval of the County of Santa Barbara in coordination with CDFW." In addition, this measure has been revised to require daily monitoring of all nests with buffers that have been reduced below the recommended sizes stated in the measure.

4.21 See Impacts WAT-1 (Erosion and Sedimentation), WAT-5 (Riparian Vegetation Removal), and BIO-3 (Wetlands, Seeps, and Springs, and Features Subject to Regulation by the USACE, Santa Barbara County, or CDFW) for impacts to drainages. Suitable aquatic habitat for unarmored threespine stickleback is found only outside the Project footprint and the Project would not impact aquatic habitats that could support this species. MM BIO-9 is proposed to minimize or avoid direct and indirect impacts to jurisdictional features and would require the preparation and implementation of a Wetland Avoidance and Riparian Habitat Restoration Plan. MMs BIO-1 through BIO-3, BIO-11c, BIO-11d, and WAT-2 are also required to avoid or minimize impacts to jurisdictional resources,

including indirect impacts to downstream aquatic habitats that could support this species. Therefore, impacts to unarmored threespine stickleback are unlikely to occur.

4.22 Regarding CDFW filing fees, the comment is noted.

4.23 As requested by the commenter and required by CEQA, CDFW will be notified when the Final SEIR is published and will also be notified of any hearing dates for the Project.