Board Policy Committee Meeting and Special SMUD Board of Directors Meeting

Date: Wednesday, August 11, 2021

Time: Scheduled to begin at 5:30 p.m.

Location: Virtual Meeting (online)

Powering forward. Together.

SMUD®

AGENDA
BOARD POLICY COMMITTEE MEETING
AND SPECIAL SMUD BOARD OF DIRECTORS MEETING

Wednesday, August 11, 2021
Scheduled to begin at 5:30 p.m.
Zoom Webinar Link: Join Policy Committee Meeting Here
Webinar ID: 160 552 3606
Password: 806324
Phone Dial-in Number: 1-669-254-5252

In accordance with the Governor's Executive Order N-29-20 and the Emergency Board Meeting Procedures adopted by the SMUD Board of Directors, the regular Board meeting and other public meetings are closed to the public to align with state, local, and federal guidelines and social distancing recommendations for the containment of the coronavirus.

Live video streams and indexed archives of meetings are available at:
http://smud.granicus.com/ViewPublisher.php?view_id=16

Members of the public may register to provide verbal comments at an upcoming Board or Committee meeting by emailing a request to speak to PublicComment@smud.org. Please include the date of the meeting, name, and topic or agenda item the requestor wishes to speak on. The request may also be submitted while the meeting is in progress during the standard time for the agenda item or topic. **Pre-registration is strongly encouraged by no later than 3:00 p.m. on the day of the meeting.**

Members of the public may provide written public comments on a specific agenda item or on items not on the agenda (general public comment) by submitting comments via e-mail. Comments may be submitted to PublicComment@smud.org and will be placed into the record of the meeting.

Members of the public that are listening to or watching the live stream of a Committee meeting and wish to comment on a specific agenda item as it is being heard may submit their comments, limited to 250 words or less, to PublicComment@smud.org, noting the agenda item number in the subject line. The Committee Chair may read comments for items on the agenda into the record, in her discretion, based upon such factors as the length of the agenda or the number of e-mail comments received. General public comment for items not on the agenda will not be read into the record but will be provided to the Board and placed into the record of the Board meeting if it is received within two hours after the meeting ends.

This Committee meeting is noticed as a joint meeting with the Board of Directors for compliance with the Brown Act. In order to preserve the function of the Committee as advisory to the Board, members of the Board may attend and participate in the discussions, but no Board action will be taken. The Policy Committee will review, discuss and provide the Committee's recommendation on the following:

DISCUSSION ITEMS

1.	Patrick Durham	Certify the **California Environmental Quality Act (CEQA) Solano 4 Wind Project (Project) Final Environmental Impact Report (FEIR)**, adopt the **Mitigation Monitoring and Reporting Program** for the **Project**, adopt the **CEQA Findings and Statement of Overriding Considerations in Connection with the Solano 4 Wind Project**, and approve the **Project**. Presentation: 10 minutes Discussion: 15 minutes
2.	Tracy Carlson	Accept the monitoring report for **Strategic Direction SD-5, Customer Relations**. Presentation: 15 minutes Discussion: 10 minutes
3.	Tom Jas	Accept the monitoring report for **Strategic Direction SD-15, Outreach and Communication**. Presentation: 20 minutes Discussion: 15 minutes

INFORMATIONAL ITEMS

4.	Nancy Bui-Thompson	Board Work Plan. Discussion: 5 minutes
5.	Public Comment	
6.	Heidi Sanborn	Summary of Committee Direction. Discussion: 1 minute

Pursuant to Resolution No. 20-06-08 adopted on June 18, 2020, Emergency Board Meeting Procedures are in effect:

Members of the public may make either a general public comment or comment on a specific agenda item by submitting comments via email. Comments may be submitted to PublicComment@smud.org. Comments will be provided to the Board and placed into the record of the Committee meeting if it is received within two hours after the meeting ends.

Members of the public that are listening or watching the live stream of a Board meeting and wish to comment on a specific agenda item as it is being heard, may submit their comments, limited to 250 words or less, to PublicComment@smud.org. The Committee Chair may read the comments into the record, in her discretion, based upon such factors as the length of the agenda or the number of email comments received. Comments will be provided to the Board and placed into the record of the Committee meeting if it is received within two hours after the meeting ends.

Members of the public may register to provide verbal comments at an upcoming Board or Committee meeting by emailing a request to speak to PublicComment@smud.org. *Please include the date of the meeting, name, and topic or agenda item the requestor wishes to speak on. The request may also be submitted while the meeting is in progress during the standard time for the agenda item or topic.* ***Pre-registration is strongly encouraged by no later than 3:00 p.m. on the day of the meeting.***

ADA Accessibility Procedures: Upon request, SMUD will generally provide appropriate aids and services leading to effective communication for qualified persons with disabilities so that they can participate equally in this virtual meeting. If you need a reasonable auxiliary aid or service for effective communication to participate, please email Toni.Stelling@smud.org*, or contact by phone at (916) 732-7143, no later than 48 hours before this virtual meeting.*

SSS No.
ES 21-010

BOARD AGENDA ITEM
STAFFING SUMMARY SHEET

Committee Meeting & Date
Policy, August 11, 2021
Board Meeting Date
August 19, 2021

TO		TO	
1.	Emily Bacchini	6.	Jennifer Davidson
2.	Pat Durham	7.	Stephen Clemons
3.	Ross Gould	8.	
4.	Frankie McDermott	9.	**Legal**
5.	Lora Anguay	10.	**CEO & General Manager**

Consent Calendar		**Yes**	X	**No** *If no, schedule a dry run presentation.*	**Budgeted**		**Yes**	X	**No** *(If no, explain in Cost/Budgeted section.)*

FROM (IPR)	DEPARTMENT	MAIL STOP	EXT.	DATE SENT
Ammon Rice	Environmental Services	B209	7466	7/23/2021

NARRATIVE:

Requested Action: Certify the California Environmental Quality Act (CEQA) Solano 4 Wind Project (Project) Final Environmental Impact Report (FEIR), adopt the Mitigation Monitoring and Reporting Program for the Project, adopt the CEQA Findings and Statement of Overriding Considerations in Connection with the Solano 4 Wind Project, and approve the Project.

Summary: SMUD's Solano Wind Project located in the Solano Wind Resource Area, Solano County now has a rated capacity of 230 MW of wind energy. The Solano 4 Wind Project would increase capacity by up to 91 MW, to a total of 306 MW. The Solano 4 Wind Project would support the Board of Directors' directive of using dependable renewable resources to meet SMUD's renewable portfolio standards (RPS) obligations. This goal is consistent with Senate Bill 100, which was enacted in 2018. The Project would also help SMUD to meet the Board-adopted 2030 Zero Carbon Plan.

The Project would result in the installation and operation of up to 22 Wind Turbine Generators (WTGs) within the existing SMUD Solano Wind Project. In addition, the Project would remove Solano 1 turbines, construct new roads, foundations and pads, reclaim old roads, and build a power collection system and related facilities.

Project alternatives included offsite wind projects, alternative technologies in the project area (e.g., solar, nuclear), a reduced turbine height alternative, and a no-project alternative. Given the proximity of the Project area to existing transmission lines, the availability of wind in Solano County, and that SMUD owns the land so no land purchase would be required, the preferred alternative is to build a wind energy project as described in the Environmental Impact Report (EIR). If the Project is approved, engineering and procurement would start shortly thereafter. Solano 4 Wind would be operational in 2024-25.

As required by CEQA, a Notice of Preparation was made available for public review January 9, 2019, and a public meeting was held on January 22, 2019. The Draft EIR was subsequently prepared and issued July 23, 2019. Notice of Availability letters were sent to relevant agencies and members of the public within one mile of the Project, and a public meeting was held on August 20, 2019. Public comments received during the 45-day public review period were addressed in the Final EIR. Responses to comments and issues raised during the comment period were made available to commenters on July 30, 2021, for a 10-day review period. The Policy Committee and SMUD Board of Directors meetings will be noticed by email to agencies and the parties that commented on the Draft EIR.

The EIR identifies potentially significant impacts that may result from construction and operation of the Project. Most impacts (e.g., aesthetics, biological, archaeological, historical, and Tribal cultural resources, geology and soils, greenhouse gas emissions and energy, hazards and hazardous materials, hydrology and water quality, land use, noise, and transportation) are mitigatable. Certain impacts to air quality cannot be mitigated to a less-than-significant level and would remain significant and unavoidable.

The air quality impacts that cannot be mitigated to below the level of significance necessitate the SMUD Board of Directors' adopting a Statement of Overriding Considerations as part of the Project approval. This statement declares that the public benefits of the project outweigh any potential significant and unavoidable impacts. Staff recommends that a Statement of Overriding Considerations be adopted for this Project.

At the request of SMUD, the Federal Aviation Administration conducted aeronautical studies and determined that the Solano 4 Wind Project "would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation" and on that basis issued a Determination of No Hazard (DNH) for each of the wind turbine locations. SMUD applied for extensions of the DNH's which resulted in the formation of a Mitigation Response Team (MRT) with Travis Air Force Base. The result of the MRT review was a conclusion by the 60th Air Mobility Wing that "[a]s proposed, Solano 4 should have minimal negative impact on Travis Operations" and a conclusion by the Department of Defense Siting Clearinghouse that the Solano 4 Wind Project "will not present an adverse impact to military operations." (Simmons, 2021; Sample, 2021).

Board Policy: *(Number & Title)*

The proposed Project supports the following Board adopted policies: SD-4, Reliability; SD-7, Environmental Leadership; and SD-9, Resource Planning. The Project supports Policy SD-4 by generating power using dependable renewable resources. The Project supports Policy SD-7 by ensuring SMUD compliance with CEQA. The Project supports SD-9 by securing long-term dependable energy generation.

Benefits:

SMUD needs new renewable and carbon-free resources to meet California's mandate for renewable procurement (60% by 2030) and to meet its Board directed goals. SMUD's Integrated Resource Plan (IRP), adopted by its Board in 2018, guides decisions on future resource developments, and lays out a pathway to achieve a Net Zero greenhouse gas (GHG) emissions goal by 2040 through investment in electrification while significantly expanding renewable and carbon-free resources in its portfolio. In July 2020, SMUD's Board declared a climate emergency and adopted a resolution calling for SMUD to take significant and consequential actions to eliminate its greenhouse gas emissions by 2030 and directed staff to develop a plan to achieve this goal. SMUD's 2030 Zero Carbon Plan calls for the addition of up to 2,300 MW of new renewables and 1,100 MW of batteries by 2030 – more than double the amount SMUD was planning for its 2018 IRP. The 2030 Plan calls for maximizing new cost-effective utility-scale renewables within our service territory (up to 1,500 MW utility scale solar) but also requires SMUD to add additional resources that it does not have locally, such as wind and geothermal.

Thus, the fundamental purpose of the Solano 4 Wind Project is to contribute to a diversified energy portfolio that will aid in the continued improvement of air quality in the Sacramento Valley Air Basin by decreasing reliance on fossil fuel combustion for the generation of electricity and reduce SMUD's exposure to price volatility associated with electricity and natural gas. The Solano 4 Wind Project would assist SMUD in achieving the Board of Directors' directive of using dependable renewable resources to meet SMUD's renewable portfolio standards (RPS) obligations. This goal is consistent with Senate Bill 100, which was enacted in 2018. The Solano 4 Wind Project would deliver a reliable supply of up to 91 MW and would accommodate the long-term viability of agricultural use within the Montezuma Hills. SMUD has long-anticipated the continued use of the Project site for wind projects, which has been a key component of SMUD's efforts for planning to meet a carbon-free energy portfolio.

Cost/Budgeted:

Since bids responding to the Request for Proposals (RFP) for the development of the Project have not been received, the final budget for the Project is being developed and will be presented to the SMUD Board for Directors for approval in late-2021. The current 2021 budget approved by the SMUD Board includes approximately $10.7 million in capital expenses for initial construction payments, Project initial environmental and Project coordination features.

Alternatives:

1) Certify the EIR for the SMUD Solano 4 Wind Project, adopt the Findings and Statement of Overriding Considerations, adopt the Mitigation Monitoring and Reporting Program, and approve the Project; 2) return the CEQA analysis to staff for further study; or 3) reject the CEQA analysis and the Project.

Affected Parties:

SMUD Power Generation and Environmental Services; US Army Corps of Engineers, Central Valley Regional Water Quality Control Board, US Fish and Wildlife Service, California Department of Fish and Wildlife, Solano County, Solano County Airport Land Use Commission, Travis Air Force Base, and the public

Coordination:

Power Generation, Environmental Services, Real Estate Services, Local Government, Legal

Presenter:

Pat Durham, Director, Environmental & Real Estate Services

Additional Links:

SUBJECT	ITEM NO. *(FOR LEGAL USE ONLY)*
Solano 4 Wind Project (CEQA)	

ITEMS SUBMITTED AFTER DEADLINE WILL BE POSTPONED UNTIL NEXT MEETING.

Sacramento Municipal Utility District
Solano 4 Wind Project

Final Environmental Impact Report • July 2021
State Clearinghouse #2019012016

Powering forward. Together.

SMUD®

Sacramento Municipal Utility District

Solano 4 Wind Project

Final Environmental Impact Report

State Clearinghouse #2019012016

July 2021

Lead Agency:

Sacramento Municipal Utility District
6201 S Street, MS B209
Sacramento, CA 95817-1899

or

P.O. Box 15830 MS B209
Sacramento, CA 95852-1830
Attn: Ammon Rice
(916) 732-7466 or ammon.rice@smud.org

Prepared by:

AECOM
2020 L Street, Suite 400
Sacramento, CA 95811
Contact: Petra Unger
petra.unger@aecom.com

Table of Contents

Chapter/Section Page

Appendices

Tables

Figure

Acronyms and Abbreviations

AB	Assembly Bill
ACC	Advanced Clean Car Program
ADLS	Asymmetric Digital Subscriber Line
AFB	Air Force Base
ALUC	Airport Land Use Commissions
APE	Area of Potential Effect
APP	Avian Protection Plan
ARB	California Air Resources Board
ASTM	American Society for Testing and Materials
ATV	all-terrain vehicle
BAAQMD	Bay Area Air Quality Management District
BBCS	Bird and Bat Conservation Strategies
BMP	best management practice
BO	biological opinion
Board	Board of Directors
CalEEMod	California Emissions Estimator Model
CARB	California Air Resources Board
Caltrans	California Department of Transportation
CCR	California Code of Regulations
CDFA	California Department of Food and Agriculture
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CEC5	California Energy Commission
CERS	California Environmental Reporting Systems
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
CRPR	California Rare Plant Rank
CTS	California tiger salamander
CURE	California Unions for Reliable Energy
CV	Central Valley
CWA	Clean Water Act

DHS	Department of Homeland Security
DNH	Determinations of No Hazard
DOD	Department of Defense
DOGGR	California Department of Conservation, Division of Oil, Gas and Geothermal Resources
Draft EIR	draft environmental impact report
EIR	environmental impact report
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
ESAs	environmentally sensitive areas
FAA	Federal Aviation Administration
FDCP	fugitive dust control plan
Final EIR	final environmental impact report
ft	feet
GHG	greenhouse gas
HDD	horizontal directional drilling
HMBP	hazardous materials business plan
HRA	health risk assessment
HSCERP	Hazardous Substance Control and Emergency Response Plan
ITP	incidental take permit
LED	light-emitting diode
LUPC	Land Use Planning Commission
m	meter(s)
MM	Mitigation Measure
MMRP	mitigation monitoring and reporting program
mph	miles per hour
MRT	Mitigation Response Team
MBTA	Migratory Bird Treaty Act
$MTCO_2e$	metric tons of carbon dioxide equivalent
MWh	megawatt hours
NAHC	Native American Heritage Commission
NAS	National Airspace System
NOTAM	Notice to Airmen
NOP	notice of preparation
NO_X	oxides of nitrogen

NPH	Notice of Presumed Hazard
NPDES	National Pollutant Discharge Elimination System
OEHHA	Office of Environmental Health Hazards Assessment
PHEV	plug-in hybrid electric vehicle
OSHA	Occupational Health and Safety Administration
PM	particulate matter
PM_{10}	fine particulate matter
PV	photovoltaic
PRC	Public Resources Code
ROG	reactive organic gases
RWQCB	Regional Water Quality Control Board
SAA	State Aeronautics Act
SCADA	supervisory control and data acquisition
SCEMD	Sacramento County Environmental Management Department
SFB	San Francisco Bay
SMAQMD	Sacramento Metropolitan Air Quality Management District
SMUD	Sacramento Municipal Utility District
SOC	Statement of Overriding Considerations
SOW	Scope of Work
SPCC	Spill Prevention, Control, and Countermeasure
SR	State Route
SWAPE	Soil/Water/Air Protection Enterprise
SWPPP	stormwater pollution prevention plan
SWRCB	State Water Resources Control Board
TAC	Technical Advisory Committee
TCR	tribal cultural resource
the Board	SMUD Board of Directors
UAIC	United Auburn Indian Community of the Auburn Rancheria
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
VOC	volatile organic compound
WEAP	worker environmental awareness program
WTG	wind turbine generator
YSAQMD	Yolo-Solano Air Quality Management District
ZEV	Zero-Emission Vehicle

This page intentionally left blank.

1 Introduction

On July 22, 2019, the Sacramento Municipal Utility District (SMUD) released for public review the draft environmental impact report (Draft EIR) for the proposed Solano 4 Wind Project (project). SMUD proposes to:

- decommission existing wind turbine generators (WTGs) at the project site;
- construct new, more technologically advanced WTGs;
- construct an associated electrical collection system, and access roads;
- implement minor upgrades to the existing Russell Substation; and
- operate and maintain the new WTGs.

1.1 Public Review and Response to Comments

In accordance with Sections 15087 and 15105 of the State CEQA Guidelines, the Draft EIR was circulated for public review and comment to lead and responsible agencies, as well as members of the public, for 45 days (July 22, 2019 through September 6, 2019). SMUD also held a public meeting on August 20, 2019 to receive comments on the Draft EIR. Written comment letters received on the Draft EIR are provided in their entirety in Chapter 2, “Comments and Responses to Comments.”

Responses to each of the comments received are provided in this document as part of the final environmental impact report (Final EIR). Although some of the comments have resulted in changes to the text of the Draft EIR (see Chapter 3, “Corrections and Revisions to the Draft EIR”), none of the changes constitute “significant new information,” which would require recirculation of the Draft EIR. Significant new information is defined in Section 15088.5(a) of the State CEQA Guidelines as follows:

> (1) A new significant environmental impact would result from the project or from a new mitigation measure proposed to be implemented.
>
> (2) A substantial increase in the severity of an environmental impact would result unless mitigation measures are adopted that reduce the impact to a level of insignificance.
>
> (3) A feasible project alternative or mitigation measure considerably different from others previously analyzed would clearly lessen the environmental impacts of the project, but the project’s proponents decline to adopt it.
>
> (4) The Draft EIR was so fundamentally and basically inadequate and conclusory in nature that meaningful public review and comment were precluded.

None of these circumstances has arisen from comments on the Draft EIR; therefore, recirculation is not required.

The Draft EIR, Final EIR, and associated appendices are available for review online at: https://www.smud.org/CEQA and at the following locations:

Sacramento Municipal Utility District
Customer Service Center
6301 S Street
Sacramento, CA 95817

Sacramento Municipal Utility District
East Campus Operations Center
4401 Bradshaw Road
Sacramento, CA 95827

As required by State CEQA Guidelines Section 15088(b), SMUD has provided a printed or electronic copy (through SMUD's website; see prior discussion) to each public agency that submitted written comments on the Draft EIR with written responses to that public agency's comments at least 10 days prior to certifying the Final EIR.

1.2 Organization of the Responses to Comments

Chapter 2 of the Final EIR consists of the written comments received on the Draft EIR and presents responses to environmental issues raised in the comments (as required by State CEQA Guidelines Section 15132). The focus of the responses to comments is on the disposition of significant environmental issues that are raised in the comments, as required by Section 15088(c) of the State CEQA Guidelines.

Each comment letter has been reproduced with individual comments bracketed and numbered. Responses to the comments follow each letter. For example, the response to the second comment of the first letter would be indicated as Response to Comment 1-2. In some instances, clarifications of the text of the Draft EIR may be required. In those cases, the text of the Draft EIR is revised and the changes compiled in Chapter 3, "Corrections and Revisions to the Draft EIR," to the Draft EIR. The text deletions are shown in strikeout (~~strikeout~~) and additions are shown in double underline (<u>double underline</u>).

1.3 FAA Compliance Process and Ongoing Federal Coordination

The United States Congress charged the Federal Aviation Administration (FAA) with the responsibility to encourage air commerce in the United States. As part of this responsibility, the FAA is tasked with ensuring air safety and preserving the National Airspace System (NAS). It is through these mandates that the FAA draws its authority to conduct aeronautical studies of tall structures including wind turbines (Aeronautical Study Process, Capitol Airspace Group 2018).

There are eight offices internal to the FAA. In addition, the Department of Defense (DOD), Army, Navy, Air Force and the Department of Homeland Security (DHS) take part in the aeronautical study process. The DoD formal review process occurs concurrently with FAA's aeronautical study. Technicians in each office review each proposed tall structure

location to ensure that the planned structure does not interfere with their areas of responsibility. Once all offices have responded, the airspace specialist, typically a former air traffic controller, assesses all of the responses and subsequently determines whether the planned structure exceeds the imaginary surfaces established under 14 CFR Part 77, Sections 77.17, 77.19 and 77.21. Structures that do not exceed these surfaces are, in most cases, issued favorable Determinations of No Hazard (DNH). Structures that exceed these surfaces are generally issued a Notice of Presumed Hazard (NPH). A NPH letter is meant to be a means for the FAA to notify the developer that the FAA has identified an issue that will require further study to determine whether or not the structure will pose a hazard to air navigation. Typically, the FAA also includes in this letter any objections received by the various responding offices in the FAA, DOD and DHS. If a military objection is raised, due to potential for impact on radar surveillance systems, for example, a Mitigation Response Team (MRT) may be formed. This team would include representatives from any potentially affected air force base. The MRT conducts detailed analyses and, if necessary, negotiates mitigation options with the structure developer. If mitigation options are identified and agreed upon, the Mitigation Oversight Committee will review the solutions (Aeronautical Study Process, Capitol Airspace Group 2018).

It is through the public comment period that the FAA collects information regarding the potential extent of any actual impact of the structure on local flights. Once the comment period closes, the FAA will collect all comments, discard those that are not of valid aeronautical nature, and proceeds to make a final decision. The FAA will issue a Determination of Hazard to Air Navigation when the aeronautical study concludes that the proposed construction or alteration will exceed an obstruction standard and would have a substantial aeronautical impact. The FAA will issue a Determination of No Hazard to Air Navigation when a proposed structure does not exceed any of the obstruction standards and would not be a hazard to air navigation. A Determination of No Hazard to Air Navigation will also be issued when the aeronautical study concludes that the proposed construction or alteration will exceed an obstruction standard but would not have a substantial aeronautical impact to air navigation and may include the following: conditional provisions of a determination, limitations necessary to minimize potential problems, such as the use of temporary construction equipment, supplemental notice requirements, when required, and marking and lighting recommendations, as appropriate. (Aeronautical Study Process, Capitol Airspace Group 2018).

On February 8, 2018, SMUD started meeting with Travis Air Force Base (AFB) to discuss the Solano 4 Wind Project and associated environmental review and project planning processes, project schedule, and studies to be prepared (radar impact study and an obstruction evaluation and airspace analysis). SMUD also met with Solano County on February 28, 2018 to share the same information. Since the February 8, 2018 meeting with Travis AFB, SMUD met with Travis AFB on five separate occasions to discuss the project, including the radar impact study and obstruction evaluation and airspace analysis. SMUD filed applications with the FAA on October 10, 2018 and on February 2, 2019 received separate Determinations of No Hazard to Air Navigation for nineteen (19) Solano 4 turbines with conditions related to marking and lighting. The determinations were subject to third party petitions received by March 3, 2019. While an attorney filed a

letter on behalf of the Airport Land Use Commission (ALUC), the FAA determined that the letter was not an objection, but constituted a series of statements. The third-party submittal period ended, and the determinations became final on March 13, 2019. SMUD notified Travis AFB on April 14, 2020 that SMUD had started the process with the FAA to request extensions for the nineteen (19) DNHs received for the Solano 4 Wind Project. On September 28, 2020 SMUD met with Colonel Simmons of Travis AFB to discuss the project. Key take-away messages from this meeting included Colonel Simmons' request that SMUD continue working with the county and ALUC as part of the FAA DNH extension. It was also stated that Travis AFB would participate in the FAA process, would conduct independent studies, and that Travis AFB would like to understand the cumulative effect of future repowering/development on radar systems. As Travis AFB worked through its own technical evaluation, SMUD scheduled bi-weekly meetings with Travis AFB to provide support and receive updates. These meetings continued until Travis AFB concluded its study. Travis submitted its Solano 4 Wind Project Operational Risk Assessment to the DOD on January 11, 2021. SMUD received the requested extensions for the nineteen (19) DNH for the Solano 4 Wind Project on January 28, 2021, and a letter dated February 9, 2021 from Steven J. Sample, Executive Director, Military Aviation and Installation, Assurance Siting Clearinghouse stating that as a result of its study of the potential impact of SMUD's proposed project, it will not present an adverse impact to military operations (See FAA Determinations in Appendix G of the DEIR and Appendix B of this FEIR).

1.4 Comments that Require Responses

Section 15088(c) of the State CEQA Guidelines specifies that the focus of the responses to comments shall be on the disposition of significant environmental issues. Responses are not required on comments regarding the merits of the project or on issues not related to the project's environmental impacts. Comments on the merits of the proposed project or other comments that do not raise environmental issues will be reviewed by SMUD's Board of Directors (the Board) before an action is taken on the project. The responses address environmental issues and indicate where issues raised are not environmental or address the merits of the project. In the latter instance, no further response is provided.

1.5 Project Decision Process

This document and the Draft EIR together constitute the Final EIR, which will be considered by the Board before a decision on whether to approve the project. If the Board decides to approve the project, it must first certify that the Final EIR was completed in compliance with CEQA's requirements, was reviewed and considered by the Board, and reflects the Board's independent judgment and analysis, as required by State CEQA Guidelines Section 15090. The Board then would be required to adopt findings of fact on the disposition of each significant environmental impact, as required by State CEQA Guidelines Section 15091. If significant and unavoidable impacts (those that cannot be mitigated to a less-than-significant level) would result from the project and the Board chooses to approve the project, the Board would need to adopt a statement of overriding

considerations, pursuant to State CEQA Guidelines Section 15093, explaining the overriding factors that the Board deems allow the project to move forward. Implementing air quality mitigation measures would reduce emissions associated with project construction. However, even after implementation of the recommended mitigation measures, the project's construction emissions would exceed applicable thresholds during certain months of construction. Therefore, this short-term construction impact would be significant and unavoidable and therefore will require a Statement of Overriding Considerations (SOC) from the Board. In the SOW, the SMUD Board states in writing the specific reasons to support its action based on the Final EIR and/or other information in the record. The SOW will be included in the Notice of Determination (California Code of Regulations 15093 (b)) that will be filed with the State Clearinghouse upon project approval by the Board. A Mitigation Monitoring and Reporting Program, which is required by CEQA Guidelines Section 15091(d), has been prepared and is included in Chapter 4 of this Final EIR.

1.6 Revisions to the Draft EIR

As discussed in Section 1.1, "Public Review and Response to Comments," above, CEQA requires recirculation of an EIR when the lead agency adds "significant new information" to an EIR, regarding changes to the project description or the environmental setting, after public notice is given of the availability of a draft EIR for public review under State CEQA Guidelines, California Code of Regulations (CCR) Section 15087, but before EIR certification (State CEQA Guidelines CCR Section 15088.5[a]). Recirculation is not required unless the EIR is changed in a way that would deprive the public of the opportunity to comment on significant new information, including a new significant impact in which no feasible mitigation is available to fully mitigate the impact (thus resulting in a significant and unavoidable impact), a substantial increase in the severity of a disclosed environmental impact, or development of a new feasible alternative or mitigation measures that would clearly lessen environmental impacts but that the project proponent declines to adopt (State CEQA Guidelines CCR Section 15088.5[a]). Recirculation is not required when the new information added to the EIR merely clarifies or amplifies or makes insignificant modifications in an adequate EIR (State CEQA Guidelines CCR Section 15088.5[b]).

All revisions to the Draft EIR were minor and would not change any of the impact conclusion presented in the Draft EIR. Therefore, recirculation of the EIR would not be required.

1.6.1 Tribal Consultation

Assembly Bill (AB) 52 requires that lead agencies undertaking CEQA consult with California Native American Tribes upon the tribes' written request, and evaluate in the EIR the potential for projects to affect tribal cultural resources. Section 3.4, "Archaeological, Historical, and Tribal Cultural Resources," of the Draft EIR describes the consultation that has occurred between the tribes and SMUD pursuant to AB 52. Specific

language requested by the tribes was incorporated in the Draft EIR prior to circulation, and consultation has been completed.

2 Comments and Responses to Comments

2.1 Master Response: Land Use and Safety Concerns Related to Project Siting

Several commenters submitted letters disagreeing with SMUD's interpretation of its authority under Government Code section 53091(d) and (e) and asserting that the DEIR was not sufficiently detailed with regards to SMUD's assertion that SMUD is not required to obtain a consistency determination from ALUC for project approval and that further analysis was needed. Commenters also expressed concern regarding potential significant impacts to airport-related land use and safety. They suggested additional information was necessary to ensure that the public and decisionmakers are properly informed and can conduct a meaningful evaluation of the way project impacts were avoided, minimized, or mitigated. The following responses address these issues by topic.

LAND USE

As described in more detail below, SMUD maintains that the Solano 4 Wind Project does not require Airport Land Use Commission Approval (ALUC) approval for the following reasons: 1) Electrical generation/production facilities are exempt from a county's building and zoning ordinances under California Government Code Section 53091, subdivisions (d) and (e); 2) The Federal Aviation Administration (FAA) finding of no significant hazard for the project preempts the ALUC regulations under the Travis Air Force Base (AFB) LUCP regarding air safety, including radar interference (Appendix G FAA Determination); 3) The ALUC does not have authority to review individual projects, such as SMUD's Generation Project, under the State Aeronautics Act, and; 4) Even if the ALUC regulations were to apply to the project, SMUD, as a local agency, has the authority to overrule any ALUC determination of inconsistency under the SAA and the evidentiary record provides justification for doing so.

Please also refer to Downey Brand's letter dated April 26, 2019 in response to the Solano County ALUC comments on SMUD's Notice of Preparation (NOP) for Solano 4 Wind Project included in Appendix C of this FEIR for additional information regarding SMUD's position on this issue.

1. Even if the LUCP were to apply, which it does not, the Solano 4 Wind Project would be exempt from ALUC review because an energy generating/production facility is exempt from a county's zoning and building ordinances under Government Code Section 53091.

SMUD's wind turbine facilities are exempted from the ALUC provisions because under subdivisions (d) and (e) of Section 53091 of the Government Code, the zoning and building ordinances of a county or city shall not apply to the location or construction of facilities for the generation of electrical energy. SMUD, as a municipal utility district, is a local agency for purposes of Section 53091. (See *City of Lafayette v. East Bay Municipal Utilities District* (1993) 16 Cal.App.4th 1005, 1012; 78 Ca1.Atty.Gen.Ops. 31 (1995); see also *Center for Biological Diversity v. County of San Bernardino* (2016) 247 Cal.App.4th 326, 344 fn.4 [county did not have authority to apply building and zoning regulations to water project proposed by local water agency pursuant to Sections 53091 and 53096].) Because a wind turbine facility is an electrical generation facility, the project qualifies for the exemptions under subdivisions (d) and (e) of Section 53091.

2. The only element of the LUCP that could apply to the Solano 4 Wind Project is preempted by federal law.

   The ALUC in its LUCP has imposed broad land use controls based on general safety and noise concerns, but in limiting the height of wind turbines specifically, it has relied solely on the narrow and technical issue of alleged radar interference. As to this narrow issue regarding radar system interference that are related to air safety and aviation navigation, the FAA regulations occupy the field and preempt the ALUC's land use regulations. Even California courts have also concluded that the FAA has authority over navigation aids such as air control towers, radio navigation systems, runway markers, and directional beams. (*Bethman v. City of Ukiah* (1989) 216 Cal.App.3d 1395, 1403, 1408; *City of Burbank v. Burbank-Glendale-Pasadena Airport Authority* (1999) 72 Cal.App.4th 366, 379.) For example, in *Big Stone Broadcasting, Inc. v. Lindbloom* (D.S.D. 2001) 161 F. Supp. 2d 1009, the court found that the local regulations cannot veto a radio tower where FAA has already issued a finding of significant hazards, including existing and planned visual flight rules (VFR) operations and procedures. (Id. at 1011-12, 1019.)

   In this case, the FAA has already evaluated the project's "impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when

combined with the impact of other existing or proposed structures." (FAA Determination of No Hazard to Air Navigation, dated February 1, 2019, and extensions dated January 28, 2021 (Appendix G FAA Determination). The FAA Determination states that the project's "aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities."

The FAA's analyses of the project's impacts included exceedances of various obstructions standards and concluded that just because a wind turbine is within the line of sight of a radar sensor does not imply that the turbine will result in unacceptable adverse impacts on Air Traffic Control (ATC) operations. While the project turbines would be within the line of sight of the Travis AFB radar facilities, "[s]tudy for possible Visual Flight Rules (VFR) effect disclosed that the proposals would have no effect on existing or proposed VFR arrival or departure operations." The FAA thus concluded that while the project turbines "would extend upwards into altitudes commonly used for en route VFR flight," there is no information that the turbines would be "located along a regularly used VFR route or that they would pose a problem for pilots operating en route" or otherwise result in unacceptable adverse impact on ATC operations. The FAA's determination is conclusive. This is consistent with the empirical evidence: SMUD is not aware of any airplane accidents, incidents, or safety issues within the Solano Wind Resource Area throughout the more than 20 years SMUD has been operating wind turbines in Solano County.

Further, the ALUC neglected to file a petition for review of the FAA Determination by the review deadline, and the FAA Determination became final on March 13, 2019. The ALUC has thus waived any challenge to the FAA's Determination of No Hazard (DNH), and the LUCP provisions that rely on unsupported and inaccurate radar interference issues are preempted under the federal law. Therefore, there is no basis for the ALUC review of the project for radar interference or under the visual flight rules.

3. The ALUC does not have authority to review individual projects, such as SMUD's Generation Project, under the SAA.

   ALUC review of local actions is greatly limited where local plans are consistent with an LUCP. An ALUC can only review individual projects (1) when there is no LUCP or, (2) when an ALUC has found a local agency's general plan or

specific plan inconsistent with the LUCP, the local agency has neither revised its general plan or specific plan to be consistent with the LUCP nor overruled this determination of inconsistency. (California Airport Land Use Planning Handbook (2002), p. 4-8, citing Pub. Utilities Code, §§ 21675.1(b), 21676.5(a); see also California Airport Land Use Planning Handbook (2011), p. 6-4 for a more recent version of Handbook.) Here, (1) the ALUC has an adopted LUCP, and (2) the ALUC found the Solano County's General Plan consistent with the LUCP and SMUD, as a local agency, does not have a planning document that would be equivalent to a General Plan). As such, the statutory triggers allowing the ALUC to review an individual project, such as the Solano 4 Wind Project, are not met in this case. Further, while an agency can agree to have an ALUC review individual projects, such review is advisory only. (Pub. Resources Code § 21676.5(b); California Airport Land Use Planning Handbook (2002), p. 4-9.) As such, the Solano 4 Wind Project is not subject to ALUC consistency determination under the SAA provisions. Further, even where an ALUC's review capacity is more than advisory, a local agency can overrule the ALUC's consistency determination. (See Pub. Resources Code § 21675.1(d).)

4. Even if the LUCP applied to the project, which it does not, SMUD can overrule the ALUC's determination.

   Assuming for the sake of argument that the State Aeronautics Act's requirement for obtaining a consistency determination encompasses SMUD's Solano 4 Wind Project, SMUD can overrule the ALUC by holding a hearing, making findings that the action is consistent with the purposes of the SAA, and obtaining a two-thirds vote of its governing body. (See Pub. Util. Code, § 21674.7(b) ["This subdivision does not limit the authority of local agencies to overrule [the ALUC] actions or recommendations pursuant to Sections 21676, 21676.5, or 21677."].)

   Broadly stated, the intent of the SAA is to minimize the risk to public health, safety, and welfare from exposure to excessive noise and safety hazards (i.e., aircraft accidents) and to ensure the orderly development and expansion of airports and surrounding areas. (Pub. Util. Code, § 21670(a); see also *Suisun Alliance*, 2010 WL 3280273 at 4-5.) Therefore, even if the ALUC provisions were to apply to the project, SMUD has the authority under Sections 21676 and 21676.5 to overrule the ALUC's consistency determination upon making the requisite findings, similar to any other local agency such as a city or county.

As stated above, and without expressly limiting the provisions to cities or counties, the SAA does not limit "the authority of local agencies" to overrule an ALUC's actions or recommendations, and certainly does not limit that discretion to only local agencies with land use authority. (See Pub. Util. Code, § 21674.7(b).) Further, by using the term "local agency" in Sections 21676 and 21676.5 of the Public Utilities Code, and conversely and expressly using the term "city or county" in Section 21675.1(d) with respect to parallel provisions regarding overruling an ALUC's determination, the legislature clearly intended that "local agencies" such as SMUD similarly have discretion to overrule the ALUC under Sections 21676 and 21676.5. (See Pub. Utilities Code, §§ 21674.7(b), 216751(d), 21676, 21676.5, and 21677 [allowing local agencies in Marin County to overrule an ALUC determination by a simple majority].) In fact, Solano County staff already conceded that "SMUD is a regulated entity by the ALUC and is similarly situated as any city or the County." (Solano County ALUC Agenda Submittal for ALUC-17-10: SMUD Plan Amendment Request [File No. AC 17-035], October 12, 2017; see also *Suisun Alliance v. Suisun City* (2010) Solano Co. Sup. Ct. Case No. A125042, 2010 WL 3280273, at 4-5).) The Legislature clarified its intent that a local agency such as a special district has the ability to overrule the ALUC determination, as long as the local agency follows the proper procedure set forth in the SAA. (See Assembly Bill Analysis for AB 332 [May 2003], at p. 3.)

As discussed above, prior to the preparation of the DEIR, SMUD commissioned a supplemental individual obstruction evaluation and airspace analysis (Capitol Airspace Group 2018a) to identify obstacle clearance surfaces established by the Federal Aviation Administration (FAA), and a supplemental radar cumulative impact study with design elements to avoid or minimize potential safety impacts (Westslope 2018a). The Capitol Airspace Group supplemental study performed a series of analyses that are similar to the FAA aeronautical analysis and process. The supplemental study was commissioned to provide SMUD with a reasonable expectation of the likely outcome of the FAA review process. The supplemental radar cumulative impact modeling study determined there would be a negligible impact over baseline to the associated Travis AFB radar systems resulting from installation of twenty-two (22) 136M turbines following removal of the existing 23 WTGs, and a net zero impact for installation of nineteen (19) 150M turbines following removal of the existing 23 WTGs compared to the existing baseline conditions, and therefore the Solano 4 Wind Project would not contribute to a cumulative impact (Westslope 2018a).

Both supplemental studies are included in Appendix A of this FEIR. Pursuant to applications filed by SMUD, the FAA issued DNHs for each of the proposed turbines for the project; the FAA also confirmed that the DNHs encompass not only the Visual Flight Rules (VFR) routes but also potential impacts on radar. As stated above, the ALUC did not file a petition challenging the Determinations. Thus, were SMUD to apply for a consistency determination by the ALUC and receive a determination of inconsistency, SMUD's decision on whether to overrule the ALUC could be based on its own commissioned findings as well as the bases identified by the FAA. (*California Aviation Council v. City of Ceres* (1992) 9 Ca1.App.4th 1384, 1393 [a court's review of a local agency's findings in support of its decision to overrule the ALUC is for substantial evidence].)

Additionally, even if SMUD were required to follow certain procedures in the State Aeronautics Act (SAA) or the Solano County Airport Land Use Commission's Travis Air Force Base Land Use Compatibility Plan (LUCP), a possible inconsistency with those procedures or standards does not automatically equate to a significant adverse change in the physical environment under CEQA. Courts have emphasized that "an inconsistency between a project and other land use controls *does not in itself* mandate a finding of significance. It is merely a factor to be considered in determining whether" a project may cause a significant impact. (*Lighthouse Field Beach Rescue v. City of Santa Cruz* (2005) 131 Cal.App.4th 1170, 1207 [emphasis added]; *California Building Industry Assn. v. Bay Area Air Quality Management Dist.* (2016) 2 Cal.App.5th 1067, 1087 [a project's inconsistency with a general plan does not mandate finding of significant effect on the environment]; *Saltonstall v. City of Sacramento* (2015) 234 Cal.App.4th 549, 585 [potential impacts to public safety by event crowds not itself a significant environmental impact under CEQA].) Here, the project is inconsistent with the LUCP's blanket provision limiting to 100 feet the height of any wind turbine within a line-of-sight of the Travis Air Force Base (AFB) Digital Airport Surveillance Radar (DASR) Radar Installation. According to the LUCP itself, the height limit for wind turbines is designed to address radar interference, as well as vertical obstruction hazards. Whatever the purpose, the EIR evaluated possible radar interference and obstruction hazard concerns with regards to local airport uses and found that this project would not result in any significant interference or other safety hazard. Further, the FAA—the Federal agency entrusted with air traffic-related safety concerns—confirmed that this project would result in no

hazard to regional air traffic. Thus, again, despite any procedural inconsistencies or disagreements among agencies, the physical impact of this project has been addressed.

Please also refer to Response to Comment Letters 4-1 and 5-1a, which addresses specific comments related to these issues. Please also see the April 2019 NOP response letter from Downey Brand (Appendix C).

PROJECT BACKGROUND AND HISTORY

Many options were available to SMUD with regards to how the Solano 4 Wind Project could be developed. SMUD contracted with Geoff Blackman of Westslope Consulting, a radar system specialist, to model the expected impact on the radar systems associated with the project area. The first configuration evaluated adding turbines in 2016 to the undeveloped property to the west of the SMUD project area. This would have resulted in the addition of approximately 16 turbines and an impact on the associated radar systems. To mitigate for a potential increase over baseline radar interference by local wind turbines, an option was developed that included the removal of the existing Solano Phase 1 project (23 Vestas 47m rotor diameter turbines on 50m and 65m towers).

SMUD conducted a survey of commercially available turbines. Using these turbines, preliminary site plans were developed including turbine counts that ranged from 19 to 25 turbines (Black and Veatch 2018; see Appendix A of this FEIR). SMUD staff then researched the turbines expected to be commercially available at the expected date of the proposed project's construction and attended the American Wind Energy Association Siting and Environmental Compliance conference to understand what was currently being permitted. From these efforts, SMUD discovered that the majority of turbine manufactures were developing larger, taller turbines. SMUD then updated the conceptual project layout configuration using revised turbine data. The final configuration considered reduced the project turbine count to a preferred 19, per the project CAISO Large Generator Interconnection Application (LGIA), with a maximum of 22 turbines. It also includes the removal of the existing 23 Solano Phase 1 turbines. The supplemental radar cumulative impact modeling study determined there would be a negligible impact over baseline to the associated Travis AFB radar systems resulting from installation of twenty-two (22) 136M turbines following removal of the existing 23 WTGs, and a net zero impact for installation of nineteen (19) 150M turbines following removal of the existing 23 WTGs compared to the existing baseline conditions, and therefore the Solano 4 Wind Project would not contribute to a cumulative impact (Westslope 2018a).

The United States Congress charged the Federal Aviation Administration (FAA) with the responsibility to encourage air commerce in the United States. As part of this responsibility, the FAA is tasked with ensuring air safety and preserving the National Airspace System (NAS). It is through these mandates that the FAA draws its authority to conduct aeronautical studies of tall structures, including wind turbines (Aeronautical Study Process, Capitol Airspace Group 2018b).

There are eight offices internal to the FAA. In addition, the Department of Defense (DOD), Army, Navy, Air Force and the Department of Homeland Security (DHS) take part in the aeronautical study process. The DOD formal review process occurs concurrently with FAA's aeronautical study. Technicians in each office review each proposed tall structure location to ensure that the structure does not interfere with their areas of responsibility. Once all offices have responded, the airspace specialist, typically a former air traffic controller, assesses all of the responses and subsequently determines whether the planned structure exceeds the imaginary surfaces established under 14 CFR Part 77, Sections 77.17, 77.19 and 77.21. Structures that do not exceed these surfaces are, in most cases, issued favorable Determinations of No Hazard (DNH). Structures that exceed these surfaces are generally issued a Notice of Presumed Hazard (NPH). An NPH letter is meant to be a means for the FAA to notify the developer that the FAA has identified an issue that will require further study to determine whether or not the structure will pose a hazard to air navigation. Typically, the FAA also includes in the letter any objections received by the various responding offices in the FAA, DOD and DHS. If a military objection is raised, due to potential for impact on radar surveillance systems for example, a Mitigation Response Team (MRT) may be formed. This team would include representatives from the potentially affected air force base. The MRT conducts detailed analyses and negotiates mitigation options with the structure developer. If mitigation options are identified and agreed upon, the Mitigation Oversight Committee will review the solutions (Aeronautical Study Process, Capitol Airspace Group 2018b).

It is through the public comment period that the FAA collects information regarding the actual impact of the structure on local flights. Once the comment period closes, the FAA will collect all comments, discard those that are not of valid aeronautical nature, and proceed to make a final decision. The FAA then issues a Determination of Hazard to Air Navigation when the aeronautical study concludes that the proposed construction or alteration will exceed an obstruction standard and would have a substantial aeronautical impact. The FAA also issues a DNH when a proposed structure does not exceed any of the obstruction standards and would not be a hazard to air navigation. A DNH will also be issued when the aeronautical study concludes that the proposed construction or alteration

will exceed an obstruction standard but would not have a substantial aeronautical impact to air navigation, and it may include the following: conditional provisions of a determination, limitations necessary to minimize potential problems, such as the use of temporary construction equipment, supplemental notice requirements, when required, and marking and lighting recommendations, as appropriate (Aeronautical Study Process, Capitol Airspace Group 2018b).

On February 8, 2018, SMUD started meeting with Travis Air Force Base (AFB) to discuss the Solano 4 Wind Project and associated environmental review and project planning processes, project schedule, and studies to be prepared (radar impact study and an obstruction evaluation and airspace analysis). SMUD also met with Solano County on February 28th, 2018 to share the same information. Since the February 8, 2018 meeting with Travis AFB, SMUD met with Travis AFB on five separate occasions to discuss the project, including the radar impact study and obstruction evaluation and airspace analysis. SMUD filed applications with the FAA on October 10, 2018 and on February 2, 2019 received DNHs for nineteen (19) Solano 4 turbines with conditions related to marking and lighting. The determinations were subject to third party petitions received by March 3, 2019. While an attorney filed a letter on behalf of the County/ALUC, the FAA determined that the letter was not an objection, but constituted a series of statements. The third-party submittal period ended, and the determinations became final on March 13, 2019. SMUD notified Travis AFB on April 14, 2020 that SMUD had started the process with the FAA to request extensions for the nineteen (19) DNHs received for the Solano 4 Wind Project. On September 28, 2020 SMUD met with Colonel Simmons of Travis AFP to discuss the project. Key take-away messages from this meeting included Colonel Simmons' request that SMUD continue working with the County as part of the FAA DNH extension process. It was also stated that Travis AFB would participate in the FAA process, would conduct independent studies, and that Travis AFB would like to understand the cumulative effect of future repowering/development at the Solano Wind project site. As Travis AFB worked through its own technical evaluation, SMUD scheduled bi-weekly meetings with Travis AFB to provide support and receive updates. These meetings continued until Travis AFB concluded its study. The DNH extension process resulted in the formation of a Mitigation Response Team (MRT) with Travis AFB as required by the DOD Military Aviation and Installation Assurance Siting Clearinghouse (the "DOD Siting Clearinghouse") mission compatibility evaluation process as documented in Part 211 of Title 32 of the Code of Federal Regulations (Military Aviation and Installation Assurance Siting Clearinghouse, accessed 2021). The result of the MRT review was a conclusion by the 60th Air Mobility Wing of "[a]s proposed, Solano 4 should have minimal negative impact on Travis Operations" and a conclusion by the DOD Siting

Clearinghouse that Solano 4 "will not present an adverse impact to military operations." (Simmons, 2021; Sample, 2021). SMUD received extensions for the 19 DNHs for Solano 4 Wind Project on January 28, 2021, as requested. (See FAA Determinations and letter from Steven J. Sample in Appendix B of the FEIR.)

With the FAA's confirmation of a safe project configuration, SMUD is now moving forward in its efforts to develop the project using this proposed configuration.

Please also see the results of the supplemental cumulative impact studies conducted by Westslope Consulting (2018a) and Capitol Airspace (2018a). As discussed above, prior to the preparation of the DEIR, these supplemental studies were prepared to assist with planning efforts and facilitate coordination with Travis AFB and inform SMUD of the FAA process. These supplemental studies are discussed in the Letter L5a-1 Response to the Shute, Mihaly, & Weinberger LLP Exhibit 1, memorandum from Dr. Jerry Johnson included in the FEIR. SMUD believes that the analysis conducted to date and provided in this FEIR is thorough and adequate.

While additional information has been provided in this FEIR and its appendices, that information merely amplifies and clarifies the evidence and findings in the DEIR. Therefore, no recirculation would be required under Public Resources Code Section 21092.1 and CEQA Guidelines Section 15088.5(a). (CEQA Guidelines, § 15088.5(a)-(b); *San Francisco Baykeeper, Inc. v. Cal. State Lands Com.* (2015) 242 Cal.App.4th 202, 224–225.)

SAFETY CONCERNS RELATED TO PROJECT SITING

Safety is a core value at SMUD, and staff developed the Solano 4 Wind Project by following the SMUD North Star priority area for safety: "Be safe. Always."

Chapter 3.7 'Hazards and Hazardous Materials' of the DEIR, Impact 3.7-3 analyzes the safety hazard to air traffic and notes that the FAA and its regulations concerning air safety and aviation navigation preempt the ALUC's land use regulations regarding radar system interference. The FAA conducted an independent evaluation of the Solano 4 Wind Project and determined there would be no significant hazard to air traffic control operations. As discussed in detail above under "Land Use," Determinations of No Hazard were issued for the 19 Solano 4 Wind turbines on February 1, 2019, and extensions were issued on January 28, 2021 (see Appendix B FAA Determinations of FEIR). The DEIR also includes Mitigation Measure 3.7-3 that requires all wind turbine generators (WTGs) be lit with temporary lighting once they reach a height of 200 feet or greater until the permanent lighting configuration is turned on.

Although SMUD, as a local agency, is not required to obtain ALUC approval for the development of its electrical generation facilities such as the project, SMUD chose to participate in County and ALUC efforts to develop criteria for the 2015 LUCP update. SMUD met repeatedly with the County, the ALUC and Travis AFB to support development of a policy that would allow for wind development while incorporating appropriate measures or design elements to avoid or minimize potential impacts to radar and aerial navigation. In addition to presenting findings on radar modeling and turbines, SMUD submitted a comment letter to the ALUC urging any plan to allow for discretionary approval of turbines (of heights above 200') upon a demonstration that the project would not interfere with radar or base operations and allow for repowering of existing wind turbine sites, rather than using an inflexible line-of-sight standard in place of actual analysis. In 2015, the ALUC ultimately adopted a LUCP relying exclusively on line-of-sight for turbines without technical evidence to justify the expansion of land use compatibility zones; but the staff report indicates the line-of-site criteria was intended to eliminate inconsistencies with the Travis AFB LUCP and other policy documents, to eliminate ambiguity and uncertainty on how the LUCP should apply to various properties, and to clarify the extent of the ALUC's jurisdiction. Later, SMUD participated in a working group to explore alternatives to the line-of-sight analysis for replacement of existing facilities or repowering of existing wind farms within the Solano Wind Resource Area. In March 2016, a group was established to address these items, which included SMUD, but the ALUC dissolved the group unceremoniously.

Nonetheless, SMUD hired Westslope Consulting, LLS to conduct a supplemental cumulative study for the Solano 4 Wind Project (Westslope 2018a) and to provide a technical analysis of the project's potential impacts on radar and aeronautical navigation. This supplemental study, the SMUD Solano 4 Cumulative Impact Study and Mitigation Solution Results for 2018 Vestas V136 and V150 Wind Turbine Layouts dated September 6, 2018, is included in Appendix A of this FEIR. This supplemental radar cumulative impact modeling study determined there would be a negligible impact over baseline to the associated Travis AFB radar systems resulting from installation of twenty-two (22) 136M turbines following removal of the existing 23 WTGs, and a net zero impact for installation of nineteen (19) 150M turbines following removal of the existing 23 WTGs compared to the existing baseline conditions, and therefore the Solano 4 Wind Project would not contribute to a cumulative impact (Westslope 2018a).

SOLANO WIND RESOURCE AREA (FORMERLY MHWRA)

The *Solano County Wind Turbine Siting Plan and Environmental Impact Report* (Siting Plan) (Solano County 1987) designated the MHWRA as suitable for wind energy

development, based on wind monitoring and assessment studies prepared in the late 1970s and 1980s by the California Energy Commission, Pacific Gas and Electric Company (PG&E), and the U.S. Bureau of Reclamation. With adoption of the *Solano County General Plan* in 2008, the Siting Plan is no longer in effect and the 2008 *Solano County General Plan* describes wind resources areas of the County as located in the Collinsville–Montezuma Hills south of SR 12. The County defers to the California Energy Commission (CEC) to define areas suitable for commercial wind energy. The CEC's map of operational wind projects in the Solano Wind Resource Area (CEC 2018) describes the project site and surrounding area as having high sustainable winds suitable for wind energy. For this reason, and the site-specific information noted above, SMUD chose the proposed project site. SMUD has ascertained that the DEIR has been sufficiently detailed so that the public and decisionmakers are properly informed and can conduct meaningful evaluation of the way project impacts were avoided, minimized, or mitigated.

State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Bay Delta Region
2825 Cordelia Road, Suite 100
Fairfield, CA 94534
(707) 428-2002
www.wildlife.ca.gov

GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

Letter 1

August 30, 2019

Mr. Ammon Rice
Sacramento Municipal Utility District
6201 S Street, MS H201
Sacramento, CA 95817

Subject: Solano 4 Wind Project, Draft Environmental Impact Report, SCH #2019012016, Solano County

Dear Mr. Rice:

The California Department of Fish and Wildlife (CDFW) received a draft Environmental Impact Report (EIR) from Sacramento Municipal Utility District (SMUD) for the Solano 4 Wind Project (Project) pursuant the California Environmental Quality Act (CEQA).

CDFW is submitting comments on the draft EIR to inform SMUD, as the Lead Agency, of our concerns regarding potentially significant impacts to sensitive resources associated with the proposed Project. CDFW is providing these comments and recommendations regarding those activities involved in the Project that are within CDFW's area of expertise and relevant to its statutory responsibilities (Fish and Game Code, § 1802), and/or which are required to be approved by CDFW (CEQA Guidelines, §§ 15086, 15096 and 15204).

CDFW ROLE

CDFW is a Trustee Agency with responsibility under CEQA (Pub. Resources Code, § 21000 et seq.) pursuant to CEQA Guidelines section 15386 for commenting on projects that could impact fish, plant, and wildlife resources. CDFW is also considered a Responsible Agency if a project would require discretionary approval, such as a California Endangered Species Act (CESA) permit, a Lake and Streambed Alteration (LSA) Agreement, or other provisions of the Fish and Game Code that afford protection to the state's fish and wildlife trust resources.

1-1

REGULATORY REQUIREMENTS

California Endangered Species Act

Please be advised that a CESA Incidental Take Permit (ITP) must be obtained if the Project has the potential to result in "take" of plants or animals listed under CESA, either during construction or over the life of the Project. Issuance of a CESA Permit is subject to CEQA documentation; the CEQA document must specify impacts, mitigation measures, and a mitigation monitoring and reporting program. If the Project will impact CESA listed species, early consultation is encouraged, as significant modification to the Project and mitigation measures may be required in order to obtain a CESA Permit.

CEQA requires a Mandatory Finding of Significance if a project is likely to substantially restrict the range or reduce the population of a threatened or endangered species. (Pub. Resources Code,

§§ 21001, subd. (c), 21083; CEQA Guidelines, §§ 15380, 15064, and 15065). Impacts must be avoided or mitigated to less-than-significant levels unless the CEQA Lead Agency makes and supports Findings of Overriding Consideration (FOC). The CEQA Lead Agency's FOC does not eliminate the Project proponent's obligation to comply with Fish and Game Code section 2080.

Lake and Streambed Alteration

CDFW requires an LSA Notification, pursuant to Fish and Game Code section 1600 et. seq., for Project activities affecting lakes or streams and associated riparian habitat. Notification is required for any activity that may substantially divert or obstruct the natural flow; change or use material from the bed, channel, or bank including associated riparian or wetland resources; or deposit or dispose of material where it may pass into a river, lake or stream. Work within ephemeral streams, washes, watercourses with a subsurface flow, and floodplains are subject to notification requirements. CDFW will consider the CEQA document for the Project and may issue an LSA Agreement. CDFW may not execute the final LSA Agreement (or ITP) until it has complied with CEQA as a Responsible Agency.

1-1 Cont'd

PROJECT DESCRIPTION SUMMARY

Proponent: Sacramento Municipal Utility District

Description and Location: The Project site is located within the Solano County Wind Resource Area (WRA) in southern Solano County. The WRA lies north of the confluence of the Sacramento and San Joaquin rivers and southwest of the City of Rio Vista. The Project would involve the decommissioning of 59 existing wind turbine generators (WTGs) and the construction and operation of up to 22 new WTGs. Associated access roads and collection lines would be installed to support the new WTGs.

COMMENTS AND RECOMMENDATIONS

CDFW offers the below comments and recommendations to assist SMUD in adequately identifying and/or mitigating the Project's significant, or potentially significant, direct and indirect impacts on fish and wildlife (biological) resources.

California Tiger Salamander (*Ambystoma californiense*)

The Project site is located within the range of California tiger salamander (CTS; *Ambystoma californiense*) and is located near known and potential breeding habitat for CTS. CTS is both federally listed and state listed as threatened. The draft EIR acknowledges potential for take of CTS, and identifies impacts to the species as potentially significant; however, Mitigation Measure 3.3-1a fails to reduce impacts to less-than-significant. Any action that could cause take of CTS, such as ground disturbance during construction or land management activities (e.g. disking), must be authorized under appropriate federal and state permits.

1-2

Due to the potential presence of this listed species and the potential for Project-related take, including relocation out of harm's way, CDFW advises that the Project proponent obtain a CESA Permit (pursuant to Fish and Game Code Section 2080 et seq.) in advance of Project

implementation. Issuance of a CESA Permit is subject to CEQA documentation; therefore, the CEQA document should specify impacts, mitigation measures, and fully describe a mitigation, monitoring and reporting program. If the proposed Project will impact any CESA-listed species, early consultation is encouraged, as significant modification to the Project and mitigation measures may be required in order to obtain a CESA Permit. More information on the CESA permitting process can be found on the CDFW website at https://www.wildlife.ca.gov/Conservation/CESA.

CDFW recommends that SMUD, as the Lead Agency, require the Project proponent to apply for an ITP for CTS as a condition of Project approval.

1-2 Cont'd

Tricolored Blackbird (*Agelaius tricolor*)

The tricolored blackbird is state listed as threatened. Impact 3.3-3 indicates permanent impacts to foraging habitat for numerous non-raptor avian species, including tricolored blackbird; however, no mitigation measures are proposed to offset these impacts. Please note that the permanent loss of habitat is considered significant in and of itself, and should be mitigated regardless of current level of disturbance or reconnaissance survey results. Additionally, the EIR acknowledges that operation of WTGs could result in take of special-status birds and identifies impacts to special-status birds (including tricolored blackbird) as potentially significant, but fails to reduce impacts to less-than-significant. Any action that could cause take of tricolored blackbird, including ongoing operation of WTGs, must be authorized under appropriate federal and state permits.

Due to the known presence of this listed species and the potential for Project-related take, CDFW advises that the Project proponent obtain a CESA Permit (pursuant to Fish and Game Code Section 2080 et seq.) in advance of Project implementation. Issuance of a CESA permit is subject to CEQA documentation; therefore, the CEQA document should specify impacts, mitigation measures, and fully describe a mitigation, monitoring and reporting program. If the proposed Project will impact any CESA-listed species, early consultation is encouraged, as significant modification to the Project and mitigation measures may be required in order to obtain a CESA permit. More information on the CESA permitting process can be found on the CDFW website at https://www.wildlife.ca.gov/Conservation/CESA.

CDFW recommends that SMUD, as the Lead Agency, require the Project proponent to apply for an ITP for tricolored blackbird as a condition of Project approval.

1-3

Swainson's Hawk (*Buteo swainsoni*)

Swainson's hawk is state listed as threatened and known to nest near and forage on the Project site. The draft EIR identifies potentially significant impacts to Swainson's hawk during Project construction and operation, including anticipated take during WTG operation. Due to the known presence of this listed species and the anticipated take, CDFW advises that the Project proponent obtain a CESA Permit (pursuant to Fish and Game Code Section 2080 et seq.) in advance of Project implementation. Issuance of a CESA Permit is subject to CEQA documentation; therefore, the CEQA document should specify impacts, mitigation measures, and fully describe a mitigation, monitoring and reporting program. If the proposed Project will

1-4

impact any CESA-listed species, early consultation is encouraged, as significant modification to the Project and mitigation measures may be required in order to obtain a CESA Permit. More information on the CESA permitting process can be found on the CDFW website at https://www.wildlife.ca.gov/Conservation/CESA. CDFW recommends that the District, as the Lead Agency, require the Project proponent to apply for an ITP for Swainson's hawk as a condition of Project approval.

To further reduce Project impacts, CDFW provides the following recommendations:

1) Revise Mitigation Measure 3.3-4a to require a qualified biologist to conduct pre-construction surveys prior to any construction activities that may impact Swainson's hawk in accordance with the Swainson's Hawk Technical Advisory Committee's (TAC) *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (2000), available on CDFW's webpage at https://www.wildlife.ca.gov/Conservation/Survey-Protocols#377281284-birds. Survey methods should be closely followed by starting early in the nesting season (late March to early April) to maximize the likelihood of detecting an active nest (nests, adults, and chicks are more difficult to detect later in the growing season because trees become less transparent as vegetation increases). Surveys should be conducted: (1) within a minimum 0.25-mile radius of the Project area or a larger area if necessary to identify potentially impacted active nests, and (2) for at least the two survey periods immediately prior to initiating Project-related construction activities. Surveys should occur annually for the duration of the Project. The qualified biologist should have a minimum of two years of experience implementing the TAC survey methodology. If an active nest is identified, a 0.25-mile buffer shall be maintained around the nest until the young fledge. If Swainson's hawk activity (foraging or courtship, not just nests) is noted within 0.25 miles of the Project site and a non-disturbance buffer of 0.25 miles cannot be implemented, the Project proponent should be required to obtain a CESA ITP and pursue further compensatory mitigation as a condition of Project approval.

2) Revise Mitigation Measure 3.3-5 to require consultation with CDFW to determine ratios for off-site compensatory mitigation. The off-site mitigation ratio of 0.75:1 (mitigation: loss) currently proposed in Mitigation Measure 3.3-5 results in a net loss of foraging habitat and may be insufficient to mitigate impacts to less-than-significant. Mitigation lands should be protected in perpetuity under a conservation easement and be managed in perpetuity through an endowment with an appointed land manager. The easement should be held by a governmental entity, special district, non-profit organization, for-profit entity, person, or another entity to hold title to and manage the property provided that the district, organization, entity, or person meets the requirements of Government Code sections 65965-65968, as amended. As the state's trustee for fish and wildlife resources, CDFW should be named as a third-party beneficiary under the conservation easement.

1-4 Cont'd

Western Burrowing Owl (*Athene cunicularia*)

Western burrowing owl is designated as a California Bird Species of Special Concern. The draft EIR states that burrowing owls are known to be present within and adjacent to the Project area.

1-5

Mitigation Measure 3.3-4b proposes passive relocation to mitigate impacts to occupied burrows within the Project site during the non-breeding season. Please be advised that CDFW does not consider exclusion of burrowing owls or "passive relocation" in and of itself sufficient to reduce the permanent loss of habitat to a level of less-than-significant. The long-term demographic consequences of exclusion techniques have not been thoroughly evaluated, and the survival rate of evicted or excluded owls is unknown. All possible avoidance and minimization measures should be considered before temporary or permanent exclusion and closure of burrows is implemented in order to avoid "take".

The CEQA document for the Project should also include measures to avoid or minimize loss of burrowing owl foraging habitat, and mitigation for loss of habitat that cannot be fully avoided. Please note that the permanent loss of habitat is considered significant in and of itself, and should be mitigated regardless of current level of disturbance or reconnaissance survey results. To offset this significant permanent impact, the Project proponent should be required to purchase and protect in perpetuity compensatory mitigation lands at a minimum of a 1:1 mitigation ratio (or a minimum mitigation ratio of 3:1 if active burrows or winter roosts are identified on site and take cannot be avoided) as a condition of Project approval. If active burrows or winter roosts are found onsite and take cannot be avoided, the mitigation ratio should be increased to a minimum of 3:1 (mitigation: loss).

1-5 Cont'd

Raptor Foraging Habitat

Reclamation of roads is briefly discussed in association with Impact 3.3-5: Removal and modification of raptor nesting, foraging, and roosting habitat during construction. The acreage of reclaimed roads is subsequently deducted from the total acreage of permanent impacts to foraging habitat. The habitat structure and value of the reclaimed acreage is not described nor mapped within the draft EIR and may not be suitable for mitigation land. Furthermore, counting reclaimed land as foraging land conflicts with Mitigation Measure 3.3-9a: Avoid and minimize operational impacts on birds and bats, which calls for maintaining a landscape within the Project area that "does not encourage bird or bat occurrence" and implementing a prey management program to reduce prey that could attract eagles and other raptors. As such, the reclaimed acreage should not be considered as mitigation habitat nor should it be deducted from cumulative Project impacts, without consultation with and concurrence of CDFW and U.S. Fish and Wildlife Service (USFWS).

1-6

Injury to and Mortality of Raptors, Other Birds, and Bats from Project Operation

Impact 3.3-9 estimates the mortality of 312 to 641 individual birds and 169 to 356 bats per year of operation as potentially significant; however, it is unclear if or how mitigation measures proposed will sufficiently reduce these impacts. Please expand the proposed mitigation measures to include quantifiable and enforceable success criteria.

Mitigation Measure 3.3-9b prescribes one year of post-construction mortality monitoring consisting of a single survey at all turbines. A single survey is insufficient to determine mortality trends and to validate pre-construction mortality estimates. CDFW recommends conducting annual mortality monitoring for a minimum of five years post-construction, followed by periodic monitoring every three years for the life WTG operation, as biological and operational conditions

1-7

may change. Survey methodology should be developed in consultation with CDFW and USFWS, and should be incorporated into the EIR in detail, including specific, quantifiable triggers for initiating implementation of Mitigation Measure 3.3-9h. All mortalities within the Project site should be reported to CDFW and USFWS immediately upon discovery.

1-7 Cont'd

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 and Game Code, § 711.4; Pub. Resources Code, § 21089).

1-8

CONCLUSION

To ensure significant impacts are adequately mitigated to a level less-than-significant, the feasible mitigation measures described above should be incorporated as enforceable conditions into the final CEQA document for the Project. CDFW appreciates the opportunity to comment on the draft EIR to assist SMUD in identifying and mitigating Project impacts on biological resources.

1-9

Questions regarding this letter or further coordination should be directed to Ms. Jennifer Rippert, Environmental Scientist, at (707) 428-2069 or Jennifer.Rippert@wildlife.ca.gov; or Ms. Melissa Farinha, Senior Environmental Scientist (Supervisory), at (707) 944-5579.

Sincerely,

Gregg Erickson
Regional Manager
Bay Delta Region

cc: State Clearinghouse

Letter 1-1 Response

Gregg Erickson, Regional Manager, Bay Delta Region
California Department of Fish and Wildlife
August 30, 2019

L1-1 *CDFW Role and Project Description. The commenter describes the responsibilities of the California Department of Fish and Wildlife (CDFW) as a Trustee Agency, discusses CDFW's relevant regulatory requirements, and provides a description of the Solano 4 Wind Project.*

The commenter has provided introductory information describing the role of CDFW and its statutory requirements. These comments are not directed at the adequacy of the DEIR, nor do they contain an argument raising significant environmental issues. The comments are noted and no further response is required.

L1-2 *California Tiger Salamander. The commenter notes that the project site is within the range of the State and federally listed California tiger salamander (CTS) and states that the project could result in take of CTS. The commenter expresses the opinion that Mitigation Measure 3.3-1a would fail to reduce the impact of the project on CTS to less than significant and recommends that SMUD obtain an Incidental Take Permit for CTS, pursuant to the California Endangered Species Act.*

As described on pages 3.3-89 through 3.3-90 of the DEIR and in CTS habitat assessments and surveys conducted in and near the project site (AECOM 2018b; Rana Resources 2010; AWE 2017d), CTS are considered highly unlikely to occur on the project site. This conclusion is based on the results of surveys and the disturbed nature of the uplands throughout the project site, which have been subject to land use practices involving ground disturbance for many decades. These uplands feature limited upland refugia, regular disruptions and barriers to dispersal, and habitat fragmentation. Furthermore, all aquatic features in or near the project site are 2.27 miles or more from the nearest known CTS occurrence and are 3.57 miles or more from the nearest known breeding occurrence of this species. And, as mentioned in the DEIR, 1.24 miles is the observed mobility of CTS.

These CTS survey results were provided to CDFW and the U.S. Fish and Wildlife Service (USFWS) before release of the DEIR. In addition, SMUD hosted a tour of the project site so that resource USFWS and CDFW staff could make their own assessments of CTS habitat conditions. SMUD also met with USFWS staff to discuss the results of the CTS surveys. At that meeting, the USFWS staff concurred with the conclusion of the survey reports that CTS were highly unlikely to be present at the site, but they nevertheless requested that a monitor be present during project activities that may affect a wandering CTS. In an abundance of caution and to be responsive to USFWS's request, a requirement for the presence of a biological monitor was included in the

mitigation measure. As presented in the DEIR, implementation of Mitigation Measures 3.3-1a and 3.3-1b will avoid or reduce potential construction impacts on this species. Additional language has been added to Mitigation Measures 3.3-1a. New text is indicated by double underlining. These mitigation measures will require avoiding and minimizing effects on aquatic resources during construction, conducting biological monitoring, and providing environmental awareness training to construction workers. Further, Mitigation Measures 3.3-13(a) through (d) have been incorporated to protect water quality and drainages during construction, which would avoid impacts to potential aquatic habitat of CTS on-site during construction.

With implementation of these mitigation measures, SMUD determined that the project would have no adverse effects on CTS. Further, no "take" of CTS is expected to occur, and thus an incidental take permit would not be required.[1] SMUD appreciates the continued involvement and input from CDFW staff.

Mitigation Measure 3.3-1a: Avoid and minimize impacts on California tiger salamander. SMUD will implement the following measures to avoid and minimize potential construction impacts on California tiger salamander:

- A qualified California tiger salamander biologist (defined as an individual with 3 years of experience conducting surveys for California tiger salamander and habitat in the project region) will be present on-site to conduct monitoring during project construction and decommissioning activities that disturb surface soils within 250 feet of drainages or any other aquatic features identified as suitable for California tiger salamander (AECOM 2018b).

- ~~To the extent possible ,~~ SMUD will confine all project-related parking, storage areas, laydown sites, equipment storage, and any other surface-disturbing activities to previously disturbed areas or areas that are not suitable habitat for California tiger salamander (AECOM 2018b). To the extent it is not possible to limit such activities to previously disturbed areas or areas that are not suitable habitat for California tiger salamander, the qualified biologist will perform a preconstruction survey within 48 hours before constructing project-related parking, storage areas, laydown sites, and equipment storage sites to ensure California tiger salamander are not present. If a California tiger salamander is found within the project area, SMUD will implement any actions necessary to avoid take of California tiger salamander including establishing appropriate buffer area and exclusion fencing in

[1] "Take" under California law is defined more narrowly to mean to: "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." (Fish & Game Code, § 86; *Environmental Council of Sacramento v. City of Sacramento* (2006) 142 Cal.App.4th 1018, 1040 (proscribed taking under California law requires "mortality," and "not the taking of habitat alone").)

consultation with USFWS and/or CDFW. If after avoidance measure cannot avoid take, SMUD shall seek an Incidental Take Permit from USFWS and/or CDFW, as appropriate, and implement any measures specified therein to reduce chances of take and minimize and fully mitigate any incidental take (including the measures in this MM 3.3-1a).

- All steep-walled holes or trenches that are 1 foot deep or greater and located within 250 feet of aquatic habitat that is suitable for CTS will have at least one escape ramp constructed of earthen fill or wooden planks. All such holes or trenches will be completely covered before sunset of each workday using boards or metal plates that are placed flush to the ground, and will be inspected before the start of daily construction activities.

- To prevent inadvertent entrapment of California tiger salamanders during project construction, maintenance, and decommissioning, all construction pipes, culverts, conduits, and other similar structures stored on-site overnight will be inspected before the structure is buried. Plastic monofilament netting will not be used for sediment control because it could pose an entrapment hazard to California tiger salamanders and other wildlife.

L1-3 Tricolored Blackbird. *The commenter states that tricolored blackbird, a State-listed threatened species, would experience loss of foraging habitat because of project construction and notes that take of tricolored blackbird from operation of the wind turbine generators (WTGs) would need to be authorized under appropriate State and federal permits. The commenter further states that the DEIR does not provide mitigation measures that would reduce the impacts on tricolored blackbird and other special-status bird species to less than significant and recommends that SMUD obtain an Incidental Take Permit for tricolored blackbird.*

As discussed on page 3.3-71 of the DEIR, tricolored blackbirds have been observed in the Solano County Wind Resource Area (WRA) during the nonbreeding season, typically in mixed flocks with other blackbird species (Estep Environmental Consulting 2018b). The only potentially suitable nesting habitat in the project area is the brackish marsh along the bank of the Sacramento River. No tricolored blackbird nesting colonies have been observed at this site, and this marsh would not be directly or indirectly affected by project construction or operation. No suitable breeding habitat for tricolored blackbird occurs on the Solano 4 Wind project sites.

As discussed on page 3.3-95 of the DEIR, the project would not directly affect freshwater marsh or riparian habitat, and the project's net permanent impact on vegetation communities would be only 43.82 acres for the 136m WTG option or 39.56 acres for the 150m WTG option. As discussed on under Foraging

Habitat starting on page 3.3-100 of the DEIR, the permanent loss of grassland foraging habitat resulting from the project would be small relative to the abundant grasslands in the project area, comprising less than 0.02 percent of the 2261 acres of grassland within the 2,549-acre project site. Furthermore, grasslands are the dominant habitat type throughout the WRA, an area of approximately 40,000 acres. Therefore, loss of foraging habitat for tricolored blackbird and other bird species would be less than significant because ample foraging habitat is available in the project area and in the WRA, and no mitigation is required.

The DEIR states on page 3.3-8 that tricolored blackbird fatalities could occur as a result of WTG collisions. Although a fatality is theoretically possible, no tricolored blackbird fatalities have been recorded in the WRA in more than 10 years of monitoring at eight wind farms (see Table 3.3-11 in the DEIR). SMUD has been coordinating with CDFW before and after publication of the DEIR and will continue to work with CDFW to determine whether an Incidental Take Permit for tricolored blackbird may be warranted for the project given the extremely low likelihood of impact.

L1-4 <u>Swainson's Hawk.</u> *The commenter states that Swainson's hawk, a State-listed threatened species, is known to nest near and forage on the project site and recommends that SMUD secure an Incidental Take Permit for this species. The commenter further recommends revisions to Mitigation Measures 3.3-4a, to require a qualified biologist to conduct preconstruction surveys before any project construction activities that may affect Swainson's hawk, as described in the Swainson's Hawk Technical Advisory Committee's (TAC) Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California 's Central Valley (CDFG 2000). The commenter further recommends revisions to Mitigation Measure 3.3-5, to require consultation with CDFW to determine ratios for off-site compensatory mitigation, noting that the proposed off-site mitigation ratio of 0.75:1 (mitigation: loss) in the DEIR may be insufficient to mitigate impacts to a less-than-significant level. The commenter requests that these mitigation lands be protected in perpetuity under a conservation easement and be managed in perpetuity through an endowment with an appointed land manager, and that the easement be held by a governmental entity, special district, non-profit organization, for-profit entity, person, or another entity, to hold title to and manage the property provided that the district, organization, entity, or person meets the requirements of Sections 65965–65968 of the Government Code, as amended. As the State's trustee for fish and wildlife resources, CDFW should be named as a third-party beneficiary under the conservation easement.*

The following revisions have been made to Mitigation Measure 3.3-4a, to reflect the commenter's recommendations that preconstruction surveys be conducted for Swainson's hawks in accordance with Swainson's Hawk Technical Advisory Committee guidance. New text is indicated by <u>double underlining</u>.

Mitigation Measure 3.3-4a: Avoid and minimize impacts on nesting raptors.

SMUD will implement the following measures to avoid and minimize impacts on nesting raptors:

- If construction activities are scheduled to occur during the breeding season (February 1–August 31), SMUD will conduct preconstruction surveys in all potential suitable raptor nesting habitat within 0.25 mile of proposed construction areas, including trees, shrubs, grasslands, and wetland vegetation. A qualified wildlife biologist shall determine the timing of preconstruction surveys based on the time of year and habitats that are present, and shall conduct the surveys no more than 30 days before construction. The 30-day survey period allows flexibility in order for surveys to be conducted when the likelihood of nest detection is maximized (e.g., during courtship, nest building, or when feeding young).

- SMUD will conduct nesting surveys for Swainson's hawks in accordance with the Swainson's Hawk Technical Advisory Committee (TAC) guidance published in 2000 (Recommended Timing and Methodology for Swainsons' Hawk Nesting Surveys in California's Central Valley). These methods will require surveys to start early in the nesting season (late March to early April). Surveys will be conducted within a minimum 0.25-mile radius of the project area or a larger area if necessary to identify potentially active nests potentially affected by project construction. As required by the TAC guidance, surveys will be conducted for at least two survey periods in the nesting season, immediately before the start of project construction activities. The qualified biologist conducting the surveys will have a minimum of 2 years of experience in implementing the TAC survey methodology.

- SMUD will maintain no-disturbance buffers around active raptor nests during the breeding season, or until it is determined the young have fledged. The no-disturbance zone shall include a 500-foot buffer around all raptor nests (including owls) and a 0.25-mile buffer for any active Swainson's hawk nests.

    - No-disturbance buffer sizes for non-special-status species raptors may be increased or decreased by a qualified biologist based on the sensitivity of the species of raptor, or based on site conditions that affect disturbance, such as the type of work, vegetation structure or density, and the line of sight between construction work and the nest to nesting raptors.

- No-disturbance buffer sizes for special-status raptor species may be increased or decreased by the qualified biologist in consultation with USFWS and CDFW as appropriate

- Buffers will not apply to construction-related traffic using existing roads that are not limited to project-specific use (e.g., county roads, highways, farm roads).

- If no nests are observed during the preconstruction survey but nesting occurs after the start of construction, it will be assumed that the individuals are acclimated to the level of ongoing disturbance.

- SMUD will clearly identify the locations of no-disturbance buffers (e.g., 250 feet, 500 feet, or 0.25 mile) on maps that will be made available to construction crews.

- Before and during construction, a qualified biologist shall identify all active nest setback areas on construction drawings, and if appropriate, shall flag or fence the setback areas.

- If construction is scheduled to occur during the non-nesting season, then no nesting bird surveys are required before construction activity begins, except provisions for surveys for burrowing owls outside the nesting season (September 1–January 31), as specified below in Mitigation Measure 3.3-4b.

The following revisions have been made to Mitigation Measure 3.3-5, to reflect the commenter's suggestions for additional text to clarify the requirements for the proposed Swainson's hawks foraging habitat mitigation lands.

Mitigation Measure 3.3-5: Acquire off-site mitigation to replace lost raptor foraging habitat.

SMUD will implement the following compensatory mitigation to offset net impacts on foraging habitat for breeding Swainson's hawks and other raptor species. Based on Swainson's hawk nest locations documented in recent years, no permanent project impacts on foraging habitat will occur within 1 mile of an active Swainson's hawk. Depending on whether the 150m WTG option or the 136m WTG option is selected, 25.38 acres or 30.49 acres of suitable Swainson's hawk foraging habitat will be required to mitigate this loss.

SMUD will mitigate the loss of Swainson's hawk foraging habitat in accordance with CDFW recommendations (DFG 1994) by providing mitigation lands as follows:

- Foraging habitat permanently lost within 5 miles of an active Swainson's hawk nest tree but more than 1 mile from the nest tree (either 25.38 acres or 30.49 acres, depending on the WTG option selected) will be replaced with 0.75 acre of mitigation land for each acre of foraging habitat permanently lost because of project construction (0.75:1 ratio). This ratio is consistent with recommendations in DFG 1994: "Projects within 5 miles of an active nest tree but greater than 1 mile from the nest tree shall provide 0.75 acres of habitat mitigation land for each acre of urban development authorized [0.75:1 ratio])." All mitigation lands protected under this requirement shall be protected in perpetuity in a form acceptable to CDFW (e.g., through fee title acquisition or conservation easement) on agricultural lands or other suitable habitats that provide foraging habitat for Swainson's hawk. The easement will be held by a governmental entity, special district, non-profit organization, for-profit entity, person, or another entity, to hold title to and manage the property provided that the district, organization, entity, or person meets the requirements of Sections 65965–65968 of the Government Code, as amended. As the State's trustee for fish and wildlife resources, CDFW is to be named as a third-party beneficiary under the conservation easement. SMUD will consult with CDFW in determining the suitability of the proposed mitigation lands to offset impacts of the project on Swainson's hawk foraging habitat.

- Management authorization holders/project sponsors will provide for management of the mitigation lands in perpetuity by funding a management endowment.

The DEIR states on page 3.3-117 that Swainson's hawk fatalities could occur as a result of WTG collisions. SMUD has been coordinating with CDFW before and after publication of the DEIR and will continue to work with CDFW. As described in Mitigation Measure 3.3-9(b), if unauthorized take of a federally listed or state-listed endangered or threatened avian or bat species occurs during project operation, SMUD will notify the appropriate agency (USFWS and/or CDFW) within 48 hours of the discovery, and will submit written documentation of the take to the appropriate agency within 2 calendar days. The documentation will describe the date, time, location, species, and if possible, cause of unauthorized take. Although not expected to occur, SMUD will implement any measures to avoid, minimize, or compensate for possible take in consultation with the USFWS and/or CDFW, including obtaining an Incidental Take Permit as appropriate. Also, see Mitigation Measure 3.3-9g *Implement Adaptive Management.*

L1-5 *Burrowing Owl. The commenter states that western burrowing owl is designated as a California Bird Species of Special Concern and is known to be present in the project area. The commenter observes that Mitigation Measure 3.3-4b proposes*

passive relocation to mitigate impacts on occupied burrows on the project site during the non-breeding season, and notes that CDFW does not consider exclusion of burrowing owls or "passive relocation" in and of itself sufficient to reduce the permanent loss of habitat to a less-than-significant level, and that all possible avoidance and minimization measures need to be considered before temporary or permanent exclusion and closure of burrows is implemented to avoid "take." The commenter further states that measures need to be included in the CEQA document to avoid and minimize loss of burrowing owl foraging habitat.

As described on page 3.3-71 of the DEIR, AECOM biologists conducted a habitat assessment for burrowing owl throughout the project site and found no evidence of owl occupancy. The only potential habitat for this species occurs in areas of nonnative annual grassland (456 acres of the 8,997-acre study area), and where agricultural land is left fallow or is grazed. As summarized in Table 3.3-7 in the DEIR, a maximum of 1.13 acres of annual grassland would be affected by the project (0.66 acre of permanent impacts, and 0.47 acre of temporary impacts, less than 0.0005 percent of the project area's annual grassland habitat), and a maximum of 5.56 acres of temporary impacts would occur on fallow agricultural lands (no permanent impacts would occur on fallow lands). Solano County has an abundance of land known to or with potential to support burrowing owls (Solano Habitat Conservation Plan, Solano County Water Agency, 2012). Because of the limited availability of suitable foraging habitat in the project area, the relatively small acreage of impacts to suitable habitat, and the relative abundance of foraging owl habitat in the County and the region, the impact of this loss of the marginal potential foraging habitat for burrowing owl would not be significant, and no mitigation is required.

As discussed on page 3.3-117 of the DEIR, the closest burrowing owl sighting relative to the project area occurred in 2014 and was recorded in Montezuma, approximately 1.5 miles from the project site, although SMUD staff members and consultants occasionally have observed evidence of burrowing owl over-wintering on the project site during the nonbreeding season. Although burrowing owl is unlikely to occur on the project site, implementation of Mitigation Measure 3.3-4b would require protocol-level preconstruction surveys for burrowing owl, and appropriate seasonal buffers would be established if a burrowing owl burrow is detected, in accordance with current CDFW guidelines.

Passive relocation also is discussed under Mitigation Measure 3.3-4b, regarding the unlikely event that a burrow would be detected that could be adversely affected by project construction. Mitigation Measure 3.3-4b has been revised to require consultation with CDFW to determine if passive relocation would be appropriate to avoid impacts on wintering or nesting burrowing owls, and to require mitigation at a 3:1 ratio to offset habitat loss. Mitigation Measure 3.3-4b has been revised as shown below.

Mitigation Measure 3.3-4b: Avoid and minimize impacts on burrowing owls.

To avoid and minimize impacts on burrowing owls, SMUD will implement the following guidelines adapted from the CDFW *Staff Report on Burrowing Owl Mitigation* (CDFG 2012):

- SMUD will have preconstruction burrowing owl surveys conducted in all areas that may provide suitable nesting habitat according to CDFW (CDFG 2012) guidelines. A qualified wildlife biologist shall conduct take avoidance surveys, including documentation of burrows and burrowing owls, in all suitable burrowing owl habitat within 500 feet of proposed construction. The take avoidance surveys, consisting of up to four visits, shall be initiated within 30 days of and completed at least 14 days before construction is initiated at a given location. In areas with burrows or refuge that could potentially support burrowing owls, a clearance visit shall be conducted within 24 hours of construction, including when construction work is reinitiated after a lapse of two or more weeks.

- SMUD will avoid disturbing active western burrowing owl nests and occupied nesting burrows.

    - In accordance with standard CDFW mitigation guidelines, SMUD and its construction contractor will avoid disturbance at occupied burrows in accordance with the following seasonal distance buffers for low, medium, and high levels of disturbance (CDFG 2012):

        - April 1 – August 15: 200 m (low), 500 m (medium), and 500 m (high)

        - August 16 – October 15: 200 m (low), 200 m (medium), and 500 m (high)

        - October 16 – March 31: 50 m (low), 100 m (medium), and 500 m (high)

    - These distances may be increased or decreased if, as determined by a qualified biologist, a different distance is required to ensure construction activities will not adversely affect occupied burrows or disrupt breeding behavior.

- If a qualified biologist, in consultation with CDFW, determines that construction could adversely affect occupied burrows during the September 1–January 31 nonbreeding season, ~~the qualified biologist~~ SMUD shall consult with CDFW to determine if ~~implement~~ passive relocation using one-way doors, in accordance with guidelines prepared

by the California Burrowing Owl Consortium (CDFG 2012), should be implemented, and if off-site compensatory mitigation is required to offset habitat loss. Compensatory mitigation for loss of burrowing owl habitat would require protection of suitable mitigation lands in perpetuity at a minimum 3:1 mitigation ratio. ~~and through coordination with CDFW~~.

L1-6 *Raptor Foraging Habitat. The commenter notes that reclamation of roads is briefly discussed in association with Impact 3.3-5 (removal and modification of raptor nesting, foraging, and roosting habitat during project construction) and comments that the acreage of reclaimed roads is subsequently deducted from the total acreage of permanent impacts on foraging habitat. The commenter notes that habitat structure and the value of the reclaimed acreage is not described or mapped in the DEIR and expresses the opinion that these reclaimed lands may not be suitable for mitigation. The commenter further notes that counting reclaimed land as foraging land conflicts with Mitigation Measure 3.3-9a: Avoid and minimize operational impacts on birds and bats, which calls for maintaining a landscape in the project area that "does not encourage bird or bat occurrence" and implementing a prey management program to reduce prey that could attract eagles and other raptors. The commenter states that the reclaimed acreage should therefore not be considered as mitigation habitat nor should it be deducted from cumulative project impacts, without consultation with and concurrence of CDFW and USFWS.*

As discussed on page 3.3-103 of the DEIR, SMUD would remove and restore 14.22 acres of access roads as part of the repowering process in the Solano 4 West portion of project site. The reclamation would involve removing gravel from the roadways and restoring roadway surfaces to support surrounding agricultural uses (grazing or dryland farming). Approximately 0.86 acre of this restoration area would overlap the project footprint for the 136m WTG option and 0.02 acre would overlap the project footprint for the 150m WTG option. This acreage would be reclaimed as part of project activities. Therefore, the net restoration acreages associated with each project option would be slightly less than 14.22 acres. This acreage would be restored to the same grazing and dryland farming conditions of the immediately adjacent habitat.

As stated on page 3.3-96 of the DEIR, most of these permanent impacts would occur on grazed, actively farmed, or fallow agricultural lands. Agricultural practices generally follow a 1- to 3-year crop rotation cycle (i.e., wheat [*Triticum asestivum*], barley [*Hordeum vulgare*], and oats [*Avena sativa*]), with predominantly cattle or sheep grazing and fallow years following planting. The Solano 4 West site was disked for planting in April 2018. Use of these reclaimed lands for grazing or dryland farming would not be considered mitigation for loss of raptor foraging habitat. Rather, because they would be used for grazing and dryland farming, as are the areas that would be developed on the property as part of the project, the reclaimed land would be deducted from the total acreage

of grazing and dryland farming. Thus, from a net value perspective, the DEIR's evaluation of existing and future foraging habitat for raptors remains accurate.

L1-7 *Operational Impacts on Birds and Bats. The commenter states that the DEIR estimates fatalities of 312 to 641 individual birds and 169 to 356 bats per year during project operation but notes that it is not clear how the mitigation measures would sufficiently reduce these impacts, and thus the commenter requests quantifiable and enforceable success criteria. The commenter also expresses the opinion that a single survey at all turbines is insufficient to determine mortality trends and validate preconstruction mortality estimates, and recommends annual mortality monitoring for a minimum of 5 years post-construction, followed by periodic monitoring every 3 years for the life of the WTG operation, because biological and operational conditions may change. The commenter recommends that survey methodology be developed in consultation with CDFW and USFWS, and include specific, quantifiable triggers for initiating implementation of Mitigation Measure 3.3-9h. The commenter further states that all mortalities on the project site need to be reported to CDFW and USFWS immediately on discovery.*

The predictions of future annual avian and bat fatalities on the project site, described in Table 3.3-11 and Table 3.3-12, respectively, are based on more than 10 years of data from post-construction monitoring studies, conducted at eight windfarms in the WRA (also see Table 3.3-10 regarding details of studies). The information from these studies is expected to reflect probable levels of project-related avian mortality because of the similarity in landscape, land use and habitat between the proposed project site and other projects in the WRA. While the estimates included in DEIR are high, it is so because the predicted number of annual mortalities in these tables are conservatively based on values ranging from the weighted average of all studies (lower number) to the maximum estimated mortality rate observed across all eight studies. This range is considered to be conservative because the maximum estimated mortality rates represent the extreme upper end of possible mortality rates, while the observed mortality rates would most likely be closer to the weighted mean and could be lower than that. As described in page 3.3-114 of the DEIR, most of the avian and bat mortalities would involve primarily common species, which are characterized as having relatively large and stable populations. Impacts on many of these species would be dispersed across populations in a broad geographic area, particularly for species that breed elsewhere and experience mortality when migrating through or overwintering on the project site. Therefore, the operational impact on common bird and bat species would be less than significant, and no mitigation is required.

The triggers for implementation of the actions described in Mitigation Measure 3.3-9h are stated in the measure and would include a project-related fatality of one or more federal or State-listed species or one or more State fully protected species. In addition, implementation of Mitigation Measure 3.3-9h would be

triggered if avian or bat mortality resulting from project operation exceeded the maximum estimated fatality rates shown in Tables 3.3-11 and 3.3-12 for special-status birds or bats as well as for common species.

The commenter's recommendation that five years of post-construction monitoring be conducted is a considerably greater monitoring effort than that recommended in California Guidelines for Reducing Impacts to Birds and Bats from Wind Energy Development (CEC and DFG 2007). Furthermore, monitoring studies have been conducted from eight other projects within the WRA for over 10 years and an abundance of post-construction monitoring information is already available for the WRA to inform adaptive management and mitigation for the Project.

The following revision has been made to Mitigation Measure 3.3-9b, to clarify that post-construction monitoring would not consist of a single survey at all turbines, but rather would require monthly surveys at all turbines for 1 year, and annual "clean sweep" surveys of all turbines for the life of the project.

Mitigation Measure 3.3-9b: Conduct bird and bat mortality monitoring.

To assess operational impacts on birds and bats and inform potential adaptive management and mitigation approaches, SMUD will conduct 1 year of postconstruction mortality monitoring in the project area, as follows:

- Qualified biologists shall monitor bird and bat mortality annually throughout the project area in accordance with the requirements set forth below, which incorporate guidelines described in SMUD's Solano BBCS (SMUD 2013), SMUD's Final Eagle Conservation Plan (SMUD 2014), and the California Guidelines for Reducing Impacts to Birds and Bats from Wind Energy Development (CEC and DFG 2007). The monitoring shall be conducted so that sufficient information is available to allow evaluation of WTG design characteristics and location effects that contribute to mortality, including information about the species, number, location, and distance of dead birds relative to WTG locations; availability of raptor prey species; and cause of bird and bat mortalities.

- Monitoring will be conducted <u>monthly</u> for 1 year at all turbines in the Solano 4 Wind Project area after the first delivery of power, and will include but not be limited to the following methods unless otherwise determined appropriate by SMUD:

    - The standard search radius will be 100 meters to account for terrain and WTG height.

- A sufficient number of "road and pad" searches will be conducted to 150 meters to determine the proportion of carcasses falling outside of the standard (100-meter) search radius.

- Searcher efficiency trials will be conducted for four seasons and will be sufficient to analyze differences in carcass size (small/medium/large) and vegetative cover.

- Data will be analyzed using procedures described by the California Energy Commission and CDFW (CEC and CDFG 2007), or newer approaches (e.g., General Estimator [Dalthorp et al. 2018], the Evidence of Absence model [Dalthorp et al. 2017]). The data analysis will address adjusted fatality rates annually, seasonally, and by species. An annual report will be prepared each year and a final report will be prepared after the 1-year monitoring period.

- If a carcass with a band is found in the project area, SMUD will promptly report the banding information to USFWS's Bird Banding Laboratory. SMUD will ~~coordinate~~consult with the laboratory to include any information provided by USFWS that is pertinent to avian mortality at the project site, if any, in the annual monitoring reports.

- After postconstruction monitoring data have been obtained, SMUD will review the data. In consultation with USFWS and CDFW, SMUD will determine which specific WTGs, if any, generate disproportionately high levels of avian mortalities (based on evidence of statistically significant higher levels of mortality relative to other WTGs), and whether adaptive management measures are needed to reduce or avoid mortalities at those specific WTGs.

- If unauthorized take of a federally listed or state-listed endangered or threatened avian or bat species occurs during project operation, SMUD will notify the appropriate agency (USFWS and/or CDFW) within 48 hours of the discovery, and will submit written documentation of the take to the appropriate agency within 2 calendar days. The documentation will describe the date, time, location, species, and if possible, cause of unauthorized take. Although not expected to occur, SMUD will implement any ~~actions required or recommended by~~ measures to avoid, minimize, or compensate for possible take in consultation with the USFWS and/or CDFW, including obtaining an Incidental Take Permit as appropriate as a result of the unauthorized take. Also see Mitigation Measure 3.3-9g *Implement Adaptive Management*.

- SMUD will design and conduct postconstruction mortality monitoring in a way that ensures at least a 50 percent chance of detecting mortality of large raptors (including golden eagle and Swainson's hawk) caused by

search area around the WTGs, the proportion of WTGs searched, or other standard parameters set forth above.

- After postconstruction monitoring activities, SMUD will conduct an annual "clean sweep" survey around all Solano 4 turbines each subsequent calendar year for the life of the project. In addition, SMUD will continue its current practice of incidental monitoring of the project area ~~will continue~~ through reporting of incidental fatalities or injured birds by on-site staff to the Avian Reporting System (see Mitigation Measure 3.3-9h, "Implement Adaptive Management to Address Disproportionate Mortality of Special-Status Birds or Bats," below). SMUD will also continue to report incidental fatalities or injured birds in compliance with its USFWS Special Purpose Utility Permit (Permit ~~#MB98730A~~ #MB189818-0). As required in Mitigation Measure 3.3-9b SMUD will notify the appropriate agency (USFWS and/or CDFW) within 48 hours of the discovery any unauthorized take of a federally listed or state-listed endangered or threatened species.

L1-8 *Filing Fees. The project would have an impact on fish and/or wildlife, and assessment of filing fees would be necessary. The fees would be payable on filing of the Notice of Determination by the Lead Agency and would serve to help defray the cost of environmental review by CDFW. Payment of the fee is required for the underlying approval for the project to be operative, vested, and final. (14 California Code of Regulations, Section 753.5; Fish and Game Code, Section 711.4; Public Resources Code, Section 21089).*

SMUD will remit the appropriate filing fee as required by Section 711.4 of the Fish and Game Code, and Section 21089 of the Public Resources Code upon filing of the NOD.

L1-9 *Conclusion. The commenter notes that the feasible mitigation measures described in the comment letter should be incorporated as enforceable conditions into the final CEQA document for the project and provides contact information for CDFW staff who are available to answer questions.*

SMUD will include all mitigation measures in the DEIR, including revisions made in the FEIR into the final mitigation monitoring and reporting program (MMRP). SMUD appreciates the input and information that CDFW has provided before and after publication of the DEIR and will continue to coordinate with CDFW as needed throughout the CEQA and permitting process for the project.

STATE OF CALIFORNIA—CALIFORNIA STATE TRANSPORTATION AGENCY Gavin Newsom, Governor

DEPARTMENT OF TRANSPORTATION
DIVISION OF AERONAUTICS – M.S. #40
1120 N STREET
P. O. BOX 942874
SACRAMENTO, CA 94274-0001
PHONE (916) 654-4959
FAX (916) 653-9531
TTY 711
www.dot.ca.gov

Letter 2

Making Conservation a California Way of Life.

September 3, 2019

Mr. Ammon Rice
Sacramento Municipal Utility District
6201 S Street, MS H201
Sacramento, CA 95817

Re: Draft Environmental Impact Report - Solano 4 Wind Project; SCH# 2019012016

Dear Mr. Rice:

The California Department of Transportation, Division of Aeronautics (Division), reviewed the above-referenced document with respect to airport-related noise and safety impacts and regional aviation land use planning issues pursuant to the California Environmental Quality Act (CEQA). The Division has technical expertise in the areas of airport operations safety, noise, and airport land use compatibility. We are a funding agency for airport projects and we have permit authority for public-use and special-use airports and heliports. The following comments are offered for your consideration.

The Solano 4 Wind Project (project) proposes the construction of up to 22 new wind turbine generators (WTGs) within the Solano County Wind Resource Area in southern Solano County. The closest of the two project areas is located approximately 15 miles southeast of Travis Air Force Base (Travis AFB), and five miles southwest of Rio Vista Municipal Airport. The existing WTGs will be decommissioned, and new, technologically advanced WTGs will be constructed in the project areas.

2-1

In accordance with CEQA, Public Resources Code Section 21096, the California Airport Land Use Planning Handbook (Handbook) must be utilized as a resource in the preparation of environmental documents for projects within airport land use compatibility plan (ALUCP) boundaries or if such a plan has not been adopted, within two miles of an airport. The Handbook is a resource that should be applied to all airports and is available on-line at: https://dot.ca.gov/programs/aeronautics/airport-land-use-planning

2-2

The project site is completely within the Travis AFB ALUCP boundaries as adopted by the Solano County Airport Land Use Commission (ALUC). Therefore, in accordance with the Handbook and relevant sections of Article 3.5 of the State Aeronautics Act (SAA) in the Public Utilities Code, this project

2-3

"Provide a safe, sustainable, integrated and efficient transportation system to enhance California's economy and livability"

must be referred to the ALUC for a consistency determination with their ALUCP. The ALUC has prepared and adopted an ALUCP for Travis AFB pursuant to the SAA and the Handbook. Despite the assertion in the Draft Environmental Impact Report, that the Federal Aviation Administration (FAA) aeronautical study and determination of no hazard would preempt the ALUC's policies preventing aviation radar system interference, the ALUC could still find this project inconsistent with their ALUCP. An ALUC review and consistency determination is required to be a properly noticed and public process.

2-3 Cont'd

Also, the FAA aeronautical study states clearly that it does not relieve sponsors from compliance with other laws and regulations of any federal, state or local governing body.

This project is not exempt from ALUC review under the SAA, as Government Code section 53091(d) and (e) expressly refers to building and zoning ordinances of a *county* and *city*, and thus inapplicable. Unlike a county and the city, the ALUC was established, pursuant to the SAA for the purposes of ensuring the orderly expansion of airports and promulgating appropriate land use measures in Solano County. (see section 21670) The ALUC is a statutorily created, quasi-legislative, public administrative agency that is responsible for conducting airport land use compatibility planning and preventing the creation of new noise or safety problems in the vicinity of public use airports. An ALUC is not a county or city as defined in Government Code section 53091(d) and (e).

2-4

The SAA mandates the ALUC to prepare and adopt an airport land use compatibility plan, as it is one of the ALUC's primary duties. The ALUCP shall be guided by the height, use noise, safety and density criteria contained in the Handbook, a handbook published by the Division; and not by a county or a city. The Division reviews the ALUCP for compliance.

2-5

If the ALUC determines that the proposed action is inconsistent with the ALUCP, the referring agency shall be notified. The local agency may, after a public hearing, propose to overrule the ALUC by a two-thirds vote of its governing body after it makes specific findings. At least 45 days prior to the decision to overrule the ALUC, the local agency's governing body shall provide to the ALUC and the Division a copy of the proposed decision and findings. The Division reviews and comments on the specific findings a local agency intends to use when proposing to overrule an ALUC. The Division specifically looks at the proposed findings to gauge their relationship to the overrule. Also, pursuant to the PUC 21670 et seq., findings should show evidence that the local agency is minimizing "...the public's exposure to excessive noise and safety hazards within areas around public airports to the extent that these areas are not already devoted to incompatible uses."

2-6

In addition to submitting the proposal to the ALUC, it should also be coordinated with Travis AFB staff to ensure that the proposal will be compatible with future as well as existing airport operations. 2-7

The protection of airports from incompatible land use encroachment is vital to California's economic future. The public-use and military airports in Solano County are economic assets that should be protected through effective airport land use compatibility planning and awareness. Although the need for compatible and safe land uses near airports is both a local and State issue, airport staff, airport land use commissions and airport land use compatibility plans are key to protecting an airport and the people residing and working in the vicinity of an airport. Consideration given to the issue of compatible land uses in the vicinity of an airport should help to relieve future conflicts between airports and their neighbors. 2-8

These comments reflect the areas of concern to the Division with respect to airport-related noise, safety, and regional land use planning issues. Thank you for the opportunity to review and comment on this proposal. If you have any questions, please contact me at (916) 654-6223, or by email at philip.crimmins@dot.ca.gov.

Sincerely,

PHILIP CRIMMINS
Aviation Environmental Specialist

c: State Clearinghouse, Solano County ALUC, Travis AFB, FAA

Letter 2-1 Response	Philip Crimmins, Aviation Environmental Specialist California Department of Transportation, Division of Aeronautics October 3, 2019

L2-1 Introduction to the Division; Brief Description of the Project. The commenter describes the California Department of Transportation, Division of Aeronautics (Division) as having technical expertise in the areas of airport operations safety, noise, and airport land use compatibility. The commenter states that the Division is a funding agency for airport projects and has permit authority for public-use and special-use airports and heliports. The commenter includes a brief description of the proposed Solano 4 Wind Project (project).

The commenter has provided introductory information describing the role of the Division, and its permit authority. The commenter has also provided a brief overview of the project. These comments are not directed at the adequacy of the DEIR, nor do they contain an argument raising significant environmental issues. No further response is required.

L2-2 California Airport Land Use Planning Handbook (Handbook). The commenter states that the Handbook must be used when preparing environmental documents for projects within airport land use compatibility plan (ALUCP) boundaries, or, if such a plan has not been adopted, within two miles of an airport.

As discussed in DEIR Section 3.9.1, page 3.9-1, SMUD consulted the California Airport Land Use Planning Handbook during preparation of the DEIR. The Handbook provides general guidance regarding development of wind energy facilities in the vicinity of airports and describes the role of airport land use commissions in planning for activities and projects near airports. As stated on page 3.9-1, the Handbook guidance was considered during preparation of the DEIR. Please also refer to the Master Response for additional detail on the project planning process employed by SMUD for the project. No revisions to the DEIR are necessary.

L2-3 Project Site within Travis AFB ALUCP boundaries. The commenter states that because the project site is within the Travis AFB ALUCP boundaries, the project must be referred to the Solano County Airport Land Use Commission (ALUC) for review and determination as to whether it is consistent with their airport land use compatibility plan (ALUCP). The commenter notes that although the DEIR

concludes that the Federal Aviation Administration (FAA) aeronautical study and determination of no hazard would preempt the ALUC's policies preventing aviation radar system interference, the ALUC could still find this project inconsistent with their ALUCP. The commenter states that an ALUC review and consistency determination is required to be a properly noticed and public process.

Although SMUD maintains that ALUC consistency determination process does not apply to this project, as noted in response to comment L4-2 of this Final EIR, on April 1, 2021, SMUD submitted an application for advisory review of ALUC consistency determination of the project. On May 20, 2021, after a noticed public hearing, the ALUC determined that the project was inconsistent with the LUCP, solely on the basis that the project's wind turbine generator (WTG) towers will be within line-of-sight of Travis AFB's Digital Airport Surveillance Radar (DASR) (See Appendix A for Westslope 2018a and Transcript of ALUC hearing May 20, 2021). Given that the ALUC determined that the project is inconsistent with the LUCP, after a public hearing, the SMUD Board of Directors may, consistent with evidence in the record before it, decide whether to overrule the ALUC determination after making the requisite findings under the State Aeronautics Act (SAA). SMUD already notified the ALUC and the Division on July 2, 2021, which is at least 45 days prior to its proposed decision to overrule the ALUC, and provided a copy of both the proposed decision and the supporting findings.

Please also refer to Downey Brand's letter dated April 26, 2019 in response to the Solano County ALUC comments on SMUD's Notice of Preparation for the Solano 4 Wind Project (NOP) included in Appendix C of this FEIR for additional information regarding SMUD's position on this issue.

L2-4 *No Exemption from ALUC Review. The commenter notes that the Federal Aviation Administration (FAA) aeronautical study states that it does not exempt sponsors from complying with other laws and regulations of any federal, state, or local governing body. The commenter states that the project is not exempt from ALUC review under the State Aeronautics Act (SAA), because Government Code sections 53091(d) and (e) expressly refer to the building and zoning ordinances of a county and city. The commenter points out that an ALUC is neither a county or a city.*

Please refer to Downey Brand's letter dated April 26, 2019 in Appendix C of this Final EIR, prepared in response to Solano County ALUC comments on

SMUD's NOP for the Solano 4 Wind Project for the project's exemption from ALUC review.

As stated in the Downey Brand letter, SMUD's wind turbine facilities are exempted from the ALUC provisions because under subdivisions (d) and (e) of Section 53091 of the Government Code, the zoning and building ordinances of a county or city *shall not* apply to the location or construction of facilities for the generation of electrical energy. SMUD, as a municipal utility district, is a local agency for purposes of Section 53091. (See *City of Lafayette v. East Bay Municipal Utilities District* (1993) 16 Cal.App.4th 1005, 1012; 78 Cal.Atty.Gen.Ops. 31 (1995); see also *Center for Biological Diversity v. County of San Bernardino* (2016) 247 Cal.App.4th 326, 344 fu.4 [county did not have authority to apply building and zoning regulations to water project proposed by local water agency pursuant to Sections 53091 and 53096].) Because a wind turbine facility is an electrical generation facility, the project qualifies for the exemptions under subdivisions (d) and (e) of Section 53091.

Further, the ALUC's authority in drafting the LUCP provisions are derived from Solano County's police powers and zoning authorities. Because the exemptions within Section 53091 are narrower and more specific than those announced in the SAA provisions, the Section 53091 exemptions control. Thus, SMUD's wind turbine facilities are exempt from the LUCP provisions.

Please also see Response to Comments L4-1 and L4-4.

The comment does not raise any issues concerning the adequacy of the DEIR or its analysis of the physical environmental impacts of the project. No revisions to the DEIR are necessary.

L2-5 ALUCP Must Comply with Division Specifications. The commenter states that the ALUC is required by the SAA to prepare and adopt an airport land use compatibility plan. The commenter further notes that the ALUCP must comply with the height, use noise, safety, and density criteria contained in the Division handbook, rather than the criteria of a county or city. The commenter states that the Division reviews the ALUCP for compliance.

The commenter provides information regarding ALUC requirement but raises no issues regarding the adequacy of the DEIR or any issues of environmental concern. No revisions are necessary. Further, as discussed above, please refer to the Downey Brand letter dated April 26, 2019 in Appendix C of this Final EIR, prepared in response to Solano County ALUC comments on SMUD's NOP regarding why the ALUC's powers in approving an LUCP is derived from and tantamount to that the land use authorities exercised by a county or a city in enacting zoning ordinances and other land use provisions.

L2-6 *Process for a Local Agency to Overrule an ALUC. The commenter states that if the ALUC finds that the proposed action is inconsistent with the ALUCP, the local agency is notified. The commenter notes that the local agency may, after a public hearing and making specific findings, propose to overrule the ALUC by a two-thirds vote of its governing body. The commenter states that at least 45 days prior to the decision to overrule the ALUC, the local agency's governing body shall provide to the ALUC and the Division a copy of the proposed decision and findings. The commenter further describes the process, stating that the Division reviews and comments on the specific findings the local agency plans to use when proposing to overrule an ALUC. According to the commenter, per PUC 21670, the findings should provide evidence that the local agency is minimizing the public's exposure to excessive noise and safety hazards within areas around public airports "… to the extent that these areas are not already devoted to incompatible uses."*

Please refer to response to comment L2-3 above and to the Master Response. The comment does not question the analysis and conclusions in the DEIR that the project's impacts related to noise and safety hazards will remain less than significant, with mitigation incorporated.

L2-7 *Coordination with Travis AFB. The commenter states that the proposed action should also be coordinated with Travis Air Force Base (AFB) staff to ensure its compatibility with existing and planned future operations.*

Please refer to the Master Response. SMUD has undertaken extensive coordination with Travis AFB in planning the project and has been actively engaged in addressing these issues with Travis AFB since inception of the project. The FAA Determination of No Hazard (DNH) extension process resulted in the formation of a Mitigation Response Team (MRT) with Travis AFB as required by the Department of Defense (DOD) Military Aviation and Installation Assurance Siting Clearinghouse (the "DOD Siting Clearinghouse")

mission compatibility evaluation process as documented in Part 211 of Title 32 of the Code of Federal Regulations (Military Aviation and Installation Assurance Siting Clearinghouse, accessed 2021). Travis AFB submitted its Solano 4 Wind Project Operational Risk Assessment to the Department of Defense (DOD) on January 11, 2021. SMUD received the requested extensions for the nineteen (19) Determinations of No Hazard (DNH) for the project on January 28, 2021. The result of the MRT review was a conclusion by the 60th Air Mobility Wing of "[a]s proposed, Solano 4 Wind project should have minimal negative impact on Travis Operations" (Simmons 2021). SMUD also received a letter dated February 9, 2021 from Steven J. Sample, Executive Director, Military Aviation and Installation, Assurance Siting Clearinghouse stating that as a result of discussions between SMUD and the U.S. Air Force, the construction of the project, submitted to the FAA on April, 17, 2020, will not present an adverse impact to military operations (See FAA Determinations, and letters from U.S. Colonel Corey Simmons and Steven J. Sample, in Appendix B). Based on substantial evidence, including the evaluation and analysis of its own aeronautics' experts, SMUD has determined that there will be no significant safety or other impacts to Travis AFB arising from this project.

L2-8 Reducing Land Use Conflicts in Areas Near Airports. The commenter states that it is important to protect California airports and the economic benefits they provide from incompatible land use encroachment. The commenter asks that consideration be given to the issue of compatible land uses in areas near airports in order to lessen future conflicts.

The proposed project is located with the Solano Wind Resource Area and has been designed to avoid or minimize any possible impacts related to airport operations and safety hazards. In particular, both the existing and replacement wind turbines have proven to be compatible with existing airport operations. Wind power generation has been occurring in the Solano Wind Resource Area for many years and there is no evidence that this have resulted in harm to local economic benefits or encroachment on other land uses. Please also see the Master Response. No revisions to the DEIR are necessary.

Letter 3

DELTA STEWARDSHIP COUNCIL
A California State Agency

980 NINTH STREET, SUITE 1500
SACRAMENTO, CALIFORNIA 95814
HTTP://DELTACOUNCIL.CA.GOV
(916) 445-5511

September 6, 2019

Ammon Rice
Sacramento Municipal Utility District
6201 S Street, MS H201
Sacramento, CA 95817

Via email: Ammon.Rice@smud.org

RE: Comments on the Draft Environmental Impact Report for the Solano 4 Wind Project, SCH#2019012016

Dear Mr. Rice:

Thank you for the opportunity to comment on the Sacramento Municipal Utility District (SMUD) Solano 4 Wind Draft Environmental Impact Report (DEIR). The Delta Stewardship Council (Council) previously sent a letter with comments on the Notice of Preparation (NOP) for the Project on February 6, 2019. Thank you for acknowledging these comments in your Scoping Report (Appendix A to the DEIR), and for meeting with Council staff to discuss this project on April 17, 2019. The Council recognizes SMUD's objectives to diversify its energy portfolio, increase the supply of renewable energy sources, and support the long-term viability of agriculture in the Montezuma Hills. 3-1

The Council is an independent State of California agency established by the Sacramento-San Joaquin Delta Reform Act of 2009 (SBX7 1; Delta Reform Act). As stated in the Delta Reform Act, the State has coequal goals for the Delta: providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem. The coequal goals shall be achieved in a manner that protects and enhances the unique cultural, recreational, natural resource, and agricultural values of the Delta as an evolving place (Water Code §85054). The Council is charged with furthering California's coequal goals for the Delta through the adoption and implementation of the Delta Plan, regulatory portions of which became effective on September 1, 2013. 3-2

Covered Action Determination and Certification of Consistency with the Delta Plan

Through the Delta Reform Act, the Council was granted specific regulatory and appellate authority over certain actions that take place in whole or in part in the Delta and Suisun Marsh, which are referred to as "covered actions".

"Coequal goals" means the two goals of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem. The coequal goals shall be achieved in a manner that protects and enhances the unique cultural, recreational, natural resource, and agricultural values of the Delta as an evolving place."

– CA Water Code §85054

The Council exercises that authority through development and implementation of the Delta Plan. State and local agencies are required to demonstrate consistency with 14 regulatory policies identified in the Delta Plan when carrying out, approving, or funding a covered action.

Based on the project description in the DEIR, the proposed project appears to meet the definition of a covered action as set forth in Water Code section 85057.5(a) because it:

1. Would occur in whole or in part within the boundaries of the Legal Delta (Water Code section12220) or Suisun Marsh (Public Resources Code section 29101). The project site includes two subareas owned by SMUD: Solano 4 East and Solano 4 West. Based on Exhibit 2-2 in the DEIR Project Description (DEIR, p. 2-3), portions of the Solano 4 West site are located within the boundaries of the Legal Delta and Suisun Marsh.
2. Would be carried out, approved, or funded by the State or a local public agency. SMUD, a local public agency, is the lead agency for this project.
3. Would have a significant impact on the achievement of one or both of the coequal goals or the implementation of a government-sponsored flood control program to reduce risks to people, property, and State interests in the Delta. It appears that this project could have a significant impact on the achievement of the coequal goal of ecosystem restoration.
4. Would be covered by one or more of the regulatory policies contained in the Delta Plan (23 CCR sections 5003-5015). Delta Plan regulatory policies that may apply to the proposed project are discussed in the next section, below.

3-2 Cont'd

It is the State or local agency approving, funding, or carrying out the project that ultimately must determine if that project is a covered action and, if so, file a Certification of Consistency with the Delta Plan (23 CCR section 5001(j)(1)(E)(3)) prior to project implementation. The DEIR lists a variety of federal, state, and local agency permits and approvals required for the proposed project (Table 2-4, page 2-27) but does not identify a Certification of Consistency with the Delta Plan among these requirements. In the Final EIR, please add a reference to the Council's Certification of Consistency process in Table 2-4.

3-3

In addition, the DEIR does not identify the Delta Plan in its description of the regulatory setting within any resource section. Please add a description of the Delta Plan to the regulatory setting discussion within the Biological Resources, Geology and Soils, Hydrology and Water Quality, and Land Use sections of the Final EIR, in addition to other relevant resource sections.

3-4

Delta Plan Regulatory Policies

The following section describes regulatory Delta Plan policies that may apply to the proposed project based on the available information in the DEIR. This information is offered to assist SMUD to describe the relationship between the proposed project and the Delta Plan in the EIR, to ensure that the EIR supports the project's eventual Certification of Consistency.

3-5

General Policy 1: Detailed Findings to Establish Consistency with the Delta Plan Delta Plan Policy **G P1** (23 CCR section 5002) specifies what must be addressed in a Certification of Consistency by a proponent of a project that is a covered action. The following is a subset of these requirements which a project must fulfill to demonstrate consistency with the Delta Plan.

Best Available Science

Delta Plan Policy **G P1(b)(3)** (23 CCR section 5002(b)(3)) states that covered actions must document use of best available science as relevant to the purpose and nature of the project. The regulatory definition of "best available science" is provided in Appendix 1A of the Delta Plan (http://deltacouncil.ca.gov/pdf/delta-plan/2015-appendix-1a.pdf). Six criteria are used to define best available science: relevance, inclusiveness, objectivity, transparency and openness, timeliness, and peer review. (23 CCR section 5001(f)). For this project, this policy generally requires that the process used by SMUD to analyze project alternatives, impacts, and mitigation measures for the project be clearly documented and effectively communicated to foster improved understanding and decision making.

Mitigation Measures

Delta Plan Policy G P1(b)(2) (23 CCR section 5002(b)(2)) requires that covered actions not exempt from CEQA must include all applicable feasible mitigation measures adopted and incorporated into the Delta Plan as amended April 26, 2018 (unless the measures are within the exclusive jurisdiction of an agency other than the agency that files the certification of consistency), or substitute mitigation measures that the agency finds are equally or more effective. These mitigation measures are identified in Delta Plan Appendix O (http://deltacouncil.ca.gov/pdf/delta-plan/2018-appendix-o-mitigation-monitoring-and-reporting-program.pdf). The DEIR identifies several significant and potentially significant impacts on Aesthetics, Air Quality, Biological Resources, Cultural Resources, Hazards and Hazardous Materials, Hydrology and Water Quality, and Transportation, and proposes a number of measures to mitigate these impacts. Council staff recommends that SMUD review the consistency and effectiveness of proposed mitigation measures with corresponding applicable and feasible Delta Plan mitigation measures for each of these impacts. (Please note that this regulatory requirement has been amended since SMUD issued the NOP for this project.)

3-5
Cont'd

Ecosystem Restoration Policy 3: Protect Opportunities to Restore Habitat

Delta Plan Policy **ER P3** (23 CCR section 5007) states that within priority habitat restoration areas depicted in Appendix 5, significant adverse impacts to the opportunity to restore habitats at appropriate elevations (as described in 23 CCR section 5006) must be avoided or mitigated. Appendix 5 is available at http://deltacouncil.ca.gov/pdf/delta-plan/2013-appendix-b-combined.pdf (starting on page 72). Based on Exhibit 2-2 in the DEIR Project Description

(DEIR, p. 2-3) portions of the Solano 4 West site are located within the boundaries of the Suisun Marsh Priority Habitat Restoration Area (PHRA).

Exhibit 2-2 does not identify any project components (e.g., turbines, access roads, collection and home run lines) within the Suisun Marsh PHRA, but the DEIR states that "the final locations of [wind turbine generators] would be determined after SMUD completes the procurement process" (Page 2-10), leaving open the possibility that these primary project components could ultimately be sited within the PHRA. In addition, the DEIR discusses other potential project elements (including meteorological towers, road improvements, and staging areas) that are not mapped. Therefore, the Council is unable to ascertain whether such features would be sited within the PHRA. Please include a discussion in the Final EIR that clarifies whether any project components or temporary project elements would be located within the Suisun Marsh PHRA, and if so, how any adverse impacts to the opportunity to restore habitats at appropriate elevations within the PHRA would be avoided or mitigated. Regardless of the proposed location of project components, SMUD should consider whether significant adverse impacts to the opportunity to restore habitat at appropriate elevations could occur within the Suisun Marsh PHRA due to construction activities or operation of project components.

3-5 Cont'd

Please discuss in the Final EIR whether the project could result in significant adverse impacts to the opportunity to restore habitat within the Suisun Marsh PHRA, and if so, how those impacts would be avoided or mitigated. Specifically, in the Biological Resources section, please identify whether any of the freshwater wetland acreage that would be impacted by project construction (as identified in Table 3.3-7) is located within the Suisun Marsh PHRA. Also, in the Geology and Soils section, please identify whether Impact 3.5-1: Substantial soil erosion or loss of topsoil could occur within and/or affect wetland or marsh habitat within the Suisun Marsh PHRA.

3-6

Ecosystem Restoration Policy 5: Avoid Introductions of and Habitat Improvements for Invasive Nonnative Species

Delta Plan Policy **ER P5** (23 CCR section 5009) requires that the potential for new introductions of or habitat improvements for invasive, nonnative species must be fully considered and avoided or mitigated in a way that appropriately protects the ecosystem. This policy applies to projects that have a reasonable probability of introducing or improving habitat conditions for nonnative invasive species. The Biological Resources section of the DEIR identifies Impact 3.3-12: Indirect Impacts on Riparian Habitat as less than significant with implementation of Mitigation Measures 3.3-12a through 3.3-12d. Impact 3.3-12 states that, "Project construction and operation could indirectly affect riparian habitat by altering existing topography and hydrology, causing fugitive dust to accumulate on vegetation, and potentially contributing to the introduction and spread of nonnative invasive plant species" [emphasis added] (DEIR, p. 3.3-128). The DEIR also states that "[o]perational impacts, including the potential for introduction and spread of invasive plant species, would be addressed by continuing implementation of SMUD's land management plan, which includes management of

3-7

Ammon Rice
Comments on the Draft Environmental Impact Report for the Solano 4 Wind Project
September 6, 2019
Page 5

invasive weeds (Althouse and Meade 2018)." (DEIR, pp. 3.3-128 – 3.3-129) Mitigation Measure 3.3-12c also describes a reclamation and revegetation plan that SMUD would prepare prior to implementation of the project. That plan would draw upon the goals and objectives of SMUD's land management plan, and would require, among other things, weed control measures which may include cultural, mechanical, and/or chemical methods (DEIR, pp. 3.3-130 – 3.3-131).

The only riparian habitat discussed or described in the DEIR appears to be located within the Solano 4 East subarea which is located outside of the boundaries of the Legal Delta and Suisun Marsh (DEIR, pp. 3.3-18 – 3.3-19). However, portions of the Solano 4 West subarea that fall within the boundaries of the Legal Delta and Suisun Marsh include other sensitive habitat types that could be susceptible to the introduction and spread of nonnative invasive plant species through the same types of construction activities that could lead to potentially significant impacts described for Impact 3.3-12. Based on Exhibit 3.3-1, these existing habitat types include estuarine and marine wetlands, freshwater wetlands, tidal brackish wetlands, and tidal marsh upland (DEIR, p. 3.3-17).

Please revise this impact discussion in the Final EIR to discuss the potential for introduction and habitat improvements for invasive, nonnative species in the Solano 4 West subarea in greater detail, describing how implementation of SMUD's land management plan and Mitigation Measure 3.3-12c would avoid introduction and habitat improvements for invasive, nonnative species, or mitigate these potential impacts in a manner that appropriately protects the ecosystem. Also, please describe specifically how SMUD's land management plan and Mitigation Measure 3.3-12c are consistent with Delta Plan Mitigation Measure 4-1, as described in the Delta Plan Mitigation Monitoring and Reporting Program (MMRP) (http://deltacouncil.ca.gov/pdf/delta-plan/2018-appendix-o-mitigation-monitoring-and-reporting-program.pdf).

3-7 Cont'd

Closing Comments

We invite SMUD to continue to engage with Council staff in early consultation. We are available to discuss topics outlined in this letter as you proceed in the next stages of your project and approval processes. Please contact Avery Livengood at (916) 445-0782 (Avery.Livengood@deltacouncil.ca.gov) with any questions.

3-8

Sincerely,

Jeff Henderson, AICP
Deputy Executive Officer
Delta Stewardship Council

Letter 3-1 Response	Jeff Henderson, AICP, Deputy Executive Officer Delta Stewardship Council September 6, 2019

L3-1 *Introduction. The commenter thanks SMUD for acknowledging the Delta Stewardship Council (Council) NOP letter and discusses SMUD's objectives for the Solano 4 Wind Project.*

These comments are not directed at the adequacy of the DEIR, nor do they contain an argument raising significant environmental issues. No further response is required.

L3-2 *Consistency with Delta Plan. The commenter discusses the role of the Council in implementing the Delta Plan, and notes that the Delta Reform Act of 2009 requires local agencies to demonstrate consistency with regulatory policies identified in the Delta Plan when carrying out a covered action. The commenter states that the project appears to meet the definition of a covered action and notes that SMUD must make that determination. If SMUD determines that the project is a covered action, the commenter states that SMUD must file a Certification of Consistency with the Delta Plan and add a description of the Delta Plan to the regulatory setting discussion in the Biological Resources, Geology and Soils, Hydrology and Water Quality, and Land Use sections of the FEIR, in addition to other relevant resource sections.*

SMUD has determined that the project is not a covered action under the Delta Plan because it will not have an impact on the achievement of one or both of the coequal goals of the Delta Reform Act or the implementation of government-sponsored flood control programs to reduce risks to people, property, and state interests in the Delta. As discussed below in responses to comments L3-5 through L3-7, project construction activities and project operation will not result in direct or indirect impacts on estuarine and marine wetlands, tidal brackish wetlands, or tidal marsh uplands, will not interfere with opportunities to restore habitat in the Suisun Marsh, and will have no impact on the Delta Plan's goals of achieving ecosystem restoration.

L3-3 *Certificate of Consistency. The commenter states that if SMUD determines the project is a covered activity SMUD must file a Certification of Consistency with the Delta Plan with the Council prior to project implementation. The commenter requests addition of a reference to the Council's Certification of Consistency process in Table 2-4.*

As discussed in response to comment L3-2, SMUD has determined that the project is not a covered activity, therefore no changes are needed to Table 2-4.

L3-4 *Description of Delta Plan in DEIR. The commenter requests the FEIR be revised to add a description of the Delta Plan to the regulatory setting discussion in the Biological Resources, Geology and Soils, Hydrology and Water Quality, and Land Use sections of the FEIR, in addition to other relevant resource sections.*

As discussed above in the response to comment L3-2 SMUD has determined that the project is not a covered activity under the Delta Plan and therefore no discussion of the Delta Plan is needed in the of any of the resource sections of the FEIR.

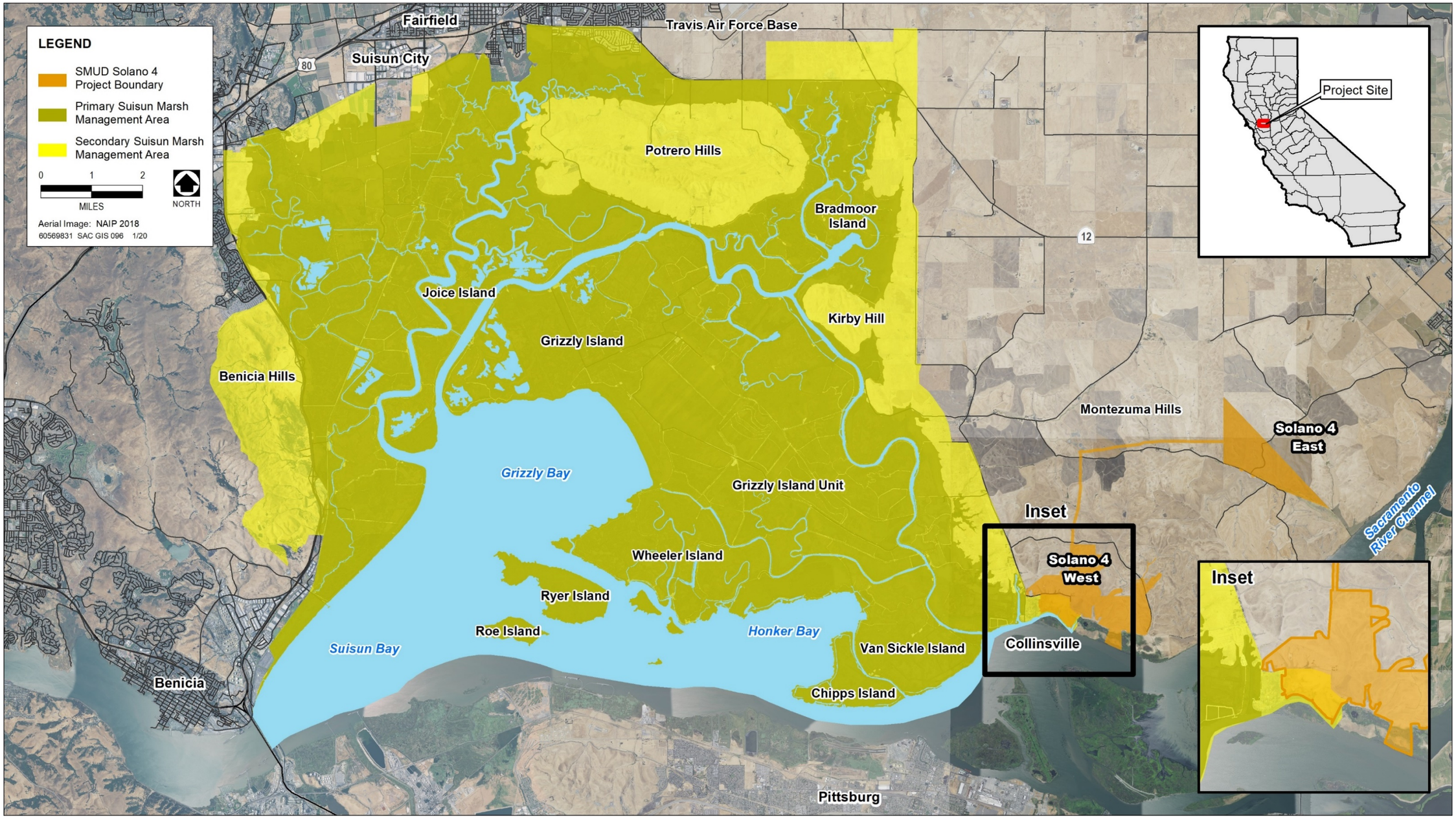
L3-5 *Delta Plan Regulatory Policies. The commenter provides a description of regulatory Delta Plan policies that the commenter believes would be relevant to the proposed project if SMUD determines that the project is a covered activity. The commenter references Ecosystem Restoration Policy 3: Opportunities to Restore Habitat and cites exhibit 5-1 in Appendix 5 which shows multiple areas in the Delta recommended for prioritization and implementation of habitat restoration projects. These areas include the Suisun Marsh, which is adjacent to the project site. The commenter requests clarification as to whether any project components or temporary project elements would be located within the Suisun Marsh Priority Habitat Restoration Area (PHRA), and an assessment as to whether the project could adversely affect opportunities for restoration.*

As shown in Figure 1, the western portion of SMUD's Solano 4 Wind project area overlaps with 182.2 acres of the Secondary Suisun Marsh Management Area. This is part of the property that SMUD owns; however, no components of the proposed project (turbines, collection/home run lines, access/local roads, or staging areas) are within the Suisun Marsh PHRA and no temporary or permanent construction and operational impacts will occur within this area (see DEIR 2.5 Project Characteristics and Components, pages 2-8 through 2-27). Thus, construction and operation of the proposed project will not affect ongoing and future planned restoration activities in the Suisun Marsh. No revisions to the DEIR are necessary.

L3-6 *Suisun Marsh PHRA. The commenter asks for a discussion in the Final EIR whether the project could result in significant adverse impacts to the opportunity to restore habitat within the Suisun Marsh PHRA, and if so, how those impacts would be avoided or mitigated. Specifically, the commenter requests that in the Biological Resources section, SMUD identify whether any of the freshwater wetland acreage that would be impacted by project construction (as identified in Table 3.3-7) is located within the Suisun Marsh PHRA. The commenter also requests that in the Geology and Soils section, the FEIR identify whether Impact 3.5-1: Substantial soil erosion or loss of topsoil could occur within and/or affect wetland or marsh habitat within the Suisun Marsh PHRA.*

As discussed above in response to comment L3-5, the proposed project will not result in adverse impacts to the opportunity to restore habitat in the Suisun Marsh PHRA. Impacts to wetlands and waters of the United States resulting from the proposed project will be minimal and will not occur to those communities targeted for restoration in the PHRA. Moreover, while a component of the Delta Plan, the rationale to make opportunities for restoration includes an assumption that baseline environmental conditions are degraded. Under CEQA, project impacts are measured against the baseline setting, which in this case is the actual physical conditions on the ground at the time of the Notice of Preparation or commencement of environmental review. (CEQA Guidelines, §§ 15125(a)(1), 15126.2(a).) The baseline does not include hypothetical situations, such as conditions that might occur under existing plans. (CEQA Guidelines, § 15125(a)(3).) As it stands, the project is not anticipated to have a significant adverse impact on wetlands, waters, and habitats beyond those already identified in the DEIR. Furthermore, impacts to these habitats would not occur within the Suisun March PHRA, as no project components are proposed in this area. No revisions to the analysis in the DEIR are necessary.

Table 3.3-7 of the DEIR describes a maximum of 0.03 acres of permanent impacts and 0.10 acres of temporary impacts on freshwater marsh/ephemeral drainages and wetlands, and none of these impacts are located within the PHRA. These impacts are a result of crossing and culverting an ephemeral drainage near the eastern portion of the project area in the Solano 4 West property. As discussed on page 27 of the *Preliminary Delineation of Waters of the United States, Including Wetlands: SMUD Solano 4 Wind Project* (in Appendix D of the DEIR), this ephemeral drainage neither flows into the Suisun Marsh nor is it hydrologically connected to the marsh; rather it flows east to the Sacramento River.



Source: SMUD 2019, DWR 2019

Figure 1. Suisun Marsh Protection Areas

This page intentionally left blank

Implementation of best management practices and the avoidance and minimization measures described in the following mitigation measures from the DEIR will ensure that project construction would not result in indirect impacts on water quality of downstream drainages or wetlands, and that no substantial soil erosion or loss of topsoil habitat would occur.

- Mitigation Measure 3.3-12b: "Comply with Section 1600 streambed alteration agreement and CWA Sections 401 and 404 or the state's Porter-Cologne Act."
- Mitigation Measure 3.3-12c: "Develop a Reclamation and Revegetation Plan."
- Mitigation Measure 3.3-12d: "Conduct Worker Awareness Training"
- Measure 3.3-13a "Avoid and Minimize Impacts on Wetlands and Other Waters of the United States"
- Mitigation Measure 3.5-1, "Prepare and Implement a SWPPP and Associated BMPs,"
- Mitigation Measure 3.7-1b, "Establish and Implement an Environmental Training Program,"
- Mitigation Measure 3.7-1c, "Prepare and Implement a Hazardous Substance Control and Emergency Response Plan,"
- Mitigation Measure 3.7-1d, "Prepare and Implement a Spill Prevention, Control, and Countermeasures Plan."

L3-7 *Ecosystem Restoration Policy: Non-Native Invasive Species. The commenter cites Delta Plan Policy ER P5 (23 CCR section 5009) which requires consideration of impacts associated with introducing invasive non-native plants and cites the DEIR discussion of potential indirect impacts of the project on riparian habitat, noting that a similar assessment of indirect impacts should be applied to estuarine and marine wetlands, freshwater wetlands, tidal brackish wetlands, and tidal marsh upland. The commenter requests additional detail on how implementation of SMUD's land management plan and Mitigation Measure 3.3-12c would avoid introduction of invasive, nonnative species, or mitigate these potential impacts in a manner that appropriately protects the ecosystem. The commenter also requested a description of how SMUD's land management plan and Mitigation Measure 3.3-12c are consistent with Delta Plan Mitigation Measure 4-1, as described in the Delta Plan Mitigation Monitoring and Reporting Program (MMRP).*

DEIR Exhibit 3.3-1: *Project Site Land Cover* depicts all land cover types that occur within parcels owned by SMUD in the Solano 4 Wind project area and

includes areas and land cover types that will not be affected by project construction and operation. Direct and indirect impacts on estuarine and marine wetlands, tidal brackish wetlands, and tidal marsh upland were not explicitly discussed in the DEIR because, as described below, none will occur. Riparian habitat at the project site occurs close to proposed project construction activities, and project impacts on freshwater marsh/ephemeral drainages are described in the DEIR and are discussed above in the response to L3-6. All other sensitive habitat types present on the parcels owned by SMUD in the Solano 4 Wind project area occur far from proposed construction activities and the proposed footprint of project components.

Table 1 below summarizes the distance of the project footprint from estuarine and marine wetlands, tidal brackish wetlands, and tidal marsh upland for the 136M turbine option. No direct or indirect project impacts will occur on these sensitive habitat types because they are far from proposed construction activities, and because implementation of the mitigation measures described above in response to comments L3-5 and L3-6 will avoid and minimize potential indirect impacts. The same holds true for the 150M option.

The DEIR provides a thorough discussion and analysis of non-native invasive weeds at the project site (see DEIR pages 3.3-20-3.3-22) and includes mitigation to address the potential impacts associated with introduction and spread of non-native invasive weeds. Mitigation Measure 3.3-12c: “Develop a Reclamation and Revegetation Plan” provides performance standards and guidance on development of a plan that would avoid the introduction and spread of invasive weeds and prevent erosion. In addition, the plan will incorporate the goals and objectives of SMUD’s Land Management Plan for the Solano Wind Farm, which also provides detailed guidance for the management of invasive weeds. Implementation of this mitigation measure and of *SMUD’s Land Management Plan for the Solano Wind Farm* address the concerns expressed by the commenter regarding potential impacts of the project on sensitive habitat types from the introduction and spread of invasive weeds.

The DEIR mitigation measures described above in response to comments L3-5 and L3-6 are generally consistent with those described in the *Delta Plan MMRP.* However, SMUD’s Solano Wind project is not a covered activity under the Delta Plan, and therefore no detailed discussion of consistency with the Delta Plan MMRP is required.

Table 1. Distance of Project Impacts from Estuarine and Marine Wetlands, Tidal Marsh Uplands, Tidal/Brackish Marsh Wetlands for 136M Turbine Option

Wetland	Project Component	Disturbance Type	Distance (Feet)
Estuarine and Marine Wetlands	Access Roads	Permanent	1,191.38
	Local Roads	Permanent	824.71
	Turbines	Permanent	758.97
	Access Roads	Temporary	1,214.21
	Local Roads	Temporary	865.04
	Collection/Home Run Lines	Temporary	659.12
	Staging Areas	Temporary	5,436.14
Tidal Marsh Uplands	Access Roads	Permanent	576.82
	Local Roads	Permanent	630.57
	Turbines	Permanent	564.39
	Access Roads	Temporary	546.82
	Local Roads	Temporary	629.63
	Collection/Home Run Lines	Temporary	550.08
	Staging Areas	Temporary	5,436.81
Tidal/Brackish Wetlands	Access Roads	Permanent	1,263.74
	Local Roads	Permanent	5,751.86
	Turbines	Permanent	1,518.74
	Access Roads	Temporary	1,233.74
	Local Roads	Temporary	5,721.87
	Collection/Home Run Lines	Temporary	1,574.08
	Staging Areas	Temporary	6,469.48

L3-8 Closing Comments. The commenter invites SMUD to continue to engage with Council staff.

SMUD appreciates the input Council staff have provided on this project and the Council's offer for continued engagement on this project.

This page intentionally left blank

Letter 4

WILLIAM F. EMLEN
Director
wfemlen@solanocounty.com
(707) 784-6765

TERRY SCHMIDTBAUER
Assistant Director
tschmidtbauer@solanocounty.com
(707) 784-6765

DEPARTMENT OF RESOURCE MANAGEMENT

SOLANO COUNTY

675 Texas Street, Suite 5500
Fairfield, CA 94533-6342
(707) 784-6765
Fax (707) 784-4805

www.solanocounty.com

September 6, 2019

SMUD – Environmental Management
Attn: Ammon Rice
P.O. Box 15830 MS H201
Sacramento, CA 95852-1830

via email: ammon.rice@smud.org

Re: Solano 4 Wind Project Draft EIR

Dear Mr. Rice:

The County of Solano, through its Department of Resource Management, offers the following comments on the above-referenced Draft EIR (DEIR).

As an initial matter, we want to clarify that the Solano County Airport Land Use Commission (ALUC) is not a commission, agency, or part of County government. Although the County has a legal responsibility to provide staffing, quarters, and equipment necessary for the operations of the ALUC (see Pub. Res. Code, § 21671.5(c)), the ALUC operates as part of state government under the supervision of the California Department of Transportation, Division of Aeronautics. Therefore, the statements made on page 3.7-8 of the DEIR suggesting that the ALUC's Travis AFB Land Use Compatibility Plan (LUCP) are the legal equivalent of County zoning and building ordinances are incorrect. In addition, although the DEIR at pages 3.7-8 and 3.7-13 contends that SMUD may overrule an ALUC determination of inconsistency, the DEIR fails to explain how SMUD believes this can be accomplished. The DEIR fails to assess whether the evidence relied upon to prepare the DEIR would be sufficient to support those specific finding. Even if it were determined that SMUD has the ability to overrule the ALUC if specific factual findings are made it would not excuse SMUD from submitting the project to the ALUC for a consistency determination in conformance with the ALUC's procedural requirements. For that reason, the list of responsible and trustee agencies in section 2.9.2 and table 2-4 of the DEIR should be corrected to identify the ALUC's role with respect to this project.

4-1

4-2

4-3

At page 3.9-2, the DEIR states that SMUD's wind turbine facilities are exempt from County zoning and building ordinances pursuant to sections 53090 – 53097.5 of the Government Code. However, Chapter 2 of the DEIR describes the project as consisting of new turbines, new homerun lines, and various other components. The recent Court of Appeal decision in *City of Hesperia v. Lake Arrowhead Community Services District,* 37 Cal.App.5th 734 (July 19, 2019), holds that lines connecting a generating facility to the grid are "transmission lines" for purposes of Government Code section 53091(e). It is unclear from the DEIR whether the homerun lines qualify as transmission lines under the *City of Hesperia* decision, and whether the new homerun lines will be installed inside or outside of existing rights of way. The Solano County Zoning Ordinance requires approval of a discretionary use permit for installation of utility lines outside of an existing right of way. In addition, section 12808.5 of the Public Utilities Code requires a municipal utility district to follow a specified process when locating or constructing transmission or distribution lines; the DEIR does not discuss this required process. Due to the incomplete information provided in the DEIR, the County is not able to assess whether it has land use jurisdiction over any elements of the project.

4-4

4-5

In section 3.11, the DEIR discusses the project's potential impacts on County roads, concludes these impacts are potentially significant, and recommends two mitigation measures to reduce these impacts to a less-than-significant level. However, Mitigation Measure 3.11-2 merely requires SMUD to make a good faith effort to enter into a mitigate agreement for the project's impacts to various County roads. A good faith effort at mitigation, while commendable, is not alone sufficient to achieve mitigation. This recommended mitigation measure should be revised to require execution of a mitigation agreement prior to the start of construction. 4-6

As a general matter, Solano County is quite concerned with impacts that the proposed taller wind turbines will have on the Travis Air Force Base radar system. Taller turbines will exacerbate already identified impacts to the Travis System. The County's General Plan identifies the importance of Travis Air Force Base not only to the County but to the region as a whole. It is high recommended that this project be reconsidered until such time as impacts to Travis Air Force Base are fully addressed. 4-7

Sincerely,

Bill Emlen, Director
Department of Resource Management

Letter 4-1 Response **Bill Emlen, Director**
Solano County Department of Resource Management
October 11, 2019

L4-1 Clarification that Solano County Airport Land Use Commission is not a Part of County Government. The commenter clarifies that the Solano County Airport Land Use Commission (ALUC) is not a part of County government. Although the County must provide staffing, quarters, and equipment to support ALUC operations, the ALUC operates as part of state government and is supervised by the California Department of Transportation, Division of Aeronautics. The commenter notes that statements made on page 3.7-8 of the DEIR suggesting that ALUC's Travis Air Force Base Land Use Compatibility Plan (LUCP) is the legal equivalent of a County zoning and building ordinance are incorrect.

Please refer to Downey Brand's letter dated April 26, 2019 in response to the Solano County ALUC comments on SMUD's Notice of Preparation for Solano 4 Wind Project (NOP) in Appendix C of this Final EIR (FEIR) for additional information regarding SMUD's position on this issue.

The ALUC's exercise of authority in drafting the LUCP is an exercise of the same zoning authority conferred by the Legislature upon cities and counties. Cities and counties draw their zoning authority from the state's general police powers. (See Cal. Const. art. XI, § 7 ["A county or city may make and enforce within its limits all local, police, sanitary, and other ordinances and regulations not in conflict with general laws"].) The Attorney General has made clear that the ALUC exercises its authority specifically by using zoning power, which derives from the general police powers possessed by cities and counties. (See 63 Ca1.Atty.Gen.Ops. 641, at pp. 3-4 (1980) ["Attorney General Opinion No. 80-416"].) "Even though generally thought of in terms of city or county regulation, zoning is one exercise of the state's police power, and there is no impediment to the legislature granting that power to other agencies in the statewide interests." (*Id.* at p. 4.) This is precisely what the legislature has done in this case in creating the ALUC under the SAA.

The ALUC was established by Solano County on December 7, 1971 by Ordinance 781 to provide for orderly development of public airports in Solano County, as well as area surrounding airports to prevent new noise and safety problems.[1] The ordinance creating the ALUC and the powers delegated to the ALUC are derived from Solano County's inherent police powers.[2] The ALUC is listed on the County's website as a county special district, and is comprised in

[1] https://www.solanocounty.com/depts/rm/boardscommissions/solano_county_airport_land_use_commission/default.asp

[2] Even the SAA recognizes the police powers of a county and require counties to establish an ALUC for orderly development of the public airports in a county and the areas around the airports. (Pub. Util. Code, § 21670(b).)

part by members appointed by the Solano County Board of Supervisors.[3] The ALUC and County share office space and staff (e.g., Director of Resource Management), and the County and ALUC are represented by the same County Counsel's office. Thus, while it may have some independence, the ALUC's powers in drafting and approving the LUCP are an extension of Solano County's police powers, and not separate powers of a wholly independent state agency.

Regardless of the specific legal structure of the ALUC, the DEIR evaluates aeronautical safety and noise issues, and concluded based on substantial evidence that this project, which replaces existing wind turbines, will not result in significant adverse impacts in these areas.

L4-2 SMUD's Ability to Overrule an ALUC Determination of Inconsistency. The commenter notes that on pages 3.7-8 and 3.7-13, the DEIR states that SMUD may overrule an ALUC determination of inconsistency but does not explain how.

While SMUD believes that the ALUC consistency determination process does not apply to this project, as noted in response to comment L4-3 below, SMUD submitted an LUCP consistency determination application to Solano County ALUC for an advisory ruling. On May 20, 2021, the ALUC determined that the project was inconsistent with the LUCP. In accordance to the State Aeronautics Act (SAA) provisions, the SMUD Board of Directors is now proposing, after a noticed public hearing and consistent with evidence in the record before it, to overrule the ALUC determination after making the requisite findings under the SAA. SMUD's proposed decision and findings were circulated to the ALUC and the California Department of Transportation's Division of Aeronautics on July 2, 2021, i.e., at least 45 days prior to its decision to overrule the ALUC.

Please also refer to Downey Brand's letter dated April 26, 2019 in response to the Solano County ALUC comments on SMUD's NOP in Appendix C of this FEIR for additional information regarding SMUD's position on this issue.

L4-3 Need for Clarification of ALUC's Role with Respect to the Project. The commenter states that even if SMUD has the authority to overrule the ALUC if specific factual findings are made, it would not excuse SMUD from submitting the project to the ALUC for a consistency determination. Accordingly, the commenter states that the list of responsible and trustee agencies in section 2.9.2 and table 2-4 of the DEIR should be corrected to identify the ALUC's role with respect to the project.

[3] See footnote 1.

Please refer to the Master Response. The ALUC has been added to Table 2-4 of the DEIR as follows:

State		
Agency	**Type of Permit**	**Purpose**
State Water Resources Control Board	Clean Water Act Section 402, construction stormwater permit	Prevent discharge of construction-related pollutants to waters of the United States.
San Francisco Bay Regional Water Quality Control Board	Clean Water Act Section 401, water quality certification	Prevent the discharge of construction-related pollutants to waters of the United States.
California Department of Fish and Wildlife	Streambed alteration agreement	Allow the project to alter a bank or streambed located in California.
California Department of Transportation	Haul truck and overload permit	Permit oversize trucks to travel on local roadways.
Solano County ALUC	ALUC consistency determination review is not required, but is advisory to SMUD	The consistency determination process is advisory only. On May 20, 2021, the ALUC determined that the project is inconsistent with the Travis Air Force Base Land Use Compatibility Plan (LUCP). SMUD Board of Directors is proposing to overrule the ALUC determination after a noticed public hearing, with the required number of votes of its Board members and after making the requisite findings under the State Aeronautics Act (SAA). The proposed decision and findings were circulated to the ALUC and the California Department of Transportation, Division of Aeronautics on July 2, 2021 as per the SAA process requirements.

L4-4 Need for Determination of Whether Home Run Lines Qualify as Transmission Lines and Will be Installed Outside of Existing Rights-of-Way; Possible Need for a Discretionary Use Permit. The commenter notes that on page 3.9-2, the DEIR states that SMUD's wind turbines are exempt from County zoning and building ordinances pursuant to sections 53090 - 53097.5 of the Government Code. The commenter also notes that Chapter 2 of the DEIR describes the project as consisting of new turbines, new home run lines, and various other components. A

Services District, 37 Cal.App.5th 734 [July 19, 2019]) held that that lines connecting a generating facility to the grid are "transmission lines" for purposes of Government Code section 53091 (e). The commenter states that the DEIR is unclear as to whether the planned home run lines qualify as transmission lines as per the recent court decision, and whether they will be installed inside or outside of existing rights-of-way. The commenter points out that a Solano County Zoning Ordinance requires the approval of a discretionary use permit for the installation of utility lines outside of an existing right-of-way.

Government Code 53091 (e) states: "Zoning ordinances of a county or city shall not apply to the location or construction of facilities for the production, generation, storage, treatment, or transmission of water, or for the production or generation of electrical energy, facilities that are subject to Section 12808.5 of the Public Utilities Code, or electrical substations in an electrical transmission system that receives electricity at less than 100,000 volts. Zoning ordinances of a county or city shall apply to the location or construction of facilities for the storage or transmission of electrical energy by a local agency, if the zoning ordinances make provision for those facilities." Storage and transmission facilities will not be located or constructed as part of the project. As described in Section 2.5.6 *Power Collection System* of the DEIR, the Solano 4 Wind Project's power collection system would include the wind turbine generator (WTG) interties, underground cable, a step-up transformer, and associated protective switching. The power, which would leave each WTG transformer, would be interconnected with adjacent WTGs. These joined circuits would convey 34,500-volt power to the Russell Substation via new underground electrical cable in a trench within the "home run" alignment (DEIR Exhibit 2-7) and would require new easements. WTGs will be electrically combined into 4-6 generation feeder circuits (underground electrical cables) on a dedicated 34.5 kilovolt medium voltage collection system. No other utility loads, end-use customers, or other uses—outside of the WTG system—will be fed by these new generation collection system feeders. Additionally, the Solano 4 Wind Project generation feeder circuits will not be under the control of PG&E.

As part of the Solano 4 Wind Project, only underground 34.5 kilovolt, medium voltage, generator collection system feeders will be constructed. Per thePG&E[4] glossary of terms, as well as the transmission system definitions provided by the California Public Utilities Commission (CPUC),[5] these generation feeders circuits do not constitute electrical transmission facilities.

The *Hesperia* decision should not be read to render the exemption in Government Code 53091(e) inapplicable to the project. Public Utilities Code Section 12808.5 is referenced in Government Code Section 53091(f), and it

[4] *Pacific Gas and Electric Glossary of Terms:* https://www.pge.com/includes/docs/pdfs/shared/customerservice/nonpgeutility/electrictransmission/handbook/glossary.pdf
See Cal.P.U.C. General Order No. 131-D, § 1: https://docs.cpuc.ca.gov/PUBLISHED/Graphics/589.PDF

was adopted in parallel with the related amendments to Government Code Section 53091—see California Statutes 1977, Chapters 324 and 436. In fact, the two sections were adopted by numerically sequential Assembly Bills, 242 and 243 (1977). Both statutes use the term "transmission," and Government Code Section 53091 uses it distinctly from "distribution," seeming to evince a clear intent on the part of the Legislature to distinguish between the electrical industry term "transmission" and other electrical industry terms such as "distribution," and thus to give a meaning to the term transmission that is not broadly encompassing of all movement of energy through any kind of conduit. The court hearing the appeal in the *Hesperia* case appears to have lacked that background and did not consider the legislative history of parallel amendments of Public Utilities Code Section 12808.5 and to Government Code Section 53091 in reaching its decision. The collection and home run lines are not intended to transmit energy from the project; they are intended to collect it to the project substation. Reading *Hesperia* to mean that the exemption does not apply to the project would render the exemption meaningless. Thus, the holding of *Hesperia* case is inapplicable here.

That said, if necessary, the SMUD Board of Directors has the authority to make transmission ordinances inapplicable to the project pursuant to qualified exemption under Government Code Section 53096 based on compliance with notice and hearing proceedings and finding there is no feasible alternative to the installation if there is no feasible alternative to the proposal.

As outlined in the *Hesperia* case, the finding of "no feasible alternative" implies that there is no alternative location for successfully accomplishing the project "'within a reasonable period of time, taking into account economic, environmental, social, and technological factors.'" (*City of Hesperia v. Lake Arrowhead Community Services Dist.* (2019) 37 Cal.App.5th 734, 762, quoting Government Code Section 53096(c).) The *Hesperia* court found further guidance for "feasibility" in application of the identical definition under the California Environmental Quality Act (CEQA). (*Id.*; see also CEQA Guidelines, § 15364; Pub. Resources Code, § 21061.1 [defining feasibility as "capable of being accomplished in a successful manner within a reasonable period of time taking into account economic, environmental, legal, social and technological factors."].) The question of feasibility is not simply whether an alternative or mitigation measure is literally possible, but whether it is reasonable and practical in light of these and other factors. (*No Slo Transit, Inc. v. City of Long Beach* (1987) 197 Cal.App.3d 241, 256 [mitigation is infeasible if it is impractical].) Alternatives can also be rejected as infeasible if they conflict with certain overarching policies (e.g., a conflict with State's Global Warming Solutions Act of 2006, or AB 32). A project alternative can be eliminated from consideration based on any one factor. Consequently, if an alternative is infeasible for noneconomic reasons, it can be rejected on that basis alone without having to evaluate other factors (including economics).

As discussed under Responses L2-23 and L2-27, the project consists of repowering wind turbines in a specified Wind Resource Area. With very few high-quality wind sites left in Northern California (or in the SMUD service and production territories), alternative sites are impractical and cost prohibitive. Moreover, regulatory restrictions and unavailability of land similarly hamper offsite alternatives. SMUD's Integrated Resource Plan (IRP) process guides decisions on future resource developments based on the need for new renewable and carbon-free resources to meet California's mandate on renewable procurement (2030, 60%) and to meet the directed energy production goals of SMUD's Board of Directors. SMUD's IRP, adopted by the Board of Directors in 2018, laid out a pathway to achieve a Net Zero greenhouse gas (GHG) emissions goal by 2040 through investment in electrification while significantly expanding renewable and carbon-free resources in SMUD's energy portfolio. In July 2020, the Board declared a climate emergency and adopted a resolution calling for SMUD to take significant and consequential actions to eliminate SMUD's greenhouse gas emissions by 2030 and directed staff to develop a plan to achieve this goal. The 2030 Zero Carbon Plan (2030 Plan) has been presented to the Board and calls for the addition of up to 2,300 MW of new renewables and 1,100 MW of batteries by 2030 – more than double the amount planned for in the 2018 IRP. The 2030 Plan calls for maximizing new cost-effective utility-scale renewables within SMUD's service territory (up to 1,500 MW utility solar), but also requires additional resources not available locally, such as wind and geothermal.

Resource diversity is coveted in resource planning and necessary for reliable operations, as it results in varying generation profiles, costs, and avoids over investing in one generation type that may result in diminishing returns. Wind generation, such as generation our proposed Solano 4 wind resource, is beneficial from a resource diversity perspective as it can provide more output during peak hours than solar generation, and typically becomes available as solar goes offline. In short, wind is an effective renewable complement to solar, and is a proven technology that can be planed for and pursued today.

Adding cost-effective renewable resources that complement the solar generation profile, are located relatively close to SMUD, and help ensure reliability will be imperative to achieving the goals of the 2030 Plan. Identifying and building enough resources in the next nine years will be a challenge, and Solano 4 Wind, as a known project on the only remaining land within the Wind Resource Area not already currently used for wind generation (or as to a portion of the project area, on land already dedicated to existing generation), and with existing infrastructure will go a long way to help meet the very aggressive GHG reduction goal. Thus, SMUD will have a factual basis for making the requisite Section 53096 feasibility findings.

Please also refer to the Master Response for SMUD's position as a lead agency for an energy generating project.

L4-5 Required Process When Locating or Constructing Transmission or Distribution Lines. The commenter notes that section 12808.5 of the Public Utilities Code requires a municipal utility district to follow a specified process when locating or constructing transmission or distribution lines. The commenter states that the DEIR does not discuss this required process. As a result, the commenter states that the County is not able to assess whether it has land use jurisdiction over any elements of the project.

Section 12808.5 of the Public Utilities Code requires a municipal utility district to follow a specified process when locating or constructing transmission or distribution lines. As discussed above in Response L4-4, the collection lines and home run lines for Solano 4 are not transmission lines. Further, Section 12808.5 of the Public Utilities Code states that it does not apply to distribution lines conveying less than 100,000 volts. (Pub. Util. Code, § 12808.5(e)(2).) The collection lines and home run lines that will be sited and constructed as part of the project would convey only 34,500-volt power to the Russell Substation. Thus, even if the collection and home run lines could be characterized as distribution lines, the lines sited and constructed as part of the project are explicitly exempted from Section 12808.5 of the Public Utilities Code.

As stated in Response L4-4 above, the project will be comprised solely of underground 34.5 kilovolt, medium voltage, generator collection system feeders, which does not constitute electrical transmission facilities and absolute exemption under section 53091(e) is still applicable. Thus, holding of *Hesperia* case is inapplicable here. Master Response Land Use further discusses why local zoning ordinances do not apply to the project. That said, if necessary, the SMUD Board of Directors has the authority to adopt a qualified exemption under Government Code Section 53096 based on compliance with notice and hearing proceedings and finding there is no feasible alternative to the proposal.

L4-6 Mitigation Measure Should Require a Mitigation Agreement. The commenter notes that the DEIR discusses the project's potential impacts on County roads in section 3.11. The commenter states that Mitigation Measure 3.11-2, requiring SMUD to make a good faith effort to enter into a mitigation agreement regarding the project's impacts to County roads, is not sufficient to achieve mitigation. Instead, the commenter requests that the recommended mitigation measure be revised to require the execution of a mitigation agreement before construction begins on the project.

Mitigation Measure 3.11-2 states that specific County roads affected by the project shall be returned to preconstruction conditions after construction. To avoid giving the impression that the mitigation is conditional, the words "good-faith effort" was deleted from Mitigation Measure 3.11-2. The revision to Mitigation Measure 3.11-2 is included in this FEIR. Please refer to section 3.4 Corrections and Revisions to the DEIR, and to the MMRP in Chapter 4.

L4-7 Impacts of Taller Turbines on Travis Air Force Base Operations. The commenter states that Solano County is very concerned about impacts of taller wind turbines on the Travis Air Force Base (AFB) radar system and believes that they will exacerbate already identified impacts. The commenter notes that the County's General Plan identifies the importance of Travis AFB, not only to the County, but also to the region as a whole. The commenter recommends that that project not proceed until potential impacts to Travis AFB are fully addressed.

Please refer to Master Response 2. SMUD has been actively engaged in addressing these issues with Travis AFB since inception of the project. Travis AFB submitted its Solano 4 Wind Project Operational Risk Assessment to the Department of Defense (DOD) on January 11, 2021. SMUD received the requested extensions for the nineteen (19) Determinations of No Hazard (DNH) for the project on January 28, 2021, and a letter dated February 9, 2021 from Steven J. Sample, Executive Director, Military Aviation and Installation, Assurance Siting Clearinghouse stating that as a result of discussions between SMUD and the U.S. Air Force, the construction of the project, submitted to the FAA on April, 17, 2020, will not present an adverse impact to military operations (See FAA Determinations in Appendix B). Based on substantial evidence, including the evaluation and analysis of its own aeronautics' experts, SMUD has determined that there will be no significant safety or other impacts to Travis AFB arising from this project.

Letter 5

SHUTE, MIHALY & WEINBERGER LLP

396 HAYES STREET, SAN FRANCISCO, CA 94102
T: (415) 552-7272 F: (415) 552-5816
www.smwlaw.com

ROBERT "PERL" PERLMUTTER
Attorney
Perlmutter@smwlaw.com

September 6, 2019

Via Email and Federal Express

Ammon Rice
Sacramento Municipal Utility District
Environmental Services
6201 S Street, MS H201
Sacramento, CA 95817
Ammon.Rice@smud.org

Re: Draft Environmental Impact Report for the Solano 4 Wind Project

Dear Mr. Rice:

On behalf of the Solano County Airport Land Use Commission ("ALUC"), we submit the following comments on the Sacramento Municipal Utility District's ("SMUD's) Draft Environmental Impact Report ("DEIR") for the Solano 4 Wind Project ("Project"). This letter follows up on, and incorporates herein by reference, our February 8, 2019 letter regarding SMUD's January 9, 2019 Notice of Preparation of an Environmental Impact Report ("NOP").

As set forth below, the DEIR fails to comply with numerous provisions of the California Environmental Quality Act ("CEQA"), Pub. Res. Code § 21000 et seq., and the regulations implementing CEQA, California Code of Regulations, Title 14, § 15000 et seq. ("CEQA Guidelines"). Specifically, the DEIR violates CEQA in that it does not: (1) adequately describe the Project or its environmental and regulatory setting; (2) adequately analyze the Project's relationship to the Travis Air Force Base Land Use Compatibility Plan ("LUCP"); (3) adequately analyze the Project's significant impacts; (4) adequately analyze the Project's cumulative impacts; (5) provide for adequate mitigation of the Project's significant impacts; and (6) evaluate a reasonable range of alternatives. SMUD must therefore revise and recirculate the DEIR in order to permit an adequate understanding of the issues at stake. 5-1

California's airport land use commissions are part of the broader framework of efforts around the country aimed at effectively ensuring compatible land

use in the vicinity of airports. ALUC looks forward to working with SMUD to ensure the Project's safety and land use compatibility with respect to airports within ALUC's coverage area. In order to fulfill this critical mission, ALUC must follow the review provisions set forth in the State Aeronautics Act, Public Utilities Code §§ 21001 et sq. ("Act") and the LUCP. Thus, ALUC reiterates its position stated in our prior letter on the NOP: ALUC strenuously disagrees with SMUD's assertion that it is not required to obtain a consistency determination from ALUC for Project approval. This assertion runs directly counter to the express terms of the State Aeronautics Act. ALUC intends to vigorously enforce the provisions of the Act and the LUCP requiring that SMUD must seek such a consistency determination for the Project from ALUC.

5-1 Cont'd

We submit with this letter a review of the DEIR by Dr. Jerry Johnson, Director of Engineering, Regulus-Group, LLC, Washington, DC. Dr. Johnson has extensive recognized experience and expertise in National Airspace System surveillance and navigation systems, including in assessing interference impacts from wind turbines on radar at airport facilities. Dr. Johnson's memorandum, along with his qualifications, are attached hereto as Exhibit 1 and incorporated in full by reference.

I. The DEIR Does Not Adequately Describe the Project or the Environmental Setting.

The environmental impact report is "the heart of CEQA." *Laurel Heights Improvement Assn. v. Regents of Univ. of Cal.* (1988) 47 Cal.3d 376, 392 (citations omitted) (*Laurel Heights*). It "is an environmental 'alarm bell' whose purpose it is to alert the public and its responsible officials to environmental changes before they have reached ecological points of no return. The EIR is also intended 'to demonstrate to an apprehensive citizenry that the agency has, in fact, analyzed and considered the ecological implications of its action.' Because the EIR must be certified or rejected by public officials, it is a document of accountability." *Id.* (citations omitted). Where, as here, an EIR fails to fully and accurately inform decision makers, and the public, of the environmental consequences of proposed actions, it does not satisfy the basic goals of the statute. *See* Pub. Res. Code § 21061 ("The purpose of an environmental impact report is to provide public agencies and the public in general with detailed information about the effect that a proposed project is likely to have on the environment; to list ways in which the significant effects of such a project might be minimized; and to indicate alternatives to such a project.").

5-2

An "accurate, stable and finite project description is the *sine qua non* of an informative and legally sufficient EIR." *San Joaquin Raptor/Wildlife Rescue Center v. County of Stanislaus* (1994) 27 Cal.App.4th 713, 730, quoting *County of Inyo v. City of*

L.A. (1977) 71 Cal.App.3d 185, 193. Such a description is "necessary for an intelligent evaluation of the potential environmental effects of a proposed activity." *Id.*, quoting *McQueen v. Board of Directors* (1988) 202 Cal.App.3d 1136, 1143. An inaccurate or incomplete project description may infect every subsequent section of the EIR and render the analysis of significant environmental impacts as well as feasible mitigation measures and alternatives inherently unreliable. Project descriptions that are internally inconsistent or incomplete are inadequate as a matter of law. *Communities for a Better Environment v. City of Richmond* (2010) 184 Cal.App.4th 70, 83, 89 (holding that an EIR was inadequate because its project description was "inconsistent and obscure" as to the extent of project activities).

5-2 Cont'd

Further, CEQA and the CEQA Guidelines mandate that an EIR include a description of "the physical environmental conditions in the vicinity of the project . . . from both a local and a regional perspective . . . Knowledge of the regional setting is critical to the assessment of environmental impacts." CEQA Guidelines § 15125(a) and (c). This requirement derives from the principle that without an adequate description of the project's local and regional context, the EIR—and thus the decision-makers and the public who rely on the EIR—cannot accurately assess the potentially significant impacts of the proposed Project.

According to the DEIR, the Project would involve construction of up to 22 massive new wind turbine generators ("WTGs")—up to 10 in Solano 4 East and up to 12 in Solano 4 West—as well as related transmission facilities. At up to 591 feet tall, the WTGs would be over 40 percent higher than any existing turbines in the area. Indeed they would be amongst the tallest anywhere in the Country. *See* FAA Digital Obstacle File website [at https://www.faa.gov/air_traffic/flight_info/aeronav/digital_products/dof/]. The turbines would also have a maximum diameter of up to 492 feet. DEIR at 2-10.

5-3

The DEIR acknowledges that WTGs increase risks of aircraft collisions and radar signal interference (DEIR at 3.7-21), and further acknowledges that the Project is within the line of sight of 4 different radar facilities, including Travis Air Force Base ("Travis") (DEIR at 3.7-14). *See also* State of California, Department of Transportation, Division of Aeronautics, California Airport Land Use Planning Handbook (Oct. 2011) [https://dot.ca.gov/programs/ aeronautics/airport-land-use-planning] ("Handbook") at 4-39 ("[W]ind-turbine farms have been known to interfere with air traffic control (ATC) or military air defense radar."). Thus, California policy counsels that "Airport land use compatibility should be one of the factors considered in the appropriate placement of these facilities." Handbook at 4-40.

Despite these acknowledged and obvious risks, the DEIR fails to provide relevant information about the Project and the environmental and regulatory setting so that a reader could assess such compatibility. The Project description is inaccurate, incomplete, inconsistent, and/or misleading in four ways. First, the DEIR states the model and final location of the WTGs will not be selected until a later date. DEIR at 2-10. However, to determine a turbine project's individual and cumulative impacts on radar, precise information such as location, height, blade size, and reflectivity need to be known. Also, the position of the turbines relative to one another is critical to assessing impacts.

5-3 Cont'd

Second, the DEIR states that "The FAA conducted an aeronautical study of the proposed project . . . ." DEIR at 3.7-8. Likewise, the DEIR says that "The FAA has conducted an independent evaluation of the Solano 4 Wind Project . . ." DEIR at p. 3.7-22. Those DEIR statements are misleading. The Project Description says it involves "22 new WTGs" while instead FAA reviewed only 19 proposed turbines. The DEIR's project description is unstable, inaccurate, and incomplete as it (1) is inconsistent as to whether the 19 turbines will comport with the specifications examined in the FAA determinations or are yet to be determined as elsewhere stated in the DEIR, and (2) gives no information whatever about the additional 3 turbines.

5-4

Moreover, the DEIR is incomplete because it attached (as Appendix F) only *one* of the FAA's determinations, which applies directly to only *one* proposed structure that was proposed to be located precisely at Latitude 38-07-54.16N NAD 83 and Longitude 121-46-31.47W. The FAA determination itself says that "This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above." Since the DEIR purports to rely entirely on the FAA determinations in its analysis of the Project's 22 proposed WTGs, the DEIR is inadequate as an informational document for failure to include FAA determinations concerning any turbines beyond that single turbine at that one specified location.

5-5

Third, the DEIR's failure to precisely identify which WTGs will be constructed and where is further reflected in the DEIR's shifting Project objective for megawatt (MW) output, which in turn impacts the DEIR's analysis of alternatives. On August 22, 2019, SMUD altered the Executive Summary to the previously circulated DEIR by, among other things, changing the project objective from producing 92 MW to producing 91 MW. (SMUD sent out notices of that change by ordinary mail, without changing the September 6 date for comments.) Meanwhile the DEIR's identification of the environmentally superior alternative is based on 92 MW. DEIR at 6-12. Further, the

5-6

DEIR excludes alternatives from detailed consideration on the basis of not meeting project objectives. The DEIR's statement of objectives is not stable and consistent, and the reviewing public cannot tell from the DEIR if there may be an appropriate alternative that would meet the 91 MW objective but was excluded from consideration on the basis of the statement that the objective was 92 MW. The DEIR must be corrected and recirculated with a proper alternatives analysis due to the shifting nature of the project objectives. Moreover, as discussed further below, this discrepancy is a further indication that the DEIR has defined its project objectives narrowly to preclude consideration of reasonable alternatives, conforming the statement of objectives around the proposed Project's details, rather than properly examining alternatives in light of the Project's bona fide objectives.

5-6 Cont'd

Fourth, the Project description is unstable and/or the cumulative impacts analysis is improper because the DEIR hints that later actions may be incorporated into the overall project, but does not specify if those actions would or should be included within this Project. DEIR at 2-26. On the one hand, the DEIR talks about "SMUD's overall Solano Wind Project" as if SMUD views it as one thing. DEIR at 2-5. "With a total of 107 WTGs ranging in size from 660 kilowatts (kW) to 3.0 MW, the overall Solano Wind Project currently has a total site rated capacity of 230 MW." DEIR at 2-6. And the DEIR also states that "SMUD is committed to long-term generation of renewable energy in the WRA. At the end of this project's operational life, SMUD would likely repower the Solano 4 Wind Project using current industry technology, or would remove the turbines and restore the project to conform with the surrounding land use." DEIR at 2-6. CEQA requires that an EIR "include an analysis of the environmental effects of future expansion or other action if: (1) it is a reasonably foreseeable consequence of the initial project; and (2) the future expansion or action will be significant in that it will likely change the scope or nature of the initial project or its environmental effects." *Laurel Heights Improvement Assn. v. Regents of University of California* (1988) 47 Cal.3d 376, 398.

5-7

As is common knowledge, and as is patently demonstrated by this phase 4 of the Solano Wind Project, the trend over time in commercial-scale turbine technology is toward larger and larger turbines. The DEIR in effect appears to take the position that it is reasonably foreseeable as part of "SMUD's overall Solano Wind Project" that SMUD will demolish these Phase 4 turbines and install even taller turbines. Yet there is no analysis of any impact of those even bigger turbines, nor even any description of them. For example, how tall will they be? Based on SMUD's saying in the DEIR that "SMUD is committed to long-term generation of renewable energy in the WRA," this defect in the DEIR extends not only to the DEIR's failure to describe and analyze future turbines to replace

Phase 4, but also with respect to the 107 turbines in Phase 1 through 3. DEIR at 2-5. The DEIR says that the maximum height of turbines in those three phases is 410 feet. DEIR at p. 2-5. The Phase 4 proposal is for turbines of 591 feet. DEIR at 2-10. If Phases 1 through 3 were replaced with turbines of Phase 4's proposed height that would be 107 more turbines of 591 feet, each at least 181 feet taller than what exists presently. The DEIR gives no indication of the impacts of that. If, as the DEIR says, those would instead be replaced in the future "using current industry technology" (i.e., the largest conceivable turbine technology then available on the market at that unspecified future time), the DEIR is further defective for failing to describe that aspect of the "overall Solano Wind Project," identify its impacts, and analyze those impacts. Whether viewed as a defect in the DEIR's project description or cumulative impacts analysis, either way the DEIR needs to be recirculated to provide an opportunity for public comment on these issues.

5-7 Cont'd

The DEIR likewise fails to disclose necessary information about the environmental setting, including what type of radar equipment is currently being used at the four airport facilities in the Project vicinity, and for what purpose, as well as the relevant attributes of that equipment. It also fails to reveal the number and types of aircraft that fly in the affected airspace, as well as where and when they fly, and for what purpose. Without providing such pertinent information, it is impossible to assess the Project's impacts upon any of those facilities, any plans that area airports may have for orderly expansion consistent with the State Aeronautics Act, and the need to protect people on the ground from the added risks that come with projects of this type, not to mention air safety and the LUCP. As discussed in detail below, the DEIR also fails to accurately describe the regulatory setting, including the role of the State Aeronautics Act, ALUC, and the LUCP. The DEIR is therefore inadequate and must be corrected and recirculated with adequate Project description and setting information.

5-8

II. The DEIR Does Not Properly Analyze the Project's Relationship to the Travis Air Force Base LUCP.

As the DEIR recognizes, CEQA requires that environmental impact reports analyze the consistency of a project with applicable local plans. *See Napa Citizens for Honest Govt. v. Napa County Bd. of Supervisors* (2001) 91 Cal.App.4th 342, 386-87; CEQA Guidelines Appendix G, § XI(b); *see also* DEIR at 3.9-4 (adopting Appendix G threshold of significance). Inconsistencies with a general plan or other local plan goals and policies that were enacted in order to protect the environment are significant impacts in and of themselves and can also be evidence of other significant impacts. *See id.*; *Pocket Protectors v. City of Sacramento* (2004) 124 Cal.App.4th 903, 929.

5-9

As stated in our comments on the NOP, the Solano County ALUC exists to protect public health, safety, and welfare by ensuring compatible land uses within the vicinity of the County's airports. Pub. Util. Code § 21670. To that end, the State Legislature has empowered ALUC to develop land use compatibility criteria and to ensure that local agency actions conform to those criteria. Pub. Util. Code §§ 21674 – 21676.5. "In formulating an airport land use compatibility plan, the commission may develop height restrictions on buildings, specify use of land, and determine building standards, including soundproofing adjacent to airports, within the airport influence area." Pub. Util. Code, § 21675(a).

In 2015, ALUC adopted the current iteration of the Travis LUCP to define land use compatibility criteria within the Base's airport influence area ("AIA"). Thus, the DEIR must fully analyze the Project's relationship to the LUCP and identify any feasible mitigation measures to lessen or avoid any inconsistencies. Here, the DEIR's analysis of the Project's consistency with the LUCP is fundamentally flawed.

Because wind turbines—especially those of the Project's size—can generate air traffic control radar interference, rotor turbulence, and vertical obstruction hazards, section 5.6.1 of the Travis LUCP requires that all new and replacement turbines in the County *that are greater than 100 feet in height* AGL "shall be referred to the ALUC for a consistency determination." Travis Air Force Base LUCP, § 5.6.1. The proposed Project's turbines would be up to 591 feet. As the DEIR recognizes, the Project site is in Zone 4 of the LUCP. DEIR at 3.9-6. The DEIR, however, dismisses potential plan inconsistencies and impacts based on three erroneous assumptions. DEIR at 3.9-6, 3.7-11. Because, as set forth below, each of the DEIR's assumptions are wrong as a matter of law, the DEIR's ultimate conclusion that the Project would have no significant land use impacts and thus "[n]o mitigation measures are required" (DEIR at 3.9-7) is unsupportable. The DEIR must be revised and recirculated to address this error.

5-9 Cont'd

A. Neither the FAA's Regulations Nor Its Determination of No Hazard Finding Preempt ALUC's Travis Air Force Base LUCP.

First, the DEIR asserts that there is no potential issue to address with respect to the LUCP because "the FAA has issued a Determination of No Hazard Finding for the Solano 4 Wind Project, and FAA and its regulations concerning air safety and aviation navigation preempt the ALUC's land use regulations regarding radar system interference." DEIR at 3.9-6; *see also* DEIR at 3.7-22 (similarly claiming preemption regarding air safety impacts). The DEIR cites no express preemption provision (nor could it) and thus apparently relies on implied preemption (either "conflict" or "field" preemption). However, there is no such implied preemption. Rather, the overwhelming

5-10

federal and state authorities demonstrate that the FAA does not have authority over local land use decisions, including those aimed to ensure compatibility with airports, and that such decisions are left in the hands of local authorities such as ALUC.

Notably, the FAA itself espouses this view in general as well as in this particular case. As the FAA's Order that sets forth that agency's "Procedures for Handling Airspace Matters" explains:

> The FAA's authority to promote the safe and efficient use of the navigable airspace, whether concerning existing or proposed structures, is predominantly derived from Title 49 U.S.C. Section 44718 (Section 44718). It should be noted however, that *Section 44718 does not provide specific authority for the FAA to regulate or control how land (real property) may be used in regard to structures that may penetrate navigable airspace.*

FAA Order JO 7400.2M (February 28, 2019) § 5-1-2a (emphases added); *see also* Handbook at 3-28 (stating same).

5-10 Cont'd

Thus, "[o]nce issued, a hazard/no-hazard determination has no enforceable legal effect. The FAA is not empowered to prohibit or limit proposed construction it deems dangerous to air navigation." *Aircraft Owners & Pilots Ass'n v. FAA* (D.C. Cir. 1979) 600 F.2d 965, 966 n. 2; *see also* Handbook at 5-11. Such land use authority is left in the hands of local governments. *See Gustafson v. City of Lake Angelus* (6th Cir. 1996) 76 F.3d 778, 784 ("The FAA has acknowledged that land use matters within the federal aviation framework are intrinsically local."); Handbook at 3-11 ("The FAA has no authority over off-airport land uses—its role is with regard to the safety of aircraft operations... State and local agencies are free to set more stringent land use compatibility policies.").

Moreover, the FAA's Determination of No Hazard Finding ("NHD") for the Project's wind turbines included in Appendix G to the DEIR reaffirms this principal with respect to the instant Project in particular. It expressly states that it "does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State or local government body."

A recent decision from the Iowa Supreme Court addressing a situation analogous to the present one provides a case in point. *Carroll Airport Commission v.*

Danner (2019) 927 N.W.2d 635. After a detailed survey of the federal and state cases on this issue, *Carroll* upheld injunctive relief granted to an airport land use commission to tear down a grain "leg" (bucket elevator) that was constructed in a flight path without the proper approvals from the commission. *Id.* at 648-53. The farmer claimed, as does the DEIR here, that the commission's approval process was preempted by the FAA and that the FAA's no-hazard determination regarding the structure was conclusive. *Id.* at 641. Notably, the no-hazard determination for the structure there contained language identical to that used for the Project here, stating that it "does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body." *Id.*

> The court explained its reasoning for rejecting preemption as follows:
>
> On balance, we decline to hold the FAA no-hazard determination preempted enforcement of local zoning requirements. We reiterate that '[t]here is a presumption against preemption.' *Huck*, 850 N.W.2d at 363 (alteration in original) (quoting *Ackerman*, 586 N.W.2d at 213). Federal courts recognize that the FAA's "hazard/no-hazard determination has no enforceable legal effect" and "[t]he FAA is not empowered to prohibit or limit proposed construction it deems dangerous to air navigation." *Aircraft Owners & Pilots Ass'n*, 600 F.2d at 966–67. Accordingly, that role must fall to state and local government, indicating Congress left room for "cooperative federalism." *See Freeman*, 848 N.W.2d at 83. In our view, the better reasoned authorities discussed above hold state and local regulators can impose stricter height restrictions on structures in flight paths notwithstanding an FAA no-hazard determination. Finally, we rely on the very language of this specific no-hazard determination, which expressly warned the Danners that they still must comply with state and local laws.

5-10
Cont'd

Id. at 653. The rationale provided in *Carroll* applies with equal force here.

It is also consistent with the guidance provided by the California Department of Transportation, which is the state agency that oversees implementation of the State Aeronautics Act. *See* Handbook at 3-33 ("[A]n FAA DNH [determination of no hazard] is not a determination that no airport land use compatibility issues exist, and an ALUC may find a project incompatible for other reasons, regardless of the issuance of a DNH."); *see also id.* at 3-48 & *Muzzy Ranch Co. v. Solano County Airport Land Use Com.* (2008) 164 Cal. App. 4th 1, 12 ("*Muzzy Ranch II*") (explaining differences between ALUC

compatibility review for military airports and other standards); *Sierra Pacific Holdings, Inc. v. County of Ventura* (2012) 204 Cal.App.4th 509 (FAA safety standards do not preempt state tort law regarding obstructions near airport runway). There is no federal preemption of ALUC's review of the Project.

5-10 Cont'd

B. The LUCP Provisions Apply to SMUD.

Next, the DEIR claims that there is no issue here because "the LUCP provisions do not apply to SMUD WTG facilities under section 53091 of the Government Code (Subdivisions d and e)." DEIR at 3.9-6; *see also* DEIR at 3.7-13, 3.7-22 (concluding same with respect to the Project's air safety impacts). The DEIR's conclusions in this regard conflict with the express provisions of state law, as explained in our January 9th letter on the NOP. By failing to acknowledge that the ALUC review requirements of the Act apply to the Project, the DEIR misleads the public. To ensure that the public—and SMUD decisionmakers—have a full and accurate understanding of the Project and the regulatory process governing its approval, the DEIR must be revised and recirculated to accurately set forth the regulatory setting. Because SMUD failed to do so in the DEIR, we provide that description here.

To begin, the Act broadly empowers ALUC to review the plans, regulations, and actions of local agencies to ensure compatibility with the appropriate LUCP. In granting this authority, the Legislature made clear that ALUC's jurisdiction reaches beyond cities and counties to include special districts and other local agencies such as SMUD. Indeed, the Legislature specifically amended the Act in 2000 to remove any doubt on this point, providing that "special districts, school districts, and community college districts are included *among* the local agencies that are subject to" ALUC review. Pub. Util. Code § 21670(f) (emphasis added); *see also* Senate Floor Bill Analysis for SB 1350 (August 2000) at ¶ 27 (rejecting the Napa Sanitation District's assertion that it was not subject to ALUC authority).

5-11

Municipal utility districts such as SMUD are organized under the laws of the State to provide "governmental, or at least quasi-governmental," services to regional service territories. *Sacramento Mun. Util. Dist. v. County of Sonoma* (1991) 235 Cal. App. 3d 726, 733. SMUD is therefore plainly "among the local agencies" that are subject to ALUC review under the Act. *See* Pub. Util. Code § 21670(f). Thus, without an explicit statutory exemption, SMUD must comply with ALUC's review procedures.

The DEIR asserts that Government Code section 53091 provides such an exemption. It does not.

Government Code section 53091 reads, in relevant part, as follows:

> (a) Each local agency shall comply with all applicable building ordinances and zoning ordinances of the county or city in which the territory of the local agency is situated.
>
> …
>
> (d) Building ordinances of a county or city shall not apply to the location or construction of facilities for the production, generation, storage, treatment, or transmission of water, wastewater, or electrical energy by a local agency.
>
> (e) Zoning ordinances of ***a county or city*** shall not apply to the location or construction of facilities for the production, generation, storage, treatment, or transmission of water, or for the production or generation of electrical energy, facilities that are subject to Section 12808.5 of the Public Utilities Code, or electrical substations in an electrical transmission system that receives electricity at less than 100,000 volts. Zoning ordinances of a county or city shall apply to the location or construction of facilities for the storage or transmission of electrical energy by a local agency, if the zoning ordinances make provision for those facilities.

5-11
Cont'd

This statutory provision does not exempt SMUD from compliance with the LUCP. On its face, Government Code section 53091 pertains only to "applicable building ordinances and zoning ordinances of [a] county or city." As a matter of law, ALUC is neither a county nor a city. Instead, it is an independent governmental entity empowered and entrusted by the Legislature to implement and safeguard the Act's important public purposes. *See, e.g.*, Pub. Util. Code § 21674; *Muzzy Ranch Co. v. ALUC* (2007) 41 Cal.4th 372, 384-85 (Pursuant to the Act and Government Code, "an airport land use compatibility plan can operate like a multijurisdictional general plan to trump the land use planning authority that affected jurisdictions might otherwise exercise through general and specific plans or zoning."). Accordingly, under the plain terms of the statute, the exemption set forth in section 53091(e) does not apply to ALUC's LUCP.

In short, under the plain language of the statute, SMUD cannot rely on section 53091 for an exemption from ALUC review.

C. SMUD Does Not Have the Authority to Overrule ALUC, Nor Would Such Authority Obviate the Need for CEQA Review.

The final reason the DEIR gives for ignoring CEQA's requirement to analyze the Project's relationship to the LUCP is that "SMUD, as a local agency, can overrule the ALUC determination consistent with the State Aeronautics Act." DEIR at 3.9-6; *see also* DEIR at 3.7-8, 3.7-13, 3.7-22 (citing Pub. Util. Code §§ 21674.7, 21676 and 21676.5). In other words, the DEIR claims that because SMUD can allegedly "overrule" any determination ultimately made by ALUC, SMUD can skip ALUC's review procedures. The DEIR also asserts that, as a result, it need not analyze or mitigate any potential land use inconsistency with the LUCP. The DEIR is wrong on both counts.

First, as with ALUC, SMUD is not a city or a county and thus it does not possess the power the Legislature granted to cities and counties—and *only* to cities and counties—to overrule certain ALUC determinations. *See* Pub. Util. Code § 21676 (granting certain override powers to cities and counties by virtue of their power to adopt and amend general plans); § 21676.5 (same); *see also Pac. Gas & Elec. Co. v. Sacramento Mun. Util. Dist.*, 92 F.2d 365, 366 (1937) (noting that "[SMUD] is not coterminous with any county or municipality."). By virtue of their independent land-use planning authority, cities and counties possess unique discretion to determine whether their land-use plans conform to the ALUC's compatibility criteria. Pub. Util. Code §§ 21676(a), 21676.5. SMUD, by contrast, does not possess independent land-use planning authority to create a general plan and thus cannot avail itself of the powers the Act grants to cities and counties. Thus, the plain language of the Public Utilities Code does not give SMUD the authority to overrule ALUC or the LUCP. 5-12

Second, even if SMUD did have the power to overrule ALUC—which it does not—the DEIR may not assume that such an override is a foregone conclusion and on that basis ignore the Project's potentially significant land use impacts. The override provisions in the Act that the DEIR cites require a certain procedure to be followed before an override could take effect. *See* Pub. Util. Code §§ 21676 and 21676.5. This procedure would begin with ALUC completing its consistency review, and then the local agency approving an override only upon a two-thirds vote and making certain findings. *Id.* Thus, as the California Supreme Court has held, "even in the event a local authority invokes the override provision, the State Aeronautics Act scheme still controls." *Muzzy Ranch*, 41 Cal.4th at 384. Furthermore, under CEQA, an agency may make any override findings only *after* a full and complete environmental review. *See* CEQA Guidelines § 15093. Thus, even if SMUD's Board could ultimately override ALUC's determination (and it cannot), SMUD must still submit its Project to ALUC for a consistency determination. And likewise the DEIR must still disclose the Project's relationship to the

LUCP and the significance of any inconsistencies, and evaluate all feasible mitigation measures to lessen such impact.

One unfortunate overall impression this DEIR creates on SMUD's behalf is that SMUD hopes to turn a blind eye to all local considerations and criteria, wishes ultimately to disregard them, and plans instead to proceed unilaterally on nothing more than its own fiat. Meanwhile, Travis Air Force Base: is the largest single employer in Solano County, accounting for nearly 10 percent of the county's total jobs; is responsible for vital strategic airlift and air refueling missions circling the globe; is the West Coast terminal for aeromedical evacuation aircraft returning sick or injured patients from the Pacific area; and regularly undertakes humanitarian response efforts around the globe, such as to areas devastated by hurricanes and earthquakes.[1]

5-12 Cont'd

In sum, SMUD must revise and recirculate the DEIR to include an adequate analysis of the Project's land use impacts, including its relationship to the LUCP, and must consider all feasible mitigation measures to lessen such impacts, including but not limited to the measures discussed below.

III. The DEIR Fails To Adequately Analyze or Mitigate the Project's Significant Impacts.

The DEIR begins with the following critical statement regarding the Project's potentially significant safety hazard to air traffic:

5-13

> The project site lies within the planning boundary of the Travis AFB LUCP, which contains policies designed to promote land use compatibility with airport operations. Placement of WTGs have the potential to intrude into navigable airspace, thereby increasing the

[1] Solano County General Plan, at pp. ED-4 to ED-5.60th Air Mobility Wing Fact Sheet (Feb. 12, 2016) [at http://www.travis.af.mil/About-Us/Fact-Sheets/Display/Article/855903/60th-air-mobility-wing/]; 2nd Lt. Sarah Johnson, *'Doing the good thing': Travis aids mission to improve education in Haiti* (Nov. 28, 2017) [at http://www.jbcharleston.jb.mil/News/Article/1382960/doing-the-good-thing-travis-aids-mission-to-improve-education-in-haiti/]; Master Sgt. Joseph Swafford, *BEEliners bring humanitarian aid to St. Croix* (Sept. 26, 2017) [at http://www.travis.af.mil/News/Article/1325298/beeliners-bring-humanitarian-aid-to-st-croix/]; Taylor Buley, *Solano airmen, humanitarian heroes, at Travis Air Force Base* (Sept. 25, 2017) at p. A1 [at https://www.dailyrepublic.com/solano-news/vacaville/solano-airmen-humanitarian-heroes-at-travis-air-force-base/].

> risk of aircraft collision, or causing interference with radar signals used by air traffic control. Therefore, this impact would be **potentially significant**.

5-13 Cont'd

DEIR at 3.7-21 (emphasis in original). The "analysis" that follows this statement, however, is woefully inadequate.

After admitting that the Project would "increas[e] the risk of aircraft collision" and "caus[e] interference with radar signals," the DEIR then proceeds to dismiss these grave impacts with a series of deflections.

First, as with the Project's land use impacts, the DEIR tries to avoid a deeper analysis of this potentially significant impact by claiming SMUD is either exempt from or can override the LUCP. DEIR at 3.7-22. As explained in detail above, this premise is legally faulty. *See supra* Part II.2 & 3. Equally important, even if SMUD were exempt from ALUC review (which it is not), it does not logically follow that the identified potentially significant impact, which is based on physical conditions not legal constructs, somehow disappears. Rather, CEQA dictates that the DEIR must analyze the actual environmental impact, regardless of the legal status of the Project's review. *See, e.g., Communities for a Better Environment v. S. Coast Air Quality Management Dist.* (2010) 48 Cal.4th 310, 320-21.

5-14

CEQA requires an EIR to "include[] sufficient detail to enable those who did not participate in its preparation to understand and to consider meaningfully the issues the proposed project raises." *Sierra Club v. County of Fresno* (2018) 6 Cal.5th 502, 510. Furthermore, the DEIR must adequately discuss the nature of, and analyze, the Project's impacts, not just baldly conclude that an impact may be potentially significant. *Id.* at 514 ("[T]he adequacy of an EIR's discussion of environmental impacts is an issue distinct from the extent to which the agency is correct in its determination whether the impacts are significant. 'An EIR's designation of a particular adverse environmental effect as 'significant' does not excuse the EIR's failure to reasonably describe the nature and magnitude of the adverse effect.'") Therefore, the EIR must explain the *nature* and *extent* of the increased risks for aircraft collision and radar interference in a manner calculated for the public to understand. Furthermore, it must set forth standards for determining how much of an increased risk and interference would be considered a significant impact under CEQA and why. When it comes to potential loss of human life and military readiness, is any such increase acceptable? The purpose of CEQA is to disclose such issues so that the public and decision-makers may be adequately informed of the consequences of their decisions.

5-15

Instead of undertaking this necessary analysis, the DEIR relies entirely on the FAA's NHD, asserting that document "described and dismissed" the air safety concerns raised by ALUC. DEIR at 3.7-22. This approach is unsupported, both factually and legally. To begin, the NHD did not "dismiss" ALUC's concerns. Instead, it concluded that the wind turbines would be within the line of sight of Travis, as well as three additional facilities, and "will affect the quality and/or availability of radar signals. The effects would be unwanted primary returns (clutter) and primary target drops, all in the area of the turbines. Tracked primary targets could diverge from the aircraft path and follow wind turbines, when the aircraft is over or near the turbines." NHD at 5. The NHD ultimately concludes that such adverse effects are not unacceptable under ***FAA standards*** based on an evaluation of factors that are "not published for public use and are not circulated for public comment." *Id.* at 6 (emphasis added).

Critically, the NHD is clear that it does not purport to satisfy anything other than the FAA's limited criteria.[2] Rather, as noted, the Determination explicitly requires the applicant to comply with "any law, ordinance, or regulation of any Federal, State, or local government body." *Id.* at 3; *see also id.* at 5 (noting that ALUC's comments were not necessarily considered an "'objection' but rather statements," some of which "are simply repeating applicable law/rule/orders."). Therefore, the NHD's ultimate conclusions are both (1) based on the understanding that the applicant would be separately complying with the LUCP and CEQA; and (2) not intended to be, and in fact are not, based on a CEQA-compliant analysis that is sufficient as a public informational document.

Indeed, the NHD does not even purport to review the entire proposed Project. As discussed above, the "Solano 4 Wind Project" is for 22 proposed WTGs, the final model and placement of which has not been determined. Yet, the NHD considered 19 specific proposed structures in specific locations with specific heights. The DEIR provides no assurances that the final Project will align with what the FAA reviewed. Moreover, as to the 3 turbines beyond the 19 reviewed by the FAA, the DEIR's analysis under Impact 3.7-3 appears to be based upon nothing whatsoever.

5-16

[2] For example, to the extent that the FAA received input from the military on the No Hazard Determination, such input would be limited to commenting on whether the Project would have an "adverse impact on military operations and readiness." To qualify as having an "adverse impact" for military purposes, the impact must be "demonstrable and [] likely to impair or degrade the ability of the armed forces to perform their warfighting missions." 10 U.S.C. § 183a(h)(1); 49 U.S.C. § 44718(h)(1).

CEQA requires that an EIR evaluate the whole Project's potentially significant environmental impacts, which is far broader in scope than an air "hazard" as defined and considered by the FAA. *Compare, e.g.*, Cal. Pub. Resources Code §§ 21002.1, 21060.5 *with* 14 C.F.R. § 77.17; *see also Town of Barnstable v. FAA* (2014) 408 U.S.App.D.C. 150, 161 (FAA determination insufficient to complete a proper environmental analysis under NEPA). Furthermore, CEQA case law makes clear that an EIR may not simply rely on compliance with certain regulatory standards to avoid an analysis of a Project's potentially significant impacts. *See, e.g.*, *Californians for Alternatives to Toxics v. Dept. of Food & Agriculture* (2005) 136 Cal.App.4th 1, 15-20 (reliance on safety regulations "is inadequate to address environmental concerns under CEQA"; EIR must independently analyze the project's impacts, including safety impacts); *E. Sacramento Partnerships for a Livable City v. City of Sacramento* (2016) 5 Cal.App.5th 281, 302-03 (agency improperly used city's general plan standard as sole threshold to avoid finding significant traffic impacts). 5-17

As set forth in further detail in the report by Dr. Johnson of the Regulus Group (Exhibit 1), it is clear that even current SMUD WTG operations have resulted in impacts. In order to assess whether the addition of even larger and taller WTGs would result in significant impacts, the DEIR would need to provide far more information that it currently does. For example, the DEIR would need to include an adequate assessment of (1) the increase in ATC Minimum Vectoring Altitudes (MVA) for the area of the WTGs; (2) objective metrics for radar interference; (3) clutter and dual tracks; and (4) workload for operator engagement with aircraft because of clutter. *See* Exhibit 1. Without providing information on these topics, the DEIR fails as an informational document and fails to provide substantial evidence to support its determination that the Project will result in insignificant air safety impacts. 5-18

Once the DEIR adequately evaluates the Project's significant air safety impacts, it must evaluate all potentially feasible mitigation measures and feasible alternatives to lessen or avoid such impacts. Pub. Res. Code § 21002; CEQA Guidelines §15126.4. Currently, the DEIR relies only upon the NHD's suggested mitigation to "mark and light wind turbine generators during construction" (Mitigation Measure 3.7-3) and then determines, without further analysis, that "implementing this mitigation measure would reduce the impact of hazards to aviation *during construction* to a less-than-significant level." DEIR at 3.7-23 (emphasis added). This is inadequate under CEQA for at least two reasons. 5-19

First, Measure 3.7-3 only purports to alleviate *construction* impacts. It does not address impacts related to the wind turbines *operation* at all. It also does not address

the fact that the structures themselves (even in the daytime) can result in radar interference. *See* Exhibit 1.

CEQA requires much more. The DEIR must consider all potentially feasible mitigation to avoid operational impacts. For example, the DEIR acknowledges, but fails to further consider, the DOD's "continued efforts to develop new strategies to identify mitigation solutions to radar interference issues, including development of new radar technology." DEIR at 3.7-13.

5-19 Cont'd

One obvious ongoing such effort that the DEIR inexplicably fails to consider is the Wind Turbine Radar Interference Mitigation (WTRIM) pilot mitigation program being conducted at the very airbase most likely to be impacted by the Project—Travis Air Force Base. As detailed in Dr. Johnson's memorandum, this pilot project is studying how small low-cost in-fill radar systems might be used to mitigate wind turbine radar interference. *See* Exhibit 1. The study is nearing completion and clearly has the potential to mitigate any significant impacts from the Project on radar systems. *Id.* Furthermore, another mitigation effort underway is to develop radar processing algorithms that may reduce clutter seen on the ATC screens. *Id.*

5-20

The DEIR must consider all such mitigation solutions to determine if they could feasibly be implemented in conjunction with the Project. This could include, *inter alia*: (1) SMUD contributing its fair share to such solutions, and/or (2) SMUD agreeing to schedule Project construction in tandem with the implementation of new radar technologies. The DEIR must also consider any feasible alternate configurations for the wind turbines that would lessen air safety impacts, including moving WTGs from the line of sight. *Id.*

Second, even with respect to construction impacts, it is impossible to know whether Measure 3.7-3 would actually reduce impacts to a less-than-significant level because the DEIR fails to adequately reveal the nature and extent of the Project's construction impacts. Nor does the DEIR reveal how much the impact would be lessened by implementation of the mitigation. "CEQA EIR requirements are not satisfied by saying an environmental impact is something less than some previously unknown amount." *Ukiah Citizens for Safety First v. City of Ukiah* (2016) 248 Cal.App.4th 256, 264 (citation omitted).

5-21

IV. The DEIR Fails To Adequately Analyze or Mitigate the Project's Significant Cumulative Impacts.

As the DEIR acknowledges, CEQA requires the lead agency to analyze and mitigate a Project's potentially significant cumulative impacts. CEQA defines cumulative impacts as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." Guidelines § 15355; *see also Communities for a Better Env't v. Cal. Res. Agency*, 103 Cal.App.4th at 120. An effect is "cumulatively considerable" when the "incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects." Guidelines § 15065(a)(3). A proper cumulative impact analysis is "absolutely critical," *Bakersfield Citizens for Local Control v. City of Bakersfield* (2004) 124 Cal.App.4th 1184, 1217, as it is a mechanism for controlling "the piecemeal approval of several projects that, taken together, could overwhelm the natural environment," *Las Virgenes Homeowners Fed'n, Inc. v. County of Los Angeles* (1986) 177 Cal.App.3d 300, 306.

As explained by Dr. Johnson, utility scale turbines impact primary surveillance radar systems when the turbines are located within the line of sight of radar, and prior turbine projects in the area have already created an impact. *See* Exhibit 1. Yet, instead of actually analyzing this impact, the DEIR disposes of this significant cumulative risk in one conclusory paragraph. *See* DEIR at 4-12.

5-22

This paragraph, however, contains no actual analysis of the impact. Instead, it relies entirely on the FAA's NHD: "Regarding impacts on air traffic, the FAA concluded that the cumulative impact of the proposed WTGs, when combined with other proposed and existing structures, is not considered to be significant." *Id.* However, neither the DEIR nor the NHD provides any facts or discussion that demonstrate the latter document evaluated cumulative impacts in the manner required by CEQA. For example, the NHD does not reveal which other projects it considered in its cumulative analysis, and does not purport to use either of the methods prescribed by CEQA Guidelines section 15130. Further, as discussed above, the NHD looks only at cumulative impacts in the context of the FAA's standards, which do not purport to align with CEQA's definition of cumulative impacts or its requirements for a cumulative impacts analysis under California state law. Thus, the DEIR must undertake or present an independent evaluation of the Project's significant cumulative air safety impacts that complies with CEQA. The DEIR cannot attempt to get by on just bare conclusions, nor on an assumption that the FAA NHD, without needing to or meaning to, evaluated such impacts in a way that would conform to CEQA's standards.

V. The DEIR Fails to Adequately Evaluate Alternatives to Lessen or Avoid the Project's Significant Impacts.

Under CEQA, a proper analysis of alternatives is essential to comply with the Act's mandate that significant environmental damage be avoided or substantially lessened where feasible. Pub. Res. Code § 21002; CEQA Guidelines §§ 15002(a)(3), 15021(a)(2), 15126(d); *Citizens for Quality Growth v. City of Mount Shasta* (1988) 198 Cal.App.3d 433, 443-45. As stated in *Laurel Heights I*, "[w]ithout meaningful analysis of alternatives in the DEIR, neither the courts nor the public can fulfill their proper roles in the CEQA process . . . . [Courts will not] countenance a result that would require blind trust by the public, especially in light of CEQA's fundamental goal that the public be fully informed as to the consequences of action by their public officials." 47 Cal.3d at 404. 5-23

Critically, an EIR must consider a "reasonable range" of alternatives "that will foster informed decision-making and public participation." CEQA Guidelines § 15126.6(a) (emphasis added); *Laurel Heights I*, 47 Cal.3d at 404 ("An EIR's discussion of alternatives must contain analysis sufficient to allow informed decision-making."). The discussion of alternatives must focus on alternatives to the project or its location that are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly. CEQA Guidelines § 15126.6(b). The DEIR for the Project fails to heed these basic mandates.

After presenting CEQA's required "no project" alternative, the DEIR offers only *one* project alternative (the "Reduced Turbine Height Alternative"), which would involve placement of 27 WTGs in a configuration similar to that of the proposed project. DEIR at 6-4 to 6-10. However, the DEIR claims that, except with respect to aesthetic impacts, the Reduced Turbine Height Alternative would result in similar or *greater* environmental impacts than the Project. *See* DEIR at 6-11. For example, with respect to air safety impacts, the DEIR states: "The Reduced Turbine Height Alternative would introduce structures that exceed the 200 foot threshold. … The placement of more WTGs on the project site may increase radar interference compared to the proposed project as the density of WTGs is greater than for the project. Overall, the Reduced Turbine Height Alternative may result in greater hazards or hazardous materials impacts compared to the project. (Greater)." DEIR at 6-10. 5-24

While there is no "magic number" for how many alternatives an EIR should examine to present a "reasonable range," at a minimum CEQA requires an agency to examine at least one potentially feasible alternative to try to avoid or lessen significant 5-25

environmental impacts that are central to the Project. *See Watsonville Pilots Ass'n.*, 183 Cal.App.4th at 1089-90 (EIR was deficient for failing to include reduced development alternative that would avoid or lessen the project's primary growth-related significant impacts); *Habitat and Watershed Caretakers v. City of Santa Cruz* (2013) 213 Cal.App.4th 1277, 1285, 1305 (invalidating EIR that failed to discuss any feasible alternative that would lessen the project's primary water supply impact). Here, presenting only one alternative that would not even reduce, but in fact would increase, the Project's significant environmental impacts does not contribute to a "reasonable range" of alternatives. *See* § 21100(b)(4); Guidelines § 15126.6(a) & (b). 5-25 Cont'd

The DEIR itself underscores its failure in providing a reasonable range of alternatives when it is forced to identify the proposed Project itself as the environmentally superior "alternative." DEIR at 6-12. This defeats the purpose of an alternatives analysis, and does not meet either the letter or the spirit of CEQA's requirement that the DEIR identify an "environmentally superior" alternative to the proposed project. CEQA Guidelines § 15126.6.

There are numerous potentially feasible alternatives that the DEIR could and should have considered to reduce the Project's potentially significant environmental impacts. For example, a revised DEIR should evaluate an alternative configuration of the WTGs that would avoid or reduce the Project's air safety and land use impacts. *See* Exhibit 1. Likewise, a revised DEIR should evaluate alternative phasing for the Project that is coordinated with the implementation of new radar technologies that reduce or eliminate the air safety impacts from WTGs. *See id.* 5-26

To the extent SMUD claims that additional alternatives would not achieve the Project objective of meeting SMUD's Renewable Portfolio Standard ("RPS") obligations, an EIR may not so narrowly define project objectives as to preclude an adequate evaluation of alternatives. *See Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692, 735-37.

Furthermore, as detailed in the attached Exhibit 2, RPS renewables can come from a range of sources and from all over the western part of North America. Under the Renewables Portfolio Standard, "eligible renewable sources" include: biodiesel, biomass, biomethane (including digester gas, and landfill gas), fuel cells using renewable fuels, geothermal, hydro-electric (including conduit hydroelectric, incremental hydroelectric generation from efficiency improvements, small hydroelectric, and water supply and conveyance), municipal solid waste combustion and conversion, ocean wave, ocean thermal, solar (including photovoltaic and solar thermal electric), tidal current, and wind. And renewable generation facilities eligible under the Renewables Portfolio 5-27

Standard may be located anywhere within the region of the Western Electricity Coordinating Council, which includes all or parts of the 14 western United States, two Canadian provinces, and the northern portion of Baja California, Mexico.[3] Therefore, in addition to alternatives in terms of potential project design in this location, there are wide ranging alternatives in terms of location and type of project.

5-27 Cont'd

Also, there are at least some temporal alternatives. Even if the Renewables Portfolio Standard did require the construction of this specific project here (which it does not), it would not require the Project's construction right now. The Renewables Portfolio Standard requires procurement of renewables such that, overall, they will constitute a specified *percentage* of annual retail sales by specified *target dates*. That does not compel SMUD to construct this particular Project within a year's time. In short, the range of alternatives available to SMUD includes numerous options, which, in the most general terms, include building something else, somewhere else, at some other time. And CEQA requires consideration of those alternatives.

5-28

Likewise, according to SMUD's own Policy SD-9, attached hereto as Exhibit 3, SMUD also meets its Net Zero goal via other methods including investments in vehicle and building electrification and energy efficiency. SMUD's Policy SD-9 also states that "[i]n meeting GHG reduction goals, SMUD shall emphasize local and regional environmental benefits." Such regional environmental benefits would be furthered by ensuring consistency with the LUCP. Finally, as noted, an alternative need not meet every Project objective or be the least costly in order to be feasible. *See* CEQA Guidelines § 15126.6(b).

5-29

VI. The DEIR Must Be Recirculated.

Under California law, the present EIR cannot properly form the basis of a final EIR. CEQA and the CEQA Guidelines describe the circumstances that require recirculation of a draft EIR. Such circumstances include: (1) the addition of significant new information to the EIR after public notice is given of the availability of the DEIR but before certification, or (2) the draft EIR is so "fundamentally and basically inadequate

5-30

[3] California Energy Commission, *Renewables Portfolio Standard Eligibility, 7th Ed., Staff Final Guidebook* (April 2013), at pp. 16, 163; California Public Utilities Commission website on *33% Procurement Rules*, [at http://www.cpuc.ca.gov/PUC/energy/Renewables/hot/33RPSProcurementRules.htm]; Western Electricity Coordinating Council, *Fact Sheet* [at https://www.wecc.biz/_layouts/15/WopiFrame.aspx?sourcedoc=/Administrative/Fact%20Sheet%20-%20REVISED.pdf&action=default&DefaultItemOpen=1].

and conclusory in nature that meaningful public review and comment were precluded." CEQA Guidelines § 15088.5.

Here, both circumstances apply. Decision-makers and the public cannot possibly assess the Project's impacts through the present DEIR, which is riddled with errors. Among other fundamental deficiencies, the DEIR repeatedly understates and does not provide the relevant information regarding the Project's significant land use and air safety impacts. Instead, it relies exclusively on the FAA's No-Hazard Determinations, which were prepared for another purpose, and assumes without analysis that minimalistic mitigation measures would effectively reduce the Project's impacts on air safety and land use. In order to resolve these issues, SMUD must prepare a revised EIR that would necessarily include substantial new information, including the information included herein. Furthermore, we reiterate that it is mandatory and imperative that SMUD obtain a consistency determination from ALUC prior to proceeding with the Solano 4 Wind Project. ALUC intends to pursue all legal means necessary to enforce this requirement.

5-30 Cont'd

ALUC looks forward to working with SMUD to ensure that any future development of the Solano 4 site prioritizes the health, safety, and welfare of Solano County's residents, and is consistent with the development criteria established in the Travis Air Force Base LUCP. Please do not hesitate to contact us if you have any questions or concerns about this letter.

Very truly yours,

SHUTE, MIHALY & WEINBERGER LLP

Robert "Perl" Perlmutter

Amy J. Bricker

Amy J. Bricker

cc: Thomas Randall, Chair, Solano County ALUC
Lee Axelrad, Deputy County Counsel

Exhibit List

Exhibit 1: Memorandum from Dr. Jerry Johnson, Director of Engineering, Regulus-Group, LLC, Washington, DC; Statement of Qualifications

Exhibit 2: Union of Concerned Scientists, "The Clean Energy Race: How Do California's Public Utilities Measure Up?" SMUD Fact Sheet

Exhibit 3: SMUD Policy SD-9

1149178.11

EXHIBIT 1

engineering the skies regulus group 238 North Main Street, Woodstock VA 22664

From: Dr. Jerry Johnson, Director of Engineering, Regulus-Group, LLC, Washington, DC
To: Shute, Mihaly, & Weinberger, LLP, San Francisco, CA
Subject: Review of Draft EIR for Additional wind turbines near Travis Air Force Base (Solano 4 Wind Project)
Date: Friday, August 6, 2019

Background
I have reviewed the portions of SMUD's Draft Environmental Impact Report for the Solano 4 Wind Project relating to air safety impacts. There are several key points about the existing wind turbine project and air operations that I'd like to mention. These are:

1. In general, it is well known that utility scale wind turbines impact primary surveillance radar systems when the turbines are located within the line of sight of radar. We discuss this issue further below.
2. Travis Air Force Base provides air traffic control services in the area where the proposed wind turbines are to be installed.
3. Travis Air Force Base air traffic controllers help maintain safe separation distances between aircraft operating in and through this area, including military and civilian aircraft up to 10,000 feet.
4. The existing turbines in the area of SMUD's current proposal have resulted in turbine radar interference affecting the primary surveillance radar system used by Travis Air Force Base.
5. Travis Air Force Base moved, and therefore lost, a circling approach as a consequence of existing turbines.
6. Travis would like to reclaim this airspace for its air operations.

5A-1

I would like to make the following points about SMUD's plan to add even more wind turbines to the wind resource area near Travis AFB.

Point #1: SMUD's Draft Environmental Impact Report (DEIR) does not include information needed to inform decision makers and the public of the scope of impacts because of the project.

The DEIR refers to the FAA aeronautical study (FAA 2019) conclusion:

> "no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities."

5A-2

However, the DEIR does not mention that study states:

> "The proposals will affect the quality and/or availability of radar signals. The effects would be unwanted primary returns (clutter) and primary target drops, all in the area of the turbines. Tracked primary targets could diverge from the aircraft path and follow wind turbines, when the aircraft is over or near the turbines."

regulus-group.com
[P] 540.459.2142
[F] 540.459.9630

engineering the skies regulus group 238 North Main Street, Woodstock VA 22664

When wind turbine radar interference (that is, clutter) is high, the controller workload could be increased. More clutter tracks impair the controller's ability to direct air traffic. This impairment is due to the following:

1. Clutter tracks can produce track duals.
    - These dual tracks require the controller to work with aircraft to determine which aircraft target is real and which is false.

2. The clutter tracks and false targets require controllers to increase separation distances between aircraft.
    - ATC is responsible for safe separation between aircraft and a clutter track is viewed as another aircraft in the air space. This added aircraft requires separation from the other aircraft.

3. Pilots, in response to ATC, may have to effect maneuvers (for example, directed turns) for the controller to discern which track is real and which is clutter.
    - This increases the amount of radio communications between ATC and pilots thereby adding to the controller's workload.

5A-2 Cont'd

Point #2: The DEIR report indicates the structures (wind turbines) would not be a hazard to air navigation, provided the turbines are marked with white paint and properly lighted.

Air lighting is necessary, but it is an obstruction avoidance system and not a radar interference mitigation technique. The lighting systems will not mitigate the interference of wind turbines on radar performance or air traffic control.

5A-3

Point #3: The DEIR does not mention the ATC Minimum Vectoring Altitudes (MVA) for the area of the turbines would need to be increased.

FAA identified that "the adverse effect as described above on the NCT MVA." While increasing the MVA doesn't impact a significant number of operations, it is a noted adverse effect.

5A-4

Point #4: The DEIR states the project could have potentially significant adverse impacts, but it does not discuss the impacts in a way that would enable the reader to know the degree or size of each type of impact.

For local public and decision makers to be informed of the degree or size of the potential impacts these proposed turbines present, the DEIR should state and discuss the following.

1. The effects on radar performance should be stated in terms of objective metrics.
    - Objective metrics allow decision makers to compare how the addition of new wind turbines will impact the primary radar.
    - These metrics include probability of false alarms and probability of detection.

5A-5

regulus-group.com
[P] 540.459.2142
[F] 540.459.9630

engineering the skies regulus group 238 North Main Street, Woodstock VA 22664

2. The usual amount of clutter tracks over the wind turbine area should be stated and compared to any additional clutter expected by the new wind turbines.
    - Metrics such as frequency of clutter tracks (number of tracks per hour), average length of clutter tracks, minimum and maximum length of clutter tracks, and a history of the clutter over a 30-day period would help guide decision makers to assess the impact of the additional wind turbines.
    - Clutter tracks can produce track seductions (a real aircraft track is pulled to a false track) and track breaks. These are further phenomena that show the effects of wind turbines.

3. The expected number of dual tracks compared to real targets should be stated. This will tell the decision makers the effects on ATC operators and pilots, as noted above.
    - Metrics might include: the number of duals per hour; length of duals with customary statistics (such as, minimum length, maximum length, and average length, over a period of, say 30 days). These will help inform decision makers of the wind turbine effects.

4. The workload for operator engagement with aircraft because of clutter should be given to decision makers.
    - Metrics such as time spent directing aircraft due to clutter tracks (hours per month, say), frequency of aircraft told to change course because of clutter (number of aircraft per month, say) are examples.
    - It may be possible to determine workload issues with interviews of current ATC operators at Travis AFB.

5A-5 Cont'd

My suggestions do not mean those items or details needed to have been included in the FAA determinations. The FAA framed its response to FAA-specific requirements and made its determination. Still, the metrics above could show the effects of the wind turbine clutter on radar performance parameters, the controllers and, by extension, on pilots who respond to controller directions for separation.

Point #5: The DEIR fails to discuss other potentially feasible means to potentially mitigate the Project's adverse impacts.

- There is currently a Pilot Mitigation Program (PMP) at Travis AFB studying how small low-cost in-fill radar systems might be used to mitigate wind turbine radar interference. The PMP has concluded its data gathering work having operated 15 separate Civil Air Patrol flights (over 76-hours of flight time) with various combinations of flight paths, radars, STARS automation configurations, and operator evaluations. The PMP team is currently collecting these data and composing a final report for review and final dissemination.

- Infill radars are currently being evaluated for FAA validation so they can be used in the National Air Space. This effort is projected to take approximately 2 years.

5A-6

regulus-group.com
[P] 540.459.2142
[F] 540.459.9630

engineering the skies regulus group 238 North Main Street, Woodstock VA 22664

- Another mitigation effort underway is development of radar processing algorithms which may reduce clutter seen on the ATC screens.

5A-6 Cont'd

While these efforts are promising they are not yet proven effective nor certified for use in the NAS. Consequently, the only way to guarantee turbines have no impact on a primary radar system today is to locate the turbines beyond line-of-sight of the radar.

regulus-group.com
[P] 540.459.2142
[F] 540.459.9630

Jerry Johnson

BS Electrical Engineering, University of Texas at San Antonio
MS Electrical Engineering, University of Kansas
PhD Electrical Engineering, Kansas State University

Jerry Johnson has more than 26 years of engineering experience with 18 of them specifically in NAS Surveillance and Navigation Systems. Most recently he provided Systems Engineering Support to the FAA for the Spectrum Efficient National Surveillance Radar (SENSR) Program, the Wind Turbine Radar Interference Mitigation (WTRIM) working group, and the Surveillance Portfolio Analysis (SPA) working group with focus on developing a strategy for an National Airspace System (NAS) surveillance roadmap from legacy to future systems.
Dr. Johnson joined Regulus Group from Thales and has excellent leadership skills that have allowed him to successfully lead engineering teams to derive requirements, design and develop highly complex products on an aggressive schedule and budget in the aerospace, telecommunications and manufacturing industries including several multi-national projects. Previous to Thales, Jerry served as a project engineer for BioServe Space Technologies where he participated in the design and integration of Life Science research hardware for 10 U.S. space shuttle missions and 2 Russian MIR missions.

Dr. Johnson acquired a Bachelor of Science in Electrical Engineering from the University of Texas at San Antonio, his Master of Science degree in Electrical Engineering from the University of Kansas, and a PhD in Electrical Engineering from Kansas State University.

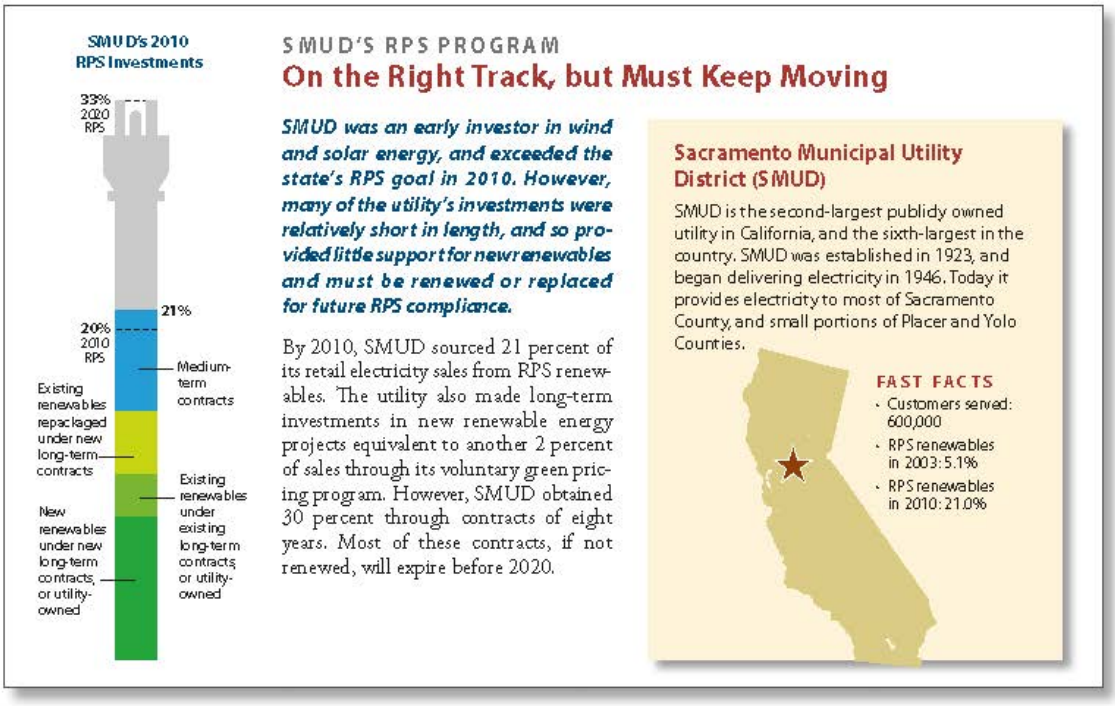
EXHIBIT 2

California's local publicly owned utilities, which supply about a quarter of the electricity used in the state, have made significant strides in investing in clean, renewable energy since the state passed its first renewable energy purchase law in 2002. The Renewables Portfolio Standard (RPS) was enacted to help California transition away from polluting fossil fuels and invest in electricity generation from renewable sources such as the wind and sun, in order to improve air quality, reduce global warming pollution, and expand the state's green economy. The original RPS set a goal for each California utility to obtain 20 percent of its electricity sales from renewable sources by 2010. In 2011, the law was strengthened to require all utilities to obtain 33 percent from renewables by 2020.

Not All Investments in Renewable Electricity Are Created Equal

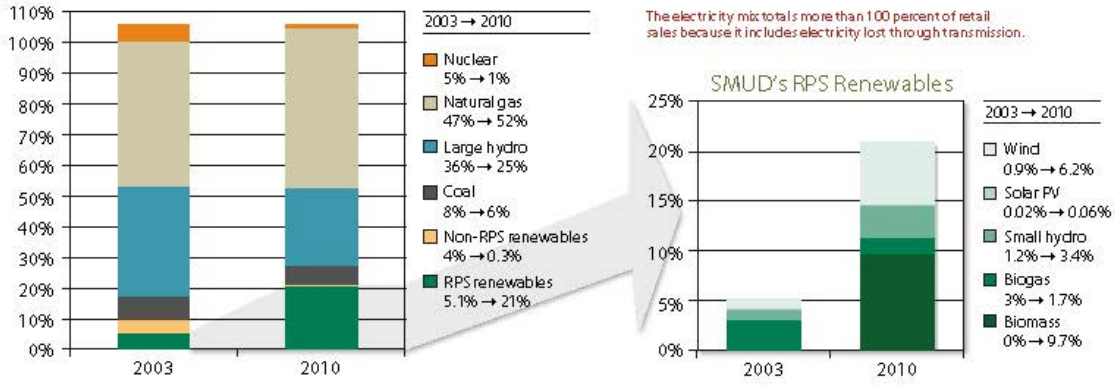
While a utility can take many approaches to procuring renewable energy, direct ownership and long-term contracts best support the development of new resources by providing financial security to developers. These long-term investments also lock in stable electricity prices for customers and help put a utility on track to meet the 33 percent RPS.

We evaluated the renewable energy investments made by California's 10 largest publicly owned utilities. We then classified each utility into one of three categories: "sprinting ahead," "on the right track, but must keep moving," or "false start," based on how much it has promoted the development of new sources of renewable energy, and whether it is on track to meet the 33 percent RPS.



Photos: © Thinkstock/Jan Wlachels (wind); © Thinkstock/Daniel Grill (solar); © Flickr/Patrick Dirden (turbines in field)

SMUD's Electricity Mix, 2003 and 2010



What's Powering SMUD?

In 2003, SMUD relied on "unspecified" market purchases—purchases from other utilities, power traders, and the electricity spot market containing a mix of resources—for just under half of its electricity. The utility generated a quarter of its electricity from its own natural gas plants. SMUD's Upper American River Project and federally owned large hydropower facilities contributed another 25 percent of electricity sales. The utility relied on a mix of renewables for the remaining 5.1 percent.

By 2010, SMUD had built the Cosumnes natural gas plant, which delivered 29 percent of the utility's electricity needs. In total, SMUD relied on natural gas to supply 52 percent of total sales. From 2003 to 2010, SMUD quadrupled its renewables to 21 percent of retail electricity sales. These investments replaced "unspecified" power purchases, which declined to 17 percent in 2010.

SMUD's Renewables

SMUD built the nation's first utility-scale photovoltaic (PV) solar array in 1984, at Rancho Seco, the site of its closed nuclear facility. A decade later, SMUD built wind turbines on land it purchased in Solano County that now hosts 230 megawatts of capacity. By 2003, SMUD sourced 5.1 percent of its electricity from renewables. In addition to its early investments in solar and wind energy, SMUD procured electricity from an existing wood-waste biomass plant in Washington, its own small hydropower facilities, biogas from two local landfills, and two other wind projects that came online in 2003.

SMUD built the nation's first utility-scale PV solar array in 1984, at the site of its closed nuclear facility. A decade later, SMUD built wind turbines on land it purchased in Solano County that now hosts 230 MW of generation capacity.

©Clean Energy Via Alex Mayhew

By 2010, SMUD was procuring 21 percent of its retail electricity sales from RPS renewables. From 2003 to 2010, SMUD signed additional contracts with existing small hydropower, biomass facilities in Washington and Idaho, existing small hydropower facilities in California, and biogas from two in-state landfills and a local dairy manure digester. The utility also invested in solar PV through its SolarShares program and the first installations under its feed-in tariff program.[1]

SMUD obtained 30 percent of its 2010 RPS mix through eight-year contracts. Most

1 SMUD's SolarShares program allows customers who cannot install solar on their roofs to invest in solar PV elsewhere and receive credit on their electricity bills for the energy those arrays produce. Of the 10 POUs we reviewed, SMUD is the only one to offer such a program.

of these brought electricity into the state temporarily from existing small hydropower and wood-waste biomass plants in Washington and Idaho. SMUD also purchased a 15-year contract for injected landfill gas from Shell Energy, collected at the McCommas Bluff landfill in Texas. The RPS-eligible electricity associated with this contract is generated at SMUD's Consumnes natural gas power plant. This contract comprised approximately 9 percent of SMUD's 2010 RPS mix. The CEC is currently reassessing how to treat the eligibility of injected landfill gas contracts for the RPS.

SMUD obtained another 37 percent of its 2010 RPS mix through 10- and 12-year contracts with out-of-state wood-waste biomass, local landfill biogas, and in-state small hydropower facilities. This group of contracts also included the 2003 contract with the High Winds wind facility in Solano County.

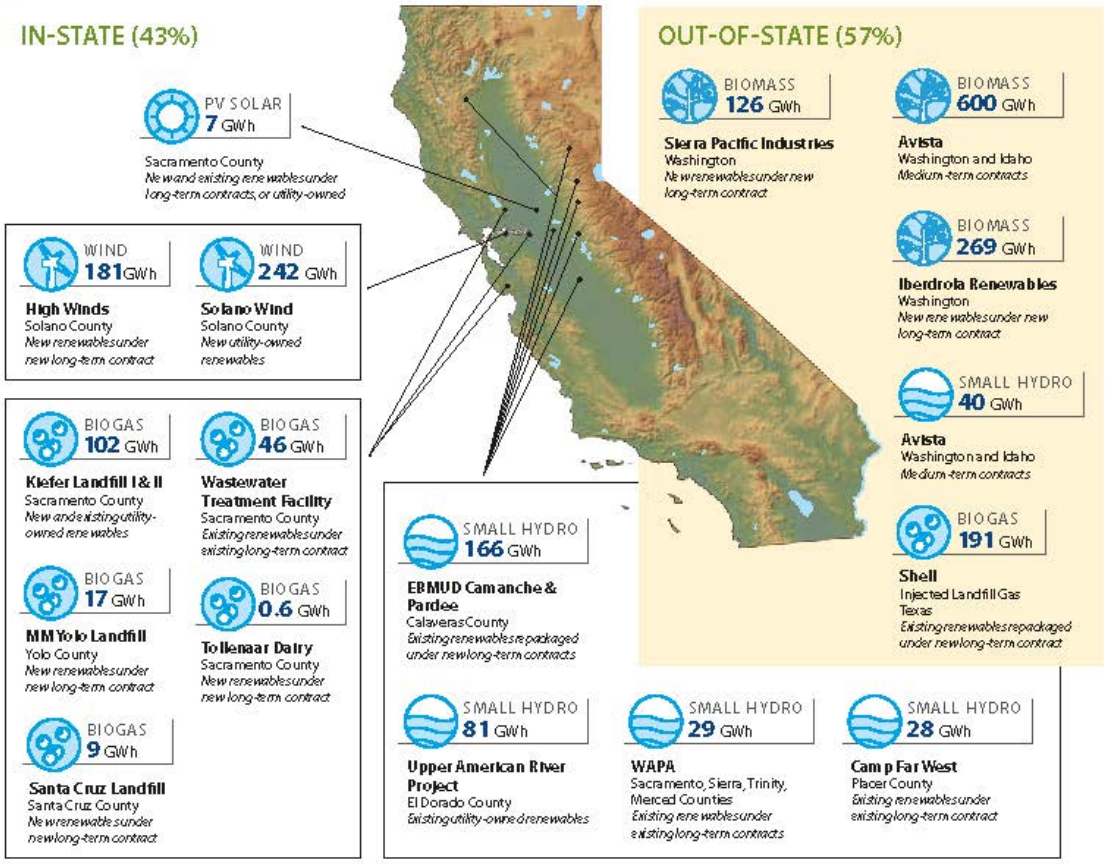
SMUD obtained just over a third of its 2010 RPS mix through longer-term investments. These include the Solano wind project; a variety of small, in-state hydropower facilities, some owned by SMUD; in-state landfill biogas units; and solar PV through SMUD's various programs and investments.

Most utilities offer voluntary green pricing programs that allow customers to purchase renewable energy at a premium. In most cases, these programs make REC-only purchases on behalf of their customers. SMUD is the only utility we reviewed that made long-term investments for new renewable energy projects as a part of its voluntary green pricing program, called Greenergy. These long-term investments, which otherwise could have been used for SMUD's RPS program, contributed approximately another 2 percent of electricity sales.[2]

SMUD obtained 30 percent of its 2010 RPS mix through eight-year contracts. Most of these brought electricity into the state temporarily from existing small hydropower and biomass plants in Washington and Idaho.

2 By the end of 2010, SMUD's Greenergy program contributed 3.8 percent of its retail electricity sales. Approximately half of this came from REC-only purchases and half from long-term contracts for new renewable energy facilities.

Sources of SMUD's RPS Renewables, 2010



Union of Concerned Scientists • July 2012

© Flickr/ATIS547

Looking Ahead to 33 Percent

The 33 percent RPS law requires each utility to procure 20 percent of its retail electricity sales from renewables by 2013, 25 percent by 2016, and 33 percent by 2020. Each utility must also make "reasonable progress" on renewable energy investments between those deadlines. If the state is to transition to a clean, safe, and sustainable electricity system, utilities must meet these standards in a way that prepares them to move well beyond the 33 percent RPS.

In 2010, SMUD's renewable energy portfolio was diverse, but its contracts were relatively short in length. Nearly 70 percent of SMUD's investments were for 12 years or less and 30 percent were for eight years or less. The utility will need to renew these contracts or sign new ones just to maintain its level of RPS renewables, let alone reach 33 percent. In addition, less than half of SMUD's investments for its 2010 RPS program were comprised of long-term commitments for new renewable energy facilities.

Since 2010, SMUD has more than doubled the generation capacity at its Solano Wind facility. The utility is also expanding the generating capacity of a local wastewater treatment plant, and expects to receive electricity from new solar PV projects through its feed-in tariff program. This additional electricity generation is expected to increase SMUD's RPS mix by another 6 percent of retail sales.

If the state is to transition to a clean, safe, and sustainable electricity system, utilities must meet these standards in a way that prepares them to move well beyond the 33 percent RPS.

Tracking Future Progress

SMUD's RPS Procurement Plan will provide details on the utility's strategy for reaching the 33 percent RPS by 2020. The utility's board of directors must approve this plan and make it available to the public. Any changes to this plan trigger a 10-day public notice that must be posted on the website of the California Energy Commission (CEC): *http://www.energy.ca.gov/portfolio/rps_pou_reports.html*. The CEC also maintains a database of contracts executed to meet the RPS, available on the same website. More information on SMUD's renewable energy programs is also available at *https://www.smud.org*.

Upper American River Project © Trout Unlimited

Union of Concerned Scientists
Citizens and Scientists for Environmental Solutions

Printed on recycled paper using vegetable-based inks

The Union of Concerned Scientists is the leading science-based nonprofit working for a healthy environment and a safer world.

The full report can be downloaded (in PDF format) from *www.ucsusa.org/cleanenergyrace*.

National Headquarters
Two Brattle Square
Cambridge, MA 02138-3780
Phone: (617) 547-5552
Fax: (617) 864-9405

Washington, DC, Office
1825 K St. NW, Suite 800
Washington, DC 20006-1232
Phone: (202) 223-6133
Fax: (202) 223-6162

West Coast Office
2397 Shattuck Ave., Suite 203
Berkeley, CA 94704-1567
Phone: (510) 843-1872
Fax: (510) 843-3785

Midwest Office
One N. LaSalle St., Suite 1904
Chicago, IL 60602-4064
Phone: (312) 578-1750
Fax: (312) 578-1751

EXHIBIT 3

SMUD BOARD POLICY		
Category: **Strategic Direction**		Title: **Resource Planning**
		Policy Number: **SD-9**
Adoption Date:	**May 6, 2004**	Resolution No. **04-05-11**
Revision:	**May 6, 2004**	Resolution No. **04-05-12**
Revision:	**September 15, 2004**	Resolution No. **04-09-11**
Revision:	**May 17, 2007**	Resolution No. **07-05-10**
Revision:	**December 18, 2008**	Resolution No. **08-12-15**
Revision:	**November 19, 2009**	Resolution No. **09-11-08**
Revision:	**May 6, 2010**	Resolution No. **10-05-03**
Revision:	**May 19, 2011**	Resolution No. **11-05-05**
Revision:	**December 20, 2012**	Resolution No. **12-12-12**
Revision	**October 3, 2013**	Resolution No. **13-10-09**
Revision:	**September 17, 2015**	Resolution No. **15-09-11**
Revision:	**October 20, 2016**	Resolution No. **16-10-14**
Revision:	**October 18, 2018**	Resolution No. **18-10-11**

It is a core value of SMUD to provide its customer-owners with a sustainable power supply through the use of an integrated resource planning process. A sustainable power supply is defined as one that reduces SMUD's net long-term greenhouse gas (GHG) emissions to serve retail customer load to Net Zero by 2040. Net Zero is achieved through investments in vehicle and building electrification, energy efficiency, clean distributed resources, RPS eligible renewables, large hydro, and biogas. SMUD shall assure reliability of the system, minimize environmental impacts on land, habitat, water quality, and air quality, and maintain a competitive position relative to other California electricity providers.

To guide SMUD in its resource evaluation and investment, the Board sets the following interim goal:

Year	Net Greenhouse Gas Emissions (metric tons)
2020	2,318,000
2030	1,350,000
2040	Net Zero
2050	Net Zero

In keeping with this policy, SMUD shall also achieve the following:

a) SMUD's goal is to achieve Energy Efficiency equal to 15% of retail load over the next 10-year period. On an annual basis, SMUD will achieve energy efficiency savings of 1.5% of the average annual retail energy sales over the three-year period ending with the current year.

To do this, SMUD will acquire as much cost effective and reliable energy efficiency as feasible through programs that optimize value across all customers. SMUD shall support additional energy efficiency acquisition by targeting one percent (1%) of retail revenues for above market costs associated with education, market transformation, and programs for hard to reach or higher cost customer segments. The market value of energy efficiency will include environmental attributes, local capacity value and other customer costs reduced by an efficiency measure.

b) Provide dependable renewable resources to meet 33% of SMUD's retail sales by 2020, 44% by 2024, 52% by 2027, and 60% of its retail sales by 2030 and thereafter, excluding additional renewable energy acquired for certain customer programs.

c) In meeting GHG reduction goals, SMUD shall emphasize local and regional environmental benefits.

d) SMUD will continue exploring additional opportunities to accelerate and reduce carbon in our region beyond the GHG goals in this policy.

e) Promote cost effective, clean distributed generation through SMUD programs.

Monitoring Method: GM Report
Frequency: Annual

Letter 5-1 Response	Robert "Perl" Perlmutter, Amy J. Bricker Shute, Mihaly & Weinberger, LLP September 6, 2019

L5-1 **The DEIR fails to comply with CEQA.** The commenters write on behalf of the Solano County Airport Land Use Commission (ALUC). Their letter incorporates by reference their earlier February 8, 2019 letter regarding SMUD's NOP. The commenters state that the DEIR fails to comply with CEQA by failing to: 1) adequately describe the project or its environmental and regulatory setting; 2) adequately analyze the project's relationship to the Travis Air Force Base Land Use Compatibility Plan (LUCP); 3) adequately analyze the project's significant impacts; 4) adequately analyze the project's cumulative impacts; 5) provide for adequate mitigation of the project's significant impacts; or 6) evaluate a reasonable range of alternatives. The commenters reiterate their earlier position that ALUC disagrees with SMUD's assertion that SMUD is not required to obtain a consistency determination from ALUC for project approval. The commenters refer to a review of the DEIR by Dr. Jerry Johnson of the Regulus-Group, LLC, which is included with the commenters' letter.

SMUD has followed the requirements of CEQA for public agencies to consider the potentially significant adverse environmental effects of projects over which they have discretionary approval authority before taking action on those projects (Public Resources Code Section 2100 et seq.). In accordance with 14 CCR Section 15161, SMUD prepared a DEIR for the proposed project and determined that the DEIR has been sufficiently detailed so that the public and decisionmakers are properly informed and can conduct meaningful evaluation of the way project impacts were avoided, minimized, or mitigated.

As discussed in detail in the Master Response - *Land Use*, SMUD maintains that the Solano 4 Wind Project does not require Airport Land Use Commission (ALUC) approval for the following reasons: 1) Electrical generation/production facilities are exempt from a county's building and zoning ordinances under California Government Code Section 53091, subdivisions (d) and (e); 2) The Federal Aviation Administration (FAA) determinations of no significant hazard for the project preempt the ALUC regulations under the Travis Air Force Base (AFB) LUCP regarding air safety, including radar interference (Appendix G FAA Determination), and no aspects of the LUCP apply to the project other than those that are preempted; 3) The ALUC does not have authority to review individual projects, such as SMUD's Generation Project, under the State Aeronautics Act (SAA); and, 4) Even if one were somehow to conclude the ALUC regulations did apply to the project, SMUD, as a local agency, has the authority to overrule the ALUC determination pursuant to the SAA.

Please refer to specific responses below regarding the six points of purported CEQA inadequacy as identified in this Shute, Mihaly & Weinberger letter.

L5-2 Point 1. The DEIR does not adequately describe the project or the environmental setting (addressed in detail in responses L5-2 through L5-8). The commenters summarize case law regarding Project Description and Environmental Setting to address their argument that the DEIR does not adequately describe the project or the environmental setting per case law and CEQA.

> The majority of the comment describes general case law regarding the requirements for an adequate Project Description and Environmental Setting under CEQA and does not raise any specific concerns about the adequacy of the DEIR. Further, in accordance with 14 CCR Section 15161, SMUD prepared a DEIR for the proposed project and determined that the DEIR has been sufficiently detailed so that the public and decisionmakers are properly informed and can conduct meaningful evaluation of the way project impacts were avoided, minimized, or mitigated.

L5-3 The commenters reiterate earlier comments about turbine details and how they are described in the EIR. They state that the information is inadequate, in part, because the model and final location of the turbines will be selected at a later date.

> As discussed in Section 2.5.1 of the DEIR (*Wind Turbine Generators*), the model of the Wind Turbine Generators (WTGs) to be used for the Solano 4 Wind Project has not yet been selected due to project schedule, ability to meet SMUD's design criteria, product availability, and construction and operating costs. Various manufacturers offer WTGs in the size ranges proposed for the project. The sizes contemplated for the project reflect the current state-of-the-industry standards for land-based WTGs deployed throughout the United States and overseas. In keeping with these standards, individual WTGs would have a maximum height of approximately 492-591 feet (150-180 meters) and a maximum rotor diameter of approximately 446-492 feet (136-150 meters).
>
> The Solano 4 Wind Project would reduce the total number of WTGs within the project boundaries by replacing 23 WTGs with up to 22 new WTGs. The FAA's Determinations of No Hazard (DNHs) state that the Solano 4 wind turbines "would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation."
>
> Exhibit 2-2 of the DEIR shows the potential siting areas (footprints) where WTGs would be installed for the Solano 4 Wind Project. Although the final locations of the WTGs would be determined after SMUD completes the procurement process (as is common place in this type of project), this analysis assumes that the 136-meter or 150-meter rotor diameter WTGs would be located in or near the locations shown in Exhibit 2-2 of the DEIR. This level of design is typical for wind projects and may require slight adjustments after final engineering has been completed. The information provided in Section 2.5 of the DEIR (*Project Characteristics and Components*), includes a detailed

description of the project including description of the WTGs; towers; rotor blades; braking system; and safety, lighting, and grounding. Mitigation Measure 3.1-1a: *Design the Project to Avoid Aesthetic Impacts*, addresses reflectivity and requires the use of low-reflectivity finishes for WTGs and all other structures (e.g., meteorology towers). The project characteristics and components and detailed layout maps provide adequate information to analyze the impacts of the project.

Additionally, prior to the preparation of the DEIR, SMUD commissioned a supplemental individual obstruction evaluation and airspace analysis (Capitol Airspace Group 2018a) to identify obstacle clearance surfaces established by the FAA, and a supplemental radar cumulative impact study with proposed solutions and design elements to avoid or minimize potential safety impacts (Westslope 2018a). The Capitol Airspace Group supplemental study performed a series of analyses that are similar to the FAA aeronautical analysis and process. The supplemental study was commissioned to provide SMUD with a reasonable expectation of the likely outcome of the FAA review process. The supplemental Travis AFB radar system modeling study determined there would be a negligible impact over baseline on the associated radar systems for installation of twenty-two (22) 136-meter turbines following removal of the existing twenty-three (23) 47-meter turbines, and a net zero impact for installation of nineteen (19) 150-meter turbines following removal of the existing twenty-three (23) 47-meter turbines compared to the existing baseline conditions, and therefore the Solano 4 Wind Project would not contribute to a cumulative impact (Westslope 2018a). Both supplemental studies are included in Appendix A of this FEIR.

L5-4 The commenters state that the FAA reviewed 19 proposed turbines although the DEIR refers to an FAA review of 22.

As discussed in Section 2.5 of the DEIR (*Project Characteristics and Components*), SMUD proposes to construct **up to** 22 new WTGs; up to 10 in Solano 4 East and up to 12 in Solano 4 West to meet the goal of generating 91 MW of electrical capacity at the point of interconnection with the grid managed by the California Independent System Operator (CAISO). SMUD would comply with the FAA and any changes to construction or alteration, including but not limited to changes in heights, which requires separate notice to the FAA. SMUD would apply to the FAA for any turbine locations that do not already have an FAA determination. The Westslope supplemental radar system modeling study determined there would be a negligible impact over baseline to the associated radar systems for installation of 22 turbines following removal of the existing 23 turbines, and a net zero impact for installation of 19 turbines following removal of the existing 23 turbines compared to the existing baseline conditions, and therefore the Solano 4 Wind Project would not contribute to a cumulative impact (Westslope 2018a). The scope of a DEIR's analysis is not limited by the number

of turbines analyzed in a FAA determination, but properly reflects the different ways the project could ultimately be designed and built and provides a conservative analysis by analyzing the environmental impacts of the largest possible project footprint, assumed to be the most impactful configuration. The FAA reviewed 19 turbines for the 150-meter WTG configuration and issued Determination of No Hazard letters dated February 1, 2019 for all turbines. SMUD submitted 19 proposed WTGs for FAA review based on the larger 150-meter rotor diameter WTGs since these turbines would be the tallest of the WTGs being considered for the project and the worst-case scenario for height. A sample DNH was included in Appendix G of the DEIR. Each turbine received the same determination from the FAA. Each of the 19 DNHs is included in Appendix B of this FEIR. SMUD would obtain FAA determinations for all final turbine locations that have either changed from the locations originally proposed or those that changed due to the design ultimately chosen. The ultimate number of turbines installed would not exceed 22 and any additional WTGs beyond the 19 the FAA already reviewed would be submitted to the FAA for review. There is no reason to speculate that any new or revised submittals would result in a different determination by the FAA for any specific WTG.

L5-5 The commenters state that the DEIR includes only one of the FAA determinations.

The DEIR states the FAA "conducted an independent evaluation of the Solano 4 Wind Project and determined there would be no significant hazard to air traffic control operations" (page 3.7-22). The FAA reviewed 19 turbines for the 150-meter WTG configuration and provided DNH letters dated February 1, 2019 for each of the turbines. As stated above in response to comment L 5-4, a sample DNH findings was included in Appendix G of the DEIR. Because the DNHs are virtually identical, it was unnecessary to include all appendices to the DEIR. For additional clarification, all 19 DNHs received from the FAA are included in Appendix B of this FEIR. The DNHs are also available to the public on the FAA website, https://oeaaa.faa.gov/oeaaa/external/searchAction.jsp.

L5-6 The commenters allege that changing megawatt output numbers in the DEIR (91 MW versus 92 MW) may be indicative of inadequate alternatives analysis.

There is no evidence to suggest that there would be a different determination in the alternatives analysis between 91 MW versus 92 MW. The difference in 91 MW versus 92 MW would not result in a different number of turbines than analyzed in the DEIR and would not result in taller or shorter turbines than those analyzed in the DEIR. Operations would remain within the parameters described and evaluated in the DEIR. Therefore, such differences are immaterial to the environmental analysis. The DEIR is sufficiently detailed to inform the public and decisionmakers and enable them to conduct a meaningful evaluation of the way project impacts were avoided, minimized, or mitigated. The adjustment of the MW output of the project did not result in a change in the

severity of any impacts disclosed in the DEIR and was not at a magnitude sufficient to warrant changing the range of alternatives; nor did it change any of the impacts conclusions reached in the DEIR. Slight project adjustments are inherent in any project as they move through refinements and design.

L5-7 The commenters state that they interpret the language in the DEIR to indicate that there could be a possible unspecified future expansion of the project (e.g., larger turbines) without any analysis of potential impacts and provide language from the DEIR they believe could be interpreted this way.

SMUD does not have any plans for replacement of Solano Phases 2 and 3 or for acquisition or development of additional property for wind generation at this time. Any wind energy development or repower projects SMUD may decide to propose in the future in the Solano Wind Resource Area are not part of the project proposed and analyzed in the DEIR and would need to go through a new, separate CEQA review process at the time proposed. It is unknown at this time what future industry technology will entail with regards to turbine design. The DEIR does not contend that any of these future changes are covered under this CEQA review. Any decisions about the future use of the site at the end of the project's operational life (typically about 30 years) would be purely speculative as it is impossible to know what future technology and energy needs will be at that time. CEQA does not require the lead agency to engage in speculation (*Center for Biological Diversity v. County of San Bernardino* (2016) 247 Cal.App.4th 326, 348-350 [rejecting similar argument that project description was unstable and misleading simply because it did not analyze operation of groundwater pumping project beyond the fifty-year term of the proposed project].) No revisions to the DEIR are necessary.

L5-8 The commenters state there is a lack of environmental setting information, such as radar equipment and aircraft types, and regulatory setting.

The *Environmental Setting* is described in each subject area chapter of the DEIR as pertinent to the analysis of the Solano 4 Wind Project. For example, the DEIR (page 3.1-37) describes the Aircraft Detection Lighting System (ADLS) as a radar-based obstacle avoidance system that activates obstruction lighting and audio signals only when an aircraft is close to an obstruction on which an ADLS unit is mounted, such as a wind turbine. According to the FAA report, the proposed WTGs would be within the line of sight of the Stockton CA (SCK) ASR-11, Travis (SUU) Digital Airport Surveillance Radar (DASR), Mill Valley (QMV) ARSR-4, and McClellan (MCC) ASR-9 radar facilities (DEIR page 3.7-14). SMUD commissioned an individual obstruction evaluation and airspace analysis (Capitol Airspace Group 2018a) to identify obstacle clearance surfaces established by the FAA, and a radar cumulative impact study with proposed mitigation solutions (Westslope 2018a). The Capitol Airspace Group study performed a series of analyses that are similar to the FAA aeronautical

analysis and process and was prepared to give SMUD a reasonable expectation of the FAA outcomes. The Travis AFB radar system modeling study determined there would be a negligible impact over baseline to the associated radar systems for installation of twenty-two (22) 136M turbines following removal of the existing 23, and a net zero impact for installation of nineteen (19) 150M turbines following removal of the existing 23 compared to the existing baseline conditions, and therefore the Solano 4 Wind Project would not contribute to a cumulative impact (Westslope 2018a). Both studies are included in Appendix A of this FEIR. Results of these supplemental cumulative impact studies conducted by Westslope Consulting and Capitol Airspace are further discussed in the Letter L5a-1 Response to the Shute, Mihaly, & Weinberger LLP Exhibit 1, memorandum from Dr. Jerry Johnson. Additionally, at the request of SMUD, the FAA determined that the Solano 4 Wind Project "would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation." The DNHs state that the aeronautical studies "considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact" resulting from the Solano 4 Wind Project when combined with the impact of other existing structures (see Appendix B of this FEIR).

The specific information on aircraft types requested by the commenter is not relevant to the analysis presented in the DEIR. Any risk to aircraft resulting from the project has been addressed through FAA regulations, which take into account any aircraft that may be operating in the nearby airspace both now and in the future. No revisions to the DEIR are necessary.

The *Regulatory Setting* is described in each subject area chapter of the DEIR as pertinent to the analysis of the Solano 4 Wind Project.

The *Regulatory Setting* section 3.7.1 in Chapter 3.7, *Hazards and Hazardous Materials* of the DEIR describes the role of the State Aeronautics Act, ALUC, and LUCP, even though the Solano 4 Wind Project does not require ALUC approval.

The LUCP has only one element in it that would apply to the Solano 4 Wind Project, the line of site standard. Please refer to the Master Response in this FEIR for an explanation of why any possible inconsistency with the LUCP does not equate to a significant adverse change in the physical environment under CEQA.

SMUD believes the DEIR contains sufficient information to inform the reader and that the FAA has sufficient information at its disposal to make a Determination of Hazard or No Hazard. Therefore, in summary, the information

requested by the commenters is either included, not relevant, or unnecessary to the hazard determination and CEQA analysis. No revisions to language in the DEIR are necessary.

L5-9 Point 2. The commenters state that the DEIR does not properly analyze the project's relationship to the Travis AFB LUCP.

Please refer to the Master Response Land Use and response to comment L5-1 above for an explanation of why the project is exempt from ALUC review and why any possible inconsistency with the LUCP does not equate to a significant adverse change in the physical environment under CEQA. Also, Chapter 3.7 of the DEIR analyzes safety hazard impacts to air traffic (page 3.7-21 to 3.7-23). No revisions to the language in the DEIR are necessary.

L5-10 The commenters disagree with the DEIR's statement that the FAA's Determination of No Hazard Finding (NHF or DNH) for the project preempts the ALUC's land use regulations regarding radar system interference. The commenters state that the FAA does not have authority over local land use decisions as evidenced by FAA Order JO 7400.2M § 5-1-2a, case law cited by the commenters, and the California Department of Transportation regarding implementation of the SAA. The commenters assert that there is no federal preemption of ALUC's review of the project.

This comment is duplicative of other comments. Please refer to the Downey Brand letter dated April 26, 2019 in response to Solano County ALUC comments on SMUD's Notice of Preparation for the Solano 4 Wind Project (included in Appendix C of this Final EIR). Also see the Master Response in this FEIR and response to comment L5-1 above for an explanation of why the project is exempt from ALUC review. *Please also refer to FEIR Appendix B (FAA Determinations).*

While the commenter may disagree with the DEIR's conclusions regarding jurisdiction, the DEIR's analysis addresses all of the possible physical environmental impacts associated with the project, including the ALUC's land use plan and possible hazards associated with wind turbines at this location. Based on substantial evidence—including the FAA DNHs, consultation with Travis AFB, and consultations with SMUD's own aeronautic safety experts, the DEIR concluded that the project's impacts in this regard will remain less than significant. Consequently, no revisions to the language in the DEIR are necessary.

L5-11 The LUCP provisions apply to SMUD**.** The commenters contest the DEIR's statement that LUCP provisions do not apply to SMUD WTG facilities under Section 53091 of the California Code. The commenters state that per the law, SMUD is among the local agencies that are subject to ALUC review. Per the commenters, the statutory exemption from LUCP compliance applies to counties or cities, and ALUC is neither.

This comment is duplicative of other comments. Please refer to Master Response Land Use and responses to comments L5-1 and L5-10, above, for an explanation of the multiple reasons why the project is exempt from ALUC review. SMUD is not solely relying on Section 53091 for exemption. No revisions to the language in the DEIR are necessary.

L5-12 SMUD does not have the authority to overrule ALUC, nor would such authority obviate the need for CEQA review. The commenters dispute the DEIR statements that SMUD as a local agency can overrule the ALUC determination, and that it need not analyze or mitigate any potential land use inconsistency with the LUCP. The commenters state that the override powers granted to cities and counties based on their power to adopt and amend general plans under the Public Utilities Code do not apply to SMUD, because it is neither a city nor a county. The commenters note that even if SMUD could override ALUC, the DEIR is mistaken in concluding that the override would happen. The commenters state that ALUC would still perform a consistency review and the local agency could approve the override only upon a two-thirds vote and making certain findings. The commenters believe that the DEIR portrays SMUD as not caring about local considerations. They ask that the DEIR be revised to include an analysis of the project's land use impacts and all feasible mitigation measures.

The comment is duplicative with other comments. Please refer to the Master Response *Land Use* and responses to comments L5-1 and L5-10 above for an explanation of why the project is exempt from ALUC review. The allegation that the DEIR fails to adequately analyze the environmental impacts of the project related to aerial safety is addressed in the Responses L5-8, L5-13, and L5-14. Further, no matter the procedural steps associated with approving the project, the DEIR evaluates both aeronautic safety, the ALUC's LUCP, and related land use issues, finding that the project as proposed would not have a significant physical impact in these areas. No revisions to the language in the DEIR are necessary.

L5-13 Points 3 and 5. The DEIR fails to adequately analyze or mitigate the project's significant impacts. The commenters point out that the DEIR states that there would be a "potentially significant" impact if "placement of the WTGs intrude into navigable airspace, thereby increasing the risk of aircraft collision, or causing interference with radar signals used by air traffic control."

Impact 3.7-3: *Safety Hazard to Air Traffic* of the DEIR (page 3.7-21) identifies this impact as "potentially significant" before mitigation. The DEIR analysis concludes that there would be a **less than significant** impact with the implementation of Mitigation Measure 3.7-3 that requires that the WTGs be marked according to FAA regulations and made visible to any air traffic for avoidance. Therefore, a clear final impact determination is stated.

Furthermore, SMUD commissioned a supplemental individual obstruction evaluation and airspace analysis (Capitol Airspace Group 2018a) to identify

obstacle clearance surfaces established by the FAA, and a supplemental radar cumulative impact study with design elements to avoid or minimize potential safety impacts (Westslope 2018a). The Capitol Airspace Group supplemental study performed a series of analyses that are similar to the FAA aeronautical analysis and process. The supplemental study was commissioned to provide SMUD with a reasonable expectation of the likely outcome of the FAA review process. The supplemental radar cumulative impact modeling study determined there would be a negligible impact over baseline to the associated Travis AFB radar systems resulting from installation of twenty-two (22) 136M turbines following removal of the existing 23 WTGs, and a net zero impact for installation of nineteen (19) 150M turbines following removal of the existing 23 WTGs compared to the existing baseline conditions, and therefore the Solano 4 Wind Project would not contribute to a cumulative impact (Westslope 2018a). Both supplemental studies are included in Appendix A of this FEIR. Pursuant to applications filed by SMUD, the FAA issued DNHs for each of the proposed turbines for the project; the FAA also confirmed that the DNHs encompass not only the Visual Flight Rules (VFR) routes but also potential impacts on radar. No revisions to the language in the DEIR are necessary.

L5-14 The DEIR analysis of the potentially significant impacts is inadequate. The commenters state that after admitting that the project would increase the risk of aircraft collisions or radar signal interference, the DEIR dismisses impacts.

The DEIR does not “admit” that the project would increase the risk of aircraft collision and cause interference with radar signals. Rather, the DEIR states there is “potential,” which is then further analyzed and discussed. Through SMUD’s thorough analysis of potential risks, it was determined that there is a less-than-significant impact.

Results of the supplemental cumulative impact studies conducted by Westslope Consulting (2018a) and Capitol Airspace (2018a), and mitigation efforts are discussed in the Letter L5a-1 Response to the Shute, Mihaly, & Weinberger LLP Exhibit 1, memorandum from Dr. Jerry Johnson. Westslope Consulting concluded there would be a negligible impact over baseline to the associated radar systems for installation of twenty-two (22) 136M turbines following removal of the existing 23 WTGs, and a net zero impact for installation of nineteen (19) 150M turbines following removal of the existing 23 WTGs compared to the existing baseline conditions, and therefore the Solano 4 Wind Project would not contribute to a cumulative impact.

Additionally, the FAA determined that the Solano 4 Wind Project “would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation.” The DNHs state that the aeronautical studies “considered and analyzed the impact on existing and proposed arrival,

departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact" resulting from the Solano 4 Wind Project when combined with the impacts of other existing structures (see Appendix B - FAA Determinations).

Also, please see Master Response *Safety Concerns Related to Project Siting*.

L5-15 CEQA Requirements for EIRs. The commenters cite CEQA guidelines for an EIR and applicable case law. The commenters state "the EIR must explain the nature and extent of the increased risks for aircraft collision and radar interference in a manner calculated for the public to understand" and set forth standards of significance.

The CEQA guidelines for EIRs and case law are noted. SMUD has followed the requirements of CEQA for public agencies to consider the potentially significant adverse environmental effects of projects over which they have discretionary approval authority before taking action on those projects (Public Resources Code Section 2100 et seq.). In accordance with 14 CCR Section 15161, SMUD prepared a DEIR for the proposed project and determined that the DEIR has been sufficiently detailed so that the public and decisionmakers are properly informed and can conduct meaningful evaluation of the way project impacts were avoided, minimized, or mitigated. As discussed above, SMUD adequately considered the hazards and air safety impacts of the WTGs.

Please also see responses to comments L5-13 and L5-14 above. No revisions to the language in the EIR are necessary.

L5-16 The DEIR relies entirely on the FAA's Determination of No Hazard (DNH). The commenters contend that the DEIR relies entirely on the FAA's NHD (DNH) to improperly dismiss air safety concerns raised by ALUC, and that the NHD (DNH) did not "dismiss" ALUC's concerns. The commenters argue that the NHD (DNH) "does not purport to satisfy anything other than the FAA's limited criteria" and requires the applicant to comply with "any law, ordinance, or regulation of any Federal, State, or local government body." The commenters state that the NHD (DNH) does not include a review of the entire proposed project (22 vs. 19 WTGs)

Please see responses L5-4 and L5-8 above and Master Response *Safety Concerns Related to Project Siting*. SMUD followed all applicable laws and rules in analyzing the project's potential impact on the environment, and relied on the FAA's DNH, consultations with Travis AFB, and the evaluation and conclusions of its own experts. Contrary to the comment, while DNHs were secured for 19 WTGs, the DEIR and appended studies evaluated up to 22 WTGs. Westslope Consulting evaluated potential sites for the twenty-two (22) 136M turbine configuration and concluded there would be a negligible impact over baseline to the associated radar systems for installation of twenty-two (22) 136M turbines following removal of the existing 23 WTGs and were all eligible

for DNH. The FAA reviewed 19 turbines for the 150-meter WTG configuration and issued DNH letters dated February 1, 2019 for all 19 turbines. SMUD submitted 19 proposed WTGs for FAA review based on the larger 150-meter rotor diameter WTGs since these turbines would be the tallest of the WTGs being considered for the project and the worst-case scenario for height. Each turbine received the same determination from the FAA. Each of the 19 DNHs is included in Appendix B of this FEIR. SMUD would obtain FAA determinations for all final turbine locations that have either changed from the locations originally proposed or those that changed due to the design ultimately chosen. The ultimate number of turbines installed would not exceed 22 and any additional WTGs beyond the 19 the FAA already reviewed would be submitted to the FAA for review. There is no reason to speculate that any new or revised submittals would result in a different determination by the FAA for any specific WTG. DNHs were not necessary for all 22 WTGs, particularly given the consistent conclusions of the issued DNHs and other substantial evidence. No changes to the language in the DEIR are necessary.

L5-17 CEQA requirements and regulatory standards. The commenters discuss CEQA requirements and case law regarding EIRs improperly relying on compliance with regulatory standards to avoid doing impact analysis (e.g., Californians for Alternatives to Toxics v. Department of Food & Agriculture (2005) 136 Cal.App.4th 1).

As stated in response to comment L5-15 above, SMUD is familiar with all relevant CEQA requirements and applicable case law.

Please see response L5-8 above and Master Response *Safety Concerns Related to Project Siting*. Here, unlike the circumstances in *Californians for Alternatives to Toxics*, SMUD did not just rely on compliance with regulatory standards to determine a less than significant impact under CEQA. Instead, SMUD relied both on regulatory standards as well as site-specific evaluation and analysis, which together constitute substantial evidence of a less than significant impact related to aerial hazards. Such analysis and conclusions are entirely appropriate. (See *Oakland Heritage Alliance v. City of Oakland* (2011) 195 Cal.App.4th 884, 904 (city compliance with building code and other regulatory provisions in conjunction with site-specific geotechnical investigation provided substantial evidence that seismic impacts would remain less than significant)). No revisions to the language in the DEIR are necessary.

L5-18 Report by Dr. Johnson of the Regulus Group and air safety impacts. The commenters reference the Regulus Group report and contend the DEIR analysis is inadequate and would need to assess “(1) the increase in ATC MVA for the area of WTGs; (2) objective metrics for radar interference; (3) clutter and dual tracks; and (4) workload for operator engagement with aircraft because of clutter.” They further state that the DEIR “fails to provide substantial evidence to support its determination that the project will result in insignificant air safety impacts.”

Please see the results of the supplemental cumulative impact studies conducted by Westslope Consulting (2018a) and Capitol Airspace (2018a) that are included in Appendix A of this FEIR, and the Westslope letter dated March 30, 2021 responding to the memorandum from Dr. Jerry Johnson included in Appendix C of this FEIR. Also, see responses from Geoff Blackman in the Transcript from the ALUC hearing included in Appendix A. The analysis provided is thorough and adequate. These findings are further supported by response to comments in letter L5a. No further revisions to the language in the DEIR are necessary.

L5-19 *Mitigation Measures and Feasible Alternatives. The commenters state that "once the DEIR adequately evaluates the project's significant air safety impacts, it must evaluate all potentially feasible mitigation measures and feasible alternatives to lessen or avoid such impacts." The commenters note that Mitigation Measure 3.7-3 addresses hazards to aviation only during construction, and not operation. The commenters also state that the DEIR does not address that the WTGs can result in radar interference, even in the daytime. The commenters state that the DEIR must consider all mitigation solutions.*

Commenters are incorrect. The DEIR has been sufficiently detailed so that the public and decisionmakers are properly informed and can conduct meaningful evaluation of the way project impacts were avoided, minimized, or mitigated. The allegation that the DEIR fails to adequately analyze the environmental impacts of the project related to aerial safety is addressed in responses L5-8, L5-13, and L5-14 above. Results of the supplemental cumulative impact studies conducted by Westslope Consulting (2018a) are described in the Letter L5a-1 Response, and confirmed by the FAA DNHs for the Solano 4 Wind Project that the project "would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft" and "would not be a hazard to air navigation" provided the wind turbines are marked/lighted in accordance with FAA Advisory Circular 70/7460-1 L Change 2, Obstruction Marking and Lighting. Mitigation Measure 3.7-3 *Mark and light wind turbine generators during construction* requires SMUD "To ensure proper conspicuity of turbines at night during construction, all WTGs shall be lit with temporary lighting once they reach a height of 200 feet or greater until the permanent lighting configuration is turned on." Regarding operation, as a condition of the FAA's DNH, safety lighting would be incorporated into the design of the WTGs using an aircraft detection system; and compliance with this FAA regulation obviates the need for additional mitigation. Please also refer to FEIR Appendix B (FAA DNHs) and Master Response *Safety Concerns Related to Project Siting.* No revisions to the mitigation measures as presented in the DEIR are necessary.

L5-20 The DEIR fails to consider Wind Turbine Radar Interference Mitigation (WTRIM). The commenters state the DEIR fails to consider the WTRIM pilot mitigation program taking place at Travis AFB.

> Under a Memorandum of Understanding signed in 2014 and building off the successful Interagency Field Test and Evaluation (IFT&E) of Wind Turbine-Radar Interference Mitigation Technologies, federal agencies established the WTRIM Working Group to address these conflicts. SMUD has closely followed WTRIM, provided data at their request, and attended WTRIM meetings. WTRIM is planning continued infill radar testing at Travis AFB (pers. comm. with Michael Lesmerises and Arthur G. Avedisian, C Speed[1]); however, after testing the system will need to be certified with the FAA, go through procurement, and then be installed and implemented. Certification requirements are being developed but use of infill radar is expected to require many additional years to approve and install. The U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy (OEERE) recommends early coordination with the FAA, National Oceanic and Atmospheric Administration, Department of Homeland Security, and U.S. Department of Defense (DOD) during the siting process to help prevent an interference issue long before a wind plant is built. As described in the Westslope letter response to the Shute, Mihaly, & Weinberger LLP Exhibit 1, memorandum from Dr. Jerry Johnson, SMUD applied to the FAA and DNHs were issued by the FAA for the Solano 4 Wind Project originally on February 1, 2019, and after further DOD and FAA review, were recently extended on January 28, 2021. The extension process resulted in the formation of a Mitigation Response Team (MRT) with Travis AFB as required by the DOD Military Aviation and Installation Assurance Siting Clearinghouse (the "DOD Siting Clearinghouse") mission compatibility evaluation process as documented in Part 211 of Title 32 of the Code of Federal Regulations (Military Aviation and Installation Assurance Siting Clearinghouse, accessed 2021). The DOD Siting Clearinghouse was established under direction of the United States Congress per the National Defense Authorization Act for Fiscal Year 2011. The result of the MRT review was a conclusion by the 60th Air Mobility Wing of "[a]s proposed, Solano 4 should have minimal negative impact on Travis Operations" and a conclusion by the DOD Siting Clearinghouse that Solano 4 Wind Project "will not present an adverse impact to military operations." (Simmons, 2021; Sample, 2021). Additionally, after modeling the potential impacts the FAA issued DNHs stating the Solano 4 Wind Project turbines "would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation." Travis AFB has served and

[1] John Cutting and Matthew Seitzler of SMUD had personal communication with Michael Lesmerises and Arthur G. Avedisian, C Speed on February 12, 2021. C Speed, LLC is a high-end supplier of custom software, electronics, and contract engineering solutions specializing in Embedded & Application Software, High Performance Analog & Digital Systems, and Signal Processing for industrial, military, medical, test & measurement, and other applications. They are supporting the infill radar effort for the U.S. Air Force.

continues to serve as an excellent source of information for the United States government and the wind industry in understanding the effects that multiple wind projects can have on a DASR and the display system used by the air traffic controllers, the Standard Terminal Automation System (STARS), at the Travis AFB Radar Approach Control (RAPCON) facility. Travis AFB and the wind projects in the Collinsville-Montezuma Hills Wind Resource Area (WRA) area also served as an excellent source of information in determining how to manage or lessen the effects of wind turbines for a DASR and STARS air traffic control systems configuration. Part of this work was conducted under Cooperative Research and Development Agreement (CRADA) No. 10-002 in collaboration with Travis AFB, Westslope Consulting, LLC (Westslope), and three wind project developers including SMUD (Air Mobility Command, 2010; United States Transportation Command Cooperative Research and Development Agreement, 2010). SMUD will continue to closely follow the progress of the WTRIM.

Please also see the results of initial supplemental cumulative impact studies conducted by Westslope Consulting (2018a) and Capitol Airspace (2018a) that are discussed in the Letter L5a-1 Response to the Shute, Mihaly, & Weinberger LLP Exhibit 1, memorandum from Dr. Jerry Johnson (specifically response to L5A-6 comment). Also, please see responses L5-8, L5-13, and L5-14 above and Master Response *Safety Concerns Related to Project Siting*. No changes to the language in the DEIR are necessary.

L5-21 Construction Impacts and Mitigation. The commenters state that it is impossible to know whether Measure 3.7-3 would actually reduce impacts to a less-than-significant level because the DEIR fails to describe the nature and extent of the project's construction impacts or how the impact would be lessened with implementation of the measure. The commenters cite case law.

Please see responses L5-8, L5-13, and L5-14 above and Master Response *Safety Concerns Related to Project Siting*.

Also, please see the results of the supplemental cumulative impact studies conducted by Westslope Consulting (2018a) and Capitol Airspace (2018a) that are included in Appendix A of this FEIR and discussed in the Letter L5a-1 Response to the Shute, Mihaly, & Weinberger LLP Exhibit 1, memorandum from Dr. Jerry Johnson (specifically response to L5A-6 comment). The studies and analysis provided are adequate and the DEIR's conclusions are backed by substantial evidence. Moreover, the case law cited in the comment is distinguishable, as here SMUD undertook an analysis of aeronautic safety issues, which are not quantifiable as was the case with regard to the energy impacts addressed in *Ukiah Citizens for Safety First v. City of Ukiah* (2016) 248 Cal.App.4th 256, 264. Measure 3.7-3 is based on requirements from the FAA that wind turbines are marked/lighted in accordance with 'FAA Advisory

Circular 70/7460-1L Change 2, Obstruction Marking and Lighting'. This is a common and effective mitigation measure for addressing possible collision hazards. The discussion adequately describes how the impact would be lessened with implementation of the measure and states, "To ensure proper conspicuity of turbines at night during construction, all WTGs shall be lit with temporary lighting once they reach a height of 200 feet or greater until the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting shall be relocated to the uppermost part of the structure." To SMUD's knowledge there have been no reported incidents of aerial collisions in this region. The project proposes to replace existing turbines, and the baseline for the project includes a fully developed wind resource area. No revisions to the language in the DEIR are necessary.

L5-22 Point 4. The DEIR fails to adequately analyze or mitigate the project's significant cumulative impacts. The commenters discuss CEQA guidelines and cite case law regarding analysis of cumulative impacts. The commenters refer to the report by Dr. Johnson. The commenters contend the DEIR does not analyze cumulative impacts in a manner required by CEQA, but relies entirely on the FAA's NHD (DNH).

The FAA conducted modeling of the issues under its jurisdiction, including cumulative impacts, and the DNHs it issued for the project turbines each conclude that the "*cumulative impact of the proposed structures*, when combined with other proposed and existing structures, is not considered to be significant" (emphasis added).

Moreover, SMUD hired Westslope Consulting, LLS to conduct a cumulative study for the Solano 4 Wind Project (Westslope 2018a). The study is titled SMUD Solano 4 Cumulative Impact Study and Mitigation Solution Results for 2018 Vestas V136 and V150 Wind Turbine Layouts dated September 6, 2018 and can be found in Appendix A of this FEIR. The cumulative study includes the following conclusions:

- Solano 4 East and West projects will replace 23 existing V47 wind turbines that are currently interfering with the Travis AFB DASR with either 22 136-meter WTGs or 19 150-meter WTGs.

- The 150-meter wind turbines for the Solano 4 East will negate the Pd drop over the Wind Resource Area as a result of the Solano 4 West 150-meter wind turbines. There would be no material difference to Travis AFB radar operations compared to the existing baseline conditions and therefore the Solano 4 Wind Project would not contribute to a cumulative impact.

- False targets are not expected to be significant and should be manageable for Solano 4 Wind Project turbines.

- No impacts to the secondary radar co-located with Travis AFB DASR.

SMUD made every effort to find a wind project configuration for the Solano 4 Wind Project to avoid or minimize the effects of the project on the DASR and on the air traffic controllers' displays in STARS. This effort and the findings of those efforts are described in more detail in the Letter L5a-1 Response to the Shute, Mihaly, & Weinberger LLP Exhibit 1, memorandum from Dr. Jerry Johnson.

Also, please see response L5-8 above and Master Response *Safety Concerns Related to Project Siting*. No revisions to the language in the DEIR are necessary.

L5-23 Point 5. The DEIR fails to adequately evaluate alternatives to lessen or avoid the project's significant impacts. The commenters discuss CEQA guidelines for alternatives analysis and cite case law.

SMUD needs new renewable and carbon-free resources to meet California's mandate for renewable procurement (60% by 2030)[2] and to meet its Board directed goals. SMUD's Integrated Resource Plan (IRP), adopted by its Board in 2018, guides decisions on future resource developments, and lays out a pathway to achieve a Net Zero greenhouse gas (GHG) emissions goal by 2040 through investment in electrification while significantly expanding renewable and carbon-free resources in its portfolio.[3] In July 2020, SMUD's Board declared a climate emergency and adopted a resolution calling for SMUD to take significant and consequential actions to eliminate its greenhouse gas emissions by 2030, and directed staff to develop a plan to achieve this goal. SMUD's 2030 Zero Carbon Plan (2030 Plan)[4] has been approved by the Board and calls for the addition of up to 2,300 MW of new renewables and 1,100 MW of batteries by 2030 – more than double the amount SMUD was planning for in its 2018 IRP. The 2030 Plan calls for maximizing new cost-effective utility-scale renewables within our service territory (up to 1,500 MW utility solar), but also requires SMUD to add additional resources that it does not have locally, such as wind and geothermal. Resource decisions will be made based on a thorough analysis of market ready and available carbon-free resource options, while evaluating financial impacts, resource type and generation profile, reliability, and sustainability. SMUD's IRP process has resulted in a diverse portfolio of renewable resources, which today include small hydro, biomass and biogas, wind, solar, and geothermal.

[2] Sen. Bill No. 100, approved by Governor, Sept. 10, 2018.
[3] https://www.smud.org/-/media/Documents/Corporate/Environmental-Leadership/Integrated-Resource-Plan.ashx.
[4] https://www.smud.org/-/media/Documents/Corporate/Environmental-Leadership/ZeroCarbon/2030-Zero-Carbon-Plan-Technical-Report.ashx.

Resource diversity is coveted in resource planning, as it results in varying generation profiles, costs, and avoiding over investing in one generation type that may result in diminishing returns as we have seen with solar development in California. Wind generation, such as that produced in the Solano wind area, is beneficial from a resource diversity perspective as its generation profile can provide more output during peak hours than solar generation, and this means it has greater value in meeting energy demand. SMUD currently owns or contracts for about 280 MW of wind resources in the Solano wind area, which is just a fraction of the total installed capacity at this high-quality wind site. With very few high-quality wind sites left undeveloped in California, the Solano area provides a valuable wind resource that is well positioned to help the State and SMUD achieve their environmental goals.

As only few high-quality wind sites remain undeveloped in California, future wind options beyond the Solano site are likely out of state. Out of state resources are more expensive and require costly transmission for delivery to SMUD's load. Other renewable technologies (such as biomass, geothermal, Biomethane/Biogas, geothermal, ocean wave power, tidal power, etc.) have either limited in-state supply or have not been fully developed technologically for market or are extremely expensive. Further, RPS guidelines must be adhered to, which limits the resource pool further. For example, RPS guidelines are prohibitive on out-of-state biomethane use for meeting renewable mandates, limiting future consideration of this resource.

Through our IRP process, we have carefully considered the variety of resource options and have decided that developing additional wind generation at Solano and utilizing land already owned by SMUD will serve both RPS and SMUD's GHG reduction goals in a reliable, environmentally sustainable, and cost-effective manner. In order to meet the State's aggressive RPS and our aggressive GHG reduction goals, we will need to rely on the myriad of proven and available carbon-free resources. In addition, given the current level of technology for—and uncertainty around—evolving alternatives, this project is considered a critical component of SMUD's strategy. If anything, unproven alternatives will also be necessary to meet SMUD's ambitious goals even with the Solano 4 Wind Project.

Also, the need for additional alternatives to address aerial safety are not necessary since there is no significant effect in light of the Westslope (2018a) radar cumulative impact modeling study that determined there would be a negligible impact over baseline to the associated Travis AFB radar systems resulting from installation of twenty-two (22) 136M turbines following removal of the existing 23 WTGs, and a net zero impact for installation of nineteen (19) 150M turbines following removal of the existing 23 WTGs compared to the existing baseline conditions, and therefore the Solano 4 Wind Project would not contribute to a cumulative impact.

Please refer to Letter L5a-1 Response to the Shute, Mihaly, & Weinberger LLP Exhibit 1, memorandum from Dr. Jerry Johnson and Appendix B of this FEIR (FAA DNHs). No revisions to the language in the DEIR are necessary.

L5-24 DEIR only offers one project alternative. The commenters contend that the DEIR only offers one project alternative that may increase radar interference.

Please see responses to L5-23 and L5-25.

L5-25 CEQA guidelines and case law regarding alternatives. The commenters discuss CEQA guidelines and case law regarding alternatives, and that the DEIR presents only one alternative that would increase the project's significant impacts. The commenters suggest that the DEIR does not offer a reasonable range of alternatives.

CEQA guidelines and case law are noted. CEQA does not require an EIR to consider every conceivable project alternative and the selection of alternatives is subject only to a rule of reason. (Guidelines, § 15126.6(a), (f).) To satisfy CEQA, the EIR's range of alternatives must examine in detail only those that would feasibly attain most of the basic project objectives while avoiding or substantially lessening any of a project's significant effects. (Guidelines, § 15126.6(a), (f).) In particular, an EIR need not include alternatives that will not implement fundamental project objectives or would change the basic nature of the project. (Guidelines, § 15126.6(a), (c); *In re Bay-Delta Programmatic Environmental Impact Report Coordinated Proceedings* (2008) 43 Cal.4th 1143, 1165 [finding evaluating reduced-export alternative not required as it conflicted with project's objectives of improving water supply reliability and providing water for beneficial uses].) Further, an EIR need not address proffered alternatives that do not provide distinct environmental advantages over the project or is already within the range of alternatives addressed in the EIR. (Guidelines, § 15126.6(b); *Village Laguna of Laguna Beach, Inc. v. Bd. of Supervisors* (1982) 134 Cal.App.3d 1022, 1028–1029 [rejecting call to evaluate alternative falling within the densities already included in the EIR]; *Tracy First v. City of Tracy* (2009) 177 Cal.App.4th 912, 929–930 [rejecting call for reduced-size store alternative because alternative would not reduce significant impacts of the project].)

The DEIR considered two project alternatives in detail: the No Project Alternative and Reduced Turbine Height Alternative. The latter alternative was responsive to one of the primary issues raised by the ALUC, turbine height. Ultimately, while Reduced Turbine Height Alternative would lessen one impact the remaining impacts would be similar to, but slightly greater than, those of the proposed project, so the DEIR concluded that the proposed project would be the environmentally superior alternative. Such a limited range of alternatives is appropriate where, as here, there are so few variations or significant impacts of the project. (See, e.g. *Marin Municipal Water Dist. v. KG Land Cal. Corp.* (1991) 235 Cal.App.3d 1652, 1666 [upheld EIR that evaluated two

alternatives—a no project alternative and conservation alternative].) No additional alternatives are necessary to adequately evaluate the project and assess its impacts in relation to other policy considerations (including satisfying the objectives of the project). The commenter does not provide evidence on how additional alternatives would enhance the analysis or result in potentially different impact conclusions. No revisions are necessary. Please also see response to L5-23 above.

L5-26 DEIR fails to provide a reasonable range of alternatives. The commenters contend that the DEIR fails to provide a range of alternatives as required by CEQA by identifying the proposed project as the environmentally superior "alternative." The commenters suggest alternatives that could and should have been considered (alternative configuration of WTGs, alternative phasing). The commenters claim SMUD project objectives are too narrow and cite case law.

Please see responses to L5-23 and L5-25 above. No changes are necessary.

L5-27 Renewables Portfolio Standards (RPS) renewables are wide ranging in terms of location and type of project. The commenter describes a range of RPS "eligible renewable sources" in North America including biodiesel, biomass, biomethane (including digester gas, and landfill gas), fuel cells using renewable fuels, geothermal, hydro-electric, municipal solid waste combustion and conversion, ocean wave, ocean thermal, solar, tidal current, and wind.

The comment is noted. Please see responses to L5-23 and L5-25 above. Other than the rule of reason, however, there is no categorical legal imperative or ironclad rule governing the nature or scope of the alternatives to be evaluated (Guidelines, § 15126.6(a), (f)). Indeed, an EIR need not consider "every conceivable alternative" to the proposed action. (*In re Bay-Delta* (2008) 43 Cal.4th 1143, 1162–1163). In particular here, SMUD was not required to consider alternatives that would fundamentally alter the essential nature of the project, or that the commenter has not shown provide any environmental advantages over the proposed project. A different project at a different location would also result in potential impacts to diverse resources and attempting to analyze them in the EIR would be speculative. Nevertheless, Section 6.2.3 of the DEIR does provide a discussion of why offsite alternatives and alternative technologies were considered but rejected from further consideration. The comment also fails to acknowledge that SMUD is already undertaking several initiatives to help meet its RPS and GHG reduction goals; the Solano 4 Wind Project is essential part of that effort. As described above under response L5-23, SMUD's 2030 Plan has been approved by the Board and calls for the addition of up to 2,300 MW of new renewables and 1,100 MW of batteries by 2030 – more than double the amount SMUD was planning for in its 2018 IRP. The 2030 Plan calls for maximizing new cost-effective utility-scale renewables within our service territory (up to 1,500 MW utility solar), but also requires

SMUD to add additional resources that it does not have locally, such as wind and geothermal. SMUD analyzed the resources to meet the 2030 goal and concluded that more wind than the Solano 4 Wind project would be needed to achieve the goal, as well as additional technologies that are either currently unknown or are not ready for large-scale adoption due to price, reliability or other factors. No changes in the DEIR are necessary.

L5-28 Temporal Alternatives. The commenter argues that the Renewables Portfolio Standard would not require the project's construction right now, but that it requires procurement of renewables that will overall be a specified percentage of annual retail sales by specified target dates. The commenter states there are numerous other alternatives available to SMUD including "building something else, somewhere else, at some other time and CEQA requires consideration of those alternatives."

Please see response to L5-23 above. No changes are necessary.

L5-29 Meeting SMUD's Net Zero Goal. The commenter states that according to SMUD's Policy SD-9, SMUD meets its Net Zero goal via other methods (investments in vehicles and building electrification and energy efficiency); and in meeting GHG reduction goals, SMUD shall emphasize local and regional environmental benefits. The commenter argues that "such regional and environmental benefits would be furthered by ensuring consistency with the LUCP." Lastly, the commenter states that "an alternative need not meet every project objective or be the least costly in order to be feasible."

Please see response to L5-23 above. SMUD has concluded that it will not meet its project and system-level objectives (Net Zero) without providing the additional renewable energy capacity provided by the Solano 4 Wind Project. As described in the DEIR section 6.3.2, the Reduced Turbine Height Alternative would introduce 27 WTG compared to the 22 WTG for the project. As such, all construction activities and resulting criteria air pollutants would be similar to, but slightly greater than, those of the project. Further significant impacts of the project can be avoided without having to resort to any project alternatives. No changes are necessary.

L5-30 The DEIR must be recirculated. The commenter states CEQA guidelines regarding the circumstances that require recirculation of a DEIR including (1) the addition of significant new information to the EIR after public notice is given of the availability of the DEIR but before certification, or (2) the DEIR is so "fundamentally and basically inadequate and conclusory in nature that meaningful public review and comment were precluded." The commenter argues that both circumstances apply here and that the DEIR "repeatedly understates and does not provide the relevant information regarding the project's significant land use and air safety impacts." The commenter states that the DEIR relies exclusively on the FAA's NHD (DNH) and assumes without analysis that minimalistic mitigation measures would effectively reduce the project's impacts on air safety and land use. The commenter contends that SMUD must prepare a revised EIR that would include substantial new information, including the information included in the

letter. The commenter reiterates that "it is mandatory and imperative that SMUD obtain a consistency determination from the ALUC prior to proceeding with the Solano 4 Wind Project."

SMUD disagrees. The DEIR is sufficiently detailed so that the public and decisionmakers are properly informed and can conduct meaningful evaluation of the way project impacts were avoided, minimized, or mitigated. The DEIR did not rely solely on the FAA's DNHs, which were themselves supported by FAA modeling of all aerial navigation and safety impacts under that agency's jurisdiction and its conclusions are supported by that additional substantial evidence in the DEIR and this FEIR. While additional information has been provided in this FEIR and its appendices, that information merely amplifies and clarifies the evidence and findings in the DEIR. In that respect, recirculation is unwarranted. (CEQA Guidelines, § 15088.5(a)-(b); *San Francisco Baykeeper, Inc. v. Cal. State Lands Com.* (2015) 242 Cal.App.4th 202, 224–225.) Please also see the Master Response *Land Use* for an explanation of why the project is exempt from ALUC review. Also, please see response L5-1 above. No revisions are necessary and recirculation is not required.

This response to the memorandum from Dr. Jerry Johnson, Director of Engineering Regulus Group, LLC dated August 6, 2019 was written in collaboration with Geoff Blackman, Owner/Principal Westslope Consulting, LLC and Joe Anderson, Director of Airspace Consulting Capitol Airspace Group, LLC. Westslope Consulting and Capitol Airspace Group provided a joint letter dated March 30, 2021 addressing each of the points raised by Dr. Johnson, which is included in Appendix C of this Final EIR.

Letter	**Dr. Jerry Johnson, Director of Engineering**
L5a-1	**Regulus-Group, LLC**
Response	**August 6, 2019**

L5a-1 The commenter addresses air safety impacts in the DEIR and states that it is well known that utility scale wind turbines impact primary surveillance radar systems when the turbines are located within the line of sight of the radar. The commenter notes that the existing turbines in the proposed project area have created turbine radar interference at Travis Air Force Base (AFB). To adjust, the AFB had to move/lose a circling approach. Per the commenter, the AFB would like to reclaim the lost airspace.

As the Draft EIR acknowledges, utility scale wind turbines within radar line-of-sight of a primary surveillance radar, such as the Travis AFB digital airport surveillance radar (DASR), could have an adverse effect on radar performance (see DEIR, page 3.7-14). In fact, Travis AFB has served and continues to serve as an excellent source of information for the United States government and the wind industry in understanding the effects that multiple wind projects can have on a DASR and the display system used by the air traffic controllers, the Standard Terminal Automation System (STARS), at the Travis AFB Radar Approach Control (RAPCON) facility. Travis AFB and the wind projects in the Collinsville-Montezuma Hills Wind Resource Area (WRA) also served as an excellent source of information in determining how to manage or lessen the effects of wind turbines for a DASR and STARS air traffic control systems configuration. Part of this work was conducted under Cooperative Research and Development Agreement (CRADA) No. 10-002 in collaboration with Travis AFB, Westslope Consulting, LLC (Westslope), and three wind project developers including the Sacramento Municipal Utility District (SMUD) (Air Mobility Command, 2010; United States Transportation Command Cooperative Research and Development Agreement, 2010). It should also be noted that while there would be negligible effects on the DASR, the Monopulse Secondary Surveillance Radar (MSSR), which is the secondary surveillance radar that is co-located with the DASR and is the main radar used for air traffic control by the base, was shown to not be affected by wind turbines. The MSSR interrogates transponder equipment on board the vast majority of aircraft operating in and around the Travis AFB RAPCON's airspace.

Secondary surveillance radar systems, such as the MSSR, are less susceptible to interference from wind turbines than primary surveillance radar. Unlike primary surveillance radar that depends on reflected energy to discern aircraft, secondary surveillance radar relies on, in general terms, two-way communication with aircraft via operating transponders. This process is cooperative whereby the secondary surveillance radar transmits a set of pulses at one frequency to interrogate transponders, then receives and processes replies from operating transponders at another frequency. Because of the use of different transmit and receive frequencies, secondary surveillance radar is not as susceptible to the effects of clutter that interfere with the performance of primary surveillance radar. Clutter is unwanted radar returns from the ground, rain or other precipitation, buildings, antenna towers, transmission lines, wind turbines, vehicular traffic, and birds. Some publicly available United States government research has considered the effects of wind turbines on secondary surveillance radar. A Department of Homeland Security (DHS) funded study conducted by JASON found that "[s]econdary (i.e., transponder, or "beacon") tracks were rarely affected" by wind farms. JASON is a group of the nation's top scientists that advises the United States government (JASON, The MITRE Corporation, 2008). In addition, the Department of Energy, Department of Defense (DOD), DHS, and the Federal Aviation Administration (FAA) sponsored flight trials conducted by Massachusetts Institute of Technology/Lincoln Laboratory (MIT/LL) and Sandia National Laboratories as part of an Interagency Field Test and Evaluation (IFT&E) program noted that "primary surveillance radars are severely impacted by wind turbines while the beacon transponder-based secondary surveillance radars was not affected by wind turbines." (Sandia National Laboratories, 2014).

The below excerpts are from the Solano 4 Wind Project (Solano 4) Determinations of No Hazard (DNHs) issued by the FAA originally on February 1, 2019, and after further DOD and FAA review, were recently extended on January 28, 2021.

> "Simply being "seen" by the radar is not the real issue though. How that target (in this case, the wind turbine) is processed and displayed for ATC is the key. The users of the system (ATC) is the sole decider on whether the system is acceptable to be able to perform their duties. Although there may be others entities using these radar systems, the responsibility and authority of the FAA is the safe and efficient use of the navigable airspace, including the impact of the radar effects on air navigation."
>
> "The turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. The proposals will affect the quality and/or availability of radar signals. The effects would be unwanted primary returns (clutter) and primary target drops, all in the area of the turbines.

> Tracked primary targets could diverge from the aircraft path and follow wind turbines, when the aircraft is over or near the turbines."
>
> "However, this would not cause an unacceptable adverse impact on ATC operations at this time."
>
> "The cumulative impact of the proposed structures, when combined with other proposed and existing structures, is not considered to be significant. Study did not disclose any significant adverse effect on existing or proposed public-use or military airports or navigational facilities, nor would the proposals affect the capacity of any known existing or planned public-use or military airport."
>
> "Therefore, it is determined that the proposed construction would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation providing the conditions set forth in this determination are met."

The extension process resulted in the formation of a Mitigation Response Team (MRT) with Travis AFB as required by the DOD Military Aviation and Installation Assurance Siting Clearinghouse (the "DOD Siting Clearinghouse") mission compatibility evaluation process as documented in Part 211 of Title 32 of the Code of Federal Regulations (Military Aviation and Installation Assurance Siting Clearinghouse, accessed 2021). The DOD Siting Clearinghouse was established under direction of the United States Congress per the National Defense Authorization Act for Fiscal Year 2011 (H.R.6523, 2011). The result of the MRT review was a conclusion by the 60th Air Mobility Wing of "[a]s proposed, Solano 4 should have minimal negative impact on Travis Operations" and a conclusion by the DOD Siting Clearinghouse that Solano 4 "will not present an adverse impact to military operations." (Simmons, 2021; Sample, 2021).

When evaluating the effects of wind turbines on radar, it is important to distinguish between effects and operational impacts. Effects do not always translate into operational impacts (i.e., a substantial adverse effect). As a result of early consultation with Travis AFB and Solano County's Windfarm Re-Power Group dating back to April 21, 2016, SMUD and Westslope undertook a substantial effort to identify a wind project configuration—considering different wind turbine layouts, numbers of wind turbines, and wind turbine models—for Solano 4 to ensure there would be no additional effects as a result of the project on the DASR and on the air traffic controllers' displays in STARS. In the spirit of collaboration, the results of multiple radar cumulative impact studies were presented to Travis AFB prior to filing the Solano 4 wind turbines with the FAA (Westslope, 2018a).

Westslope's studies indicate that removing and replacing 23 existing wind turbines with up to 22 136-meter rotor diameter or up to 19 150-meter rotor diameter modern wind turbines will have no material difference to the DASR or on the air traffic controllers' displays in STARS.

The Solano 4 wind turbines are located outside of Travis AFB circling approach areas and will have no effect on the base's published visual flight rules (VFR) operations or on instrument flight rules (IFR) operations (U.S. Department of Transportation, 2016, 2018). Solano 4 will replace 23 existing Vestas V47 wind turbines, which currently interfere with the Travis AFB DASR, with up to 22 136-meter rotor diameter or up to 19 150-meter rotor diameter wind turbines. Because construction of Solano 4 will result in fewer overall wind turbines and the proposed wind turbines will have no effect on the base's published VFR or IFR operations, Solano 4 will have no material difference on the performance of the DASR and STARS configuration compared to current conditions and will not impact current RAPCON air traffic operations. Further, the secondary surveillance radar co-located with the DASR, which is the main radar used for air traffic control, will not be affected. These conclusions regarding impacts are supported by the MRT process and FAA's DNHs that states that the Solano 4 wind turbines "would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation."

With regards to the desire of Travis AFB to "reclaim airspace," it should be noted that the existence of extensive wind energy development in the Montezuma Hills is an existing condition and thus would be considered part of the baseline against which the potential impacts of the Solano 4 Wind Project are evaluated. It is well settled that ongoing activities—here, operations of the existing wind turbines—are part of the existing conditions baseline. (See, e.g., *Communities for a Better Env't v South Coast Air Quality Mgmt. Dist.* (2010) 48 Cal.4th 310; *Mount Shasta Bioregional Ecology Ctr. v County of Siskiyou* (2012) 210 Cal.App.4th 184, 200; *Citizens for E. Shore Parks v State Lands Comm'n* (2011) 202 Cal.App.4th 549 [lease renewal for marine terminal serving an oil refinery included the terminal and its ongoing operations in its existing conditions baseline].) It is not the purpose of the EIR or any proposed mitigation to ameliorate existing conditions. Rather, the purpose of the Draft EIR is to address the nature and extent of impacts to the extent resulting from the proposed project and to offset those impacts.

L5a-2 The commenter addresses the potential for additional wind turbines by making several points. Point one per the commenter is that the DEIR does not include information needed to inform decision makers and the public about the scope of the project's impacts. The commenter notes that the DEIR refers to an FAA aeronautical study conclusion that navigable airspace is not affected by turbine operation, but the DEIR does not mention that the study also reports that quality

and availability of radar signals would be affected. The commenter further notes that when wind turbine radar interference (i.e., clutter) is high, air traffic controller workloads can increase due to the creation of track duals (false tracks), which increase the need for more coordination between controllers and pilots and greater distances among aircraft, and may impact aircraft maneuvers.

The DEIR focused on the conclusion of the aeronautical study process rather than FAA's initial findings. As pointed out by Dr. Johnson, the FAA's initial findings state that the "[t]he proposals will affect the quality and/or availability of radar signals. The effects would be unwanted primary returns (clutter) and primary target drops, all in the area of the turbines. Tracked primary targets could diverge from the aircraft path and follow wind turbines, when the aircraft is over or near the turbines." This language is standard language used by the FAA for any wind turbine that is within line-of-sight of a primary surveillance radar and is used to inform the proponent of a wind project that further study is required to determine whether these effects could result in operational impacts.

After in-depth study, at the request of SMUD, the FAA determined that Solano 4 "would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation." Further, the DNHs state that the aeronautical studies "considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact" resulting from Solano 4 when combined with the impact of other existing structures.

Regarding "track duals," Dr. Johnson appears to be confusing this term with "false targets." Track duals and false targets are two different effects. It is also possible that Dr. Johnson may be confusing track duals with a phenomenon identified during testing of in-fill radar ongoing at Travis AFB at this time.

While false primary targets are possible, replacing the 23 existing wind turbines with up to 22 136-meter rotor diameter or up to 19 150-meter rotor diameter modern wind turbines will have no material difference in the number of false primary targets reported by the DASR or in the number of the false primary tracks on the air traffic controllers' displays in STARS. After construction, system optimization, including updating the range-azimuth gate map in the DASR, will address the difference in the location and number of wind turbines. In other words, the conditions under the Solano 4 Wind Project would not be any different than the current condition. Thus, the DEIR did not identify a significant impact and no mitigation is required.

Further, the Project will not adversely affect safety through any indirect increase in the workload of individual traffic controllers. As discussed in detail by Mr.

Geoff Blackman with ALUC Commissioners at the ALUC's May 2021 Commission Meeting, this is due to the efforts of SMUD and its consultants to eliminate a net increase in radar interference impacts over baseline through design, number, and location of wind turbines.[1] The FAA concurred that there will be no unacceptable adverse impact to air traffic controller operations at this time (Federal Aviation Administration Determination of No Hazard to Air Navigation, Aeronautical Study No. 2018-WTW-13388-OE to 2018-WTW-13406-OE).

L5a-3 The commenter's second point is that while the DEIR indicates that the wind turbines would not be a hazard to air navigation if the turbines are properly painted and lighted, these are measures for obstruction avoidance and would not mitigate the turbines' interference with radar or air traffic control.

Per the FAA issued DNHs, Solano 4 "would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft" and "would not be a hazard to air navigation" provided the wind turbines are marked/lighted in accordance with FAA Advisory Circular 70/7460-1 L Change 2, Obstruction Marking and Lighting. This advisory circular provides the FAA's standard for marking and lighting to ensure the appropriate daytime and nighttime conspicuity so that pilots can visibly see and avoid wind turbines. Please see the Master Response for additional information on the FAA process and regulations.

L5a-4 The commenter's third point is that the DEIR does not mention that Air Traffic Control (ATC) Minimum Vectoring Altitudes (MVAs) for the turbine area would need to be increased. The commenter notes that the FAA has identified this as an adverse effect.

During the aeronautical study process, the FAA's prime objective is to ensure the safety of air navigation and the efficient utilization of navigable airspace (U.S. Department of Transportation, 2019a). As many as ten different government offices take part in each study, including: the FAA's Office of Airports, Instrument Flight Procedures Impact Team, Flight Standards, Technical Operations, and Frequency Management, and the United States Air Force, United States Navy, United States Army, DHS, and the DOD. The FAA utilizes the information provided by each office, as well as defined metrics, to determine whether or not the proposed wind turbines would be hazardous (U.S. Department of Transportation, 2019b). Please see the Master Response for additional information on the FAA process.

During the review of Solano 4, the FAA identified that the proposed wind turbines would have an adverse effect on a minimum vectoring altitude (MVA) sector. A MVA defines the lowest altitude that air traffic controllers can normally

[1] (Solano County ALUC Hearing Transcript, May 20, 2021, at pp. 71-72.

issue radar vectors to aircraft and is based on obstacle clearance. Specifically, the FAA identified an effect on Sector MCC_B which is utilized by the air traffic controllers at Northern California Terminal (NCT) Radar Approach Control (TRACON). To address this effect, the FAA requires Form 7460-2, Part 1, Notice of Actual Construction or Alteration to be submitted at least 60 days before the start of construction so that appropriate action can be taken to amend the affected procedure(s) and/or altitude(s), if necessary. By SMUD e-filing FAA Form 7460-2, Part 1, Notice of Actual Construction or Alteration at least 60 days before the start of construction, the FAA would take appropriate action to amend the affected procedure(s) and/or altitude(s), if necessary." The FAA will modify Sector MCC_B by increasing the MVA from 1,700 to 1,800 feet above mean sea level (MSL). This increase ensures the appropriate obstacle clearance and, as a result, maintains safety (U.S. Department of Transportation, 2018). This amendment to modify the sector by increasing the MVA to 1,800 feet MSL removes the adverse effect on the MVA sector. Lastly, Northern California TRACON confirmed that this would not have an operational impact on providing radar vectoring services. For these reasons, the effect on a MVA sector will not result in the degradation of safety or efficiency. Mitigation measure 3.7-3 in the DEIR states that "SMUD will e-file FAA Form 7460-2, Part 1, Notice of Actual Construction or Alteration at least 60 days before the start of construction, so that appropriate action can be taken to amend the affected procedure(s) and/or altitude(s), if necessary." Thus, the DEIR did not identify any significant impacts related to air traffic safety and no additional mitigation is required.

L5a-5 *The commenter's fourth point is that while the DEIR acknowledges that the project could have potentially significant adverse impacts, it does not provide enough information about the impacts for readers to comprehend them. The commenter states that the DEIR should 1) discuss objective metrics regarding the effects on radar performance, 2) compare clutter tracks over the wind turbine area with the additional clutter that would be generated by the new turbines, 3) compare expected dual tracks with real targets and provide metrics such as length measured over a span of time, and 4) discuss increased operator workload (controllers and pilots) due to clutter and provide metrics regarding this.*

As stated above, SMUD undertook extensive efforts to identify a wind project configuration for Solano 4 to ensure there would be no additional effects as a result of the project on the DASR and on the air traffic controllers' displays in STARS. Results of an initial cumulative impact study conducted by Westslope, employing the same method verified under CRADA No. 10-002 and using primary probability of detection (Pd) as a metric, showed that the 22 136-meter rotor diameter wind turbines will result in a 0.1 percent overall decrease in the primary Pd over the Collinsville-Montezuma Hills WRA. A subsequent cumulative impact study for 19 150-meter rotor diameter wind turbines at the proposed locations showed no drop in the primary Pd. In other words, the

conditions under Solano 4 will result in no material difference on the performance of the DASR and STARS configuration compared to existing conditions. These findings were presented to Travis AFB on September 6, 2018 and were used to support the current layouts proposed for the Solano 4 wind turbines. Please see Appendix A of this FEIR for copies of the specific technical studies conducted.

As determined by the supplemental Basic Radar Line-of-Sight Study (Westslope 2018b) and the FAA as stated in the Solano 4 DNHs, the turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. Per the FAA Solano 4 DNHs, the proposals will affect the quality and/or availability of radar signals. The effects would be unwanted primary returns (clutter) and primary target drops, all in the area of the turbines. Tracked primary targets could diverge from the aircraft path and follow wind turbines, when the aircraft is over or near the turbines." The FAA DNHs conclude, "[h]owever, this would not cause an unacceptable adverse impact on ATC operations at this time."

The number of false primary targets reported by the DASR and the number of false primary tracks presented on the STARS' displays were also considered as a metric during these studies; however, based on Westslope's experience with the Travis AFB DASR and STARS, as well as other similar facilities, and the fact that Solano 4 will replace 23 existing wind turbines with 22 or 19 new wind turbines, Westslope expects no material difference in the number of false primary targets out of the DASR or the number of false primary tracks on the STARS' displays. As stated above, the result of the MRT review was a conclusion by 60th Air Mobility Wing Commander of "[a]s proposed, Solano 4 should have minimal negative impact on Travis Operations" and a conclusion by the DOD Siting Clearinghouse that Solano 4 "will not present an adverse impact to military operations." The FAA determined that the proposed Solano 4 wind turbines "would not cause an unacceptable adverse impact on ATC operations at this time" and "would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation providing the conditions set forth in this determination are met." Further, SMUD received extensions for the 19 DNHs for Solano 4 Wind Project on January 28, 2021, as requested. Also, please see the Master Response for additional information about SMUD's coordination efforts with Travis AFB.

L5a-6 The commenter's fifth point is that the DEIR does not discuss other potentially feasible means to mitigate the project's adverse impacts, such as a Pilot Mitigation Program at Travis AFB that is studying how in-fill radar systems could mitigate turbine radar interference, or an effort that is underway to develop radar processing algorithms that could reduce clutter on air traffic control screens. The commenter

notes that these are not yet proven or certified for use, and so the only way to limit turbine impacts on radar systems is to locate the turbines beyond the line-of-sight of the radar.

As discussed above and in the cumulative impact studies conducted by Westslope, the Solano 4 wind turbines will result in no material difference on the performance of the DASR and STARS configuration compared to existing conditions, and will not impact current RAPCON air traffic operations. Further, the secondary surveillance radar co-located with the DASR, which is the main radar used for air traffic control, will not be affected. These conclusions are supported by the FAA's DNHs that states that the Solano 4 wind turbines "would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation". Based on the analysis conducted, the DEIR concluded that there would be no significant impact to air traffic safety resulting from the project; therefore, exploration of further mitigation is not necessary. No changes to the DEIR are needed.

Letter 6

STATE OF CALIFORNIA

Governor's Office of Planning and Research

State Clearinghouse and Planning Unit

Gavin Newsom
Governor

Kate Gordon
Director

September 6, 2019

Ammon Rice
Sacramento Municipal Utility District
6201 S Street, MS H201
Sacramento, CA 95817

Subject: Solano 4 Wind Project Environmental Impact Report
SCH#: 2019012016

Dear Ammon Rice:

The State Clearinghouse submitted the above named EIR to selected state agencies for review. The review period closed on 9/5/2019, and the comments from the responding agency (ies) is (are) available on the CEQA database for your retrieval and use. If this comment package is not in order, please notify the State Clearinghouse immediately. Please refer to the project's ten-digit State Clearinghouse number in future correspondence so that we may respond promptly.

Please note that Section 21104(c) of the California Public Resources Code states that:

> "A responsible or other public agency shall only make substantive comments regarding those activities involved in a project which are within an area of expertise of the agency or which are required to be carried out or approved by the agency. Those comments shall be supported by specific documentation."

6-1

Check the CEQA database for submitted comments for use in preparing your final environmental document: https://ceqanet.opr.ca.gov/2019012016/2 . Should you need more information or clarification of the comments, **we recommend that you contact the commenting agency directly.**

This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act. Please contact the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process.

Sincerely,

Scott Morgan
Director, State Clearinghouse

cc: Resources Agency

1400 TENTH STREET P.O. BOX 3044 SACRAMENTO, CALIFORNIA 95812-3044
TEL 1-916-445-0613 state.clearinghouse@opr.ca.gov www.opr.ca.gov

	Scott Morgan, Director
Letter	**State of California Governor's Office of Planning and Research**
6-1	**State Clearinghouse and Planning Unit**
Response	**September 6, 2019**

L6-1 *Letter of Acknowledgement from the State Clearinghouse. The commenter states that this letter acknowledges that SMUD has complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to CEQA.*

SMUD notes the acknowledgement from the State Clearinghouse that they have complied with the State Clearinghouse's review requirements for draft environmental documents, pursuant to CEQA. No response is required.

This page intentionally left blank

3 Corrections and Revisions to the Draft EIR

This chapter contains changes to the text of the Draft EIR in response to certain comments. These changes are generally referenced in the responses to comments in Chapter 2, or are provided to be consistent with changes referenced in Chapter 2. The changes are presented in the order in which they appear in the Draft EIR and are identified by Draft EIR page number. Text deletions are shown in strikeout (~~strikeout~~) and additions are shown in double underline (double underline). The changes identified below do not alter the conclusions of the EIR with respect to any of the significant impacts of the project and do not necessitate recirculation of the Draft EIR.

3.1 Revisions to the Project Description

In response to comment L4-3 from the Solano County Department of Resource Management, the Airport Land Use Commission (ALUC) has been added to Table 2-4 under "*State*" of the DEIR as follows:

Table 2-4. Other Agency Permits and Approvals Required for the Proposed Project

State		
State Water Resources Control Board	Clean Water Act Section 402, construction stormwater permit	Prevent discharge of construction-related pollutants to waters of the United States.
San Francisco Bay Regional Water Quality Control Board	Clean Water Act Section 401, water quality certification	Prevent the discharge of construction-related pollutants to waters of the United States.
California Department of Fish and Wildlife	Streambed alteration agreement	Allow the project to alter a bank or streambed located in California.
California Department of Transportation	Haul truck and overload permit	Permit oversize trucks to travel on local roadways.
Solano County ALUC	ALUC consistency determination review is not required, but is advisory to SMUD	The consistency determination process is advisory only. On May 20, 2021, the ALUC determined that the project is inconsistent with the Travis Air Force Base Land Use Compatibility Plan (LUCP). SMUD Board of Directors is proposing to overrule the ALUC determination after a noticed public hearing, with the required number of votes of its Board members and after making the requisite findings under the State Aeronautics Act (SAA). The proposed decision and findings were circulated to ALUC and California Department of Transportation, Division of Aeronautics on July 2, 2021 as per the SAA process requirements.

3.2 Revisions Clarifying Collection and Home Run Lines

The following minor revisions have been made to clarify reference to collection and home run lines and not transmission lines. The minor revisions in no way chance the impact conclusions presented in the Draft EIR; therefore, recirculation of the EIR is not required.

Aesthetics (Chapter 3.1, page 3.1-35)

Mitigation Measure 3.1-1a: Design the Project to Avoid Aesthetic Impacts.

SMUD or its contractor shall consider topography when siting wind turbines and shall avoid major modifications to natural landforms or other characteristic parts of the landscape. The turbines shall be clustered or grouped to break up overly long lines of turbines. The turbines shall be similar in shape and size.

Each WTG shall be painted a uniform white or light-grey color, “RAL 7035” or similar, per manufacturer’s requirements. To minimize the structures’ reflectivity, the paint used shall have a gloss level that does not exceed 30 percent, or 60–70 gloss units,1 as calculated by the manufacturer. The surfaces of all other structures (e.g., meteorology towers) shall be given low-reflectivity finishes with neutral colors to minimize the contrast of the structures with their backdrops.

Fewer, larger turbines shall be preferred over more, smaller turbines. Commercial messages and symbols shall be prohibited on wind turbines. Collection and home run lines shall be underground; no overhead collection or home run ~~transmission~~ lines shall be used.

To minimize ground disturbance, to the extent feasible, existing roadways shall be used to access turbine pads. All construction-related areas shall be kept clean and tidy, with construction materials and equipment stored in the construction staging and laydown areas and/or generally away from public view. SMUD or its contractor shall remove construction debris promptly at intervals of 2 weeks or less, at any one location.

Biological Resources (Chapter 3.3, page 3.3-2)

Between 2016 and 2019, numerous project-specific biological resources surveys were completed in the proposed project subareas, Solano 4 West and Solano 4 East, and along the electrical ~~transmission~~ home run lines that run northward and westward, respectively, from each subarea to the centrally located Russell Substation (Exhibit 2-2 in Chapter 2, “Project Description”).

Hazards and Hazardous Materials (Chapter 3.7, page 3.7-17)

Exposure of people or structures to the risk of wildfires

The project would place electrical ~~transmission~~ collection and home run lines underground to avoid potential for arcing lines to spark a fire. The WTGs are monitored by a SCADA which is able to monitor operating conditions and inform the operators of abnormal activity so actions can be taken to avoid overheating a WTG causing potential mechanical failure.

Hydrology and Water Quality (Chapter 3.8, page 3.8-8 and 3.8-9)

A portion of the Solano 4 West subarea is located within the Secondary Management Area. According to the Suisun Marsh Local Protection Program, the upland grasslands and cultivated lands of the Secondary Management Area provide habitat for marsh-related wildlife. More importantly, through their location and existing uses, they buffer the wetlands and lowland grasslands from the adverse impacts of both urban development and other upland land uses and practices incompatible with preservation of the marsh. The Suisun Marsh Preservation Act also identifies protected channels within the Suisun Marsh watershed and the watershed's overall boundaries. Although the Solano 4 West project subarea, the majority of the ~~transmission~~ collection line corridors, and a portion of the Solano 4 East subarea are within the Solano Marsh watershed, no protected channels intersect with any planned project components (Solano County 2018).

Cumulative Impacts (Chapter 4, page 4-4 and 4-5)

Visual changes during operation of the project, including the presence of taller WTGs would not be noticeable to residents, recreationists, and motorists in the area. The proposed WTGs would be slightly taller than the existing WTGs in the area but the number of WTGs would be reduced from current conditions. The mean height for the existing WTGs is 396 feet; the mean height for the largest of the WTGs proposed for the Solano 4 Wind Project is 591 feet. All ~~transmission~~ electrical collection and home run lines infrastructure associated with the project would be placed underground. Implementation of Mitigation Measures 3.1-1a and 3.1-1b would reduce potential visual effects. Therefore, the impact of the proposed project on scenic vistas and the visual character of the site and adjacent scenic roadways would be less than significant.

3.3 Revisions to Biological Resources

In response to comment L1-2, the following revisions have been made to Mitigation Measure 3.3-1a: Avoid and minimize impacts on California tiger salamander. The Draft EIR is revised as follows:

> ***Mitigation Measure 3.3-1a: Avoid and minimize impacts on California tiger salamander.*** SMUD will implement the following measures to avoid and minimize potential construction impacts on California tiger salamander:
>
> - A qualified California tiger salamander biologist (defined as an individual with 3 years of experience conducting surveys for California tiger salamander and habitat in the project region) will be present on-site to conduct monitoring during project construction and decommissioning activities that disturb surface soils within 250 feet of drainages or any other aquatic features identified as suitable for California tiger salamander (AECOM 2018b).
> - ~~To the extent possible ,~~SMUD will confine all project-related parking, storage areas, laydown sites, equipment storage, and any other surface-disturbing activities to previously disturbed areas or areas that are not suitable habitat for California tiger salamander (AECOM 2018b). To the extent it is not possible to limit

such activities to previously disturbed areas or areas that are not suitable habitat for California tiger salamander, the qualified biologist will perform a preconstruction survey within 48 hours before constructing project-related parking, storage areas, laydown sites, and equipment storage sites to ensure California tiger salamander are not present. If a California tiger salamander is found within the project area, SMUD will implement any actions necessary to avoid take of California tiger salamander including establishing appropriate buffer area and exclusion fencing in consultation with USFWS and/or CDFW. If after avoidance measure cannot avoid take, SMUD shall seek an Incidental Take Permit from USFWS and/or CDFW, as appropriate, and implement any measures specified therein to reduce chances of take and minimize and fully mitigate any incidental take (including the measures in this MM 3.3-1a).

- All steep-walled holes or trenches that are 1 foot deep or greater and located within 250 feet of aquatic habitat that is suitable for CTS will have at least one escape ramp constructed of earthen fill or wooden planks. All such holes or trenches will be completely covered before sunset of each workday using boards or metal plates that are placed flush to the ground, and will be inspected before the start of daily construction activities.

- To prevent inadvertent entrapment of California tiger salamanders during project construction, maintenance, and decommissioning, all construction pipes, culverts, conduits, and other similar structures stored on-site overnight will be inspected before the structure is buried. Plastic monofilament netting will not be used for sediment control because it could pose an entrapment hazard to California tiger salamanders and other wildlife.

In response to comment L1-4, the following revisions have been made to Mitigation Measure 3.3-4a, to reflect the commenter's recommendations that preconstruction surveys be conducted for Swainson's hawks in accordance with Swainson's Hawk Technical Advisory Committee guidance. New text is indicated by underlining. The Draft EIR is revised as follows:

Mitigation Measure 3.3-4a: Avoid and minimize impacts on nesting raptors. SMUD will implement the following measures to avoid and minimize impacts on nesting raptors:

- If construction activities are scheduled to occur during the breeding season (February 1–August 31), SMUD will conduct preconstruction surveys in all potential suitable raptor nesting habitat within 0.25 mile of proposed construction areas, including trees, shrubs, grasslands, and wetland vegetation. A qualified wildlife biologist shall determine the timing of preconstruction surveys based on the time of year and habitats that are present, and shall conduct the surveys no more than 30 days before construction. The 30-day survey period allows flexibility in order for surveys to be conducted when the likelihood of nest detection is maximized (e.g., during courtship, nest building, or when feeding young).

- SMUD will conduct nesting surveys for Swainson's hawks in accordance with the Swainson's Hawk Technical Advisory Committee (TAC) guidance published in

2000 (Recommended Timing and Methodology for Swainsons' Hawk Nesting Surveys in California's Central Valley). These methods will require surveys to start early in the nesting season (late March to early April). Surveys will be conducted within a minimum 0.25-mile radius of the project area or a larger area if necessary to identify potentially active nests potentially affected by project construction. As required by the TAC guidance, surveys will be conducted for at least two survey periods in the nesting season, immediately before the start of project construction activities. The qualified biologist conducting the surveys will have a minimum of 2 years of experience in implementing the TAC survey methodology.

- SMUD will maintain no-disturbance buffers around active raptor nests during the breeding season, or until it is determined the young have fledged. The no-disturbance zone shall include a 500-foot buffer around all raptor nests (including owls) and a 0.25-mile buffer for any active Swainson's hawk nests.
    - No-disturbance buffer sizes for non-special-status species raptors may be increased or decreased by a qualified biologist based on the sensitivity of the species of raptor, or based on site conditions that affect disturbance, such as the type of work, vegetation structure or density, and the line of sight between construction work and the nest to nesting raptors.
    - No-disturbance buffer sizes for special-status raptor species may be increased or decreased by the qualified biologist in consultation with USFWS and CDFW as appropriate.
    - Buffers will not apply to construction-related traffic using existing roads that are not limited to project-specific use (e.g., county roads, highways, farm roads).
    - If no nests are observed during the preconstruction survey but nesting occurs after the start of construction, it will be assumed that the individuals are acclimated to the level of ongoing disturbance.
        - SMUD will clearly identify the locations of no-disturbance buffers (e.g., 250 feet, 500 feet, or 0.25 mile) on maps that will be made available to construction crews.
        - Before and during construction, a qualified biologist shall identify all active nest setback areas on construction drawings, and if appropriate, shall flag or fence the setback areas.
        - If construction is scheduled to occur during the non-nesting season, then no nesting bird surveys are required before construction activity begins, except provisions for surveys for burrowing owls outside the nesting season (September 1–January 31), as specified below in Mitigation Measure 3.3-4b.

In response to comment L1-4, the following revisions have been made to Mitigation Measure 3.3-5, to reflect the commenter's suggestions for additional text to clarify the requirements for the proposed Swainson's hawks foraging habitat mitigation lands.

Mitigation Measure 3.3-5: Acquire off-site mitigation to replace lost raptor foraging habitat.

SMUD will implement the following compensatory mitigation to offset net impacts on foraging habitat for breeding Swainson's hawks and other raptor species. Based on Swainson's hawk nest locations documented in recent years, no permanent project impacts on foraging habitat will occur within 1 mile of an active Swainson's hawk. Depending on whether the 150m WTG option or the 136m WTG option is selected, 25.38 acres or 30.49 acres of suitable Swainson's hawk foraging habitat will be required to mitigate this loss.

SMUD will mitigate the loss of Swainson's hawk foraging habitat in accordance with CDFW recommendations (DFG 1994) by providing mitigation lands as follows:

- Foraging habitat permanently lost within 5 miles of an active Swainson's hawk nest tree but more than 1 mile from the nest tree (either 25.38 acres or 30.49 acres, depending on the WTG option selected) will be replaced with 0.75 acre of mitigation land for each acre of foraging habitat permanently lost because of project construction (0.75:1 ratio). This ratio is consistent with recommendations in DFG 1994: "Projects within 5 miles of an active nest tree but greater than 1 mile from the nest tree shall provide 0.75 acres of habitat mitigation land for each acre of urban development authorized [0.75:1 ratio])." All mitigation lands protected under this requirement shall be protected in perpetuity in a form acceptable to CDFW (e.g., through fee title acquisition or conservation easement) on agricultural lands or other suitable habitats that provide foraging habitat for Swainson's hawk. The easement will be held by a governmental entity, special district, non-profit organization, for-profit entity, person, or another entity, to hold title to and manage the property provided that the district, organization, entity, or person meets the requirements of Sections 65965–65968 of the Government Code, as amended. As the State's trustee for fish and wildlife resources, CDFW is to be named as a third-party beneficiary under the conservation easement. SMUD will consult with CDFW in determining the suitability of the proposed mitigation lands to offset impacts of the project on Swainson's hawk foraging habitat.

- Management authorization holders/project sponsors will provide for management of the mitigation lands in perpetuity by funding a management endowment.

In response to comment L1-5, the following revision has been made to Mitigation Measure 3.3-4b to require consultation with CDFW to determine if passive relocation would be appropriate to avoid impacts on wintering or nesting burrowing owls, and to require mitigation at a 3:1 ratio to offset habitat loss.

Mitigation Measure 3.3-4b: Avoid and minimize impacts on burrowing owls.

To avoid and minimize impacts on burrowing owls, SMUD will implement the following guidelines adapted from the CDFW *Staff Report on Burrowing Owl Mitigation* (CDFG 2012):

- SMUD will have preconstruction burrowing owl surveys conducted in all areas that may provide suitable nesting habitat according to CDFW (CDFG 2012) guidelines. A qualified wildlife biologist shall conduct take avoidance surveys, including documentation of burrows and burrowing owls, in all suitable burrowing owl habitat within 500 feet of proposed construction. The take avoidance surveys, consisting of up to four visits, shall be initiated within 30 days of and completed at least 14 days before construction is initiated at a given location. In areas with burrows or refuge that could potentially support burrowing owls, a clearance visit shall be conducted within 24 hours of construction, including when construction work is reinitiated after a lapse of two or more weeks.
- SMUD will avoid disturbing active western burrowing owl nests and occupied nesting burrows.
    - In accordance with standard CDFW mitigation guidelines, SMUD and its construction contractor will avoid disturbance at occupied burrows in accordance with the following seasonal distance buffers for low, medium, and high levels of disturbance (CDFG 2012):
        - April 1 – August 15: 200 m (low), 500 m (medium), and 500 m (high)
        - August 16 – October 15: 200 m (low), 200 m (medium), and 500 m (high)
        - October 16 –March 31: 50 m (low), 100 m (medium), and 500 m (high)
    - These distances may be increased or decreased if, as determined by a qualified biologist, a different distance is required to ensure construction activities will not adversely affect occupied burrows or disrupt breeding behavior.
- If a qualified biologist, in consultation with CDFW, determines that construction could adversely affect occupied burrows during the September 1–January 31 nonbreeding season, ~~the qualified biologist~~ SMUD shall consult with CDFW to determine if ~~implement~~ passive relocation using one-way doors, in accordance with guidelines prepared by the California Burrowing Owl Consortium (CDFG 2012), should be implemented, and if off-site compensatory mitigation is required to offset habitat loss. Compensatory mitigation for loss of burrowing owl habitat would require protection of suitable mitigation lands in perpetuity at a minimum 3:1 mitigation ratio. ~~and through coordination with CDFW.~~

In response to comment L1-7, the following revision has been made to Mitigation Measure 3.3-9b, to clarify that post-construction monitoring would not consist of a

single survey at all turbines, but rather would require monthly surveys at all turbines for 1 year.

Mitigation Measure 3.3-9b: Conduct bird and bat mortality monitoring. To assess operational impacts on birds and bats and inform potential adaptive management and mitigation approaches, SMUD will conduct 1 year of postconstruction mortality monitoring in the project area, as follows:

- Qualified biologists shall monitor bird and bat mortality annually throughout the project area in accordance with the requirements set forth below, which incorporate guidelines described in SMUD's Solano BBCS (SMUD 2013), SMUD's Final Eagle Conservation Plan (SMUD 2014), and the California Guidelines for Reducing Impacts to Birds and Bats from Wind Energy Development (CEC and DFG 2007). The monitoring shall be conducted so that sufficient information is available to allow evaluation of WTG design characteristics and location effects that contribute to mortality, including information about the species, number, location, and distance of dead birds relative to WTG locations; availability of raptor prey species; and cause of bird and bat mortalities.
- Monitoring will be conducted monthly for 1 year at all turbines in the Solano 4 Wind Project area after the first delivery of power., and will include but not be limited to the following methods unless otherwise determined appropriate by SMUD:
    - The standard search radius will be 100 meters to account for terrain and WTG height.
    - A sufficient number of "road and pad" searches will be conducted to 150 meters to determine the proportion of carcasses falling outside of the standard (100-meter) search radius.
    - Searcher efficiency trials will be conducted for four seasons and will be sufficient to analyze differences in carcass size (small/medium/large) and vegetative cover.
    - Data will be analyzed using procedures described by the California Energy Commission and CDFW (CEC and CDFG 2007), or newer approaches (e.g., General Estimator [Dalthorp et al. 2018], the Evidence of Absence model [Dalthorp et al. 2017]). The data analysis will address adjusted fatality rates annually, seasonally, and by species. An annual report will be prepared each year and a final report will be prepared after the 1-year monitoring period.
    - If a carcass with a band is found in the project area, SMUD will promptly report the banding information to USFWS's Bird Banding Laboratory. SMUD will ~~coordinate~~consult with the laboratory to include any information provided by USFWS that is pertinent to avian mortality at the project site, if any, in the annual monitoring reports.

- After postconstruction monitoring data have been obtained, SMUD will review the data. In consultation with USFWS and CDFW, SMUD will determine which specific WTGs, if any, generate disproportionately high levels of avian mortalities (based on evidence of statistically significant higher levels of mortality relative to other WTGs), and whether adaptive management measures are needed to reduce or avoid mortalities at those specific WTGs.

- If unauthorized take of a federally listed or state-listed endangered or threatened avian or bat species occurs during project operation, SMUD will notify the appropriate agency (USFWS and/or CDFW) within 48 hours of the discovery, and will submit written documentation of the take to the appropriate agency within 2 calendar days. The documentation will describe the date, time, location, species, and if possible, cause of unauthorized take. Although not expected to occur, SMUD will implement any ~~actions required or recommended by~~ measures to avoid, minimize, or compensate for possible take in consulation with the USFWS and/or CDFW, including obtaining an Incidental Take Permit as appropriate~~as a result of the unauthorized take~~. Also see Mitigation Measure 3.3-9g *Implement Adaptive Management*.

SMUD will design and conduct postconstruction mortality monitoring in a way that ensures at least a 50 percent chance of detecting mortality of large raptors (including golden eagle and Swainson's hawk) caused by a collision with a project WTG. Modeling tools such as the Evidence of Absence model (Dalthorp et al. 2017) can be used to design studies with such an objective in mind. This may require adjusting the radius of the search area around the WTGs, the proportion of WTGs searched, or other standard parameters set forth above.

After postconstruction monitoring activities, SMUD will conduct an annual "clean sweep" survey around all Solano 4 turbines each subsequent calendar year for the life of the project. In addition, SMUD will continue its current practice of incidental monitoring of the project area ~~will continue~~ through reporting of incidental fatalities or injured birds by on-site staff to the Avian Reporting System (see Mitigation Measure 3.3-9h, "Implement Adaptive Management to Address Disproportionate Mortality of Special-Status Birds or Bats," below). SMUD will also continue to report incidental fatalities or injured birds in compliance with its USFWS Special Purpose Utility Permit (Permit ~~#MB98730A~~ #MB189818-0). As required in Mitigation Measure 3.3-9b SMUD will notify the appropriate agency (USFWS and/or CDFW) within 48 hours of the discovery any unauthorized take of a federally listed or state-listed endangered or threatened species.

The following mitigation measure numbers/letters have been corrected:

- ***Mitigation Measure 3.3-9~~d~~c:*** Implement a training program for construction and project personnel.

- ***Mitigation Measure 3.3-9~~e~~d:*** Provide funding for raptor recovery and rehabilitation.

- ***Mitigation Measure 3.3-9~~f~~e:*** Reduce vehicle collision risks to wildlife.

- ***Mitigation Measure 3.3-9~~g~~f:*** Secure an eagle incidental take permit for Solano 4 Wind from USFWS and implement permit conditions.
- ***Mitigation Measure 3.3-9~~h~~g:*** Implement adaptive management to address disproportionate mortality of special-status birds or bats.

3.4 Revisions to Cultural Resources

The following minor revision has been made to clarify Mitigation Measure 3.4-1a and avoid any ambiguity about how the mitigation would be implemented. The minor revision in no way changes the impact conclusions presented in the Draft EIR; therefore, recirculation of the EIR is not required.

> ***Mitigation Measure 3.4-1a: Avoid or conduct subsurface testing and/or monitoring during construction in areas with high potential for the presence of buried archaeological sites.***
>
> The construction contractor shall avoid conducting ground-disturbing activities in the few locations within the direct APE that have high or the highest potential for buried archaeological sites. If these areas cannot be avoided and project-related ground disturbance in those areas would be sufficiently deep that they could encounter buried archaeological resources, then additional actions may be necessary to mitigate any impacts on as-yet unidentified buried resources. These minimization efforts could include conducting subsurface testing before project construction and/or monitoring during the construction period. In the event that a historic-period archaeological site (such as concentrated deposits of bottles or bricks with makers marks, amethyst glass, or other historic refuse) is uncovered during grading or other construction activities, all ground-disturbing activity within 100 feet of the discovery shall be halted until a qualified archaeologist can assess the significance of the find. SMUD will be notified of the potential find and a qualified archeologist shall be retained to investigate its significance. Any previously undiscovered resources found during construction will be recorded on appropriate California Department of Parks and Recreation 523 forms and evaluated for significance under all applicable regulatory criteria. If the archaeologist determines that the find does not meet the CRHR standards of significance for cultural resources, construction may proceed. If the find is determined to be significant by the qualified archaeologist (i.e., because the find is determined to constitute either a historical resource or a unique archaeological resource), the archaeologist shall work with SMUD to follow accepted professional standards such as further testing for evaluation or data recovery, as necessary. If artifacts are recovered from significant historic-period archaeological resources, they shall be housed at a qualified curation facility. The results of the identification, evaluation, and/or data recovery program for any unanticipated discoveries shall be presented in a professional-quality report that details all methods and findings, evaluates the nature and significance of the resources, analyzes and interprets the results.

3.5 Revisions to Transportation and Traffic

The following minor revision has been made to clarify Mitigation Measure 3.11-2 and avoid any ambiguity about whether the mitigation will be implemented. The minor revision in no way changes the impact conclusions presented in the Draft EIR; therefore, recirculation of the EIR is not required.

> ***Mitigation Measure 3.11-2: Monitor the physical condition of roadway segments along primary access routes to the project site and restore the physical condition of affected roadways to the extent damaged by the project.***
>
> SMUD or its construction contractor will conduct a preconstruction survey and assessment of existing pavement conditions along SR 12 east, Shiloh Road, Collinsville Road, Talbert Lane, Stratton Road, Birds Landing Road, and Montezuma Hills Road. If the preconstruction pavement conditions are deficient, the preconstruction pavement analysis shall establish the baseline for required improvements. If the preconstruction pavement conditions are acceptable, improvements shall be required only if the postconstruction pavement condition is deficient, and only to the extent that the project demonstrably contributed to such deficiencies. If deficient following construction, any segments of SR 12 east and Shiloh Road, Collinsville Road, Talbert Lane, Stratton Road, Birds Landing Road, and Montezuma Hills Road that are affected by the project shall be returned to preconstruction conditions after construction. Implementing this measure will ensure that construction activities will not worsen pavement conditions, relative to existing conditions.
>
> Before construction, SMUD will ~~make a good-faith effort to~~ enter into mitigation agreements with Caltrans (for SR 12 east) and Solano County (for Shiloh Road, Collinsville Road, Talbert Lane, Stratton Road, Birds Landing Road, and Montezuma Hills Road) to verify the location, extent, timing, and fair-share cost to be paid by SMUD for any necessary pre- and postconstruction physical improvements. The fair-share amount will be either the cost to return the affected roadway segment to its preconstruction condition or a contribution to programmed planned improvements. Repairs may include overlays or other surface treatments.

This page intentionally left blank

4 Mitigation Monitoring and Reporting Program

This mitigation monitoring and reporting program (MMRP) summarizes the mitigation measures, implementation schedule, and responsible parties for monitoring the mitigation measures required of the proposed Solano 4 Wind Project, as set forth in the EIR prepared for the project.

Section 21081.6 of the California Public Resources Code and Section 15091(d) and Section 15097 of the State CEQA Guidelines require public agencies "to adopt a reporting or monitoring program for changes to the project which it has adopted or made conditions of project approval to mitigate or avoid significant effects on the environment." An MMRP is required for the project because the EIR for the project identified potentially significant adverse impacts related to construction and operation of the project, and mitigation measures have been identified to reduce most of those impacts to a less-than-significant-level.

This MMRP will be adopted by SMUD if it approves the project and will be kept on file at SMUD's Customer Service Center at 6301 S Street, Sacramento, CA 95817; and at SMUD's East Campus Operations Center at 4401 Bradshaw Road, Sacramento, CA 95827. SMUD will use this MMRP to ensure that identified mitigation measures, adopted as a condition of project approval, are implemented appropriately.

4.1 Mitigation Implementation and Monitoring

SMUD shall be responsible for monitoring the implementation of mitigation measures designed to minimize impacts associated with the project. Allthough SMUD shall have ultimate responsibility for ensuring implementation, others may be assigned the responsibility of actually implementing the mitigation. SMUD shall retain the primary responsibility for ensuring that the project meets the requirements of this MMRP and other permit conditions imposed by participating regulatory agencies.

SMUD shall designate specific personnel who will be responsible for monitoring implementation of the mitigation that will occur during project construction. The designated personnel will be responsible for submitting documentation and reports to SMUD on a schedule consistent with the mitigation measure and in a manner necessary for demonstrating compliance with mitigation requirements. SMUD shall ensure that the designated personnel have authority to require implementation of mitigation requirements and shall be capable of terminating project construction activities found to be inconsistent with mitigation objectives or project approval conditions.

SMUD and its appointed contractor also shall be responsible for ensuring that its construction personnel understand their responsibilities for adhering to the performance requirements of the mitigation plan and other contractual requirements related to the implementation of mitigation as part of project construction. In addition to the prescribed mitigation measures, Table 4-1 lists each identified environmental resource being affected (in the same order and using the same numbering system as in the EIR), the associated CEQA checklist question (used as the thresholds of significance in the EIR), the corresponding monitoring and reporting requirement, the party responsible for

ensuring implementation of the mitigation measure and monitoring effort, and the project component to which the mitigation measure applies.

If an issue addressed in the EIR does not result in mitigation, it is not included in the table.

4.2 Mitigation Enforcement

SMUD shall be responsible for enforcing mitigation measures. If alternative measures are identified that would be equally effective in mitigating the identified impacts, implementation of these alternative measures will not occur until agreed on by SMUD.

4.3 Reporting

SMUD shall, or may require the developer to, prepare a monitoring report on completion of the project describing the compliance of the activity with the required mitigation measures. Information regarding inspections and other requirements will be compiled and explained in the report. The report will be designed to simply and clearly identify whether mitigation measures have been adequately implemented. At a minimum, each report will identify the mitigation measures or conditions to be monitored for implementation, whether compliance with the mitigation measures or conditions has occurred, the procedures used to assess compliance, and whether further action is required. The report will be presented to SMUD's Board of Directors.

4.4 Mitigation Monitoring and Reporting Program Table

The categories identified in Table 4.1 are described below.

Issue Area – This column identifies which CEQA issue area the mitigation measure is attributed to in the EIR.

Impacts – This column provides the potential impacts summary.

Mitigation Measure – This column provides the verbatim text of the adopted mitigation measure.

Implementation Duration – This column identifies when the mitigation measure will be implemented (e.g., before construction, during construction, during operations-maintenance, during decommissioning).

Monitoring Duration – This column identifies the period within which monitoring will be conducted.

Responsibility – This column identifies the party(ies) responsible for implementation and/or enforcing compliance with the requirements of the mitigation measure.

Applicable Project Component – This column identifies with what component or under what conditions the mitigation measure will be implemented (e.g., all project components, during high wind conditions, construction within wetlands).

Table 4-1 Summary of Impacts and Mitigation Measures

CEQA Issue Area	Impacts	Mitigation Measures	Implementation Duration	Monitoring Duration	Responsibility		Applicable Project Component
					Implementation	Monitoring	
Aesthetics	**Impact 3.1-1: Project impacts on scenic vistas and potential for substantial degradation of existing visual character or quality of public views of the site and surroundings, including those within the viewshed of a state or locally designated scenic highway.**	**Mitigation Measure 3.1-1a: Design the Project to Avoid Aesthetic Impacts.** SMUD or its contractor shall consider topography when siting wind turbines and shall avoid major modifications to natural landforms or other characteristic parts of the landscape. The turbines shall be clustered or grouped to break up overly long lines of turbines. The turbines shall be similar in shape and size. Each WTG shall be painted a uniform white or light-grey color, "RAL 7035" or similar, per manufacturer's requirements. To minimize the structures' reflectivity, the paint used shall have a gloss level that does not exceed 30 percent, or 60–70 gloss units,[1] as calculated by the manufacturer. The surfaces of all other structures (e.g., meteorology towers) shall be given low-reflectivity finishes with neutral colors to minimize the contrast of the structures with their backdrops. Fewer, larger turbines shall be preferred over more, smaller turbines. Commercial messages and symbols shall be prohibited on wind turbines. Collection and home run lines shall be underground; no overhead collection of home run lines shall be used. To minimize ground disturbance, to the extent feasible, existing roadways shall be used to access turbine pads. All construction-related areas shall be kept clean and tidy, with construction materials and equipment stored in the construction staging and laydown areas and/or generally away from public view. SMUD or its contractor shall remove construction debris promptly at intervals of 2 weeks or less, at any one location.	Before and during construction All construction debris shall be removed promptly at intervals of 2 weeks or less, at any one location.	During construction	SMUD and Contractor	SMUD	All project components
Aesthetics	**Impact 3.1-1: Project impacts on scenic vistas and potential for substantial degradation of existing visual character or quality of public views of the site and surroundings, including those within the viewshed of a state or locally designated scenic highway.**	**Mitigation Measure 3.1-1b: Implement Operational Measures to Reduce Aesthetic Impacts.** Wind turbines shall be kept clean and in good repair. Nacelle covers and rotor nose cones shall always be maintained in place and undamaged. Inoperative turbines shall be repaired, replaced, or removed as quickly as feasible because a turbine that is broken or disabled will create a health and safety hazard and disrupt the visual experience of the casual observer. SMUD or its contractor shall remove derelict WTGs and derelict parts and pieces. Similarly, operations and maintenance areas shall be kept clean and tidy, with all equipment, parts, and supplies stored in areas that are screened from view and/or are generally not visible to the general public. Grading and landscape treatment around tower foundations shall match the conditions of surrounding landscape and habitat to recreate a pleasing visual environment.	During construction, operation-maintenance, and maintenance	During construction, operation, and maintenance	SMUD and/or Contractor	SMUD	All project components
Aesthetics	**Impact 3.1-2: Creation of new sources of substantial light or glare that would adversely affect day or nighttime views in the area.**	**Mitigation Measure 3.1-2: Use Technology to Reduce Night Sky Impacts.** To reduce the potential for visual impacts associated with lighting, lighting for the turbine doorways shall be limited to the illumination required for safety of personnel and security of project infrastructure. To minimize the effect of light pollution in the surrounding area, all lighting shall be motion-activated and downcast. To minimize night sky impacts from hazard navigation lighting associated with wind facilities, ADLS technology will be employed as described in the FAA Determination of No Hazard. ADLS is a radar-based obstacle avoidance system that activates obstruction lighting and audio signals only when an aircraft is close to an obstruction on which an ADLS unit is mounted, such as a wind turbine.	During construction and operation-maintenance	During construction and operation	Contractor	SMUD	Turbines and associated facilities (i.e. meteorological towers).
Air Quality	**Impact 3.2-1: Project construction activities would emit NO_X and PM_{10} at levels that could exceed YSAQMD and BAAQMD daily**	**Mitigation Measure 3.2-1: Reduce construction-related exhaust and dust emissions.** The construction contractor shall prepare a fugitive dust control plan for the project's construction phases. Before the start of construction, the plan shall be submitted to YSAQMD and BAAQMD for review and approval. The fugitive dust control plan shall include but not be limited to the following measures for all construction phases to reduce fugitive dust emissions and emissions of PM and NO_X exhaust:	Submit FDCP prior to start of construction to YSAQMD and BAAQMD for review and approval;	Before and during construction	Contractor	SMUD	All project components

[1] Gloss units is a measurement scale based on a highly polished reference black glass standard with a refractive index of 100 gloss units at the specified angle of measurement. A measurement of 70 gloss units represents a low-gloss condition.

Table 4-1 Summary of Impacts and Mitigation Measures

CEQA Issue Area	Impacts	Mitigation Measures	Implementation Duration	Monitoring Duration	Responsibility		Applicable Project Component
					Implementation	Monitoring	
	emissions thresholds for these pollutants.	Fugitive Dust Control Plan • All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered at a frequency adequate to maintain minimum soil moisture of 12 percent (at least two times per day). Moisture content can be verified by lab samples or moisture probe. • All haul trucks transporting soil, sand, or other loose material off-site shall be covered. • All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited. • All vehicle speeds on unpaved roads shall be limited to 15 miles per hour. • All roadways, driveways, and wind turbine generator foundations and work areas to be paved or graveled shall be completed as soon as possible. These areas shall be paved or graveled as soon as possible after grading unless seeding or soil binders are used. No recycled concrete will be utilized on the roadways. • Idling times shall be minimized either by shutting equipment off when not in use or by reducing the maximum idling time to 2 minutes. Clear signage shall be provided for construction workers at all access points. • All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition before operation. • A publicly visible sign shall be posted identifying the name and telephone number of the person to contact at SMUD regarding dust complaints. This person shall respond and take corrective action within 48 hours. The air districts' phone numbers shall also be visible to ensure compliance with applicable regulations. • All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 miles per hour. • Vegetative ground cover (e.g., fast-germinating native grass seed) shall be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established. • The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time shall be limited. Activities shall be phased to reduce the surface area disturbed at any one time. • All trucks and equipment, including their tires, shall be washed off before leaving the site. • Site access areas shall be covered with a 6- to 12-inch compacted layer of wood chips, mulch, or gravel to a distance of 100 feet from the paved road. • Sandbags or other erosion control measures shall be installed to prevent silt runoff to public roadways from sites with a slope greater than 1 percent. • The project shall develop a plan demonstrating that off-road equipment exceeding 50 horsepower) to be used in the construction project (owned, leased, and subcontractor vehicles) would achieve project-wide, fleet-average emissions reductions of 20 percent for NO_X and 45 percent for PM, compared to the most recent ARB fleet average. Acceptable options for reducing emissions include the use of late-model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, add-on devices such as particulate filters, and/or other options as they become available. • Low-VOC (i.e., ROG) coatings shall be used beyond local requirements (Regulation 8, Rule 3, "Architectural Coatings").	implement the FDCP during construction.				

Table 4-1 Summary of Impacts and Mitigation Measures

CEQA Issue Area	Impacts	Mitigation Measures	Implementation Duration	Monitoring Duration	Responsibility		Applicable Project Component
					Implementation	Monitoring	
		• All construction equipment, diesel trucks, and generators shall be equipped with best available control technology for reduction of NO_X and PM emissions. • All contractors shall use equipment that meets ARB's most recent certification standard for off-road heavy-duty diesel engines (BAAQMD 2017:Tables 8-2 and 8-3).					
Biological Resources	**Impact 3.3-1: Temporary and permanent construction impacts on special-status amphibians and reptiles.**	**Mitigation Measure 3.3-1a: Avoid and minimize impacts on California tiger salamander.** SMUD will implement the following measures to avoid and minimize potential construction impacts on California tiger salamander: • A qualified California tiger salamander biologist (defined as an individual with 3 years of experience conducting surveys for California tiger salamander and habitat in the project region) will be present on-site to conduct monitoring during project construction and decommissioning activities that disturb surface soils within 250 feet of drainages or any other aquatic features identified as suitable for California tiger salamander (AECOM 2018b). • SMUD will confine all project-related parking, storage areas, laydown sites, equipment storage, and any other surface-disturbing activities to previously disturbed areas or areas that are not suitable habitat for California tiger salamander (AECOM 2018b). To the extent it is not possible to limit such activities to previously disturbed areas or areas that are not suitable habitat for California tiger salamander, the qualified biologist will perform a preconstruction survey within 48 hours before constructing project-related parking, storage areas, laydown sites, and equipment storage sites to ensure California tiger salamander are not present. If a California tiger salamander is found within the project area, SMUD will implement any actions necessary to avoid take of California tiger salamander, including establishing appropriate buffer area and exclusion fencing in consultation with USFWS and/or CDFW. If after avoidance measure cannot avoid take, SMUD shall seek an Incidental Take Permit from USFWS and/or CDFW, as appropriate, and implement any measures specified therein to reduce chances of take and minimize and fully mitigate any incidental take (including the measures in this MM 3.3-1a). • All steep-walled holes or trenches that are 1 foot deep or greater and located within 250 feet of aquatic habitat that is suitable for CTS will have at least one escape ramp constructed of earthen fill or wooden planks. All such holes or trenches will be completely covered before sunset of each workday using boards or metal plates that are placed flush to the ground, and will be inspected before the start of daily construction activities. • To prevent inadvertent entrapment of California tiger salamanders during project construction, maintenance, and decommissioning, all construction pipes, culverts, conduits, and other similar structures stored on-site overnight will be inspected before the structure is buried. Plastic monofilament netting will not be used for sediment control because it could pose an entrapment hazard to California tiger salamanders and other wildlife.	Qualified biologist to monitor during construction and decommissioning activities that disturb surface soils within 250 ft of drainages or other aquatic features. Ramp trenches or holes before sunset each workday and inspect before start of daily construction. Inspect pipes, culverts, conduits, etc. stored overnight before buried. Avoidance and minimization measures to be implemented during construction, operation-maintenance, and decommissioning.	During construction, operation, and decommissioning	Qualified Biologist and Contractor	SMUD	All project components near suitable habitat for CTS
Biological Resources	**Impact 3.3-1: Temporary and permanent construction impacts on special-status amphibians and reptiles.**	**Mitigation Measure 3.3-1b: Develop and implement a worker environmental awareness program.** Before the start of any construction activity, SMUD will develop a worker environmental awareness program that will be provided to all personnel working on the project site during construction and operation. Training materials and briefings will include but not be limited to the following elements: • A discussion of applicable requirements established by the following laws and regulations, consequences of noncompliance, and the specific conditions of permits obtained for the project from regulatory agencies (USACE, the RWQCB, USFWS, and CDFW) under these laws and regulations: • the federal ESA and CESA; • the Bald and Golden Eagle Protection Act; • the Migratory Bird Treaty Act;	SMUD to develop worker environmental awareness program (WEAP) before construction. Provide WEAP to all personnel working on project site during construction, operation-	During construction, operation-maintenance, and decommissioning	Qualified Biologist and Contractor	SMUD	All project components

Table 4-1 Summary of Impacts and Mitigation Measures

CEQA Issue Area	Impacts	Mitigation Measures	Implementation Duration	Monitoring Duration	Responsibility		Applicable Project Component
					Implementation	Monitoring	
		• the Clean Water Act; • Sections 3503, 3503.5, 3511, 3513, 3800(a), 4150, 4700, 5050, 5515, and 1602 of the California Fish and Game Code; • California Code of Regulations Title 14, Sections 30.10 and 251.1; • the Porter-Cologne Water Quality Control Act; • Sections 5004 and 7201 of the CDFA Code; and • California Coastal Act. • Information about workers' responsibilities with regard to California tiger salamander, an overview of the species' appearance and habitat, and a description of the measures being taken to reduce potential effects on the species during project construction. • Identification and values of the special-status plant and wildlife species to be protected by the project; identification of important wildlife habitat and sensitive natural communities to be protected; and identification of special-status species, life history descriptions, habitat requirements during various life stages, and the species' protected status. • Fire protection measures, measures to avoid introduction and minimize the spread of invasive weeds during construction and operation; procedures for managing trash and food waste to prevent attracting corvids or nuisance wildlife to the site; and procedures for preventing and containing spills of hazardous substances. SMUD will conduct the worker-training program for new employees coming on the project site before the start of any construction, maintenance, or decommissioning activity that would disturb surface soils. SMUD will ensure that all personnel working on-site receive the training, including construction contractors and personnel who will operate and maintain project facilities. The training program will be recorded and subsequently shown to any project personnel who are unable to attend the initial training program. If a California tiger salamander, alive or dead, is encountered (i.e., observed, killed, or otherwise taken) at any location on the project site during the project's lifetime, SMUD will notify USFWS and CDFW on the same day as the detection. Project personnel will not move the salamander encountered unless instructed to do so by USFWS and CDFW. If instructed to move the California tiger salamander by USFWS, a USFWS-approved and permitted biologist will carefully relocate the salamander by hand to a suitable, nearby active burrow system (e.g., for Botta pocket gopher or California ground squirrel) outside the area where project activities could injure or kill the animal. (The USFWS-approved and permitted biologist will be an individual with a Section 10[a][1][A] handler's permit for California tiger salamander.) The qualified biologist will monitor the rescued California tiger salamander until it enters the burrow. In addition to the measures described above, SMUD will implement the following measures, listed after Impact 3.3-13 below, to protect water quality and drainages during construction: • Mitigation Measure 3.3-13a, "Avoid and Minimize Impacts on Wetlands and Other Waters of the United States" • Mitigation Measure 3.3-13b, "Avoid and Minimize Potential Effects on Waters of the United States Associated with Installation of Access Road Culvert Crossings" • Mitigation Measure 3.3-13c, "Comply with Section 1602 Streambed Alteration Agreement" • Mitigation Measure 3.3-13d, "Avoid and Minimize Potential Effects on Waters of the United States from Horizontal Directional Drilling"	maintenance, and decommissioning. Ongoing WEAP training. SMUD will notify USFWS and CDFW (on the same day) if a CTS is detected (dead or alive) and follow agency directions.				

Table 4-1 Summary of Impacts and Mitigation Measures

CEQA Issue Area	Impacts	Mitigation Measures	Implementation Duration	Monitoring Duration	Responsibility		Applicable Project Component
					Implementation	Monitoring	
Biological Resources	**Impact 3.3-2: Construction impacts on nesting birds (nonraptors).**	**Mitigation Measure 3.3-2: Avoid impacts on nesting birds.** In addition to Mitigation Measure 3.3-1b, "Develop and Implement a Worker Environmental Awareness Program," and measures for biological monitors, SMUD will implement the following measures to avoid directly or indirectly affecting nesting birds during project construction: • SMUD will conduct preconstruction nesting bird surveys to locate all active nests of special-status birds and birds protected under the MBTA and California Fish and Game Code Sections 3503 and 3503.5. No more than one week before any construction activities occur during the nesting season (February 1–August 31), including vegetation removal if necessary, a qualified biologist shall conduct nesting bird surveys to identify any nests within 100 feet of proposed work areas. The qualified biologist is defined as an individual knowledgeable about the distribution, habitat, life history, and identification of Northern California birds, and with 3 years of experience in nest searching for birds that may be present in the project area. • If nests are detected during the preconstruction surveys, a 100-foot exclusion zone will be established around the nest in which no work will be allowed until the young have successfully fledged or nesting activity has ceased. The qualified biologist will make the determination of fledging or cessation of nesting. In consultation with a qualified avian biologist, USFWS, and CDFW, the size of the exclusion zone may be modified depending on the species and the type of construction activity and associated disturbance anticipated near the nest.	Preconstruction surveys 1 week or less before construction during nesting season (Feb 1 – Aug 31). Establish 100-ft buffers around nests and monitor during construction. Buffers may be modified in consultation with avian biologist, USFWS, and CDFW.	Before and during construction	Qualified Biologist and Contractor	SMUD, CDFW and USFWS	All project components
Biological Resources	**Impact 3.3-4: Construction impacts on raptor nesting activity.**	**Mitigation Measure 3.3-4a: Avoid and minimize impacts on nesting raptors.** SMUD will implement the following measures to avoid and minimize impacts on nesting raptors: • If construction activities are scheduled to occur during the breeding season (February 1–August 31), SMUD will conduct preconstruction surveys in all potential suitable raptor nesting habitat within 0.25 mile of proposed construction areas, including trees, shrubs, grasslands, and wetland vegetation. A qualified wildlife biologist shall determine the timing of preconstruction surveys based on the time of year and habitats that are present, and shall conduct the surveys no more than 30 days before construction. The 30-day survey period allows flexibility in order for surveys to be conducted when the likelihood of nest detection is maximized (e.g., during courtship, nest building, or when feeding young). • SMUD will conduct nesting surveys for Swainson's hawks in accordance with the Swainson's Hawk Technical Advisory Committee (TAC) guidance published in 2000 (Recommended Timing and Methodology for Swainsons' Hawk Nesting Surveys in California's Central Valley). These methods will require surveys to start early in the nesting season (late March to early April). Surveys will be conducted within a minimum 0.25-mile radius of the project area or a larger area if necessary to identify potentially active nests potentially affected by project construction. As required by the TAC guidance, surveys will be conducted for at least two survey periods in the nesting season, immediately before the start of project construction activities. The qualified biologist conducting the surveys will have a minimum of 2 years of experience in implementing the TAC survey methodology. • SMUD will maintain no-disturbance buffers around active raptor nests during the breeding season, or until it is determined the young have fledged. The no-disturbance zone shall include a 500-foot buffer around all raptor nests (including owls) and a 0.25-mile buffer for any active Swainson's hawk nests. o No-disturbance buffer sizes for non-special-status species raptors may be increased or decreased by a qualified biologist based on the sensitivity of the species of raptor, or based on site conditions that affect disturbance, such as the type of work, vegetation structure or density, and the line of sight between construction work and the nest to nesting raptors. o No-disturbance buffer sizes for special-status raptor species may be increased or decreased by the qualified biologist in consultation with USFWS and CDFW as appropriate.	Preconstruction surveys in all potential suitable raptor nesting habitat within 0.25 mile of proposed construction areas, including trees, shrubs, grasslands, and wetland vegetation, if construction occurs Feb 1 – Aug 31. No-disturbance zone of 500-foot buffer around all raptor nests (including owls) and a 0.25-mile buffer for any active Swainson's hawk nests.	Before and during construction	Qualified Biologist and Contractor	SMUD and CDFW	All project components within suitable habitat for nesting raptors

Table 4-1 Summary of Impacts and Mitigation Measures

CEQA Issue Area	Impacts	Mitigation Measures	Implementation Duration	Monitoring Duration	Responsibility		Applicable Project Component
					Implementation	Monitoring	
		○ Buffers will not apply to construction-related traffic using existing roads that are not limited to project-specific use (e.g., county roads, highways, farm roads). ○ If no nests are observed during the preconstruction survey but nesting occurs after the start of construction, it will be assumed that the individuals are acclimated to the level of ongoing disturbance. • SMUD will clearly identify the locations of no-disturbance buffers (e.g., 250 feet, 500 feet, or 0.25 mile) on maps that will be made available to construction crews. • Before and during construction, a qualified biologist shall identify all active nest setback areas on construction drawings, and if appropriate, shall flag or fence the setback areas. • If construction is scheduled to occur during the non-nesting season, then no nesting bird surveys are required before construction activity begins, except provisions for surveys for burrowing owls outside the nesting season (September 1–January 31), as specified below in Mitigation Measure 3.3-4b.					
Biological Resources	**Impact 3.3-4: Construction impacts on raptor nesting activity.**	**Mitigation Measure 3.3-4b: Avoid and minimize impacts on burrowing owls.** To avoid and minimize impacts on burrowing owls, SMUD will implement the following guidelines adapted from the CDFW *Staff Report on Burrowing Owl Mitigation* (CDFG 2012): • SMUD will have preconstruction burrowing owl surveys conducted in all areas that may provide suitable nesting habitat according to CDFW (CDFG 2012) guidelines. A qualified wildlife biologist shall conduct take avoidance surveys, including documentation of burrows and burrowing owls, in all suitable burrowing owl habitat within 500 feet of proposed construction. The take avoidance surveys, consisting of up to four visits, shall be initiated within 30 days of and completed at least 14 days before construction is initiated at a given location. In areas with burrows or refuge that could potentially support burrowing owls, a clearance visit shall be conducted within 24 hours of construction, including when construction work is reinitiated after a lapse of two or more weeks. • SMUD will avoid disturbing active western burrowing owl nests and occupied nesting burrows. ○ In accordance with standard CDFW mitigation guidelines, SMUD and its construction contractor will avoid disturbance at occupied burrows in accordance with the following seasonal distance buffers for low, medium, and high levels of disturbance (CDFG 2012): ▪ April 1 – August 15: 200 m (low), 500 m (medium), and 500 m (high) ▪ August 16 – October 15: 200 m (low), 200 m (medium), and 500 m (high) ▪ October 16 – March 31: 50 m (low), 100 m (medium), and 500 m (high) ○ These distances may be increased or decreased if, as determined by a qualified biologist, a different distance is required to ensure construction activities will not adversely affect occupied burrows or disrupt breeding behavior. • If a qualified biologist, in consultation with CDFW, determines that construction could adversely affect occupied burrows during the September 1–January 31 nonbreeding season, SMUD shall consult with CDFW to determine if passive relocation using one-way doors, in accordance with guidelines prepared by the California Burrowing Owl Consortium (CDFG 2012), should be implemented, and if off-site compensatory mitigation is required to offset habitat loss. Compensatory mitigation for loss of burrowing owl habitat would require protection of suitable mitigation lands in perpetuity at a minimum 3:1 mitigation ratio.	Preconstruction surveys in suitable habitat before construction (up to 4 visits, initiated within 30 days of and completed at least 14 days before construction begins in a given area). Clearance visit required 24 hours before construction in areas potentially supporting burrowing owls and when construction work is reinitiated after a lapse of 2 or more weeks. Implement applicable seasonal distance buffers for low, medium, or high levels of disturbance. Passive relocation if necessary, during Sept 1 – Jan 31 in consultation with CDFW.	Before and during construction	Qualified Biologist and Contractor	SMUD and CDFW	All project components within suitable habitat for burrowing owls
Biological Resources	**Impact 3.3-5: Removal and modification of raptor nesting, foraging,**	**Mitigation Measure 3.3-5: Acquire off-site mitigation to replace lost raptor foraging habitat.**	Before construction	N/A	SMUD	Mitigation Management Organization	Foraging habitat for Swainson's hawk

Table 4-1 Summary of Impacts and Mitigation Measures

CEQA Issue Area	Impacts	Mitigation Measures	Implementation Duration	Monitoring Duration	Responsibility		Applicable Project Component
					Implementation	Monitoring	
	and roosting habitat during construction.	SMUD will implement the following compensatory mitigation to offset net impacts on foraging habitat for breeding Swainson's hawks and other raptor species. Based on Swainson's hawk nest locations documented in recent years, no permanent project impacts on foraging habitat will occur within 1 mile of an active Swainson's hawk. Depending on whether the 150m WTG option or the 136m WTG option is selected, 25.38 acres or 30.49 acres of suitable Swainson's hawk foraging habitat will be required to mitigate this loss. SMUD will mitigate the loss of Swainson's hawk foraging habitat in accordance with CDFW recommendations (DFG 1994) by providing mitigation lands as follows: • Foraging habitat permanently lost within 5 miles of an active Swainson's hawk nest tree but more than 1 mile from the nest tree (either 25.38 acres or 30.49 acres, depending on the WTG option selected) will be replaced with 0.75 acre of mitigation land for each acre of foraging habitat permanently lost because of project construction (0.75:1 ratio). This ratio is consistent with recommendations in DFG 1994: "Projects within 5 miles of an active nest tree but greater than 1 mile from the nest tree shall provide 0.75 acres of habitat mitigation land for each acre of urban development authorized [0.75:1])." All mitigation lands protected under this requirement shall be protected in perpetuity in a form acceptable to CDFW (e.g., through fee title acquisition or conservation easement) on agricultural lands or other suitable habitats that provide foraging habitat for Swainson's hawk. The easement will be held by a governmental entity, special district, non-profit organization , for-profit entity, person, or another entity, to hold title to and manage the property provided that the district, organization, entity, or person meets the requirements of Sections 65965–65968 of the Government Code, as amended. As the State's trustee for fish and wildlife resources, CDFW is to be named as a third-party beneficiary under the conservation easement. SMUD will consult with CDFW in determining the suitability of the proposed mitigation lands to offset impacts of the project on Swainson's hawk foraging habitat. • Management authorization holders/project sponsors will provide for management of the mitigation lands in perpetuity by funding a management endowment.		Management of the mitigation lands will be monitored in perpetuity by funding a management endowment			
Biological Resources	**Impact 3.3-6: Construction impacts on bald and golden eagle nesting activity.**	**Mitigation Measure 3.3-6: Avoid and minimize impacts on nesting eagles.** SMUD will implement the following measures to avoid and minimize impacts on nesting eagles: • Ground-based surveys will be conducted to assess the status of all previously documented eagle nest locations (CNDDB or other reliable sources) within the 2-mile buffer of the project area, and will follow guidance set forth in USFWS (2013) for ground-based surveys to determine occupancy, including the following site-specific recommendations: ○ Two 4-hour observations shall be conducted at each nest (multiple nests may be observed simultaneously), one in late January and the other in late February, to determine whether territories are occupied by adult eagles and identify nesting activity where possible. ○ If an active nest is located, no further ground monitoring is required. However, if nesting behavior is observed within 2 miles of the project buffer and a nest site is not located, an aerial inspection of the area shall be conducted. ○ The results of the surveys shall be documented in a report and submitted to USFWS and CDFW no later than August of the breeding season in which the survey was conducted (e.g., August 2020 for winter/spring 2020 surveys). SMUD will implement the following avoidance buffer distances for bald eagle and golden eagle (respectively) for the indicated construction activity, assuming a direct line of sight between the construction activity and the active nest: • Human foot traffic: 400 meters/800 meters • Pass-through vehicular traffic: 200 meters/400 meters	Preconstruction surveys and research before construction. Nest surveys in Jan and Feb. Results of surveys to be submitted to USFWS and CDFW no later than Aug of the breeding season in which the survey was conducted (e.g., Aug 2020 for winter/spring 2020 surveys). SMUD to implement avoidance buffer distances for bald eagle and golden eagle nests.	Before and during construction.	Qualified Biologist and Contractor	SMUD, USFWS, CDFW	All project components within nest buffers

Table 4-1 Summary of Impacts and Mitigation Measures

CEQA Issue Area	Impacts	Mitigation Measures	Implementation Duration	Monitoring Duration	Responsibility		Applicable Project Component
					Implementation	Monitoring	
		• Any other construction work except the types described below: 800 meters/1,600 meters • Blasting: 1,600 meters for both species • Helicopter flight: 1,600 meters (horizontal and vertical) for both species Active eagle nests and associated buffers will be indicated in construction drawings for the project and will be discussed in the worker environmental awareness program training for construction workers (Mitigation Measure 3.3-1b).	Ongoing WEAP training.				
Biological Resources	**Impact 3.3-7: Removal and modification of golden eagle foraging habitat during construction.**	**Mitigation Measure 3.3-7: Implement Mitigation Measure 3.3-5.** SMUD will implement Mitigation Measure 3.3-5, "Acquire Off-site Mitigation to Replace Disturbed Raptor Foraging Habitat," listed above.	See MM 3.3-5	See MM 3.3-5	See MM 3.3-5	See MM 3.3-5	See MM 3.3-5

Biological Resources	**Impact 3.3-9: Injury to and mortality of raptors, other birds, and bats from project operation.**	**Mitigation Measure 3.3-9a: Avoid and minimize operational impacts on birds and bats.**
		SMUD will design and operate the project to minimize potential operational impacts on birds and bats by adhering to impact avoidance and minimization measures, including those described the *SMUD Solano Wind* Bird *and Bat Conservation Strategies* (SMUD 2013), and SMUD's Eagle Conservation Plan (SMUD 2014). These measures include the following:
		• Maintain a landscape that does not encourage bird or bat occurrence by conducting regular rotational agricultural activities to keep rodent prey populations to relatively low levels. In addition, implement a prey management program to reduce the availability of rabbits, ground squirrels, and other prey that could attract eagles and other raptors.
		• Adhere to the general guidelines for turbine and WTG tower design and operation to minimize bird and bat mortality:
		  ○ Use turbines and WTG tower designs lacking potential raptor perches that may encourage bird activity near the moving rotors.
		  ○ Use turbines with rotor tips at least 25 meters, preferably 30 meters, above the ground.
		• Avoid guy wires on meteorological towers.
		• Select WTG sites using the following guidelines designed to minimize the extent of potential avian and bat mortality:
		  ○ Minimize the density of WTGs on the landscape and avoid placing WTGs close together in long strings, which creates barriers to movement by restricting the available space for birds and bats to negotiate through a WTG field.
		  ○ Establish setbacks from roads, residences, and wetlands and other unique habitats where birds and bats are more likely to congregate.
		  ○ Where possible, avoid steep slopes, canyons, saddles, and other high-risk topographic features.
			Before and during construction-maintenance, and decommissioning	Before and during construction-maintenance, and decommissioning	SMUD and Contractor	SMUD	All project components

Biological Resources	**Impact 3.3-9: Injury to and mortality of raptors, other birds, and bats from project operation.**	**Mitigation Measure 3.3-9b: Conduct bird and bat mortality monitoring.** To assess operational impacts on birds and bats and inform potential adaptive management and mitigation approaches, SMUD will conduct 1 year of postconstruction mortality monitoring in the project area, as follows: • Qualified biologists shall monitor bird and bat mortality annually throughout the project area in accordance with the requirements set forth below, which incorporate guidelines described in SMUD's Solano BBCS (SMUD 2013), SMUD's *Final Eagle Conservation Plan* (SMUD 2014), and the *California Guidelines for Reducing Impacts to Birds and Bats from Wind Energy Development* (CEC and DFG 2007). The monitoring shall be conducted so that sufficient information is available to allow evaluation of WTG design characteristics and location effects that contribute to mortality, including information about	For 1 year during operation. An annual report will be prepared each year and a final report will be prepared after the 1-year monitoring period.	Each month for 1 year; thereafter an annual "clean sweep" around all Solano 4 turbines will be conducted each subsequent calendar year for the life of the project	Qualified biologists and SMUD	SMUD	All project turbines and roads

Table 4-1 Summary of Impacts and Mitigation Measures

CEQA Issue Area	Impacts	Mitigation Measures	Implementation Duration	Monitoring Duration	Responsibility		Applicable Project Component
					Implementation	Monitoring	
		the species, number, location, and distance of dead birds relative to WTG locations; availability of raptor prey species; and cause of bird and bat mortalities. • Monitoring will be conducted monthly for 1 year at all turbines in the Solano 4 Wind Project area after the first delivery of power, and will include but not be limited to the following methods unless otherwise determined appropriate by SMUD: ○ The standard search radius will be 100 meters to account for terrain and WTG height. ○ A sufficient number of "road and pad" searches will be conducted to 150 meters to determine the proportion of carcasses falling outside of the standard (100-meter) search radius. ○ Searcher efficiency trials will be conducted for four seasons and will be sufficient to analyze differences in carcass size (small/medium/large) and vegetative cover. ○ Data will be analyzed using procedures described by the California Energy Commission and CDFW (CEC and CDFG 2007), or newer approaches (e.g., General Estimator [Dalthorp et al. 2018], the Evidence of Absence model [Dalthorp et al. 2017]). The data analysis will address adjusted fatality rates annually, seasonally, and by species. An annual report will be prepared each year and a final report will be prepared after the 1-year monitoring period. ○ If a carcass with a band is found in the project area, SMUD will promptly report the banding information to USFWS's Bird Banding Laboratory. SMUD will consult with the laboratory to include any information provided by USFWS that is pertinent to avian mortality at the project site, if any, in the annual monitoring reports. • After postconstruction monitoring data have been obtained, SMUD will review the data. In consultation with USFWS and CDFW, SMUD will determine which specific WTGs, if any, generate disproportionately high levels of avian mortalities (based on evidence of statistically significant higher levels of mortality relative to other WTGs), and whether adaptive management measures are needed to reduce or avoid mortalities at those specific WTGs. • If unauthorized take of a federally listed or state-listed endangered or threatened avian or bat species occurs during project operation, SMUD will notify the appropriate agency (USFWS and/or CDFW) within 48 hours of the discovery, and will submit written documentation of the take to the appropriate agency within 2 calendar days. The documentation will describe the date, time, location, species, and if possible, cause of unauthorized take. Although not expected to occur, SMUD will implement any measures to avoid, minimize, or compensate for possible take in consultation with the USFWS and/or CDFW, including obtaining an Incidental Take Permit, as appropriate. Also, see Mitigation Measure 3.3-9g *Implement Adaptive Management*. SMUD will design and conduct postconstruction mortality monitoring in a way that ensures at least a 50 percent chance of detecting mortality of large raptors (including golden eagle and Swainson's hawk) caused by a collision with a project WTG. Modeling tools such as the Evidence of Absence model (Dalthorp et al. 2017) can be used to design studies with such an objective in mind. This may require adjusting the radius of the search area around the WTGs, the proportion of WTGs searched, or other standard parameters set forth above. After postconstruction monitoring activities, SMUD will conduct an annual "clean sweep" survey around all Solano 4 turbines each subsequent calendar year for the life of the project. In addition, SMUD will continue its current practice of incidental monitoring of the project area through reporting of incidental fatalities or injured birds by on-site staff to the Avian Reporting System (see Mitigation Measure 3.3-9h, "Implement Adaptive Management to Address Disproportionate Mortality of Special-Status Birds or Bats," below). SMUD will also continue to report incidental fatalities or injured birds in compliance with its USFWS Special Purpose Utility Permit (Permit #MB189818-0). As required in Mitigation Measure 3.3-9b SMUD will notify	SMUD to promptly report any banded carcasses to USFWS's lab. After 1 year data collection, SMUD to consult with USFWS and CDFW. Notify USFWS and/or CDFW within 48 hours of discovery of unauthorized take of a listed species. After postconstruction monitoring activities, incidental monitoring of the project area will continue through reporting of incidental fatalities or injured birds				

Table 4-1 Summary of Impacts and Mitigation Measures

CEQA Issue Area	Impacts	Mitigation Measures	Implementation Duration	Monitoring Duration	Responsibility		Applicable Project Component
					Implementation	Monitoring	
		the appropriate agency (USFWS and/or CDFW) within 48 hours of the discovery any unauthorized take of a federally listed or state-listed endangered or threatened species.					
Biological Resources	**Impact 3.3-9: Injury to and mortality of raptors, other birds, and bats from project operation.**	**Mitigation Measure 3.3-9c: Implement a training program for construction and project personnel.** SMUD will implement a training program so that on-site staff will have a thorough understanding of eagle mortality issues and corresponding protocols. The training program focuses on staff members with direct and indirect implementation responsibilities, including managers, supervisors, engineers, and on-site field crews. The training program will include the following elements: • introduction and description of eagle mortality issues; • description of SMUD's environmental stewardship policy (SMUD Board Policy SD-7); • description of avian resources in the project area and the species most susceptible to collision mortality or injury; • discussion of federal and state regulations that protect birds, legal implications, and the need for compliance; • protocols for recording/reporting avian incident data and procedures for carcass collection and injured wildlife; and • responsibilities of staff members to implement the BBCS.	Before and during construction, operation-maintenance, and decommissioning	Before and during construction, operation-maintenance, and decommissioning	Qualified Biologists and SMUD	SMUD	All project components
Biological Resources	**Impact 3.3-9: Injury to and mortality of raptors, other birds, and bats from project operation.**	**Mitigation Measure 3.3-9d: Provide funding for raptor recovery and rehabilitation.** SMUD will contribute $5,000 each year for the duration of project operation to the University of California, Davis, California Raptor Center (UC Davis Raptor Center) or its successors for rehabilitation of injured avian species, including eagles and other raptors. The UC Davis Raptor Center is authorized by USFWS and CDFW to rehabilitate injured and orphaned raptors. The UC Davis Raptor Center successfully returns approximately 60 percent of the sick, injured, and orphaned birds it receives to the wild each year (UC Davis California Raptor Center 2019).	Annually for duration of project operation	N/A	SMUD	SMUD	Project operations
Biological Resources	**Impact 3.3-9: Injury to and mortality of raptors, other birds, and bats from project operation.**	**Mitigation Measure 3.3-9e: Reduce vehicle collision risks to wildlife.** SMUD's operators will enforce a speed limit of 15 miles per hour on all roads on the project site to minimize the risk of collisions with small mammals and other wildlife, thereby reducing the number of roadkills, a potential food source that could attract eagles and increase their risk of vehicle collisions.	During construction and operation-maintenance, and decommissioning	During construction and operation-maintenance, and decommissioning	SMUD and Contractor	SMUD	All project component roads
Biological Resources	**Impact 3.3-9: Injury to and mortality of raptors, other birds, and bats from project operation.**	**Mitigation Measure 3.3-9f: Secure an eagle incidental take permit for Solano 4 Wind from USFWS and implement permit conditions.** SMUD will compensate for the loss of any golden or bald eagles injured or killed as a result of project operation by complying with the conditions described in SMUD's Eagle Take Permit. Compensatory mitigation for eagle fatalities may include paying for the retrofitting of electrical utility poles that present a high risk of electrocution to eagles, as prescribed in the *Eagle Conservation Plan Guidance*, Appendix G (USFWS 2013). The performance standard for this compensatory mitigation would be to implement sufficient measures (e.g., electric utility retrofits) to offset all eagle fatalities directly attributable to project operation and resulting in permanent removal of an eagle from the wild, whether detected during structured postconstruction mortality monitoring surveys or detected incidentally. For each instance of project-related injury or mortality that removes a bird from the population, 32 utility poles shall be retrofitted. This is based on a resource equivalency analysis performed in accordance with USFWS guidelines (USFWS 2013:Appendix G) and assumes that each retrofitted pole would result in 10 years of avoided loss because of electrocution. The resource equivalency analysis also assumes that the take of one eagle and the associated compensatory mitigation will occur during the same year. Certain utility poles may be eligible for "reframing" (as opposed to retrofitting) to avoid electrocution, which USFWS assumes will result in 30 years of avoided loss rather	Before and during construction, operation-maintenance, and decommissioning. Compensatory mitigation for the loss of each eagle shall be completed within 1 year of each instance of documented take. Comply with the federal ITP permit for the life of the project.	During construction, operation-maintenance, and decommissioning.	SMUD and Contractor	SMUD, USFWS	All project components.

Table 4-1 Summary of Impacts and Mitigation Measures

CEQA Issue Area	Impacts	Mitigation Measures	Implementation Duration	Monitoring Duration	Responsibility		Applicable Project Component
					Implementation	Monitoring	
		than 10 years. The reframing of 14 eligible utility poles is sufficient to offset take of a single eagle, according to the resource equivalency analysis. Compensatory mitigation for the loss of each eagle shall be completed within 1 year of each instance of documented take. Retrofitted poles must be considered "high-risk" for electrocution (per USFWS 2013:Appendix G). For instances of bald eagle take, retrofitted poles must be located in areas where both species occur and within the Pacific Flyway north of 40 degrees North latitude. For instances of golden eagle take, retrofitted poles must be located within the Pacific Flyway. These areas represent the USFWS-designated "Eagle Management Units" at the project site for bald eagles and golden eagles, respectively (USFWS 2016). SMUD will comply with the federal eagle incidental take permit that will be secured for the project. Any mitigation completed toward fulfillment of the eagle take permit requirements will be counted toward the mitigation requirements described above. If mitigation requirements specified in the USFWS eagle take permit differ from those described above, the USFWS permit requirements shall prevail.					

Biological Resources	**Impact 3.3-9: Injury to and mortality of raptors, other birds, and bats from project operation.**	**Mitigation Measure 3.3-9g: Implement adaptive management to address disproportionate mortality of special-status birds or bats.**
		SMUD will implement adaptive management strategies if postconstruction mortality monitoring studies determine that project operation is resulting in disproportionate mortality of one or more avian or bat species. The goal of the adaptive management strategies is to avoid a local population of avian or bat species dropping below self-sustaining levels. In accordance with the Solano BBCS (SMUD 2014), a determination to implement adaptive management based on "disproportionate mortality" will consider the factors listed below.
		• Number of annual fatalities per turbine
		• Disproportionate representation of a particular species
		• Comparison to other wind energy facilities
		As part of the annual survey and monitoring program described in Mitigation Measure 3.3-3b above, SMUD will analyze information related to these factors. Through this process of data collection, analysis, and consideration of these factors, disproportionate mortality at individual WTGs will be analyzed.
		A project-related fatality of one or more federal- or California-listed species or one or more California Fully Protected Species would trigger consultation with USFWS and/or CDFW, and implementation of the adaptive management and compensatory mitigation measures described below. If avian or bat mortality resulting from operation of the Solano 4 Wind Project exceeds the maximum estimated fatality rates described in Tables 3.3-11 and 3.3-12 for special-status birds or bats as well as common species, SMUD will develop and implement a comprehensive set of biologically based, reasonable, and feasible management and/or mitigation measures for responding to the fatality threshold exceedance, along with a timeline for implementation. SMUD will consult the USFWS and CDFW in development of the adaptive management and compensatory mitigation strategies for special-status birds and bats. Potential adaptive management actions to be considered include but are not limited to the following:
		• *Implement avian or bat detection/deterrent systems.* This involves testing and implementing systems that detect birds and bats and taking actions designed to reduce the probability of a collision (e.g., informed WTG curtailment, utter deterrents designed to warn or frighten birds and bats from operating WTGs), including:
		  ○ DT Bird/DT Bat Systems
		  ○ IdentiFlight Eagle Detection System
			After postconstruction mortality monitoring studies; during operations of project.
			SMUD will consult the USFWS and CDFW in development of the adaptive management and compensatory mitigation strategies for special-status birds and bats if necessary.
			Implement adaptive management actions if necessary.
				During construction-maintenance.	SMUD	SMUD	All project components

Table 4-1 Summary of Impacts and Mitigation Measures

CEQA Issue Area	Impacts	Mitigation Measures	Implementation Duration	Monitoring Duration	Responsibility		Applicable Project Component
					Implementation	Monitoring	

		• *Implement passive avian or bat deterrents.* This involves testing and implementing deterrents designed to warn or frighten birds and bats from operating WTGs, including:
		  ○ improved blade marking (compatible with Solano County visual guidelines) such as variations in paint color and color patterns;
		  ○ blade designs that produce bird warning "whistles" (without upsetting blade integrity or exceeding ambient noise limits); and
		  ○ ultrasonic devices that infuse the blade-swept area with high-frequency sounds that alert or frighten bats.
		• *Reduce on-site hazards.* Additional techniques for reducing on-site hazards, including possible operational adjustments, should be discussed if mortality rates substantially exceed study estimates. This could include making adjustments to cut-in speed or changes during migratory periods, if such actions are demonstrated to be effective as avoidance and minimization techniques.
		• *Reduce off-site hazards.* This can include installing safety features, such as anti-perching devices on poles or anti-electrocution retrofits and diverters on power lines, outside the project area (with concurrence from landowners and Pacific Gas and Electric Company or their successors) to discourage bird use. This should take advantage of Avian Power Line Interaction Committee guidelines and use hazard reduction techniques identified in SMUD's avian protection plan.
		• *Implement operational minimization protocols (curtailment) during high-risk periods for bats.* High-risk periods include nighttime when wind speeds are low, spring and autumn migration periods, and certain weather conditions such as before and after storms (Arnett et al. 2011), Standard curtailment protocols can reduce bat fatalities by up to 93 percent, and feathering turbine blades can reduce bat fatalities by an average of 35 percent. Refined curtailment approaches such as the predictive algorithm-based curtailment approach developed by Korner-Nievergelt et al. (2013 in Sutter 2018) and Behr et al. (2017 in Sutter 2018), and activity-based curtailment strategies based on bat detection (Sutter 2018) have also been shown to substantially reduce bat mortality.
		• *Contribute to ongoing conservation efforts.* Examples include acquisition of additional conservation property (or easements) that provide habitat for species affected by project operations, and additional direct contributions to habitat restoration organizations or facilities such as the UC Davis Raptor Center					

Biological Resources	**Impact 3.3-12: Indirect impacts on riparian habitat.**	**Mitigation Measure 3.3-12a: Avoid indirect impacts on riparian habitat.** SMUD will avoid and minimize indirect impacts on riparian habitat by implementing the following mitigation measures: • Mitigation Measure 3.5-1, "Prepare and Implement a SWPPP and Associated BMPs," listed in Section 3.5, "Geology, Soils, Paleontological Resources, and Mineral Resources" • Mitigation Measure 3.7-1b, "Establish and Implement an Environmental Training Program," listed in Section 3.7, "Hazards and Hazardous Materials" • Mitigation Measure 3.7-1c, "Prepare and Implement a Hazardous Substance Control and Emergency Response Plan," listed in Section 3.7, "Hazards and Hazardous Materials" • Mitigation Measure 3.7-1d, "Prepare and Implement a Spill Prevention, Control, and Countermeasures Plan," listed in Section 3.7, "Hazards and Hazardous Materials" In addition, SMUD will implement the following measures: • Before any construction activity, SMUD will assign a qualified biologist to identify the locations of riparian habitat and corresponding setbacks required by project permits, for avoidance. Identification of riparian habitat for avoidance will be in addition to and distinguished from any required construction boundary	Before and during construction, operations-maintenance, and decommissioning.	Before and during construction, operations-maintenance, and decommissioning.	SMUD and Contractor	Qualified Biologists and SMUD	All project components with potential to affect riparian habitat

Table 4-1 Summary of Impacts and Mitigation Measures

CEQA Issue Area	Impacts	Mitigation Measures	Implementation Duration	Monitoring Duration	Responsibility		Applicable Project Component
					Implementation	Monitoring	
		fencing or flagging. Setback requirements will be identified as appropriate (e.g., 100-foot setback) on project maps to comply with requirements specified in 404, 401, or 1602 permit conditions.					
Biological Resources	**Impact 3.3-12: Indirect impacts on riparian habitat.**	**Mitigation Measure 3.3-12b: Comply with Section 1600 streambed alteration agreement and CWA Sections 401 and 404 or the state's Porter-Cologne Act.** SMUD will obtain all necessary permits under Section 1602 of the California Fish and Game Code (Lake and Streambed Alteration Agreement) and Sections 401 and 404 of the CWA or the state's Porter-Cologne Act and will implement all conditions and requirements of these state and federal permits obtained for the project. **Mitigation Measure 3.3-12c: Develop a reclamation and revegetation plan.** Before project construction, SMUD will develop and implement a reclamation and revegetation plan to restore sites disturbed by construction, and to reclaim abandoned access roads that will be restored to agricultural uses. The plan will describe reclamation and revegetation efforts to be conducted during project construction, both to stabilize the site and to return temporarily affected areas to pre-project conditions or restore abandoned roads to agricultural uses. The goals of the reclamation and restoration plan will be to: • avoid the introduction and spread of invasive weeds, • develop vegetative cover in disturbed areas to prevent erosion, and • restore abandoned roads to agricultural uses (livestock grazing and dryland farming). The reclamation and restoration plan will be consistent with the goals and objectives described in SMUD's Land Management Plan for the Solano Wind Farm (Althouse and Meade 2018) or subsequent updates to that plan. The targets for percent vegetative cover and percent non-native species composition will be based on pre-project baseline surveys in areas that will be subject to disturbance. Monitoring to assess success (i.e., achieving the target pre-project vegetative cover and species composition) will occur for a period of 2 years. If the success criteria are not met at the end of 2 years, adaptive management measures for weed and erosion control, as described in SMUD's Land Management Plan (Althouse and Meade 2018), will be implemented. The reclamation and revegetation plan will be developed and implemented to reclaim existing vegetation communities and agricultural land uses in the project area to the maximum extent feasible. Reclamation and revegetation of temporarily disturbed sites immediately after the completion of construction activities will help protect against indirect effects on riparian habitat by stabilizing soil and reducing the potential for invasion by nonnative invasive and noxious weeds. The plan will include, at a minimum, the following provisions: • Reclamation of all areas disturbed by project construction, including temporary disturbance areas around construction sites, laydown/staging areas, temporary access roads, and the home run collection lines. Pest species listed by CDFA as List A or B, listed by the California Invasive Plant Council as Moderate or High, and/or targeted by the Solano Weed Management Area for eradication in Solano County shall not be used. A qualified biologist with demonstrated experience with the land cover types to be revegetated will have oversight for the selection of reclamation species. • Revegetation of areas of temporary disturbance as soon as construction is complete to reduce erosion and inhibit the establishment of invasive weeds. • A description of proven available revegetation techniques and procedures (such as hydroseeding, drill seeding, and broadcast seeding, adapted to local conditions) on all disturbed areas. • Salvage of topsoil in all areas subject to grading or excavation. Topsoil will be removed, stockpiled on-site, and returned to the original site (reclaimed) or used in habitat reclamation activities elsewhere on the site.	Before and during construction, and immediately after construction. Obtain necessary permits before construction. Before construction, SMUD will develop and implement a reclamation and revegetation plan. SMUD to implement reclamation and revegetation plan immediately after construction.	Before and during construction, and operation-maintenance.	SMUD and Contractor	SMUD	All project components with potential to affect jurisdictional waters or features

Table 4-1 Summary of Impacts and Mitigation Measures

CEQA Issue Area	Impacts	Mitigation Measures	Implementation Duration	Monitoring Duration	Responsibility		Applicable Project Component
					Implementation	Monitoring	
		• Monitoring of revegetated and reclaimed habitat for a minimum of 2 years or until herbaceous cover meets or exceeds preproject conditions. Success criteria are defined as minimum thresholds for herbaceous vegetative cover, and maximum thresholds for noxious weeds, based on preproject (baseline) conditions for each habitat type to be revegetated (e.g., grazed annual grassland, farmland). • Weed control measures, which may include cultural, mechanical, and/or chemical methods. Any application of herbicides shall be in compliance with all federal and state laws and regulations and implemented by a licensed qualified applicator. Herbicides shall not be applied during or within 72 hours of a scheduled rain event. In riparian areas and near streams and wetlands, only water-safe herbicides shall be used. Herbicides shall not be applied when wind velocities exceed 6 miles per hour. • Adaptive management measures and a remedial planting plan. Remedial measures (e.g., additional planting, weeding, or erosion control) will be taken during the monitoring period if necessary to ensure success of the revegetation or reclamation effort. • Maintenance, monitoring, and reporting procedures. If the revegetation/reclamation fails to meet the established performance criteria for vegetative cover within the maintenance and monitoring period, monitoring of remedial planting shall extend beyond the initial period until the criteria are met, unless otherwise approved by the permitting agencies. If elements of the revegetated/reclaimed area(s) meet their success criteria before the end of 2 years of monitoring, they may be eliminated from future monitoring with approval from the permitting agencies. ***Mitigation Measure 3.3-12d: Conduct worker awareness training.*** SMUD will implement Mitigation Measure 3.3-1b, "Develop and Implement a Worker Environmental Awareness Program," to include specific information regarding riparian habitat that occurs on the project site and that would be identified for avoidance. Training will be conducted before the start of construction. The training will include information about the locations and extent of riparian habitat, methods of resource avoidance, permit conditions, and possible fines for violating permit conditions and federal and/or state environmental laws. The training will also include guidance on methods to avoid the introduction and spread of invasive plant species.					
Biological Resources	**Impact 3.3-13: Loss and degradation of federally protected waters of the United States.**	**Mitigation Measure 3.3-13a: Avoid and minimize impacts on wetlands and other waters of the United States.** SMUD will avoid and minimize impacts on wetlands and other waters of the United States by implementing the following mitigation measures: • Mitigation Measure 3.3-12c, "Develop a Reclamation and Revegetation Plan" • Mitigation Measure 3.5-1a, "Prepare and Implement a SWPPP and Associated BMPs," listed in Section 3.5, " Geology, Soils, Paleontological Resources, and Mineral Resources" • Mitigation Measure 3.7-1b, "Establish and Implement an Environmental Training Program," listed in Section 3.7, "Hazards and Hazardous Materials" • Mitigation Measure 3.7-1c, "Prepare and Implement a Hazardous Substance Control and Emergency Response Plan," listed in Section 3.7, "Hazards and Hazardous Materials" • Mitigation Measure 3.7-1d, "Prepare and Implement a Spill Prevention, Control, and Countermeasures Plan," listed in Section 3.7, "Hazards and Hazardous Materials" SMUD will obtain and implement the terms of all necessary permits under Section 1602 of the California Fish and Game Code (Lake and Streambed Alteration Agreement) and CWA Sections 401 and 404, and will comply with the conditions and requirements of all other federal and state permits obtained for the project. In addition, SMUD will implement the following measures:	Before and during construction, and operations-maintenance, and decommissioning. SMUD will obtain all necessary permits before construction. SMUD will implement all permit conditions during construction and operations-maintenance, and decommissioning. Before the start of any construction activity, SMUD will assign a qualified	Before and during construction, and operations-maintenance, and decommissioning.	SMUD, Qualified Biologists, and Contractor	SMUD	All project components with potential to affect wetlands or other waters of the US

Table 4-1 Summary of Impacts and Mitigation Measures

CEQA Issue Area	Impacts	Mitigation Measures	Implementation Duration	Monitoring Duration	Responsibility		Applicable Project Component
					Implementation	Monitoring	
		• SMUD will identify corresponding setback requirements as appropriate (e.g., 100-foot setback) on project maps to comply with setback requirements described in permit conditions. Any required setback will be shown on project construction drawings and plans (e.g., grading and improvement plans). Construction activities and project components will be located at least 100 feet from aquatic resources wherever feasible. • Before the start of any construction activity, SMUD will assign a qualified biologist to identify the locations of wetlands and other waters and their corresponding setbacks (if applicable) as required by project permits, for avoidance. Identification of wetlands and other waters for avoidance will be in addition to and distinguished from any required construction boundary fencing or flagging.	biologist to identify the locations of wetlands and other waters and their corresponding setbacks.				
Biological Resources	**Impact 3.3-13: Loss and degradation of federally protected waters of the United States.**	**Mitigation Measure 3.3-13b: Avoid and minimize potential effects on waters of the United States from installation of access road culvert crossings.** SMUD will comply with the following mitigation measures to minimize potential effects on waters of the United States caused by installation of culvert crossings to allow vehicular access across waters: • Before project construction, SMUD will design culvert crossings to maintain hydrological connectivity while allowing vehicular access across aquatic features. A hydrology study of the proposed culvert location(s) will be conducted to analyze existing drainage conditions and calculate appropriate culvert size(s). • Before project construction, the contractor will obtain a grading permit from Solano County. During construction, the contractor will comply with all terms and conditions of the permit, including any supplemental conditions if applicable, and with the provisions of Chapter 31 of the Solano County Code, "Grading, Drainage, Land Leveling, and Erosion Control Ordinance." All grading work will be performed in accordance with good design and construction practice. SMUD will supply a bond if requested by Solano County. • The contractor for culvert installation shall adhere to the following general design principles and standards, which shall serve as minimum guidelines for grading and erosion control work performed pursuant to the project's grading permit: ○ All work shall be done in a manner that will minimize soil erosion. ○ Existing natural vegetation shall be retained and preserved wherever possible and practical. ○ Increased potential for erosion by removal of vegetation shall be limited by minimizing the area and time of vegetation removal to the extent practical. Exposure of barren soils shall be limited by completing work before the onset of the rainy season, to ensure that the soil is stabilized and vegetation is established in advance of the rainy season (October 15–April 15). ○ Facilities shall be constructed to retain sediment produced on-site. Sediment basins, sediment traps, and similar required measures shall be installed before any clearing or grading activities, and shall be maintained throughout any such operations until removal is authorized. ○ Seeding, mulching, and other suitable stabilization measures shall be used to protect exposed erodible areas in advance of the rainy season. ○ Provisions shall be made to mitigate any increased runoff caused by altered soil conditions during and after construction. ○ Neither cut nor fill slopes shall be steeper than two parts horizontal to one part vertical (2:1) unless a geological or engineering analysis indicates that steeper slopes are safe and appropriate erosion control measures are specified.	Before and during construction. Before construction, SMUD will design culvert crossings and the contractor will obtain a grading permit from Solano County. Contractor will comply with all terms of conditions of permit and mitigation noted here.	Before and during construction.	SMUD, Qualified Biologist, Contractor	SMUD	All project components with potential to affect waters of the US.

Table 4-1 Summary of Impacts and Mitigation Measures

CEQA Issue Area	Impacts	Mitigation Measures	Implementation Duration	Monitoring Duration	Responsibility		Applicable Project Component
					Implementation	Monitoring	
		○ Cleared vegetation and excavated materials shall be disposed of in a manner that reduces the risk of erosion, and in conformance with the provisions of the approved grading permit. Topsoil shall be conserved for use in revegetation of disturbed areas whenever possible or practical. ○ Every effort shall be made to preserve existing channels and watercourses. No work shall be performed within a channel or watercourse unless no reasonable alternative is available. If such work is performed, it shall be limited to the minimum amount necessary. ○ All fill material shall not include organic, frozen, or other deleterious materials. No rock or similar irreducible material greater than 12 inches in any dimension shall be included in fills. ○ All fill supporting a structure shall be compacted to 90 percent of maximum density as determined by ASTM D 1557, modified proctor, in lifts not exceeding 12 inches in depth.					
Biological Resources	**Impact 3.3-13: Loss and degradation of federally protected waters of the United States.**	**Mitigation Measure 3.3-13c: Comply with Section 1602 streambed alteration agreement for construction activities in jurisdictional areas.** Before construction, SMUD will submit a notification of streambed alteration to CDFW under Section 1602 of the Fish and Game Code. If CDFW concludes that the project will result in adverse impacts to fish and wildlife resources, it will provide a proposed Streambed Alteration Agreement, which must obtain reasonable conditions. SMUD will implement all reasonable permit conditions, including requirements for compensatory mitigation (if any). Where feasible, the compensatory mitigation requirement may be combined with those for other mitigation measures or mitigation required for the CWA Section 404 and 401 permits. These conditions may include the following measures: • Pre-construction Measures: Before any construction activities begin, a qualified wetland biologist will identify and flag the boundaries of all wetlands in the project area. Appropriate barriers (straw bales, silt, fences, etc.) will be installed near sensitive resources to prevent sedimentation outside the work areas. During construction, wetlands will be treated as exclusion areas and activities within them will be strictly limited to those pertaining to this permit application. • SWPPP: The construction contractor shall prepare and implement a SWPPP and associated BMPs. • Hazardous Substance Control Plan. SMUD shall prepare and implement a construction-specific hazardous substance control and emergency response plan for quick, safe cleanup of accidental spills. • Buffer from Drainages. All staging and stockpile areas will be adjacent to the proposed road crossings, but away from sensitive areas. A minimum buffer of 100 feet from drainages would be used for refueling and storage. • Worker Education: Prior to construction, Environmental Awareness Training will be provided to all construction workers. This will consist of tailgate environmental training sessions conducted by a qualified biologist for the purpose of informing all personnel about the wetlands and intermittent streams in the project area and the importance of spill prevention, emergency response measures, and proper implementation of BMPs. Any sensitive species in the project region will also be discussed. Personnel will be trained on the locations of sensitive areas and species as well as rules and methods for avoiding these resources. They will also be briefed on all permit conditions as well as the potential disciplinary actions that could result from violations of state or federal laws. • Construction Monitoring. A qualified biologist will be on site during grading and construction activities to ensure protection of biological and other resources. • Erosion Control: Erosion control and slope stabilization best management practices will be implemented. These practices may include installation of orange construction fencing, silt fencing, hay wattles, hay bales and other protective measures to avoid impacts to unvegetated areas.	Before and during construction. Before construction, SMUD will submit 1602 Permit application to CDFW. If 1602 Permit is issued by CDFW, SMUD will implement conditions.	During construction.	SMUD, Qualified Biologists, Contractor	SMUD, CDFW	Project components with potential to affect jurisdictional areas.

Table 4-1 Summary of Impacts and Mitigation Measures

CEQA Issue Area	Impacts	Mitigation Measures	Implementation Duration	Monitoring Duration	Responsibility		Applicable Project Component
					Implementation	Monitoring	

Biological Resources	**Impact 3.3-13: Loss and degradation of federally protected waters of the United States.**	**Mitigation Measure 3.3-13d: Avoid and minimize potential effects on waters of the United States from horizontal directional drilling.**
		SMUD will implement the following mitigation measures to avoid and minimize potential effects on aquatic resources from horizontal directional drilling underneath drainage and swale features during installation of the underground home run collection lines:
		• SMUD will provide notification regarding the HDD to CDFW as part of the streambed alteration agreement application. SMUD will assign a qualified biological monitor with previous HDD monitoring experience and knowledge of the environmental sensitivities of the project area to monitor all HDD activities. The monitor shall be on-site for the duration of HDD activities and shall provide brief reports of daily activities to CDFW.
		• SMUD's biologist shall conduct on-site briefings for all HDD workers to ensure that all field personnel understand the locations of aquatic resources and their responsibility for timely reporting of frac-outs.
		• Barriers (e.g., straw bales, sedimentation fences) shall be erected between the bore site and all nearby aquatic resources before drilling to prevent any material from reaching aquatic resource areas. The distance between the bore site and aquatic resource areas shall be compliant with requirements for protective setback boundaries as specified the CDFW permit.
		• If the biological monitor suspects a potential frac-out that is not yet visible at the surface (e.g., loss of bentonite slurry in the drill pit but no frac-out at the surface), the HDD contractor shall immediately cease HDD activities and implement measures to reduce the potential for a frac-out (e.g., increase the density of the drilling mud or reduce the pressure of the drill). The contractor shall then be allowed to continue HDD activities.
		• The HDD contractor shall keep necessary response equipment and supplies (e.g., vacuum truck, straw bales, sediment fencing, sand bags) on-site during HDD operations so that they are readily available in the event of a frac-out.
		• SMUD shall prepare a frac-out contingency plan. In the event a frac-out is detected, the HDD contractor shall implement the following measures to reduce or minimize effects on the affected aquatic resource:
		  ○ All work shall stop until the frac-out has been contained and cleaned up.
		  ○ The frac-out area shall be isolated with straw bales, sandbags, or silt fencing to surround and contain the drilling mud; cleanup shall be performed using a vacuum truck supported by construction workers on foot using hand tools, as necessary. (To avoid affecting the stream bed and banks, mechanized equipment shall not be used to scoop or scrape up frac-out materials.)
		  ○ If a frac-out occurs, SMUD shall notify the appropriate jurisdictional agency (USACE, the Central Valley RWQCB, and/or CDFW) by telephone and in writing (email is acceptable) within 24 hours. The required notification shall describe the frac-out and cleanup measures implemented.
		If a frac-out occurs and, based on consultation with appropriate agencies, is considered to have negatively affected waters of the United States, SMUD will implement appropriate measures to restore the area to pre-HDD conditions in consultation with the permitting agencies.
			Before and during construction.
			Before construction, SMUD will provide notification regarding HDD to CDFW as part of streambed alteration agreement application.
			Before construction, SMUD will prepare a frac-out contingency plan.
			Avoidance and minimization measures will be implemented during construction.
			If a frac-out occurs, measures will be taken to stop and contain frac-out and applicable jurisdictional agency/agencies will be contacted.
				During construction.	SMUD, Qualified Biologists, Contractor	SMUD	HDD activities near or under jurisdictional features.

Biological Resources	**Impact 3.3-13: Loss and degradation of federally protected waters of the United States.**	**Mitigation Measure 3.3-13e: Conduct worker awareness training.** SMUD will implement Mitigation Measure 3.3-1b, "Develop and Implement a Worker Environmental Awareness Program," to include specific information regarding wetlands and other waters that occur on the project site and that either will be affected or have been identified for avoidance. Training will be conducted before the start of construction and will include information about the locations and extent of wetlands and other waters, methods of resource avoidance, permit conditions, and possible fines for violating permit conditions and federal and/or state environmental laws.	Before and during construction, operations-maintenance, and decommissioning. Ongoing WEAP training.	During construction, operations-maintenance, and decommissioning.	SMUD, Qualified Biologists, Contractor	SMUD	All project components

Table 4-1 Summary of Impacts and Mitigation Measures

CEQA Issue Area	Impacts	Mitigation Measures	Implementation Duration	Monitoring Duration	Responsibility		Applicable Project Component
					Implementation	Monitoring	
Biological Resources	**Impact 3.3-13: Loss and degradation of federally protected waters of the United States.**	**Mitigation Measure 3.3-13f: Restore temporarily affected waters of the United States.** SMUD will require the construction contractor to restore temporarily disturbed wetlands and other waters of the United States by returning them to preconstruction conditions after construction in accordance with the project's reclamation and restoration plan (Mitigation Measure 3.3-12c). SMUD will comply with all conditions and requirements of federal and state permits obtained for the project.	During construction. See MM 3.3-12c	During construction.	SMUD, Qualified Biologists, Contractor	SMUD	All project components affecting waters of the US.
Biological Resources	**Impact 3.3-13: Loss and degradation of federally protected waters of the United States.**	**Mitigation Measure 3.3-13g: Compensate for loss of waters of the United States.** The acreage and function of all wetlands and other waters lost as a result of project implementation will be replaced and restored on a "no-net-loss" basis. SMUD will compensate for the loss of aquatic resources by purchasing credits from a USACE-approved mitigation bank; purchasing in-lieu fee credits; or restoring, preserving, creating, or enhancing similar habitats at another USACE-approved mitigation area as determined during CWA Section 404 and Section 401 permitting. The minimum wetland compensation ratio to achieve no net loss of the functions and services of wetlands and other waters will be at least 1:1. Final ratios will be determined during the permitting process.	Before construction during permit process.	N/A	SMUD	SMUD	All project components affecting waters of the US.
Archaeo-logical, Historical, and Tribal Cultural Resource	**Impact 3.4-1: Impacts on unique archaeological resources.**	**Mitigation Measure 3.4-1a: Avoid or conduct subsurface testing and/or monitoring during construction in areas with high potential for the presence of buried archaeological sites.** The construction contractor shall avoid conducting ground-disturbing activities in the few locations within the direct APE that have high or the highest potential for buried archaeological sites. If these areas cannot be avoided and project-related ground disturbance in those areas would be sufficiently deep that they could encounter buried archaeological resources, then additional actions may be necessary to mitigate any impacts on as-yet unidentified buried resources. These minimization efforts could include conducting subsurface testing before project construction and/or monitoring during the construction period. In the event that a historic-period archaeological site (such as concentrated deposits of bottles or bricks with makers marks, amethyst glass, or other historic refuse) is uncovered during grading or other construction activities, all ground-disturbing activity within 100 feet of the discovery shall be halted until a qualified archaeologist can assess the significance of the find. SMUD will be notified of the potential find and a qualified archeologist shall be retained to investigate its significance. Any previously undiscovered resources found during construction will be recorded on appropriate California Department of Parks and Recreation 523 forms and evaluated for significance under all applicable regulatory criteria. If the archaeologist determines that the find does not meet the CRHR standards of significance for cultural resources, construction may proceed. If the find is determined to be significant by the qualified archaeologist (i.e., because the find is determined to constitute either a historical resource or a unique archaeological resource), the archaeologist shall work with SMUD to follow accepted professional standards such as further testing for evaluation or data recovery, as necessary. If artifacts are recovered from significant historic-period archaeological resources, they shall be housed at a qualified curation facility. The results of the identification, evaluation, and/or data recovery program for any unanticipated discoveries shall be presented in a professional-quality report that details all methods and findings, evaluates the nature and significance of the resources, analyzes and interprets the results.	Before and during construction. Before construction, SMUD's Archaeologist shall conduct subsurface testing and/or mark locations within the direct APE as environmentally sensitive areas (ESAs) to be avoided by construction. During construction, monitoring will be conducted in locations within the direct APE that cannot be avoided.	Before and during construction.	SMUD, Qualified Archaeologists, Contractor	SMUD	All project components in APEs
Archaeo-logical, Historical, and Tribal Cultural Resource	**Impact 3.4-1: Impacts on unique archaeological resources.**	**Mitigation Measure 3.4-1b:** Prior to the start of construction, SMUD shall provide worker awareness training to the construction contractor and SMUD's project superintendent regarding the potential for cultural and tribal cultural resources that could be encountered during ground disturbance, the regulatory protections afforded to such finds, and the procedures to follow in the event of discovery of a previously unknown resource,	Before and during construction. Before construction, SMUD to provide	Before and during construction.	SMUD, Qualified Archaeologists, Contractor	SMUD and UAIC	All project components

Table 4-1 Summary of Impacts and Mitigation Measures

CEQA Issue Area	Impacts	Mitigation Measures	Implementation Duration	Monitoring Duration	Responsibility		Applicable Project Component
					Implementation	Monitoring	
		including notifying SMUD representatives. SMUD shall invite representatives of UAIC to periodically inspect the active areas of the project, including any soil piles, trenches, or other disturbed areas. UAIC shall be notified at least 48 hours prior to start of construction. In the event that tribal representatives or construction workers find evidence of potential tribal cultural resources, the procedures identified in Mitigation Measure 3.4-1c and 3.4-2 shall be implemented.	WEAP training to workers. UAIC to be notified at least 48 hours prior to start of construction. Ongoing WEAP training for new workers.				
Archaeo-logical, Historical, and Tribal Cultural Resource	**Impact 3.4-1: Impacts on unique archaeological resources.**	**Mitigation Measure 3.4-1c: Halt ground-disturbing activity upon discovery of subsurface archaeological features.** If any prehistoric or historic-era subsurface archaeological features or deposits, including locally darkened soil ("midden"), that could conceal cultural deposits are discovered during construction, all ground-disturbing activity shall cease within 100 feet of the resource(s) discovered. A qualified cultural resources specialist and Native American representatives and monitors from culturally affiliated Native American Tribes shall assess the significance of the find and make recommendations for further evaluation and treatment as necessary. These recommendations shall be documented in the project record. For any recommendations made by interested Native American Tribes that are not implemented, the project record shall provide a justification explaining why the recommendation was not followed. If the qualified archaeologist determines the find to be significant (because the find constitutes either a historical resource, a unique archaeological resource, or a tribal cultural resource), and if an adverse impact on a TCR, unique archaeology, or other cultural resource occurs, then SMUD shall consult with interested Native American groups and individuals regarding mitigation contained in PRC Sections 21084.3(a) and 21084.3(b) and State CEQA Guidelines Section 15370. Potential mitigation measures developed in coordination with interested Native American groups may include: • preservation in place (the preferred manner of mitigating impacts on archaeological sites), • archival research, • replacement of cultural items for educational or cultural purposes, • preservation of substitute TCRs or environments and/or subsurface testing, or contiguous block unit excavation and data recovery (when it is the only feasible mitigation, and pursuant to a data recovery plan).	During construction. If any prehistoric or historic-era subsurface archaeological features or deposits are discovered during construction, all ground-disturbing activity shall cease within 100 feet of the resource(s) discovered. Involve qualified cultural resource specialist and Native American representatives as applicable.	During construction.	SMUD, Qualified Archaeologist, Contractor	SMUD, Native American representative(s)	All project components
Archaeo-logical, Historical, and Tribal Cultural Resource	**Impact 3.4-2: Impacts on tribal cultural resources.**	**Mitigation Measure 3.4-2: Complete AB 52 consultation.** SMUD concluded consultation with the UAIC and Wilton Rancheria under AB 52. If TCRs are identified that have the potential to be adversely affected by the project, SMUD shall notify Tribal Historic Preservation Officer Matthew Moore (THPO@auburnrancheria.com) and Lou Griffin (hgriffin@wiltonrancheria-nsn.gov) should an inadvertent discovery of TCRs occur, and will develop mitigation measures in consultation with interested Native American groups and individuals to minimize those impacts. These mitigation measures could include the following or equally effective mitigation measures (as identified in PRC Section 21084.3): (1) Avoidance and preservation of the resources in place, including but not limited to planning and construction to avoid the resources and protect the cultural and natural context, or planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria. (2) Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including but not limited to the following:	During construction. If inadvertent discovery during construction, SMUD will notify Tribal Historic Preservation Officers and develop mitigation measures in consultation with interested Native American groups and individuals to minimize impacts.	During construction.	SMUD and Qualified Archaeologist	SMUD	All project components

Table 4-1 Summary of Impacts and Mitigation Measures

CEQA Issue Area	Impacts	Mitigation Measures	Implementation Duration	Monitoring Duration	Responsibility		Applicable Project Component
					Implementation	Monitoring	
		(A) protecting the cultural character and integrity of the resource; (B) protecting the traditional use of the resource; or (C) protecting the confidentiality of the resource. (3) Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places. (4) Protecting the resource. (5) Preserving substitute TCRs, resources, or environments.					
Archaeo-logical, Historical, and Tribal Cultural Resource	**Impact 3.4-3: Impacts on previously unidentified human remains.**	**Mitigation Measure 3.4-3: Halt ground-disturbing activity upon discovery of human remains.** If human remains are discovered during any demolition/construction activities, potentially damaging ground-disturbing activities within 100 feet of the remains shall be halted immediately, and SMUD will notify the Solano County coroner and the NAHC immediately, according to PRC Section 5097.98 and Section 7050.5 of the California Health and Safety Code. If the remains are determined by the NAHC to be Native American, the guidelines of the NAHC shall be followed during the treatment and disposition of the remains. SMUD will also retain a professional archaeologist with Native American burial experience to conduct a field investigation of the specific site and consult with the Most Likely Descendant, if any, identified by the NAHC. Following the coroner's and NAHC's findings, the archaeologist and the NAHC-designated Most Likely Descendant shall determine the ultimate treatment and disposition of the remains and take appropriate steps to ensure that additional human interments are not disturbed. PRC Section 5097.94 identifies the responsibilities for acting upon notification of a discovery of Native American human remains.	During construction. If human remains are discovered, potentially damaging ground-disturbing activities within 100 feet of the remains will be halted immediately. SMUD will notify Solano County coroner and the NAHC immediately.	During construction.	SMUD, Qualified Archaeologists, Contractor	SMUD, Solano County, NAHC	All project components
Geology and Soils	**Impact 3.5-1: Substantial soil erosion or loss of topsoil.**	**Mitigation Measure 3.5-1: Prepare and implement a SWPPP and associated BMPs.** Before any ground-disturbing activities begin, the construction contractor shall apply for and maintain coverage under the Construction General Permit. The contractor shall prepare and implement a SWPPP, including an erosion control plan, that includes erosion control measures and construction waste containment measures to ensure that waters of the United States and the state are protected during and after project construction. The SWPPP shall include site design measures to minimize off-site stormwater runoff that might otherwise affect surrounding habitats. The SWPPP shall be provided to SMUD for review and approval before it is provided to the SWRCB. The Central Valley Regional Water Quality Control Board and/or San Francisco Bay Regional Water Quality Control Board will review and monitor the effectiveness of the SWPPP through mandatory reporting by SMUD and the construction contractor as required. The SWPPP shall be prepared with the following objectives: • Identify all pollutant sources, including sources of sediment, that may affect the quality of stormwater discharges from construction of the project. • Identify BMPs that effectively reduce or eliminate pollutants in stormwater discharges and authorized nonstormwater discharges from the site during construction to the Best Available Technology/Best Control Technology standard. • Provide calculations and design details as well as BMP controls for site run-on that are complete and correct. • Identify project discharge points and receiving waters. • Provide stabilization BMPs to reduce or eliminate pollutants following construction. The construction contractor shall implement the SWPPP, including all BMPs, and shall inspect all BMPs during construction. Potential SWPPP BMPs could include but would not be limited to the following: • Preserve existing vegetation where possible.	Before and during construction. Before construction, contractor shall apply for and maintain coverage under the Construction General Permit. Before construction, the contractor shall prepare and implement a SWPPP, including erosion control plan. Contractor shall provide SWPPP to SMUD for review and approval before submitting to SWRCB.	During construction.	SMUD and Contractor	SMUD, CV-RWQCB, SFB-RWQCB	All project components

Table 4-1 Summary of Impacts and Mitigation Measures

CEQA Issue Area	Impacts	Mitigation Measures	Implementation Duration	Monitoring Duration	Responsibility		Applicable Project Component
					Implementation	Monitoring	
		• Roughen the surfaces of final grades to prevent erosion, decrease runoff, increase infiltration, and aid in vegetation establishment. • Place riparian buffers or filter strips along the perimeter of the disturbed area to intercept pollutants before off-site discharge. • Place fiber rolls around on-site drain inlets to prevent sediment and construction-related debris from entering inlets. • Place fiber rolls along down-gradient disturbed areas of the site to reduce runoff flow velocities and prevent sediment from leaving the site. • Place silt fences down-gradient of disturbed areas to slow down runoff and retain sediment. • Stabilize the construction entrance to reduce the tracking of mud and dirt onto public roads by construction vehicles. • Stage excavated and stored construction materials and soil stockpiles in stable areas and cover or stabilize materials to prevent erosion. • Stabilize temporary construction entrances to limit transport/introduction of invasive species and control fugitive dust emissions.					
Geology and Soils	**Impact 3.5-2: Location of the project on a geologic unit or soil that is unstable, or that would become unstable as a result of the project.**	**Mitigation Measure 3.5-2: Conduct a site-specific geotechnical investigation.** Before final design of the project, the construction contractor shall complete a design level geotechnical investigation and report for the project, to be prepared by a California Registered Civil Engineer or Geotechnical Engineer. The report will set forth design and construction measures intended to ensure site stability in compliance with applicable seismic and building codes. The report shall address and make recommendations on the following: • road, pavement, and parking area design; • structural foundations; • grading practices; • erosion/winterization; • special problems discovered on-site (e.g., groundwater, expansive/unstable soils); and • slope stability. All recommendations of the geotechnical report shall be incorporated into the construction plans and specifications that are reviewed and stamped by a licensed engineer of the appropriate discipline. SMUD must include the measures in the contract for implementation by the construction contractor for the duration of construction related activities.	Before final design of project, contractor to complete a design level geotechnical investigation and report for project. During construction, implement design and construction measures to ensure site stability. Include all recommendations of geotechnical report into construction plans and specifications.	Before and during construction.	SMUD and Contractor	SMUD	All project components
Geology and Soils	**Impact 3.5-3: Creation of a substantial risk as a result of expansive soils.**	**Mitigation Measure 3.5-3: Implement Mitigation Measure 3.5-2, "Implement all recommendations from the geotechnical investigation."** The construction contractor shall implement Mitigation Measure 3.5-2, above, which requires the completion of a design level geotechnical investigation and report for the project and the implementation of all design and construction measures contained therein.	See MM 3.5-2	See MM 3.5-2	See MM 3.5-2	See MM 3.5-2	See MM 3.5-2
Geology and Soils	**Impact 3.5-4: Degradation or destruction of a unique paleontological resource.**	**Mitigation Measure 3.5-4: Conduct a site-specific paleontological resource investigation and implement identified protective measures.** Before the start of any ground-disturbing activities, SMUD shall have prepared a site-specific analysis of paleontological resources. At a minimum, the site-specific analysis shall include a review of the types of the geologic formation(s) present at the project site and a determination of the likelihood that those formation(s) would contain a "unique paleontological resource" as stated in Title 14, California Code of Regulations, Appendix G (the CEQA checklist). If a site-specific analysis determines that a	Before and during construction. Before construction, a site-specific analysis of paleontological	Before and during construction.	SMUD, Qualified paleontologist, Contractor	SMUD	All project components

Table 4-1 Summary of Impacts and Mitigation Measures

CEQA Issue Area	Impacts	Mitigation Measures	Implementation Duration	Monitoring Duration	Responsibility		Applicable Project Component
					Implementation	Monitoring	
		project may have an adverse effect on a "unique paleontological resource," project-specific mitigation measures shall be identified and implemented to address the following requirements: • Cessation of work in the vicinity of the find and notification to SMUD. • Retention of a qualified paleontologist to evaluate the resource and prepare a proposed mitigation plan, which may include some or all of the following elements: a field survey, construction monitoring, sampling and data recovery procedures, museum storage coordination for any specimen recovered, and a report of findings. • Implementation of recommendations made by the paleontologist, where SMUD determines that such recommendations are necessary and feasible. All recommendations of the report shall be incorporated into the construction plans and specifications that are reviewed and stamped by a licensed engineer of the appropriate discipline. SMUD must include the measures in the contract for implementation by the construction contractor for the duration of construction related activities.	resources will be prepared. All recommendations of the report shall be incorporated into the construction plans and specifications. Retention of qualified paleontologist if necessary.				
Hazards and Hazardous Materials	**Impact 3.7-1: Exposure of people and the environment to hazardous materials.**	**Mitigation Measure 3.7-1a: Implement Mitigation Measure 3.5-1, "Prepare and implement a SWPPP and associated BMPs."** The contractor shall implement Mitigation Measure 3.5-1 listed in Section 3.5, "Geology, Soils, and Mineral Resources." This measure requires the preparation of a project-specific SWPPP and implementation of the SWPPP by the construction contractors, including all necessary BMPs.	See MM 3.5-1	See MM 3.5-1	See MM 3.5-1	See MM 3.5-1	See MM 3.5-1
Hazards and Hazardous Materials	**Impact 3.7-1: Exposure of people and the environment to hazardous materials.**	**Mitigation Measure 3.7-1b: Establish and implement an environmental training program.** Before the start of construction, SMUD or its contractor shall establish an environmental training program to communicate environmental concerns and appropriate work practices to all field personnel. The training program shall cover the use of hazardous materials, waste management, spill prevention, emergency response measures, and proper implementation of BMPs. The program shall emphasize site-specific physical conditions to improve hazard prevention (e.g., identification of potentially hazardous substances) and shall include a review of all site-specific plans, including but not limited to the project's SWPPP, health and safety plan (as required by OSHA), fugitive dust control plan, and hazardous substances control and emergency response plan.	Before and during construction. Before construction, give WEAP training. Ongoing WEAP training to new employees during construction.	Before and during construction.	SMUD and/or Contractor	SMUD	All project components
Hazards and Hazardous Materials	**Impact 3.7-1: Exposure of people and the environment to hazardous materials.**	**Mitigation Measure 3.7-1c: Prepare and implement a hazardous substance control and emergency response plan.** Before the start of construction, SMUD or its contractor shall prepare a construction-specific hazardous substance control and emergency response plan. The plan shall include preparations for quick and safe cleanup of accidental spills; prescribe procedures for handling hazardous materials to reduce the potential for a spill during construction; and include an emergency response program to ensure quick and safe cleanup of accidental spills. The hazardous substance control and emergency response plan shall also identify BMPs in the event a spill occurs. BMPs may include but are not limited to the following: use of oil-absorbent materials, tarps, and storage drums to contain and control any minor releases; and storage and use of emergency-spill supplies and equipment in locations adjacent to work and staging areas. The hazardous substance control and emergency response plan shall identify areas where refueling and vehicle maintenance activities and storage of hazardous materials, if any, will be permitted.	Before and during construction. Before the start of construction, SMUD or its contractor shall prepare a construction-specific hazardous substance control and emergency response plan. Implement plans during construction.	During construction.	SMUD or Contractor	SMUD	All project components
Hazards and Hazardous Materials	**Impact 3.7-1: Exposure of people and the environment to hazardous materials.**	**Mitigation Measure 3.7-1d: Prepare and implement a spill prevention, control, and countermeasures (SPCC) plan.** If more than 1,320 gallons of petroleum products will be stored on-site (excluding vehicles), SMUD's construction contractor shall prepare and implement a SPCC plan in accordance with state and federal requirements, including 40 CFR 112. The SPCC plan shall identify engineering and	Before and during construction. If more than 1,320 gallons of petroleum products will be stored on-site	During construction.	Contractor	SMUD	All project components

Table 4-1 Summary of Impacts and Mitigation Measures

CEQA Issue Area	Impacts	Mitigation Measures	Implementation Duration	Monitoring Duration	Responsibility		Applicable Project Component
					Implementation	Monitoring	
		containment measures for preventing releases of oil into waterways. The SPCC plan shall be submitted to SMUD for review and approval before the start of operations, or during construction. If less than 1,320 gallons of petroleum products will be stored on-site (excluding vehicles), this mitigation measure is not required.	(excluding vehicles), SMUD's construction contractor shall prepare and implement a SPCC plan in accordance with state and federal requirements.				
Hazards and Hazardous Materials	**Impact 3.7-1: Exposure of people and the environment to hazardous materials.**	**Mitigation Measure 3.7-1e: Prepare and implement a hazardous materials business plan.** If the project will use or store hazardous materials equal to or greater than 55 gallons of liquids, 500 pounds of solids, and/or 200 cubic feet (at standard temperature and pressure) of compressed gases, SMUD's construction contractor shall prepare a hazardous materials business plan that will conform with Solano County Environmental Health requirements. The contractor shall file the plan with SMUD annually. The hazardous materials business plan shall identify site activities; list the contact information for the business owner/operator; provide an inventory of hazardous materials used on-site; provide a facilities map; and identify an emergency response plan/contingency plan. During the construction phase, if threshold quantities of any hazardous materials are stored on-site for more than 90 consecutive days, then the hazardous materials business plan shall be filed and maintained for as long as any of those thresholds are met or exceeded. During the operations phase, if the threshold for any hazardous materials is met or exceeded for more than 30 consecutive days, then the hazardous materials business plan shall be to SMUD and shall be maintained as long as the thresholds are met or exceeded. The regulations require annual submittal of the hazardous materials business plan as long as the project meets the conditions for the continued applicability of the regulations. If less than 55 gallons of liquids, 500 pounds of solids, and/or 200 cubic feet (at standard temperature and pressure) of compressed gases will be used or stored on-site, this mitigation measure is not required.	Before and during construction. Contractor shall prepare a hazardous materials business plan that will conform with Solano County Environmental Health requirements. During construction, the hazardous materials business plan shall be filed and maintained. During the operations, the hazardous materials business plan shall be maintained.	Before and during construction.	SMUD and Contractor	SMUD	All project components
Hazards and Hazardous Materials	**Impact 3.7-2: Exposure of people and the environment to subsurface hazardous materials disturbed during construction.**	**Mitigation Measure 3.7-2a: Implement Mitigation Measures 3.7-1a through 3.7-1e.** SMUD or its construction contractor shall implement Mitigation Measures 3.7-1a through 3.7-1e, listed above. These measures establish and require implementation of various plans to minimize the risk of accidental release of hazardous materials.	See MM 3.7-1a through 3.7-1e	See MM 3.7-1a through 3.7-1e	See MM 3.7-1a through 3.7-1e	See MM 3.7-1a through 3.7-1e	See MM 3.7-1a through 3.7-1e
Hazards and Hazardous Materials	**Impact 3.7-2: Exposure of people and the environment to subsurface hazardous materials disturbed during construction.**	**Mitigation Measure 3.7-2b: Delineate any construction areas where the presence of hazardous materials is known or suspected.** Before the start of construction, SMUD or its contractor shall delineate construction areas where the presence of hazardous materials is known or suspected. Such areas shall be avoided during construction to the extent feasible. These areas include but are not limited to abandoned gas wells and underground gas pipelines. Underground utilities, such as gas pipelines and high-voltage lines, shall be identified and marked clearly. If necessary, appropriate encroachment permits shall be obtained before work begins. A Spill Discovery Response Plan shall be developed before construction begins. The plan shall be implemented in the event that hazardous materials are unexpectedly encountered during construction. The plan shall include instructions for work crews to stop work immediately, notify the appropriate emergency response agency, and in the case of natural gas pipelines, notify the pipeline operator.	Before and during construction. Before construction, delineate construction areas where there are known or suspected hazardous materials. Avoid such areas during construction. Before construction, develop a Spill	Before and during construction.	SMUD and/or Contractor	SMUD	All project components

Table 4-1 Summary of Impacts and Mitigation Measures

CEQA Issue Area	Impacts	Mitigation Measures	Implementation Duration	Monitoring Duration	Responsibility		Applicable Project Component
					Implementation	Monitoring	
			Discovery Response Plan and implement during construction in the event that hazardous materials are encountered.				
Hazards and Hazardous Materials	**Impact 3.7-2: Exposure of people and the environment to subsurface hazardous materials disturbed during construction.**	**Mitigation Measure 3.7-2c: Maintain access to gas wells.** Should a gas well location be verified, SMUD and its construction contractor shall implement the following measures: • Maintain physical access to any gas well encountered. • Ensure that the abandonment of gas wells is to current standards. • If one or more unknown wells is discovered during project development, immediately notify the California Department of Conservation, Division of Oil, Gas, and Geothermal Resources so that the newly discovered well(s) can be incorporated into the records and investigated. Any wells found during implementation of the project, and any pertinent information obtained, shall be communicated to the Solano County Recorder for inclusion in the title information of the subject real property. This is to ensure that present and future property owners are aware of (1) the wells located on the property, and (2) potentially significant issues associated with any improvements near oil or gas wells. • Avoid performing work on any oil or gas well without written approval from the California Department of Conservation, Division of Oil, Gas, and Geothermal Resources in the form of an appropriate permit. This includes but is not limited to mitigating leaking fluids or gas from abandoned wells, modifications to well casings, and/or any other re-abandonment work.	Before and during construction. Before and during construction, if a gas well is located: maintain access, ensure abandonment of well(s) is to current standards, immediately notify DOGGR, avoid working on any oil or gas well without written approval from DOGGR.	Before and during construction.	SMUD and Contractor	SMUD	All project components
Hazards and Hazardous Materials	**Impact 3.7-3: Safety hazard to air traffic.**	**Mitigation Measure 3.7-3: Mark and light wind turbine generators during construction.** SMUD will e-file FAA Form 7460-2, Part 1, Notice of Actual Construction or Alteration, at least 60 days before the start of construction, so that appropriate action can be taken to amend the affected procedure(s) and/or altitude(s), if necessary. To ensure proper conspicuity of turbines at night during construction, all WTGs shall be lit with temporary lighting once they reach a height of 200 feet or greater until the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting shall be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights shall be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, WTGs shall be lit with self-contained, solar-powered light-emitting diode (LED) steady red light fixtures that meet the photometric requirements of an FAA Type L-810 lighting system. The lights shall be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a Notice to Airmen (NOTAM) (D) to avoid lighting WTGs within the project site until completion of the entire project is prohibited. This measure includes temporary construction equipment such as cranes and derricks, which may be used during actual construction of the structures. However, this equipment shall not exceed a height of 200 feet. Separate notice shall be provided to the FAA for any equipment taller than 200 feet.	Before and during construction. At least 60 days before start of construction, SMUD to file Form 7460-2, Part 1 with FAA. Light all WTGs with temporary lighting once they reach a height of 200 ft or greater until permanent lighting is turned on. Light temporary construction equipment (i.e. cranes and derricks), which shall not exceed height of 200 ft.	Before and during construction.	SMUD and Contractor	SMUD	WTGs and associated facilities (i.e. meteorological towers) and temporary construction equipment.

Table 4-1 Summary of Impacts and Mitigation Measures

CEQA Issue Area	Impacts	Mitigation Measures	Implementation Duration	Monitoring Duration	Responsibility		Applicable Project Component
					Implementation	Monitoring	
Hazards and Hazardous Materials	**Impact 3.7-4: Exposure of employees and the public to hazards from accidental rotor failure.**	**Mitigation Measure 3.7-4: Conduct Safety Evaluation of WTGs.** The Contractor shall provide a safety evaluation of the proposed siting plan, and ensure that the design and layout of the Project considers the safety evaluation. The Contractor's safety evaluation shall include an analysis of the following types of failure that could occur: a. Blade Throw Risk Analysis: Probability of Loss of an entire blade by failure at the hub attachment. b. Tower Failure. Complete failure of the tower, particularly at the base. c. Rotor Delamination. Failure of the fiberglass rotor skin, resulting in flying fragments. d. Blade-Throw Strike. Impact of a failed rotor blade on the tubular tower	Before construction. Contractor to provide safety evaluation of proposed siting plan before construction.	Before construction.	Contractor	SMUD	All project components involving WTGs.
Hazards and Hazardous Materials	**Impact 3.7-5: Exposure of people or structures to a significant risk of loss, injury, or death involving wildfires.**	**Mitigation Measure 3.7-5a: Prepare and implement a grass fire control plan.** SMUD or its construction contractor will develop a grass fire control plan. The plan shall be implemented for use during construction and operation of the project to reduce potential impacts on public services relative to fire protection services in the project area. The plan shall include notification procedures and emergency fire precautions, as discussed in Section 4.8, "Hazards and Hazardous Materials." This shall include the training of construction workers in the use of firefighting equipment available on-site (e.g., fire extinguishers) and communicating with the Montezuma Fire Protection District. Additionally, the nearby Montezuma Fire Protection District stations are equipped for grass fires, and the proposed access roads for WTG maintenance shall be used to improve access by fire trucks during emergency situations and serve as a fire break. The operations and maintenance building shall be designed to SMUD's safety standards and shall include a fire alarm. In addition, construction and maintenance crews shall be trained in fire prevention, carry fire extinguishers in all vehicles, and have access to one or more water trucks.	Before and during construction, and operation-maintenance. Before construction, develop a Grass Fire Control Plan. Implement Plan during construction and operation. Training for construction and maintenance crews.	Before and during construction.	SMUD and Contractor	SMUD	All project components
Hazards and Hazardous Materials	**Impact 3.7-5: Exposure of people or structures to a significant risk of loss, injury, or death involving wildfires.**	**Mitigation Measure 3.7-5b: Implement Mitigation Measure 3.11-1b, "Create and implement an emergency access plan and notify emergency services providers of anticipated roadway obstructions."** SMUD will implement Mitigation Measure 3.11-2 listed in Section 3.11, "Transportation and Traffic." This measure requires the development and implementation of a plan to maintain emergency access during WTG transport and throughout the construction period.	See MM 3.11-1b	See MM 3.11-1b	See MM 3.11-1b	See MM 3.11-1b	See MM 3.11-1b
Hydrology and Water Quality	**Impact 3.8-1: Short-term degradation of water quality.**	**Mitigation Measure 3.8-1a: Implement Mitigation Measure 3.5-1, "Prepare and implement a SWPPP and associated BMPs."** SMUD shall prepare and the construction contractor to implement Mitigation Measure 3.5-1 listed in Section 3.5, "Geology, Soils, and Mineral Resources." This measure requires the construction contractor to implement a SWPPP, including all necessary BMPs.	See MM 3.5-1	See MM 3.5-1	See MM 3.5-1	See MM 3.5-1	See MM 3.5-1
Hydrology and Water Quality	**Impact 3.8-1: Short-term degradation of water quality.**	**Mitigation Measure 3.8-1b: Implement Mitigation Measure 3.7-1b, "Establish and implement an environmental training program."** The construction contractor shall implement Mitigation Measure 3.7-1b listed in Section 3.7, "Hazards and Hazardous Materials." This measure requires SMUD to establish and require implementation of an environmental training program for all field personnel that communicates spill prevention, emergency response measures, and proper implementation of BMPs.	See MM 3.7-1b	See MM 3.7-1b	See MM 3.7-1b	See MM 3.7-1b	See MM 3.7-1b
Hydrology and Water Quality	**Impact 3.8-1: Short-term degradation of water quality.**	**Mitigation Measure 3.8-1c: Implement Mitigation Measure 3.7-1c, "Prepare and implement a hazardous substance control and emergency response plan."** The construction contractor shall implement Mitigation Measure 3.7-1c listed in Section 3.7, "Hazards and Hazardous Materials." This measure requires SMUD to prepare and implement a construction-specific hazardous substance control and emergency response plan for quick, safe cleanup of accidental spills.	See MM 3.7-1c	See MM 3.7-1c	See MM 3.7-1c	See MM 3.7-1c	See MM 3.7-1c

Table 4-1 Summary of Impacts and Mitigation Measures

CEQA Issue Area	Impacts	Mitigation Measures	Implementation Duration	Monitoring Duration	Responsibility		Applicable Project Component
					Implementation	Monitoring	
Hydrology and Water Quality	**Impact 3.8-1: Short-term degradation of water quality.**	**Mitigation Measure 3.8-1d: Implement Mitigation Measure 3.7-1d, "Prepare and implement a spill prevention, control, and countermeasures plan."** The construction contractor shall implement Mitigation Measure 3.7-1d listed in Section 3.7, "Hazards and Hazardous Materials." This measure requires SMUD to prepare and the construction contractor to implement a spill prevention control and closures plan to prevent the discharge of petroleum products into waterways.	See MM 3.7-1d	See MM 3.7-1d	See MM 3.7-1d	See MM 3.7-1d	See MM 3.7-1d
Transportation	**Impact 3.11-1: Short-term construction transport-related traffic hazards and incompatible uses.**	**Mitigation Measure 3.11-1a: Create and implement a traffic control plan and notify the public of anticipated roadway obstructions.** SMUD or its construction contractor will work with Caltrans, Solano County, and the City of Napa to determine the lowest hourly traffic flows on affected facilities and develop a traffic control plan. The traffic control plan shall specify travel times and days and provide for public notification of anticipated roadway obstructions before transporter travel days. Traffic control plan measures shall include the use of pilot cars for oversize loads; traffic safety measures, such as warning signs; coordination with local jurisdictions; and safety personnel to direct traffic as needed. To minimize impacts on roadway traffic flows, transporters shall travel under loaded conditions during off-peak hours and possibly during evenings or at night. The final plan shall be submitted to all affected agencies for review and approval. After agency approvals have been received, the traffic control plan shall be implemented during transport of the WTG components.	Before and during construction. Before construction, develop a Traffic Control Plan and implement during construction. Consult with other agencies.	Before and during construction.	SMUD and Contractor	SMUD, Caltrans, Solano County, City of Napa	All project components.
Transportation	**Impact 3.11-1: Short-term construction transport-related traffic hazards and incompatible uses.**	**Mitigation Measure 3.11-1b: Create and implement an emergency access plan and notify emergency services providers of anticipated roadway obstructions.** SMUD or its construction contractor will work with affected emergency services providers to develop and implement a plan to maintain emergency access during transport of WTG components and throughout the construction period. The plan shall identify alternative emergency access routes; the need to station emergency equipment in areas where access will be reduced; and notification protocols between SMUD, its contractors, and affected providers. The final plan shall be submitted to all affected agencies for review and approval. After agency approvals have been received, the emergency access plan shall be implemented during transport of WTG components and throughout the construction period as necessary.	Before and during construction. Consult with emergency services to develop and implement an Emergency Access Plan during transport of WTG components.	Before and during construction.	SMUD and Contractor	SMUD and affected agencies (Caltrans, Solano County, City of Napa)	During transport of WTG components.
Transportation	**Impact 3.11-1: Short-term construction transport-related traffic hazards and incompatible uses.**	**Mitigation Measure 3.11-1c: Obtain an agency transportation permit for each load exceeding weight, length, width, and height standards.** SMUD or its construction contractor will submit an application to Caltrans, Solano County, and the City of Napa for a transportation permit for each load that exceeds weight, length, width, or height standards. The applications shall identify the specific transporter to be used and provide details about the turbine components' load specifications, the requested route, and the time and date of transport. All permit conditions shall be implemented during transport of WTG components.	Before and during construction. Submit transportation permit applications to affected agencies. Implement all permit conditions during transport of WTG components.	Before and during construction.	SMUD and Contractor	SMUD and affected agencies (Caltrans, Solano County, City of Napa)	During transport of WTG components.
Transportation	**Impact 3.11-1: Short-term construction transport-related traffic hazards and incompatible uses.**	**Mitigation Measure 3.11-1d: Improve roadways to enable safe use or use shorter transporters, and obtain agency transportation permits for transport of extra-legal length vehicles.** SMUD or its construction contractor will make improvements to public roads to enable delivery of WTG components and provide access for construction equipment. These improvements shall accommodate all turning movements of the maximum-size transporter. A detailed topographic survey shall be conducted to determine the exact limits, and to identify additional areas that may be affected. All roadway improvements shall be designed and implemented in close cooperation with Solano County (and other jurisdictions, if applicable).	During construction. Make improvements to public roads, as necessary, in cooperation with Solano County (and other jurisdictions, if applicable).	During construction.	SMUD and Contractor	SMUD and affected agencies (Solano County, etc.)	Roads used to transport WTG components.

Table 4-1 Summary of Impacts and Mitigation Measures

CEQA Issue Area	Impacts	Mitigation Measures	Implementation Duration	Monitoring Duration	Responsibility		Applicable Project Component
					Implementation	Monitoring	
		An alternative mitigation measure is to use shorter transporters to reduce the impact, although this measure is also expected to require a reduction in the size of the WTG components, which likely will increase the number of trips if the overall turbine dimensions remain the same.	Conduct topographic survey.				
Transportation	**Impact 3.11-2: Short-term increase in construction traffic on physically deficient roadway segments.**	**Mitigation Measure 3.11-2: Monitor the physical condition of roadway segments along primary access routes to the project site and restore the physical condition of affected roadways to the extent damaged by the project.** SMUD or its construction contractor will conduct a preconstruction survey and assessment of existing pavement conditions along SR 12 east, Shiloh Road, Collinsville Road, Talbert Lane, Stratton Road, Birds Landing Road, and Montezuma Hills Road. If the preconstruction pavement conditions are deficient, the preconstruction pavement analysis shall establish the baseline for required improvements. If the preconstruction pavement conditions are acceptable, improvements shall be required only if the postconstruction pavement condition is deficient, and only to the extent that the project demonstrably contributed to such deficiencies. If deficient following construction, any segments of SR 12 east and Shiloh Road, Collinsville Road, Talbert Lane, Stratton Road, Birds Landing Road, and Montezuma Hills Road that are affected by the project shall be returned to preconstruction conditions after construction. Implementing this measure will ensure that construction activities will not worsen pavement conditions, relative to existing conditions. Before construction, SMUD will enter into mitigation agreements with Caltrans (for SR 12 east) and Solano County (for Shiloh Road, Collinsville Road, Talbert Lane, Stratton Road, Birds Landing Road, and Montezuma Hills Road) to verify the location, extent, timing, and fair-share cost to be paid by SMUD for any necessary pre- and postconstruction physical improvements. The fair-share amount will be either the cost to return the affected roadway segment to its preconstruction condition or a contribution to programmed planned improvements. Repairs may include overlays or other surface treatments.	Before and post-construction. Preconstruction survey and assessment of existing pavement conditions. Before construction, SMUD will make a good-faith effort to enter into mitigation agreements with Caltrans and Solano County. Repair of damaged roads post-construction as necessary.	Before, during, and post-construction.	SMUD and Contractor	SMUD, Caltrans, Solano County	Roads used to transport WTG components.

This page intentionally left blank

5 References

Appendix A. Technical Study Reports and Presentations

Black & Veatch. 2018. *Solano Wind Energy Project Wind Project Expansion Assessment*. Prepared for SMUD by Black & Veatch, Rancho Cordova, CA. 4 January 2018.

Downey Brand. *April 26, 2019 Letter to Shute Mihaly & Weinberger LLP re: Solano County ALUC Comments on SMUD Notice of Preparation for Solano 4 Wind Project*. Prepared for SMUD by Downy Brand.

Capitol Airspace Group. 2018a. *SMUD Solano Phase 1 & Phase 4 Obstruction Evaluation & Airspace Analysis*. Prepared for SMUD by Capitol Airspace Group, Alexandria, VA. 25 July 2018.

_____. 2018b. *Capitol Airspace Aeronautical Study Process*. Prepared for SMUD by Capitol Airspace Group, Alexandria, VA. 31 July 2018.

Federal Aviation Administration (FAA). *Determination of No Hazard to Air Navigation, Aeronautical Study No. 2018-WTW-13388-OE to 2018-WTW-13406-OE*. 1 February 2019.

_____. *Extension of Determination of No Hazard to Air Navigation, Aeronautical Study No. 2018-WTW-13388-OE to 2018-WTW-13406-OE*. 28 January 2021.

Sacramento Municipal Utilities District (SMUD). 2019. *Resource Planning Report: IRP filing report for submission to the California Energy Commission*. SMUD, Sacramento, CA. April 2019.

_____. 2021. *2030 ZERO Carbon Plan*. SMUD, Sacramento, CA. April 2021.

Sample, Steven, Executive Director Military Aviation and Installation Assurance Siting Clearinghouse, Department of Defense. *February 9, 2021 letter re: FAA Study Number 2018-WTW-13388-OE and 18 associated structures*. Washington, DC.

Simmons, Colonel Cory A., USAF Commander. *January 11, 2021 Letter re: 60 AMW Solano 4 Wind Project Operational Risk Assessment*. Travis Air Force Base, CA.

Solano County. 2021. *Solano County ALUC Hearing Transcript, May 20, 2021*. Solano County, 675 Texas Street, Fairfield, California. 20 May 2021.

Westslope Consulting, LLC. 2018a. *SMUD Solano 4 Cumulative Impact Study and Mitigation Solution Results for 2018 Vestas V136 and V150 Wind Turbine Layouts*. Prepared for SMUD by Westslope Consulting, LLC, Norman, OK. 6 September 2018.

_____. *Solano Phase I Repower Wind Project Basic Radar Line-of-Sight Study*. Prepared for SMUD by Westslope Consulting, LLC, Norman, OK. 16 April 2018.

Westslope Consulting, LLC and Capitol Airspace Group. 2021. *March 30, 2021 Letter of Response to Dr. Jerry Johnson, Director of Engineering Regulus Group, LLC*. Westslope Consulting, LLC, Norman, OK. Capitol Airspace Group, Alexandria, VA.

6 Final EIR Authors/Preparers

6.1 Sacramento Municipal Utility District (Lead Agency)

Ammon Rice.....Supervisor, Environmental Services
Buck Cutting.....Manager, Project Development and Renewable Generation Assets

6.2 AECOM (FEIR Preparation)

Petra Unger.....Project Manager
Jody Fessler.....Deputy Project Manager
Susan Sanders, Ph.D.....Senior Biologist
Deborah Jew.....Document Production Specialist
Bryn Montgomery.....GIS Specialist

This page intentionally left blank.

Appendix A

Technical Studies

SOLANO WIND ENERGY PROJECT

Wind Project Expansion Assessment

B&V PROJECT NO. 194957
B&V FILE NO. 40.0000

PREPARED FOR

SMUD™

Sacramento Municipal Utility District (SMUD)

4 JANUARY 2018

NO	Date	Revision Issue
0	01/04/2017	Final Report

BLACK & VEATCH
Building a world of difference.®

Table of Contents

LIST OF TABLES

LIST OF FIGURES

Legal Notice

This report was prepared for SMUD by Black & Veatch and is based on information not within the control of Black & Veatch. Black & Veatch has assumed that the information provided by others, both verbal and written, is complete and correct. While it is believed that the information, data, and opinions contained herein will be reliable under the conditions and subject to the limitations set forth herein, Black & Veatch does not guarantee the accuracy thereof.

1.0 Executive Summary

Black & Veatch assessed options for repowering and expansion of the Solano Wind projects in the Montezuma Hills in Solano County, California. This effort included preparation of preliminary project layouts, energy production assessments, conceptual civil and electrical plans, capital and operational cost estimates, and a plan for studying vertical wind profiles on site. It was conducted in two revisions; one preliminary ("Revision 1") and one follow on ("Revision 2"). The focus of Revision 1 was to assess the projects of interest prior to turbine vendor recommendations being provided to SMUD. Revision 2 adds analysis of turbine layouts and energy performance, road plans, collections system designs, and capital cost specific to two additional turbine models recommended by Vestas. For both revisions, the expansion is specific to two areas of the existing Solano Wind development area. Phase 1 is a currently operational installation of turbines owned by SMUD. Black & Veatch evaluated the phase for full repowering of turbines along with possible expansion of the phase to the east. Phase 4 is an opportunity for new development to the southwest portion of the project boundary, west of the operating Phase 3 wind project.

At the start of this effort, SMUD had not committed to any turbine make or model for the expansion. To begin Revision 1, Black & Veatch reviewed several possible turbines for site suitability and expected performance. These turbine options were then reviewed with SMUD and a single option was selected as the assumed turbine make and model until Revision 2 began. All turbine options considered as part of this effort are shown in Table 1-1.

Table 1-1 Options for Turbine Implementation Evaluated

Revision	Make	Model	Capacity (MW)	Hub Height	Rotor Diameter
1	GE Energy	GE2.3-116	2.30	80 m	116 m
1	Vestas	V110-2.0	2.00	80 m	110 m
1 & 2	Vestas	V126-3.45	3.45	87 m	126 m
2	Vestas	V136-4.20	4.20	82 m	136 m
2	Vestas	V150-4.20	4.20	105 m	150 m
1	Siemens	SWT2.3-108	2.30	80 m	108 m

After considering the Revision 1 above options, SMUD elected to assume the future installation of Vestas V126-3.45 turbines at both Phase 1 and Phase 4 for the duration of the revision. Revision 2 warranted additional consideration of Vestas V136-4.20 and Vestas V150-4.20 model turbines. Performance results from Revision 2 included additional loss assumptions beyond the wake losses considered in preliminary Revision 1 assessment. The resulting P50 annual energy production values found for each phase are provided in Table 1-2, Table 1-3, and Table 1-4.

Table 1-2 Vestas V126-3.45 P50 Annual Energy and Net Capacity Factor

Phase	Make	Model	#WTGs	Capacity (MW)	Wake Loss	Net Energy (GWh)	Capacity Factor
Phase 1	Vestas	V126-3.45	8	27.6	12.2%	91.9	38.0%
Phase 1 Addn.	Vestas	V126-3.45	4	13.8	9.0%	46.5	38.4%
Phase 4	Vestas	V126-3.45	13	44.9	10.8%	142.5	36.2%
Total			**25**	**86.3**	**11.0%**	**280.8**	**37.1%**

Table 1-3 Vestas V136-4.20 P50 Annual Energy and Net Capacity Factor

Phase	Make	Model	#WTGs	Capacity (MW)	Wake Loss	Net Energy (GWh)	Capacity Factor
Phase 1	Vestas	V136-4.20	6	25.2	11.2%	81.7	37.0%
Phase 1 Addn.	Vestas	V136-4.20	4	16.8	12.1%	52.2	35.5%
Phase 4	Vestas	V136-4.20	12	50.4	9.7%	156.9	35.5%
Total			**22**	**92.4**	**10.6%**	**290.8**	**35.9%**

Table 1-4 Vestas V150-4.20 P50 Annual Energy and Net Capacity Factor

Phase	Make	Model	#WTGs	Capacity (MW)	Wake Loss	Net Energy (GWh)	Capacity Factor
Phase 1	Vestas	V150-4.20	5	21.0	8.0%	79.4	43.2%
Phase 1 Addn.	Vestas	V150-4.20	4	16.8	8.9%	61.7	41.9%
Phase 4	Vestas	V150-4.20	10	42.0	8.1%	151.0	41.0%
Total			**19**	**79.8**	**8.3%**	**292.1**	**41.8%**

With three viable turbine models and layouts for each aspect of the expansion known, Black & Veatch moved to conceptual designs of the major components of civil and electrical works at each phase and for each Revision 2 turbine option. Preliminary access road routes were prepared based on the developed turbine layouts, site terrain, environmental features, and existing infrastructure. Cost considerations were made for both required road distances and complexity of implementation when traversing complex terrain. Existing Phase 1 roads were utilized where practical, though some sections were considered too steep for delivery of large turbines.

Collection system design at Phase 1 focused on two options. The first option was to use the existing 21.6kV overhead line to Russell substation, while the second option was to install a new 34.5kV underground line to Russell 3 substation. Option 2 was determined to be the most feasible implementation and was considered the preferred choice for all Revision 2 designs. Black & Veatch also reviewed the options for the Phase 4 collection system and found that using the underground collection cable and existing feeder plus installing two new circuits to be the most economical option considering electrical limitations of the existing infrastructure.

The substation review revealed that minor work will need to be completed at Russell 3 Substation in order to accommodate the collection system options outlined above. The nature of

this minor work at Russell 3 Substation is detailed in Section 5.3. No additional work is required at Russell Substation for all options.

Following the conceptual design of each phase and for each Revision 2 turbine layout of the Solano Wind expansion, Black & Veatch completed cost estimates of implementation. This estimate excluded turbine procurement costs but did include decommission costs incurred through the repowering of Phase 1. The estimated total costs of engineering, procurement, construction (EPC) are provided below in Table 1-5.

Table 1-5 Estimated Costs of Implementation for Selected Turbine Models

Category	V126-3.45	V136-4.20	V150-4.20
Phase 1 Decommissioning	$1,219,000	$1,219,000	$1,219,000
Substation and Interconnection	$45,000	$45,000	$45,000
BOP	$23,371,833	$23,783,437	$22,930,798
Wind Turbines - NOT INCLUDED	$0	$0	$0
TOTAL PROJECT	**$24,635,833**	**$25,047,437**	**$24,194,798**

These values assume that repower and expansion of Phase 1 will occur concurrently with new construction of Phase 4.

Black & Veatch additionally prepared a 10-year cost estimate of operations and maintenance ("O&M") of the expansion portion of the project. The estimate was informed by existing agreements for Solano Wind 3, provided by SMUD and tailored by Black & Veatch according to industry experience. It was completed prior to the additional consideration of Vestas V136-4.20 and V150-4.20 turbines and focuses solely on the Vestas V126-3.45 turbine option. The primary results of this estimate are provided in Table 1-6 below.

Table 1-6 Operating Cost Estimate of Vestas V126-3.45 Layout

Year	Total Cost	$/kW-yr
1	$1,500,000	$17,390
5	$1,624,000	$18,830
10	$2,977,000	$34,520
Cumulative 10 Year Total	**$22,118,000**	**$25,650**

The project area of Solano Wind is moderately complex with variably arranged ridgelines rising 15 to 30 meters above the site average elevation. It has been SMUD's experience of the duration of operation of Solano Wind that wind patterns tend to be affected by the complexity of the local terrain in ways not easily explained intuitively. It was requested, as a final effort in the Revision 1 scope of work, that assistance be provided in designing a study aimed at measuring these wind patterns. A study design is provided in Section 7.0. It provides recommendations to SMUD for conducting a study of vertical wind speed profiles by use of remote sensing technology at various ridgeline locations across the expansion area. The intention is for unique and identifiable patterns to emerge depending on sensor location and ridgeline orientation.

2.0 Introduction

This report is presented by Black & Veatch as a summary of the recent two-part study of a possible expansion to the existing Solano Wind project, prepared for the Sacramento Municipal Utility District (SMUD). The primary purpose of this study was to prepare conceptual designs and cost estimates for repowering of the existing Phase 1 of Solano Wind and of the new construction of a new Phase 4. This effort required the development of preliminary layouts for each phase and the subsequent evaluation of the potential performance of the project using turbine technologies from several wind turbine suppliers. Three final turbine model options were then selected by SMUD and conceptual designs of site access roads, collection systems, and substation upgrades were completed. The sections to follow detail the Black & Veatch effort to provide SMUD with potential options for repower and expansion turbines, assist SMUD with the selection of the most likely options, and design conceptual EPC plans for implementation.

2.1 KEY ASSUMPTIONS AND STUDY LIMITATIONS

- Black & Veatch reviewed several potential wind turbine models based on current industry models and vendor recommendations as they apply to the specific wind patterns at Solano Wind. Changes to technologies offered by wind turbine suppliers in the future may have an impact on estimated annual energy production values (AEP).
- Performance based results contained herein are based on the assumption of use of Vestas V126-3.45 model turbines with 87 m hub heights, Vestas V136-4.20 model turbines with 82 m hub heights, or Vestas V150-4.20 model turbines with 105 m hub heights at expansion area locations. Changes to the selected model turbines or their locations will invalidate the applicability of performance results presented herein.
- No future development or repowering of surrounding wind projects was considered. If there is wind farm development in the vicinity of the Solano Wind project, then there may be a potential impact on the estimated AEP.
- Black & Veatch has assessed the provided information for accuracy and completeness. However, errors in the supplied information may affect the findings of this assessment.

3.0 Preliminary Performance Assessment

3.1 SITE DETAILS

Solano Wind consists of three project phases located in the Montezuma Hills in Solano County, California. The site is approximately 36 miles southwest of Sacramento, California. Montezuma Hills is a well-known and heavily developed wind area, and the Solano site is adjacent to several existing projects including Shiloh Wind 1 – 4, Montezuma Wind 1 & 2, High Winds Energy, and the EnXco 5 RePower. This study considers a potential repowering and expansion of Phase 1 of Solano Wind, at the eastern end of the project area, and potential development of a new Phase 4 at the southwestern end of the area.

3.2 SITE TOPOGRAPHY

The site consists of moderately sized ridgelines of varying rise and orientation. The elevation within the Solano Wind boundary averages approximately 35 meters, with ridgeline elevations averaging approximately 55 meters. Ridgelines are present within both the Phase 1 and Phase 4 areas. The vegetation consists mostly of grazing land with grass cover, and is largely barren of trees and other structures that might block the wind, with the exception of existing wind turbines. Areas of wetlands and ponds are located south of the project area, but away from the locations anticipated to be useful for turbine siting.

3.3 FACTORS AFFECTING SITE WIND SPEEDS

3.3.1 Surface Roughness

As the wind moves across the ground surface obstacles such as vegetation or structures impede its flow, reducing velocity of the wind through the lowest levels of the surface boundary layer. The surface roughness length is an indirect measure of this frictional effect. While surface roughness is expressed as a dimension of length, it is not a direct measure of the size of the object. Surface roughness length is a scalar value that characterizes the roughness of the ground terrain (including obstacles) which has an effect upon the vertical wind-speed profile. The project site is characterized by mostly short grasses; the corresponding surface roughness length for short grass is generally between 0.01 and 0.04 meters.

3.3.2 Terrain Features

The project is located on rolling terrain, with existing turbines located in higher elevation areas along the ridgelines, which are anticipated to have the greatest local wind resource. The terrain is complex and is typical of this area of California.

3.3.3 Air Density

The mean site elevation across the project area is 35 meters above mean sea-level (AMSL), with a variation of approximately 35 meters across the site. The average site air density was

calculated to be approximately 1.21 kg/m^3, consistent with previous studies in this area of California. The air density calculation is based local area elevation and an assumed air density lapse rate of -0.113 (kg/m^3)/km.

3.4 WIND RESOURCE DATA

Black & Veatch used publicly available wind resource information, along with onsite meteorological (MET) mast data, to prepare the models for estimated wind resource. After review of available MET mast locations as well as existing turbine locations, Black & Veatch determined that greater use could be gained through the use of wind data from the publically available National Renewable Energy Laboratory (NREL) Wind Toolkit as opposed to onsite MET mast data. The basis for this determination was the need to model existing turbines surrounding SMUD phases 1 and 4. Figure 3-1 shows the defined phases of Solano Wind with the locations of existing turbines expected to influence wind flows on new installations.

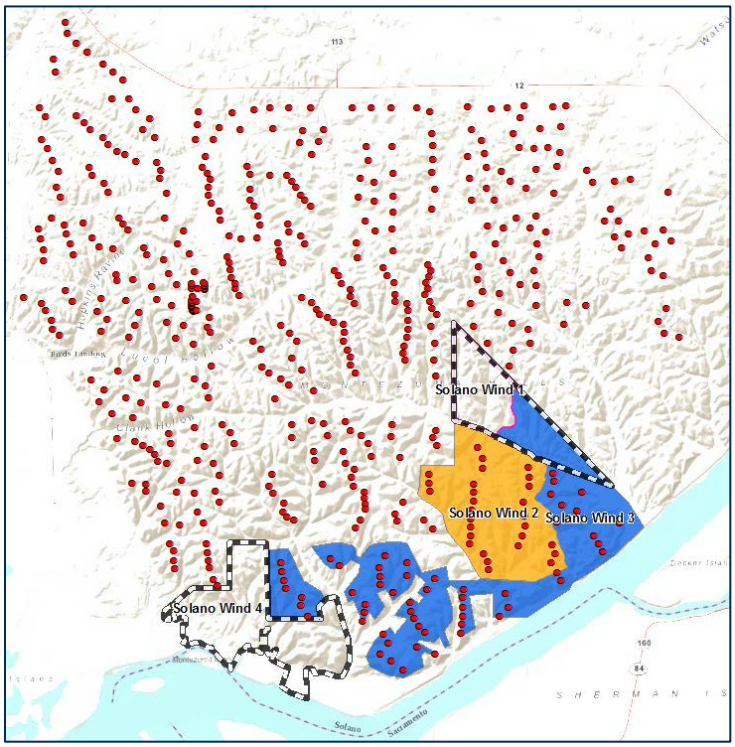


Figure 3-1 Wind turbines External to, but Influencing, Phases 1 and 4

In all, there are 525 turbines standing that may impact future project performance. It can be seen from Figure 3-1 above that the locations of these influencing turbines extend far beyond the boundary of Solano Wind. Use of NREL's Wind Toolkit dataset allows for full and consistent coverage of both the project area as well as all influencing turbine locations. Black & Veatch additionally considers it necessary to begin analysis with wind resource data uninfluenced by existing turbines in order to identify wake implication specific to particular projects and phases.

3.5 ENERGY PRODUCTION ESTIMATES FOR PRELIMINARY TURBINES

Based on the wind resource data collected from the NREL Wind Toolkit datasets, Black & Veatch estimated the potential energy production for Solano Wind Phases 1 and 4 for each of four scenarios. The intent for these scenarios was not to pinpoint or recommend a specific turbine model for implementation but rather to provide options of reasonably applicable turbine models for SMUD to review. The evaluation of these preliminary scenarios was part one (Revision 1) of the two-part study. Turbines from General Electric, Vestas, and Siemens were considered. Specific turbine models evaluated in Revision 1 are provided below in Table 3-1.

Table 3-1 Revision 1 Turbines Considered for Use in Expansion

Make	Model	Capacity (MW)	Hub Height	Rotor Diameter	Rated Wind Speed	IEC Class*
GE Energy	GE2.3-116	2.30	80 m	116 m	10.0	S
Vestas	V110-2.0	2.00	80 m	110 m	12.0	IIIA
Vestas	V126-3.45	3.45	87 m	126 m	12.0	IIA
Siemens	SWT2.3-108	2.30	80 m	108 m	11.5	IIB

Black & Veatch considered the turbines listed above to adequately encompass a spectrum of reasonable offerings to SMUD from turbine suppliers. This section details the Black & Veatch evaluation of turbines and results provided to Client for consideration prior to selecting final Revision 2 turbine models for further evaluations of performance and implementation.

3.5.1 Layout Development

SMUD provided Black & Veatch with land control boundaries and existing turbine locations. Based on this information and the wind resource data developed and reviewed in the section above, Black & Veatch developed project layouts at Phase 1 and Phase 4, for the GE, Vestas, and Siemens turbine options.

In developing the layouts, Black & Veatch first considered physical, environmental, and property line constraints which govern the available locations for wind turbines, collector lines, access roads, transmission lines, and related project facilities. Noteworthy restrictions applied when planning layouts include a physical limitation eliminating placement of wind turbines on terrain with slopes greater than 8.0 percent. Environmental restrictions considered prevented development near publically available wetland locations and FEMA defined 100 Year Floodplains.

Black & Veatch developed site layouts using Openwind®. Turbine spacing was chosen in view of the rotor diameter of the turbine model and wind resource. The minimum crosswind spacing between turbines is 2.0 rotor diameters. The minimum downwind spacing between rows is 8.0 rotor diameters. The primary wind direction was considered to be 270° which is consistent with measured site and long-term MERRA2 data. Layouts were developed with the aid of the Openwind® optimizer to maximize energy production based on changes in wind resource and wake loss across the site.

3.5.2 Site Climatology

Black & Veatch developed a model of each site wind resource utilizing Openwind®, a wind farm design software package developed by AWS Truepower. The Openwind® model develops site specific climatological conditions to estimate generation at the wind plant. Openwind® was used to derive wind resource grids, which provide a model for the varying wind resource across each unique site in the Portfolio. Wind resource grids are derived from representative site specific meteorological mast data. Background surface roughness values, based on observed land cover from the United States Geological Survey National Land Cover Dataset, were applied in the model according to terrain types. OpenWind® was then used to calculate wind resource grids at the respective hub heights of turbines present within and around the Solano Wind Boundary.

3.5.3 Wake Modeling

Black & Veatch also used Openwind® for wake modeling and project performance estimates. A wake model is used to determine the changes to the ambient wind speeds due to the effects of surrounding turbines at each turbine location within a wind farm. There are two available wake models in Openwind®, the Modified PARK model and the Eddy Viscosity model. Unlike the PARK wake model, the Eddy Viscosity model does not assume a linear wake expansion. Instead, it utilizes a two dimensional Computational Fluid Dynamics (CFD) calculation that employs a finite-difference solution of the Navier-Stokes equations for thin shear layers. Consideration of turbine-to-turbine wake losses makes the Eddy Viscosity model more accurate than the Modified PARK model. For this reason, Black & Veatch employed the Eddy Viscosity model to calculate the effective wind speeds and turbulence intensity for each turbine location for the energy production analyses.

3.6 PRELIMINARY ESTIMATE RESULTS

Table 3-2 Performance Results of Preliminary Screening

Phase	Make	Model	#WTGs	Phase Capacity (MW)	Wake Loss	Net Energy (GWh)*	Capacity Factor*
1	Vestas	V110-2.0	13	26.0	8.6%	113.0	50.0%
1	GE	GE2.3-116	13	29.9	9.1%	126.9	48.4%
1	Vestas	V126-3.45	12	41.4	10.0%	158.5	43.7%
1	Siemens	2.3-108	14	32.2	10.5%	130.7	46.3%
4	Vestas	V110-2.0	14	28.0	7.5%	116.8	47.6%
4	GE	GE2.3-116	14	32.2	8.1%	129.4	45.9%
4	Vestas	V126-3.45	13	44.9	9.1%	164.2	41.8%
4	Siemens	2.3-108	17	39.1	10.2%	146.8	42.8%

* Estimation Includes Array Efficiency Losses Only. Additional Losses ≈ 12% are Realistic

4.0 Final Performance Assessment

4.1 SCENARIO SELECTION FROM PRELIMINARY ESTIMATES

After review of the portfolio of options provided above in Table 3-2, SMUD selected the Vestas V126-3.45 model turbine as the option of choice. The selection was predicated on the perceived net benefit of maximizing energy production while minimizing the number of turbines. A Vestas model selection is likely to additionally provide simplicity to SMUD given existing operations and maintenance agreements with the company. The agreed upon layouts for the Vestas V126-3.45 option are provided below in Figure 4-1 and Figure 4-2.

4.2 ADDITIONAL SELECTIONS BY SMUD REQUEST

Toward the completion of Revision 1, it was recommended to SMUD by Vestas that the following options also be considered for implementation at Solano Phases 1 and 4.

Table 4-1 Revision 2 Turbines Considered for Use in Expansion

Make	Model	Capacity (MW)	Hub Height	Rotor Diameter	Rated Wind Speed	IEC Class*
Vestas	V136-4.20	4.20	82 m	136 m	13.5	IIB
Vestas	V150-4.20	4.20	105 m	150 m	12.0	IIIB

Following the same methodologies described in the sections 3.5.1, 3.5.2, and 3.5.3 above, Black & Veatch evaluated the options available to SMUD for locating these turbines within Solano Phase 1 and 4 boundaries. Adherence to required setbacks, dependent upon total turbine height, became a greater challenge during the siting of these turbines. As a result, it was necessary to reduce the number of turbines installed. The greater turbine capacity of 4.20 megawatts largely negates any negative impacts to the reduction in turbine quantities at each phase..

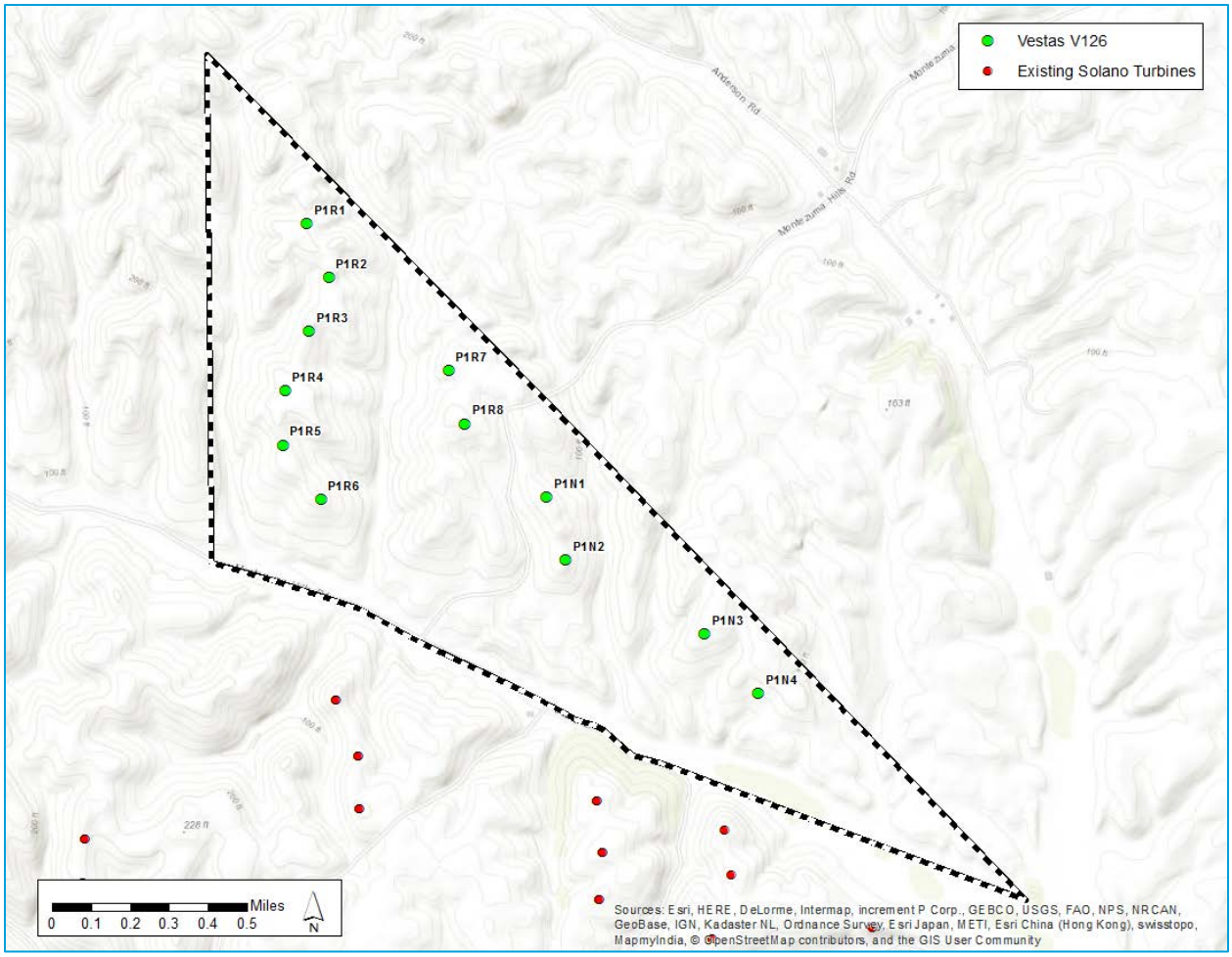


Figure 4-1 Phase 1 Turbine Layout (Vestas V126-3.45)

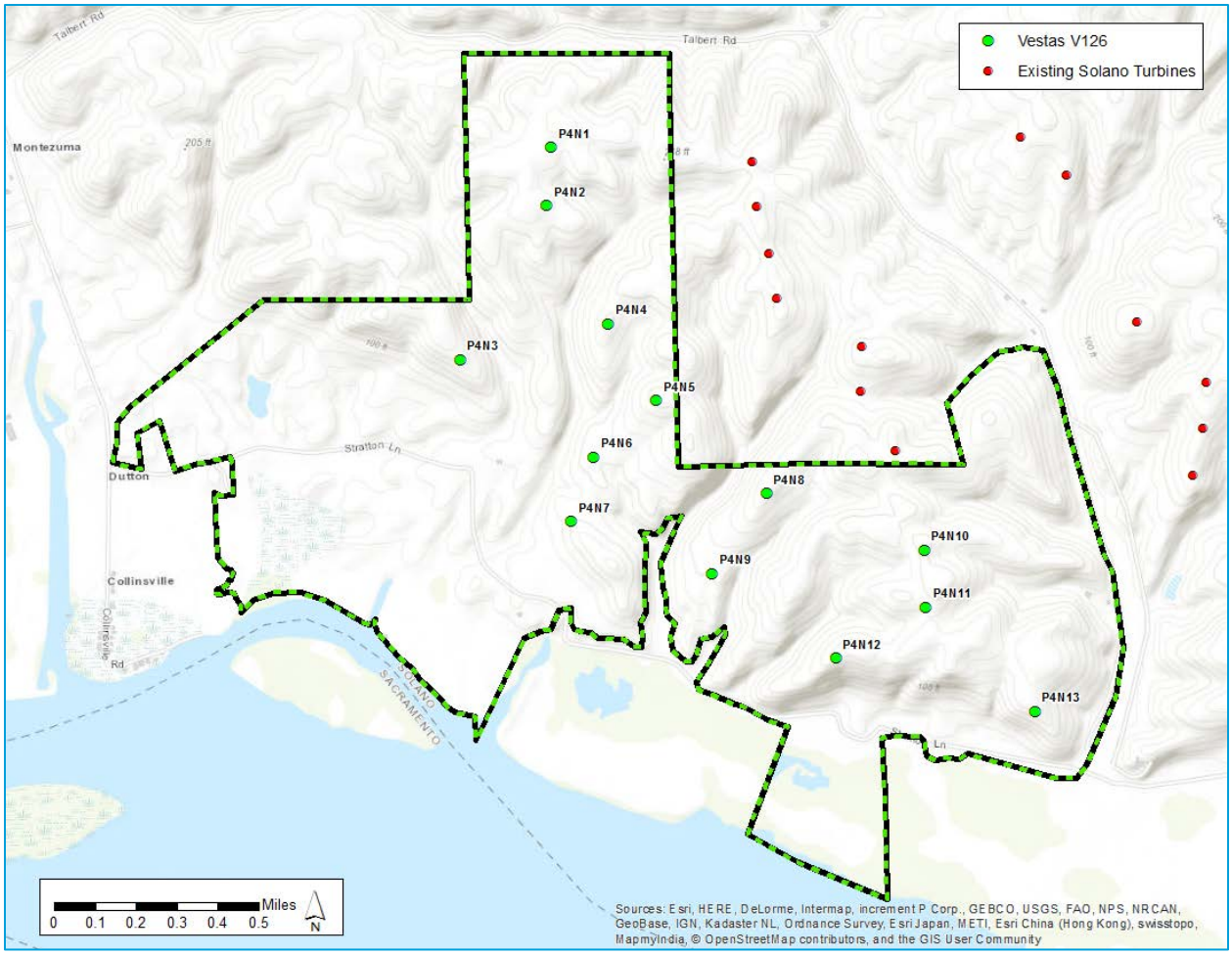


Figure 4-2 Phase 4 Turbine Layout (Vestas V126-3.45)

4.3 ADDITIONAL SELECTIONS BY SMUD REQUEST

Toward the completion of Revision 1, it was recommended to SMUD by Vestas that the following options also be considered for implementation at Solano Phases 1 and 4.

Table 4-1 Revision 2 Turbines Considered for Use in Expansion

Make	Model	Capacity (MW)	Hub Height	Rotor Diameter	Rated Wind Speed	IEC Class*
Vestas	V136-4.20	4.20	82 m	136 m	13.5	IIB
Vestas	V150-4.20	4.20	105 m	150 m	12.0	IIIB

Following the same methodologies described in the sections 3.5.1, 3.5.2, and 3.5.3 above, Black & Veatch evaluated the options available to SMUD for locating these turbines within Solano Phase 1 and 4 boundaries. Adherence to required setbacks, dependent upon total turbine height, became a greater challenge during the siting of these turbines. As a result, it was necessary to reduce the number of turbines installed. The greater turbine capacity of 4.20 megawatts largely negates any negative impacts to the reduction in turbine quantities at each phase.

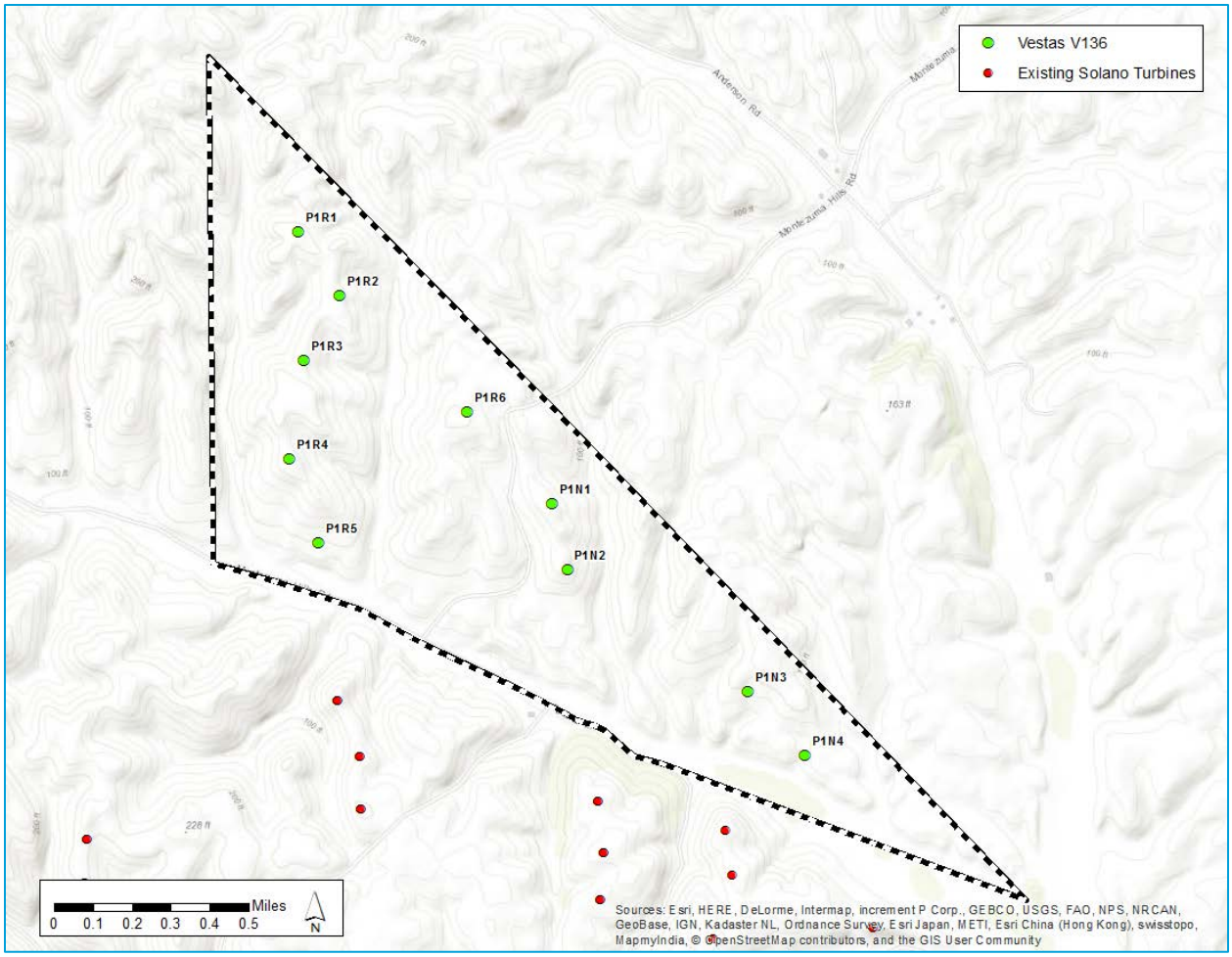


Figure 4-3 Phase 1 Turbine Layout (Vestas V136-4.20)

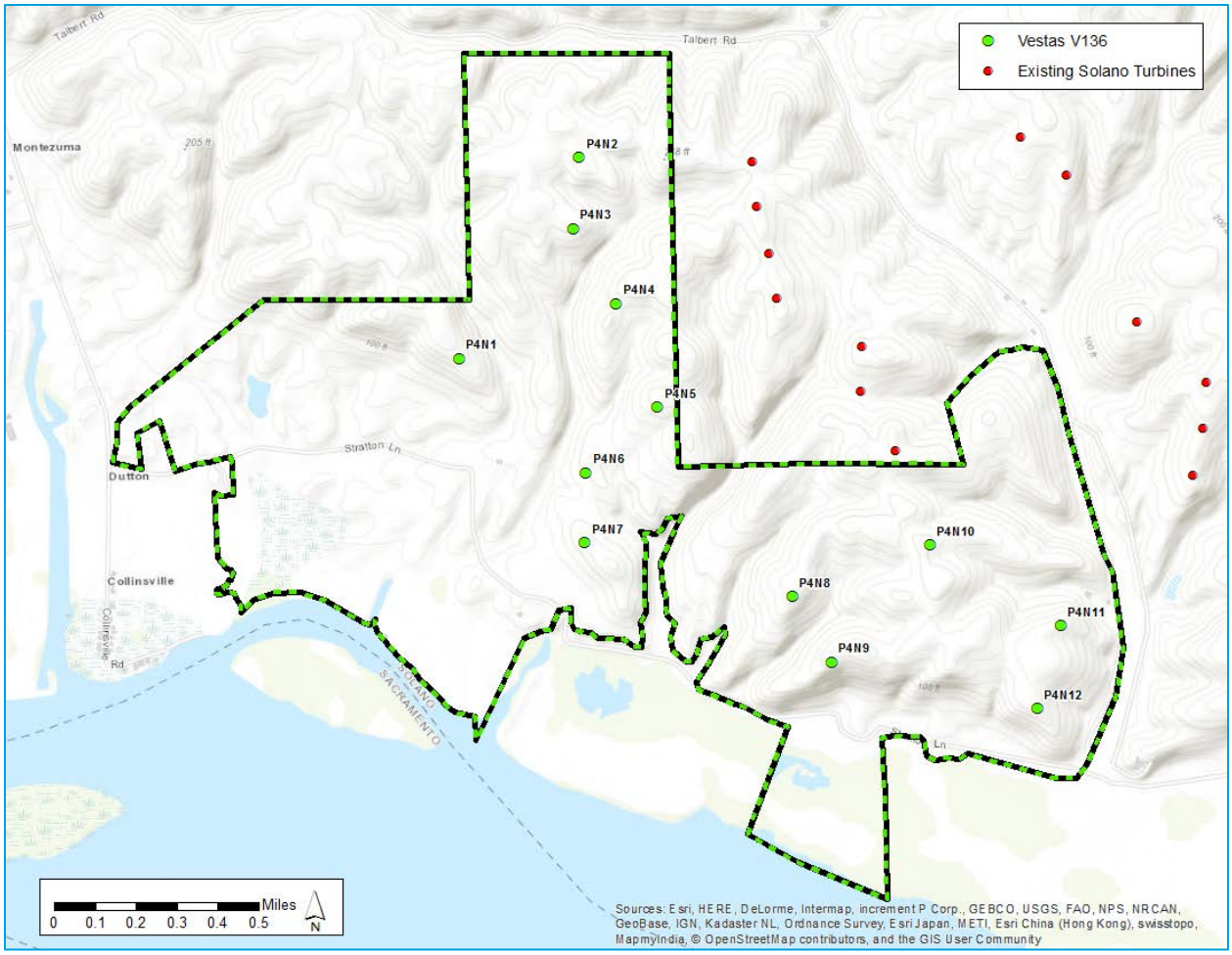


Figure 4-4 Phase 4 Turbine Layout (Vestas V136-4.20)

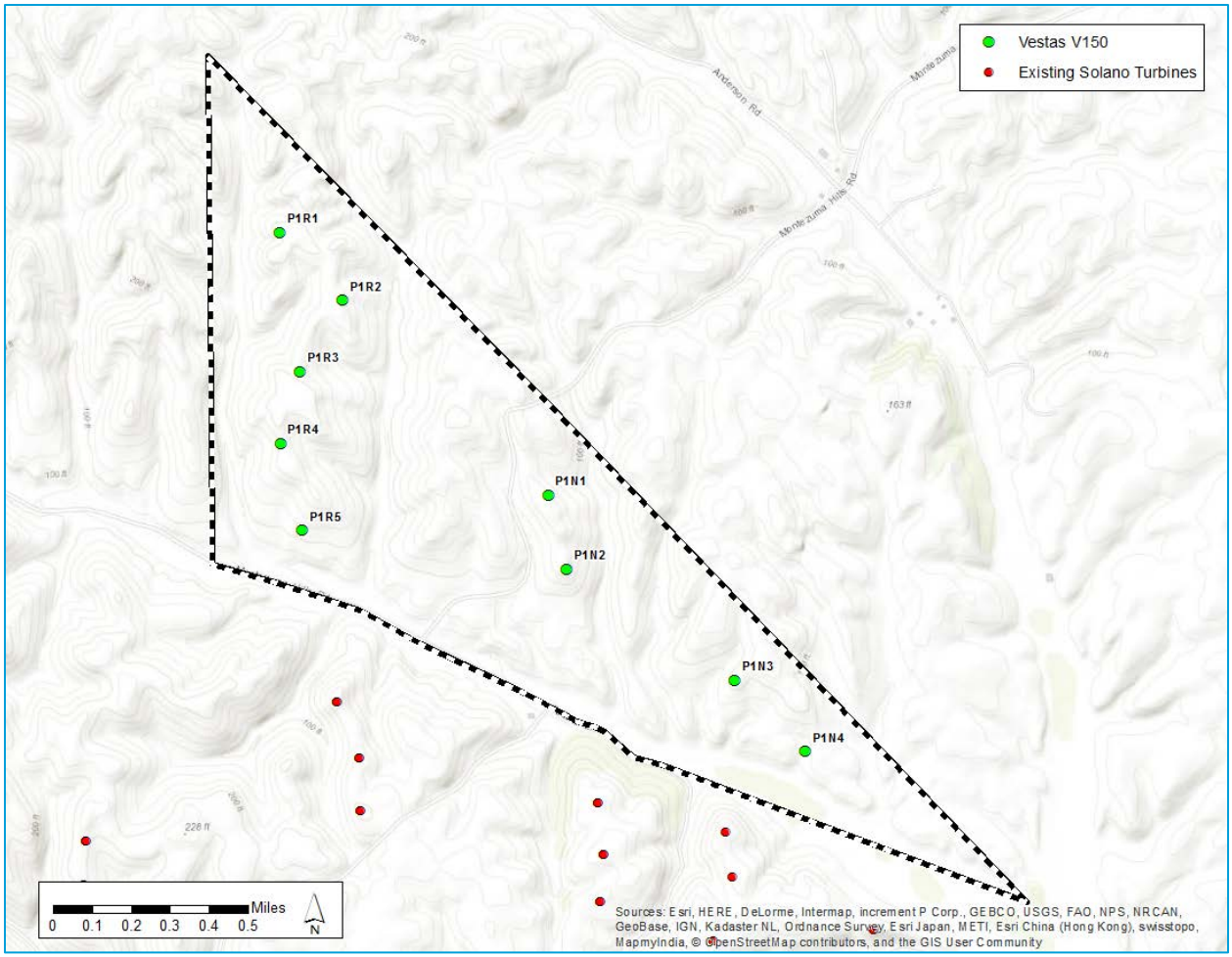


Figure 4-5 Phase 1 Turbine Layout (Vestas V150-4.20)

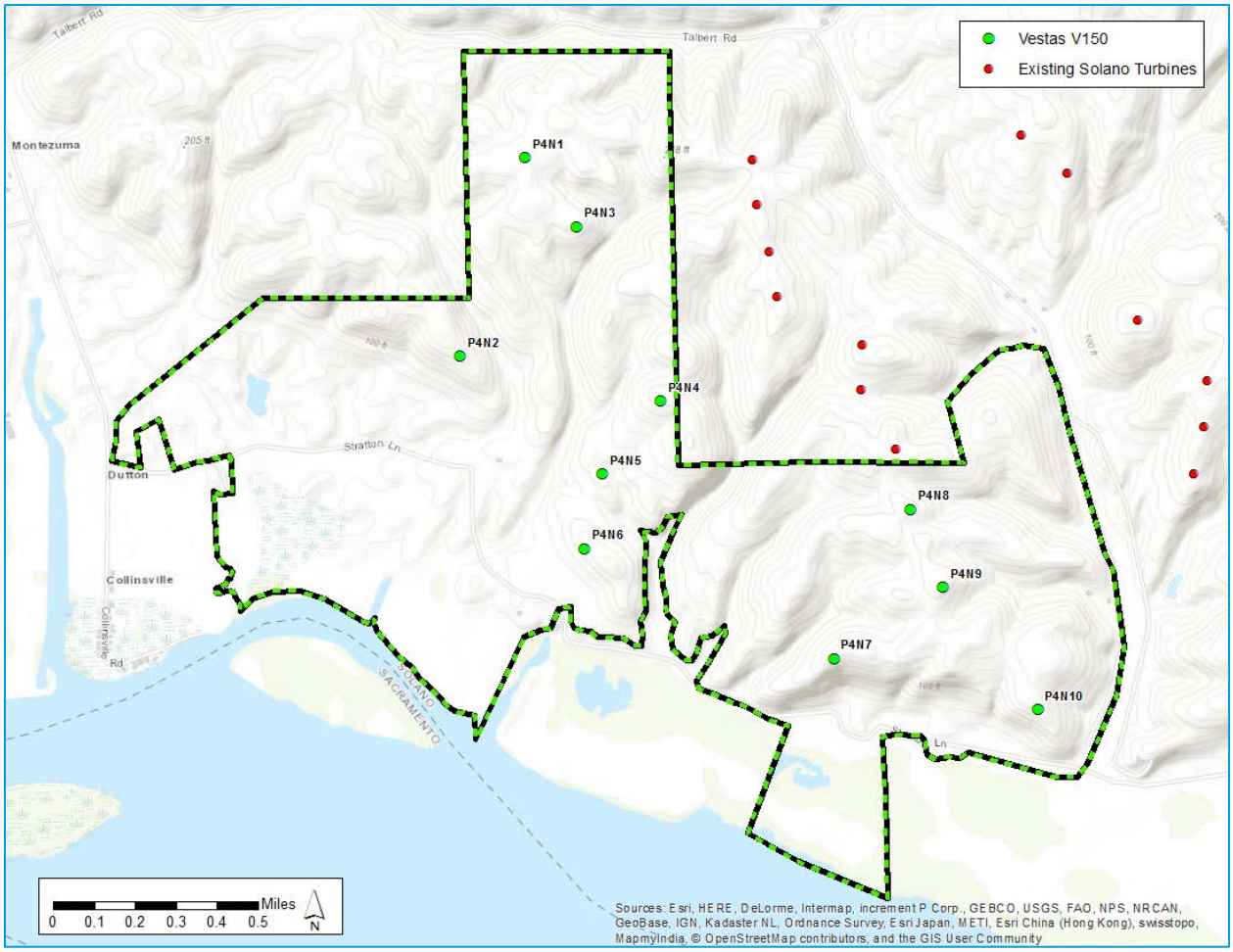


Figure 4-6 Phase 4 Turbine Layout (Vestas V150-4.20)

4.3.1 Additional Losses

Black & Veatch estimated the production losses that could potentially impact wind energy production at the Project site. Losses external to the Project site, including environmental (bird or bat) curtailment, and transmission losses and curtailment beyond the point of delivery were not considered in this analysis. Annual losses are shown in Table 4-2. Black & Veatch considered it reasonable to assume consistent losses, with the exception of Array Efficiency, across all selected turbine models. Losses are discussed in greater detail in Appendix E.

Table 4-2 Annual Energy Efficiency and Losses Applied to Estimates

		Efficiency (%)			Loss (%)		
Parameter	**Project**	**V126**	**V136**	**V150**	**V126**	**V136**	**V150**
Array Efficiency	Phase 1 Repower	87.8	88.8	92.0	12.2	11.2	8.0
	Phase 1 Addition	91.0	87.9	91.1	9.0	12.1	8.9
	Phase 4	89.2	90.3	91.9	10.8	9.7	8.1
Electrical Efficiency	All	97.5			2.5		
Turbine Availability	All	98.0			2		
Environmental	All	98.0			2.0		
Balance of Plant Maintenance	All	99.5			0.5		
Turbine Performance	All	98.0			2.0		
Utility Downtime	All	99.5			0.5		
Power Curve	All	98.0			2.0		
High Wind Hysteresis	All	99.5			0.5		
Wind Sector Management	All	100.0			0.0		
Total	**Phase 1**	**77.8**	**78.7**	**81.5**	**22.2**	**21.3**	**18.5**
Total	**Phase 1 Addn.**	**80.7**	**77.8**	**80.7**	**19.3**	**22.2**	**19.3**
Total	**Phase 4**	**79.0**	**80.0**	**81.4**	**21.0**	**20.0**	**18.6**

4.4 ESTIMATES FOR ANNUAL ENERGY PRODUCTION

The resulting energy and capacity factor estimates for each project site are provided below in Table 4-3, Table 4-4, and Table 4-5. The values were derived from modelling methodology presented in section 3 after the application of additional losses presented in Table 4-2.

Table 4-3 Vestas V126-3.45 P50 Annual Energy and Net Capacity Factor

Phase	Make	Model	#WTGs	Capacity (MW)	Wake Loss	Net Energy (GWh)	Capacity Factor
Phase 1	Vestas	V126-3.45	8	27.6	12.2%	91.9	38.0%
Phase 1 Addn.	Vestas	V126-3.45	4	13.8	9.0%	46.5	38.4%
Phase 4	Vestas	V126-3.45	13	44.9	10.8%	142.5	36.2%
Total			**25**	**86.3**	**11.0%**	**280.8**	**37.1%**

Table 4-4 Vestas V136-4.20 P50 Annual Energy and Net Capacity Factor

Phase	Make	Model	#WTGs	Capacity (MW)	Wake Loss	Net Energy (GWh)	Capacity Factor
Phase 1	Vestas	V136-4.20	6	25.2	11.2%	81.7	37.0%
Phase 1 Addn.	Vestas	V136-4.20	4	16.8	12.1%	52.2	35.5%
Phase 4	Vestas	V136-4.20	12	50.4	9.7%	156.9	35.5%
Total			**22**	**92.4**	**10.6%**	**290.8**	**35.9%**

Table 4-5 Vestas V150-4.20 P50 Annual Energy and Net Capacity Factor

Phase	Make	Model	#WTGs	Capacity (MW)	Wake Loss	Net Energy (GWh)	Capacity Factor
Phase 1	Vestas	V150-4.20	5	21.0	8.0%	79.4	43.2%
Phase 1 Addn.	Vestas	V150-4.20	4	16.8	8.9%	61.7	41.9%
Phase 4	Vestas	V150-4.20	10	42.0	8.1%	151.0	41.0%
Total			**19**	**79.8**	**8.3%**	**292.1**	**41.8%**

5.0 Civil and Electrical Design

5.1 SITE ROAD ACCESS

Terrain complexity within the Solano site poses a significant challenge for road routing. These roadways will be utilized for day-to-day project needs but more significantly used for turbine delivery. Roads will need to conform to minimum requirements for turbine delivery, including bearing capacity, width, radius, and incline restrictions. Black & Veatch has prepared preliminary access road routes based on the developed turbine layouts, site terrain, environmental features, and existing infrastructure. Cost considerations were made for both required road distances and complexity of implementation when traversing complex terrain. In order to limit construction costs, existing roads were utilized wherever possible. Road access details for each of the three selected turbine options are detailed below.

Access to Phase 1 was routed from the north via Montezuma Hills Road. Existing Phase 1 roads were utilized where practical, though some sections were considered too steep for delivery of large turbines. Talbert Lane and existing Phase 3 roads were used to access Phase 4. At the direction of SMUD, access to the western edge of the layouts is shown through adjacent property to the north, which is outside of the site boundary provided. Mapped road paths are shown in Figure 5-1 through Figure 5-7.

5.2 COLLECTION SYSTEM – PRELIMINARY ASSESSMENT

Black & Veatch reviewed potential collection system options for the Solano Phase 1 repower and Phase 4 addition. The particular options of interest for Phase 1 were the use of the existing 21.6kV overhead line to Russell substation or to install a new 34.5kV underground line to Russell 3 substation. Black & Veatch also reviewed the options for the Phase 4 collection system and found that using the underground collection cable and existing feeder plus installing two new circuits to be the most economical option while overcoming the electrical limitations. The preliminary collection system assessment was completed under the assumption that Vestas V126-3.45 model turbines are to be installed. Revision 2 collection system recommendations are provided in section 5.3 to follow. The remainder of section 5.2 is dedicated to presenting the Black & Veatch preliminary evaluation of collection system options for Phase 1 and Phase 4, assuming Vestas V126-3.45 model turbines are installed.

5.2.1 Phase 1, Option 1

Option 1 required the installation of new 21.5kV underground circuits with 5 turbines along with the reuse of the existing 21.5kV overhead line to Russell Substation and one new collection circuit with 7 turbines to Russell 3 substation. A map of the option is provided below.

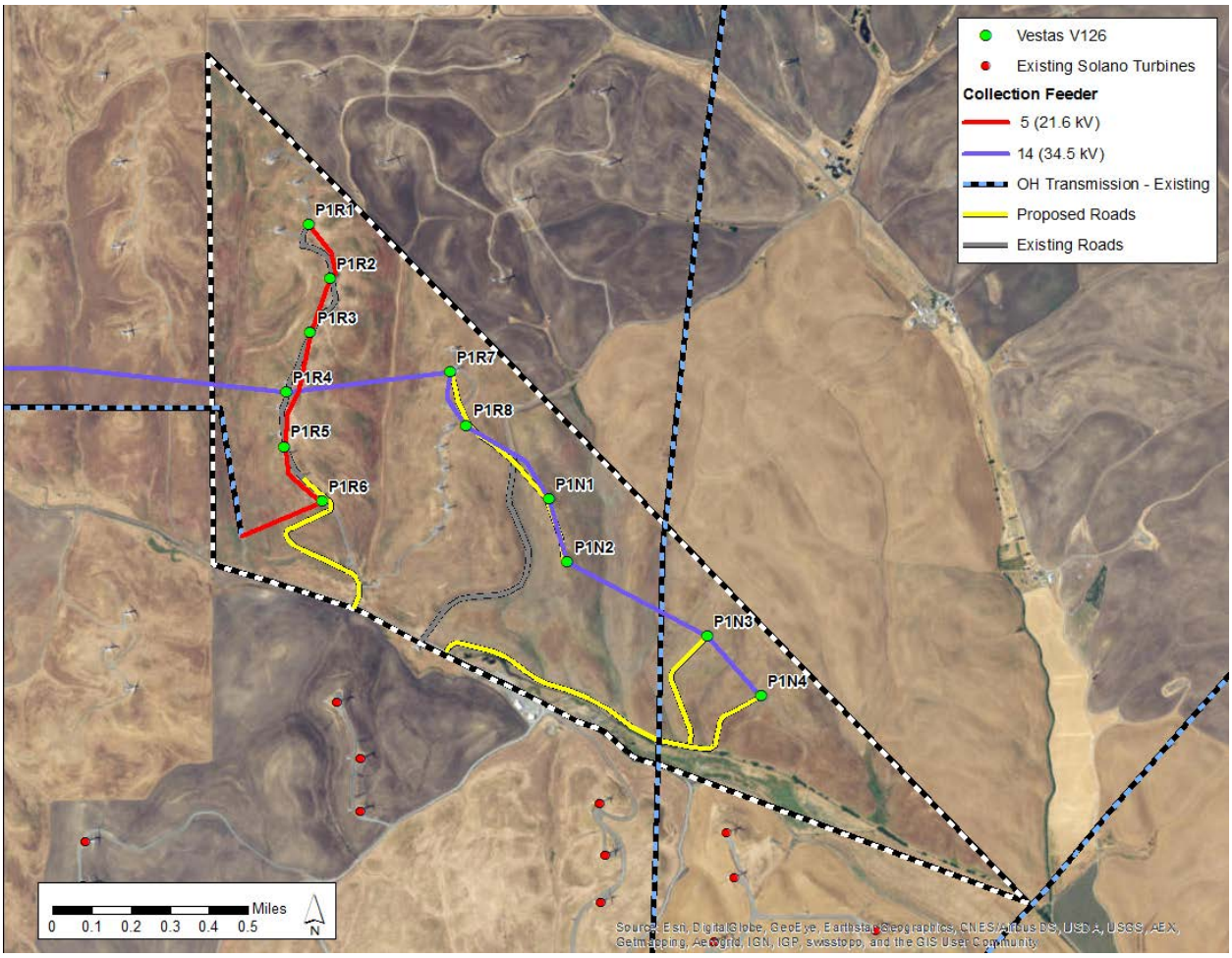


Figure 5-1 Vestas V126-3.45 Phase 1 (Option 1) Road and Collection Routing

5.2.2 Phase 1, Option 2

Option 2 requires that the existing 21.5kV collection system be abandoned and 2 new collection circuits with 6 turbines per circuit be installed with connection to Russell 3 substation. A map of the option is provided below.

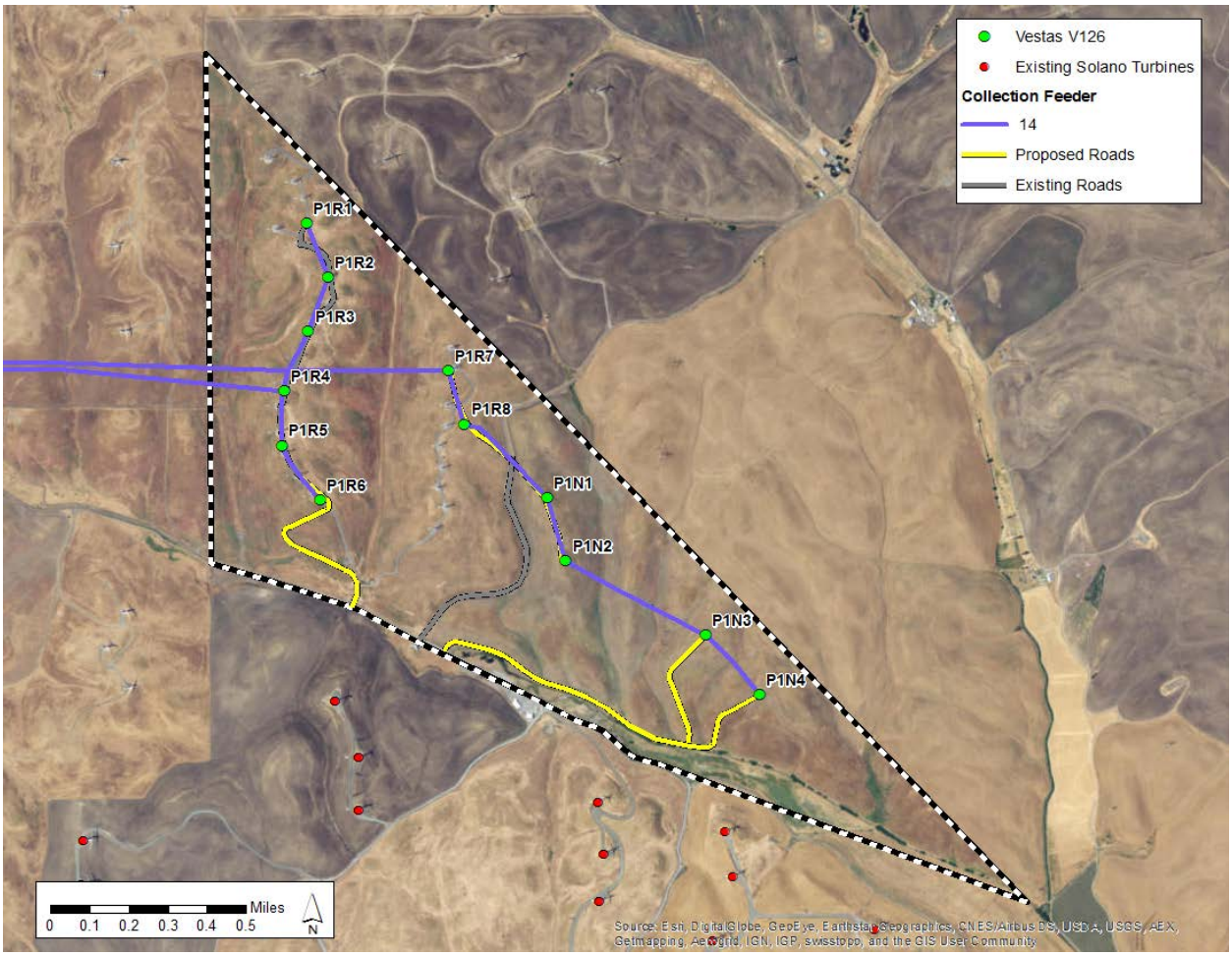


Figure 5-2 Vestas V126-3.45 Phase 1 (Option 2) Road and Collection Routing

5.2.3 Phase 4

Black & Veatch recommends installation of 2 new 34.5kV underground circuits with 4 turbines per circuit to Russell 3 substation for Phase 4. A map of the recommendation is provided below.

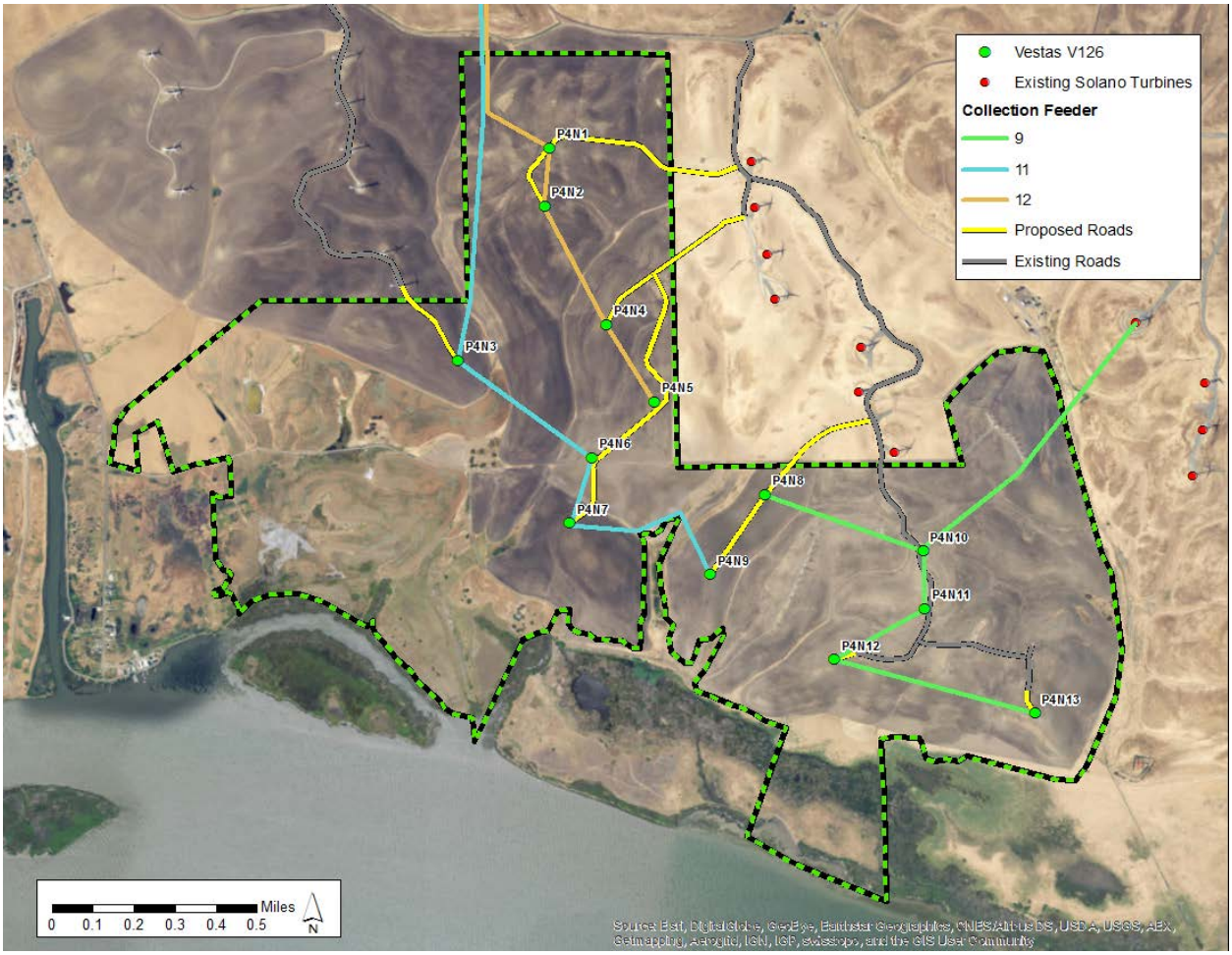


Figure 5-3 Vestas V126-3.45 Phase 4 Road and Collection Routing

Table 5-1 and Table 5-2, in section 5.4, show the electrical capabilities of these potential collection system options.

5.3 COLLECTION SYSTEM – FINAL ASSESSMENT

The addition of the Vestas V136-4.20 and V150-4.20 model options to the selected turbines group for Revision 2 warranted revised collection system assessment for each turbine model. Recommendations for each of the two additional turbine models and for each phase of implementation are detailed below in sections 5.3.1 and 5.3.2

5.3.1 Vestas V136 – 4.20

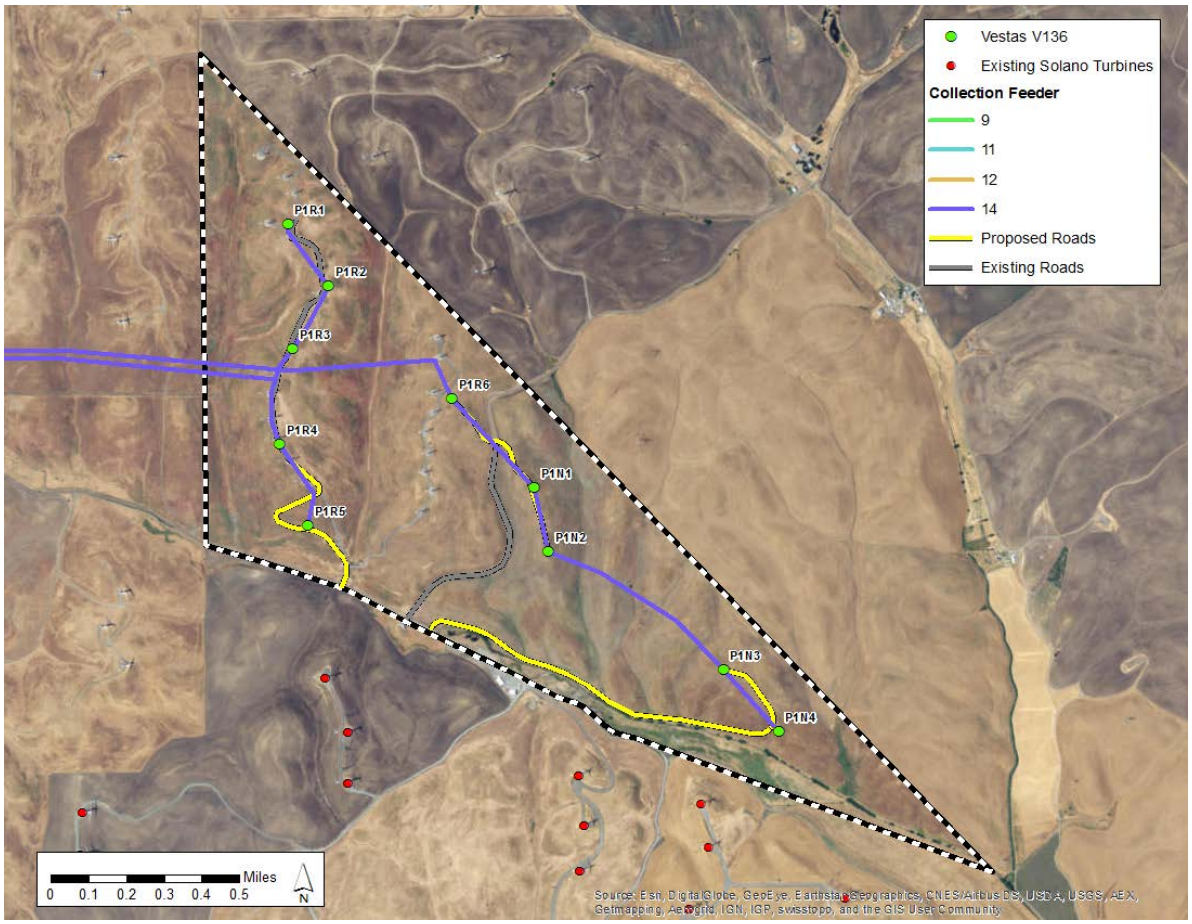


Figure 5-4 Vestas V136-4.20 Phase 1 Road and Collection Routing

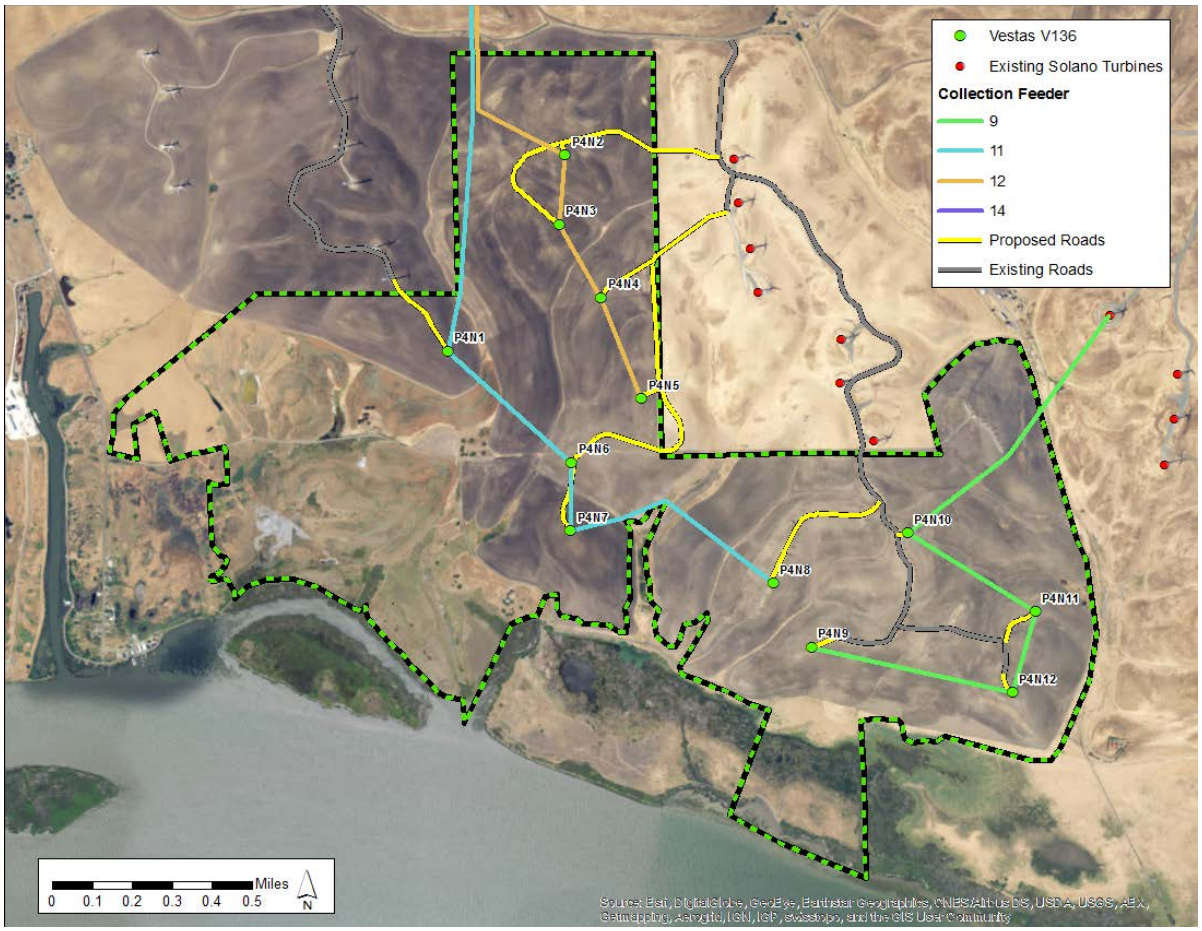


Figure 5-5 Vestas V136-4.20 Phase 4 Road and Collection Routing

5.3.2 Vestas V150 – 4.20

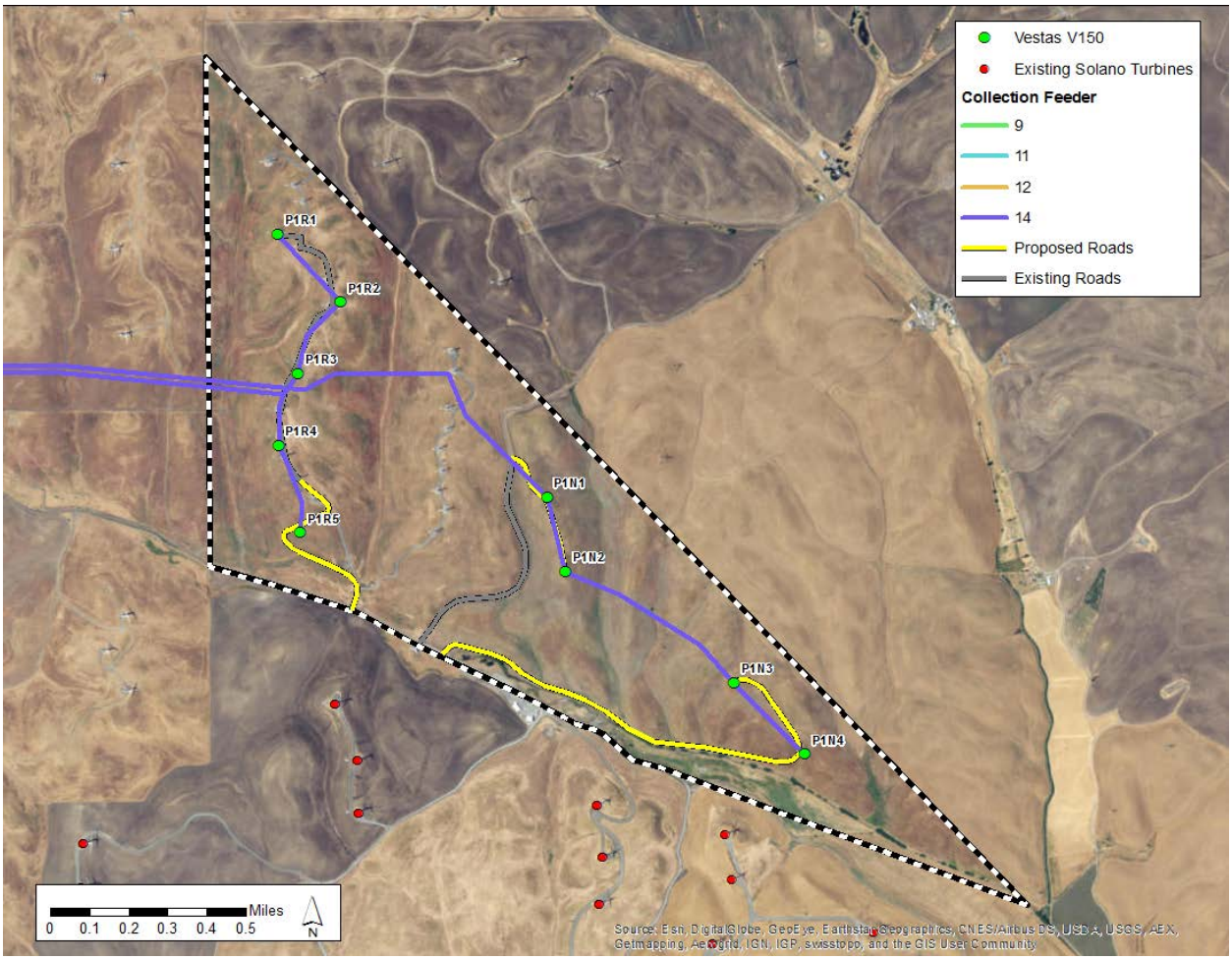


Figure 5-6 Vestas V150-4.20 Phase 1 Road and Collection Routing

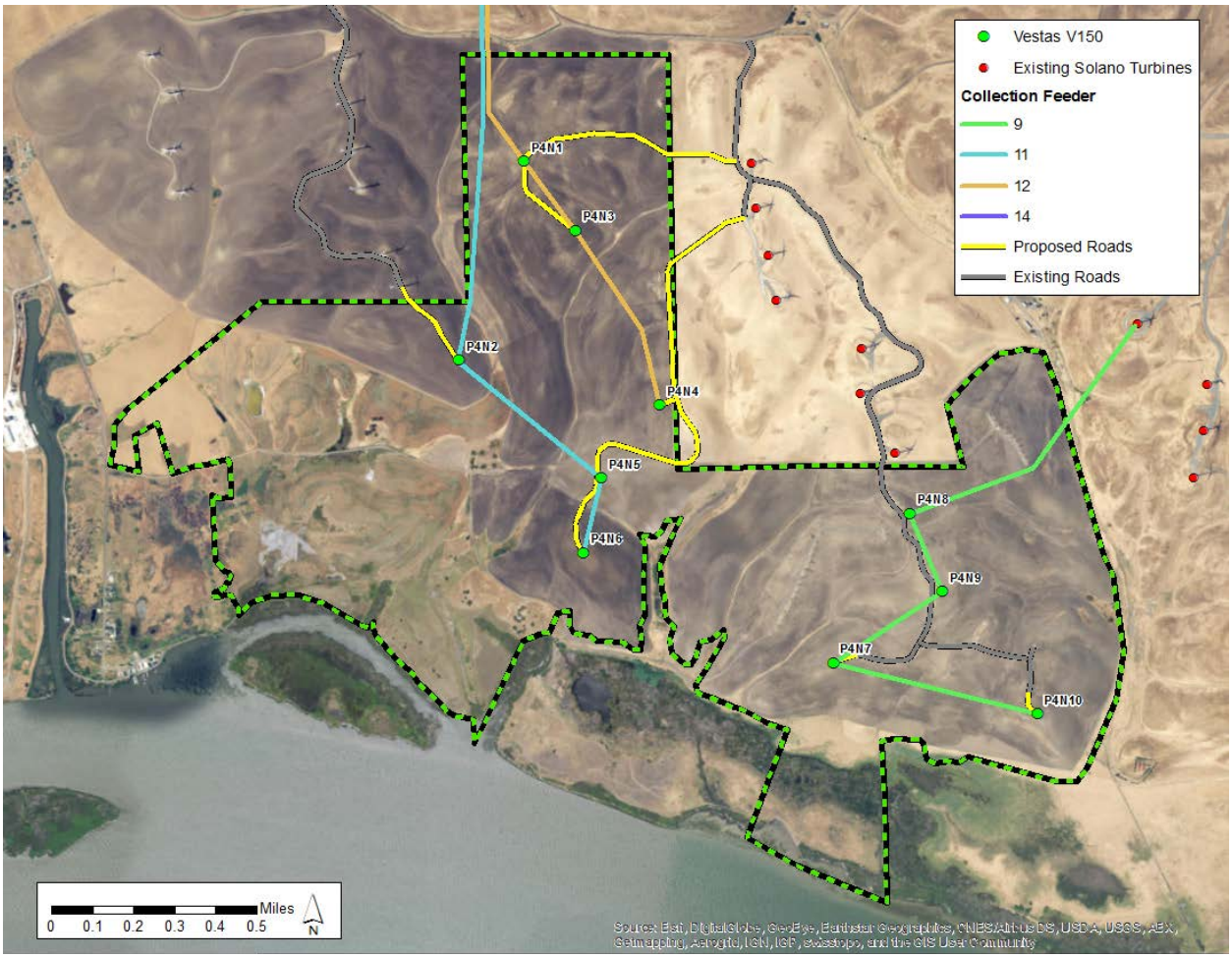


Figure 5-7 Vestas V150-4.20 Phase 4 Road and Collection Routing

Table 5-3 in section 5.4.2 and Table 5-4 in section 5.4.3, show the electrical capabilities of the Vestas V136 and V150 options respectively.

5.4 SUBSTATION

Several factors influenced the collection system conceptual designs including but not limited to substation transformer T2 and T3 ratings and switch ratings. The considerations and results of the three designs are discussed below.

5.4.1 Vestas V126-3.45 Design

The results of Table 5-1 show that transformer T2 shall be sufficient to support a net generation of approximately 104 MW while transformer T3 shall support approximately 197 MW allowing capacity for additional generation. Alternatively, the results of Table 5-2 show that transformer T2 shall support approximately 87 MW allowing capacity for additional generation while transformer T3 shall be sufficient to support a net generation of approximately 214 MW from Phase 1 and Phase 4. Further studies such as reactive power and collection system losses should be

considered during detailed design to more accurately determine the electrical properties of the collection system.

In order to accommodate the collection system options outlined above, minor work will need to be completed at Russell 3 Substation. No additional work is required at Russell Substation for all options. For Phase 1 Repower (Option 1) and Phase 4 Addition, new disconnect switches will need to be installed on the existing riser structure at Feeders 11B and 12B for a total of 6 hook-stick disconnects switches. For Phase 1 Repower (Option 2) and Phase 4 Addition, a new disconnect switch will need to be installed on the existing riser structure at Feeders 11B and 12B as well as an additional disconnect switch at Feeder14B for a total of 9 hook-stick disconnect switches. Option 2 is the presumed option of choice for the remainder of this Report. Refer to Appendix F Collection System and Substations One Line Diagram for further details.

Table 5-1 Vestas V126-3.45 Phase 1 Repower (Option 1) and Phase 4 Addition

SUBSTATION	TRANSFORMER	VOLTAGE (KV)	PHASE	FEEDER	WTG QTY.	WTG MW	ADDITIONAL MW	TOTAL MW
Russell	T2	21.6	1	5	23	0.66	-15.18	104.3
			1	5A	5	3.45	17.25	
Russell 3	T3	34.5	1	14	7	3.45	24.15	196.8
			4	9B	5	3.45	17.25	
			4	11B	4	3.45	13.8	
			4	12B	4	3.45	13.8	

Table 5-2 Vestas V126-3.45 Phase 1 Repower (Option 2) and Phase 4 Addition

SUBSTATION	TRANSFORMER	VOLTAGE (KV)	PHASE	FEEDER	WTGS QTY.	WTG MW	ADDITIONAL MW	TOTAL MW
Russell	T2	21.6	1	5	23	0.66	-15.18	87.0
Russell 3	T3	34.5	1	14A	6	3.45	20.7	214.1
			1	14B	6	3.45	20.7	
			4	9B	5	3.45	17.25	
			4	11B	4	3.45	13.8	
			4	12B	4	3.45	13.8	

5.4.2 Vestas V136-4.20 Design

The results in Table 5-3 show that transformer T2 will have a loading of only 87 MW after removing the existing 660 kW WTG's, leaving additional capacity for future use. T3 will likely have enough capacity to support additional generation from 22 Vestas V136-4.20 WTG's. The net loading on T3 would be approximately 220 MW. Further studies such as reactive power and collection system losses should be considered during detailed design to more accurately determine the electrical properties of the collection system.

In order to accommodate the collection system options outlined above minor work will need to be completed at Russell 3 Substation. No additional work is required at Russell Substation. New disconnect switches will need to be installed on the existing riser structure at Feeders 11B, 12B, and 14B for a total of 9 hook-stick disconnects switches. Refer to Appendix F for further details.

Table 5-3 Vestas V136-4.20 Phase 1 Repower and Phase 4 Addition

SUBSTATION	TRANSFORMER	VOLTAGE (KV)	PHASE	FEEDER	WTGS QTY.	WTG MW	ADDITIONAL MW	TOTAL MW
Russell	T2	21.6	1	5	23	0.66	-15.18	87.0
Russell 3	T3	34.5	4	9B	4	4.20	16.8	220.2
			4	11B	4	4.20	16.8	
			4	12B	4	4.20	16.8	
			1	14A	5	4.20	21	
			1	14B	5	4.20	21	

5.4.3 Vestas V150-4.20 Design

The results in Table 5-4 show that transformer T2 will have a loading of only 87 MW after removing the existing 660 kW WTG's, leaving additional capacity for future use. T3 should have enough capacity to support additional generation from 19 Vestas V136-4.20 WTG's. The net loading on T3 would be approximately 208 MW. Further studies such as reactive power and collection system losses should be considered during detailed design to more accurately determine the electrical properties of the collection system.

In order to accommodate the collection system options outlined above minor work will need to be completed at Russell 3 Substation. No additional work is required at Russell Substation. New disconnect switches will need to be installed on the existing riser structure at Feeders 11B, 12B, and 14B for a total of 9 hook-stick disconnects switches. Refer to Appendix F for further details.

Table 5-4 Vestas V150-4.20 Phase 1 Repower and Phase 4 Addition

SUBSTATION	TRANSFORMER	VOLTAGE (KV)	PHASE	FEEDER	WTGS QTY.	WTG MW	ADDITIONAL MW	TOTAL MW
Russell	T2	21.6	1	5	23	0.66	-15.18	87.0
Russell 3	T3	34.5	4	9B	4	4.20	16.8	207.6
			4	11B	3	4.20	12.6	
			4	12B	3	4.20	12.6	
			1	14A	4	4.20	16.8	
			1	14B	5	4.20	21	

6.0 Capital and O&M Costs

Black & Veatch has estimated the capital cost required for Phase 1 decommissioning and construction of Phases 1 and 4 for each of the three turbine models selected. The high-level cost estimates include the following items:

- Phase 1 Decommissioning
- Civil and Structural Works
- Electrical Works
- Project Indirects
- Substation Upgrades

The baseline cost estimates are assumed to be for the Northern California region, with a strong union work force and high labor rates. Turbines are not included in the cost estimates, nor are owner's costs such as permitting, legal fees, owner's engineering, and various other internal expenses. Additional assumptions include:

- A permanent met tower is not required
- No existing laydown/storage facilities are available
- A Patrick & Henderson foundation will be used
- Upgrades including road and curve widening and resurfacing will be required for existing access roads used for Phase 1 & Phase 4
- Each collection circuit is conservatively assumed to consist of 50% 1250 kcmil, 25% 750 kcmil, and 25% 4/0 cables
- Decommissioned Vestas V47 turbines will have no resale value, only salvage value
- Phase 1 decommissioning and Phase 1 and Phase 4 construction will be concurrent, so that single mobilization and demobilization is required

Appendix B provides itemized cost estimates for Phase 1 decommissioning, expansion balance of plant costs, and expansion substation and interconnection costs for each selected turbine model. These cost estimates are high level, with an accuracy of approximately +/- 30 percent. Accuracy estimations are further detailed in Appendix C. The summations of the estimated costs for option 1 of Phase 1 and Phase 4, for each selected turbine model, are provided by Table 6-1 below.

Table 6-1 Estimated Costs of Implementation for Selected Turbine Models

Category	Total Cost		
	V126-3.45	V136-4.20	V150-4.20
Phase 1 Decommissioning	$1,219,000	$1,219,000	$1,219,000
Substation and Interconnection	$45,000	$45,000	$45,000
BOP	$23,371,833	$23,783,437	$22,930,798
Wind Turbines - NOT INCLUDED	$0	$0	$0
Total Project	**$24,635,833**	**$25,047,437**	**$24,194,798**

6.1 COST ESTIMATION OF OPERATIONS AND MAINTENANCE (O&M)

Black & Veatch also prepared an operating cost estimate for the expansion. Black & Veatch assumed that turbine (WTG) and balance of plant (BOP) O&M services would be covered by a similar contract with Vestas as is currently used for Solano Wind 3. SMUD provided Black & Veatch with summary level details of the current Solano Wind 3 contract. The interpretation of that contract's scope is that it is limited to WTG scheduled & unscheduled maintenance for 15 years, plus BOP service.

The estimate provided below is based on the assumption of similar full scope O&M (excluding BOP) for Phase 1 and Phase 4 using Vestas V126-3.45 turbines. Typical service costs are estimated on a per-machine basis based on known industry average costs, but escalation and BOP service fees incorporate the existing Solano 3 O&M contract information as well. The resulting baseline values are shown in Table 6-2 below.

Table 6-2 Estimated Components Contributing to Annual Operating Cost

Parameter	Value	Unit
10 YEAR SERVICE & MAINTENANCE CONTRACT (WTG Vendor FOR 25 UNITS)		
Years 1-5	$60,000	wtg/year
Years 6-10	$110,000	wtg/year

* BOP maintenance included
** Estimate excludes certain SMUD internal costs such as utilities, insurance, and environmental monitoring

From the above values, Black & Veatch compiled a 10 year running estimate of annual operating costs. This estimate is show below in Table 6-3.

Table 6-3 Projected Annual Operating Cost of Expansion (Years 1 - 10)

Year	Total Cost	$/MW-yr
1	$1,500,000	$17,390
2	$1,530,000	$17,740
3	$1,561,000	$18,100
4	$1,592,000	$18,460
5	$1,624,000	$18,830
6	$2,750,000	$31,880
7	$2,805,000	$32,520
8	$2,861,000	$33,170
9	$2,918,000	$33,830
10	$2,977,000	$34,520
Total	**$22,118,000**	**$25,650**

Black & Veatch considers the values presented above for the Vestas V126-3.45 in Table 6-2 and Table 6-3 to be the most costly of all turbine models considered as part of Revision 2. Although

O&M costs were not estimated for Vestas V136-4.20 and V150-4.20 turbine layouts, the reduction in turbine quantities relative to those of the V126-3.45 turbine layouts could reasonably be assumed to reduce the O&M costs presented herein.

7.0 Study Recommendation for Vertical Wind Profile

In an effort to better understand the effects of terrain complexity on the vertical wind patterns across the project site, SMUD requested that Black & Veatch assist with designing a study. The objective of this study is to characterize the effect of local terrain on the resulting measurements recorded. This information is of significance to SMUD because it will inform turbine siting tendencies with respect to this region of Solano County in the future as well as reduce uncertainty with respect to extrapolation of MET wind speeds to turbine hub heights.

7.1 RECOMMENDED TECHNOLOGY AND SETUP

This study was conceived with the assumption that a single measurement device will be utilized and moved every three months. It would be ideal for all measurements to be recorded during summer months (April – September); given that analysis shows that these will be the most energetic months. Black & Veatch recommends that measurements are taken through remote sensing technology for the purposes of this campaign. This may be accomplished either using LiDAR technology or SoDAR technology. Both LiDAR and SoDAR technology will allow for this along with dynamic flexibility in selecting measurement heights. Black & Veatch recommends that measurements are recorded across the final turbine selection's rotor at heights of (hub height - blade length), (hub height - blade length/2), hub height, (hub height + blade length/2), and (hub height + blade length).

7.2 RECOMMENDED LOCATIONS AND DURATION

Black & Veatch's review of modelled wind flows across the site indicated that the grade and orientation of terrain features will impact realized wind shear effects. Black & Veatch recommends that SMUD attempt to assess six total locations over a two year period. These locations are provided in Table 7-1 below. Mapped study locations are provided in Appendix D.

Table 7-1 Recommended Locations for Study of Vertical Wind Speed Profiles

Location Number	Longitude	Latitude
1	-121.830674	38.090738
2	-121.822121	38.079207
3	-121.812810	38.078961
4	-121.774548	38.127130
5	-121.766950	38.124418
6	-121.755712	38.116431

It is Black & Veatch's opinion that the sites provided above will adequately provide coverage of both project sites while also accounting for some of the complexity of ridgeline orientation. Review of Phase 1 terrain shows ridges featuring proposed turbines running predominately north and south. Phase 4 feature ridgelines of varying orientations and currently has proposed turbine locations on both ridges running north-south and east-west.

Appendix A. Coordinates of Selected Turbine Options

Appendix A1. Vestas V126-3.45

Table A-1 Vestas V126-3.45 Phase 1 Repower Turbine Coordinates

WTG #	Model	Height	Northing	Easting	Latitude	Longitude	Elev (m)
P1R1	V126-3.45	87 m	4221170	607441	38.131956	-121.774082	59.51
P1R2	V126-3.45	87 m	4220950	607532	38.129958	-121.773083	58.21
P1R3	V126-3.45	87 m	4220720	607449	38.127963	-121.774063	58.27
P1R4	V126-3.45	87 m	4220480	607351	38.125749	-121.775218	63.24
P1R5	V126-3.45	87 m	4220250	607341	38.123728	-121.775360	57.13
P1R6	V126-3.45	87 m	4220030	607499	38.121684	-121.773595	54.89
P1R7	V126-3.45	87 m	4220560	608028	38.126416	-121.767485	59.33
P1R8	V126-3.45	87 m	4220340	608094	38.124420	-121.766765	61.84

Table A-2 Vestas V126-3.45 Phase 1 Addition Turbine Coordinates

WTG #	Model	Height	Northing	Easting	Latitude	Longitude	Elev (m)
P1N1	V126-3.45	87 m	4220040	608434	38.121653	-121.762923	51.47
P1N2	V126-3.45	87 m	4219770	608510	38.119295	-121.762095	48.09
P1N3	V126-3.45	87 m	4219470	609087	38.116481	-121.755562	42.92
P1N4	V126-3.45	87 m	4219220	609309	38.114234	-121.753072	26.53

Table A-3 Vestas V126-3.45 Phase 4 Turbine Coordinates

WTG #	Model	Height	Northing	Easting	Latitude	Longitude	Elev (m)
P4N1	V126-3.45	87 m	4216787	602585	38.093061	-121.830113	71.07
P4N2	V126-3.45	87 m	4216558	602565	38.091008	-121.830374	71.03
P4N3	V126-3.45	87 m	4215954	602226	38.085599	-121.834327	52.33
P4N4	V126-3.45	87 m	4216093	602810	38.086789	-121.827645	61.84
P4N5	V126-3.45	87 m	4215792	602998	38.084056	-121.825549	63.35
P4N6	V126-3.45	87 m	4215572	602751	38.082093	-121.828387	33.55
P4N7	V126-3.45	87 m	4215317	602664	38.079807	-121.829418	28.03
P4N8	V126-3.45	87 m	4215429	603431	38.080728	-121.820661	60.11
P4N9	V126-3.45	87 m	4215114	603217	38.077916	-121.823148	31.42
P4N10	V126-3.45	87 m	4215206	604053	38.078647	-121.813600	62.33
P4N11	V126-3.45	87 m	4214981	604058	38.076624	-121.813574	55.88
P4N12	V126-3.45	87 m	4214780	603705	38.074852	-121.817634	55.24
P4N13	V126-3.45	87 m	4214571	604491	38.072876	-121.808706	45.19

Appendix A2. Vestas V136-4.20

Table A-4 Vestas V136-4.20 Phase 1 Repower Turbine Coordinates

WTG #	Model	Height	Northing	Easting	Latitude	Longitude	Elev (m)
P1R1	V136-4.20	82 m	4221140	607399	38.131740	-121.774565	62.63
P1R2	V136-4.20	82 m	4220880	607573	38.129339	-121.772626	56.84
P1R3	V136-4.20	82 m	4220610	607422	38.126931	-121.774385	57.76
P1R4	V136-4.20	82 m	4220200	607363	38.123272	-121.775114	59.57
P1R5	V136-4.20	82 m	4219850	607483	38.120118	-121.773797	31.94
P1R6	V136-4.20	82 m	4220390	608101	38.124925	-121.766670	60.15

Table A-5 Vestas V136-4.20 Phase 1 Addition Turbine Coordinates

WTG #	Model	Height	Northing	Easting	Latitude	Longitude	Elev (m)
P1N1	V136-4.20	82 m	4220010	608452	38.121453	-121.762721	50.48
P1N2	V136-4.20	82 m	4219740	608514	38.118993	-121.762061	47.41
P1N3	V136-4.20	82 m	4219240	609264	38.114350	-121.753589	27.77
P1N4	V136-4.20	82 m	4218970	609499	38.111947	-121.750938	13.94

Table A-6 Vestas V136-4.20 Phase 4 Turbine Coordinates

WTG #	Model	Height	Northing	Easting	Latitude	Longitude	Elev (m)
P4N1	V136-4.20	82 m	4215960	602221	38.085641	-121.834375	52.64
P4N2	V136-4.20	82 m	4216750	602695	38.092688	-121.828856	70.47
P4N3	V136-4.20	82 m	4216470	602670	38.090181	-121.829187	65.52
P4N4	V136-4.20	82 m	4216170	602840	38.087507	-121.827289	59.38
P4N5	V136-4.20	82 m	4215770	603002	38.083826	-121.825503	62.02
P4N6	V136-4.20	82 m	4215510	602720	38.081526	-121.828756	31.10
P4N7	V136-4.20	82 m	4215230	602716	38.079048	-121.828842	38.16
P4N8	V136-4.20	82 m	4215020	603532	38.077053	-121.819569	58.22
P4N9	V136-4.20	82 m	4214760	603686	38.074714	-121.817854	53.76
P4N10	V136-4.20	82 m	4215230	604076	38.078825	-121.813340	61.29
P4N11	V136-4.20	82 m	4214910	604588	38.075915	-121.807550	48.35
P4N12	V136-4.20	82 m	4214580	604499	38.072979	-121.808606	44.82

Appendix A3. Vestas V150-4.20

Table A-7 Vestas V150-4.20 Phase 1 Repower Turbine Coordinates

WTG #	Model	Height	Northing	Easting	Latitude	Longitude	Elev (m)
P1R1	V150-4.20	105 m	4221140	607325	38.131710	-121.775408	61.51
P1R2	V150-4.20	105 m	4220860	607586	38.129139	-121.772471	54.92
P1R3	V150-4.20	105 m	4220560	607410	38.126525	-121.774525	56.86
P1R4	V150-4.20	105 m	4220260	607327	38.123845	-121.775516	55.36
P1R5	V150-4.20	105 m	4219900	607418	38.120594	-121.774541	35.25

Table A-8 Vestas V150-4.20 Phase 1 Addition Turbine Coordinates

WTG #	Model	Height	Northing	Easting	Latitude	Longitude	Elev (m)
P1N1	V150-4.20	105 m	4220050	608436	38.121802	-121.762906	48.67
P1N2	V150-4.20	105 m	4219750	608513	38.119030	-121.762066	47.59
P1N3	V150-4.20	105 m	4219290	609207	38.114823	-121.754220	34.07
P1N4	V150-4.20	105 m	4218990	609499	38.112136	-121.750943	14.81

Table A-9 Vestas V150-4.20 Phase 4 Turbine Coordinates

WTG #	Model	Height	Northing	Easting	Latitude	Longitude	Elev (m)
P4N1	V150-4.20	105 m	4216740	602484	38.092646	-121.831268	73.51
P4N2	V150-4.20	105 m	4215960	602226	38.085651	-121.834317	52.70
P4N3	V150-4.20	105 m	4216470	602685	38.090189	-121.829013	63.36
P4N4	V150-4.20	105 m	4215780	603013	38.083970	-121.825369	30.78
P4N5	V150-4.20	105 m	4215500	602787	38.081430	-121.827991	64.32
P4N6	V150-4.20	105 m	4215200	602717	38.078793	-121.828832	64.86
P4N7	V150-4.20	105 m	4214770	603695	38.074802	-121.817743	54.80
P4N8	V150-4.20	105 m	4215360	603997	38.080033	-121.814218	44.85
P4N9	V150-4.20	105 m	4215050	604122	38.077278	-121.812832	35.24
P4N10	V150-4.20	105 m	4214570	604499	38.072901	-121.808609	65.06

Appendix B. Cost Estimate Details

Appendix B1. Vestas V126-3.45

Table B-2 Vestas V126-3.45 Estimation of Phase 1 Decommissioning Costs

Cost Breakdown	Total Cost	Base Cost	Per	Quantity
DECOMMISSIONING PHASE 1				
Turbines	$1,610,000	$70,000	WTG	23
Foundations	$207,000	$9,000	WTG	23
Roads and crane pads	$161,000	$7,000	WTG	23
Electrical	$138,000	$6,000	WTG	23
Mobilization/ Indirects	$0	$0	Project	0
Salvage Value (no resale)	($897,000)	$40,000	WTG	23
Total Decommissioning	**$1,219,000**			

Table B-3 Vestas V126-3.45 Estimation of Substation and Interconnection Costs

Category	Total Cost	Base Cost	Per	Quantity
SUBSTATION AND INTERCONNECTION				
Phase 1 - Option 2				
Feeder 14 - 1200A Switch	$15,000	$15,000	Each	1
Phase 4				
Feeder 11 - 1200A Switch	$15,000	$15,000	Each	1
Feeder 12 - 1200A Switch	$15,000	$15,000	Each	1
Total Substation/Interconnection	**$45,000**			

Table B-4 Vestas V126-3.45 Estimation of Balance of Plant Costs

Cost Breakdown	Total Cost	Base Cost	Per	Quantity
Balance of Plant - Phase 1				
Civil & Structural Works				
Access Roads - New	$875,991	$67	LF	13,055
Access Roads - Improvements	$102,480	$24	LF	4,200
Public Road Restoration	$250,000	$250,000	Project	1
WTG Site Prep	$541,680	$45,140	WTG	12
Crane Pads	$181,536	$15,128	WTG	12
WTG Foundations	$2,100,000	$175,000	WTG	12
O&M Building	$0	$0	Project	0
Wind Turbine Erection	$1,683,600	$140,300	WTG	12
Met Tower	$0	$0	Project	0
Electrical Works – Option 2				
Cable, junction box, ground, etc.	$2,504,205	$55	LF	45,351
Misc. Cable, Connectors, Etc.	$45,000	$45,000	LS	1
Testing & Commissioning	$145,991	$145,991	LS	1
Balance of Plant - Phase 4				
Civil & Structural Works				
Access Roads - New	$973,621	$67	LF	14,510
Access Roads - Improvements	$446,520	$24	LF	18,300
Public Road Restoration	$250,000	$250,000	Project	1
WTG Site Prep	$586,820	$45,140	WTG	13
Crane Pads	$196,664	$15,128	WTG	13
WTG Foundations	$2,275,000	$175,000	WTG	13
O&M Building	$0	$0	Project	0
Wind Turbine Erection	$1,823,900	$140,300	WTG	13
Met Tower	$0	$0	Project	0
Electrical Works				
Cable, junction box, ground, etc.	$2,481,545	$55	LF	45,119
Testing & Commissioning	$172,428	$162,428	LS	1
Project Indirects				
Misc. Construction Indirects				
Temp. Construction Facilities	$732,000	$732,000	Project	1
Site Mob/Demobilization	$630,852	$630,852	Project	1
Project Indirects				
BOP Engineering & Studies	$1,200,000	$1,200,000	Project	1
Construction Management	$2,440,000	$2,440,000	Project	1
Primary Laydown Area	$732,000	$732,000	Project	1
Total Balance of Plant	**$23,371,833**			

Appendix B2. Vestas V136-4.20

Table B-5 Vestas V136-4.20 Estimation of Phase 1 Decommissioning Costs

Cost Breakdown	Total Cost	Base Cost	Per	Quantity
DECOMMISSIONING PHASE 1				
Turbines	$1,610,000	$70,000	WTG	23
Foundations	$207,000	$9,000	WTG	23
Roads and crane pads	$161,000	$7,000	WTG	23
Electrical	$138,000	$6,000	WTG	23
Mobilization/ Indirects	$0	$0	Project	0
Salvage Value (no resale)	($897,000)	$40,000	WTG	23
Total Decommissioning	**$1,219,000**			

Table B-6 Vestas V136-4.20 Estimation of Substation and Interconnection Costs

Category	Total Cost	Base Cost	Per	Quantity
SUBSTATION AND INTERCONNECTION				
Phase 1				
Feeder 14 - 1200A Switch	$15,000	$15,000	Each	1
Phase 4				
Feeder 11 - 1200A Switch	$15,000	$15,000	Each	1
Feeder 12 - 1200A Switch	$15,000	$15,000	Each	1
Total Substation/Interconnection	**$45,000**			

Table B-7 Vestas V136-4.20 Estimation of Balance of Plant Costs

Cost Breakdown	Total Cost	Base Cost	Per	Quantity
Balance of Plant - Phase 1				
Civil & Structural Works				
Access Roads - New	$813,118	$67	LF	12,118
Access Roads - Improvements	$122,000	$24	LF	5,000
Public Road - Improvements Temp.	$300,000	$300,000	Project	1
Public Road Restoration	$250,000	$250,000	Project	1
WTG Site Prep	$400,000	$40,000	WTG	10
Crane Pads	$120,000	$12,000	WTG	10
WTG Foundations	$1,800,000	$180,000	WTG	10
O&M Building	$0	$0	Project	0
Wind Turbine Erection	$1,850,000	$185,000	WTG	10
Met Tower	$0	$0	Project	0
Electrical Works				
Cable, junction box, ground, etc.	$2,585,825	$55	LF	47,015
Misc. Cable, Connectors, Etc.	$45,000	$45,000	LS	1
Testing & Commissioning	$205,254	$205,254	LS	1
Balance of Plant - Phase 4				
Civil & Structural Works				
Access Roads - New	$1,084,202	$67	LF	16,158
Access Roads - Improvements	$244,000	$24	LF	10,000
Public Road Temporary	$300,000	$300,000	Project	1
Public Road Restoration	$250,000	$250,000	Project	1
WTG Site Prep	$480,000	$40,000	WTG	12
Crane Pads	$144,000	$12,000	WTG	12
WTG Foundations	$2,160,000	$180,000	WTG	12
O&M Building	$0	$0	Project	0
Wind Turbine Erection	$2,220,000	$185,000	WTG	12
Met Tower	$0	$0	Project	0
Electrical Works				
Cable, junction box, ground, etc.	$2,501,455	$55	LF	45,481
Testing & Commissioning	$173,732	$163,732	LS	1
Project Indirects				
Misc. Construction Indirects				
Temp. Construction Facilities	$732,000	$732,000	Project	1
Site Mob/Demobilization	$630,852	$630,852	Project	1
Project Indirects				
BOP Engineering & Studies	$1,200,000	$1,200,000	Project	1
Construction Management	$2,440,000	$2,440,000	Project	1
Primary Laydown Area	$732,000	$732,000	Project	1
Total Balance of Plant	**$23,783,437**			

Appendix B3. Vestas V150-4.20

Table B-8 Vestas V150-4.20 Estimation of Phase 1 Decommissioning Costs

Cost Breakdown	Total Cost	Base Cost	Per	Quantity
DECOMMISSIONING PHASE 1				
Turbines	$1,610,000	$70,000	WTG	23
Foundations	$207,000	$9,000	WTG	23
Roads and crane pads	$161,000	$7,000	WTG	23
Electrical	$138,000	$6,000	WTG	23
Mobilization/ Indirects	$0	$0	Project	0
Salvage Value (no resale)	($897,000)	$40,000	WTG	23
Total Decommissioning	**$1,219,000**			

Table B-9 Vestas V150-4.20 Estimation of Substation and Interconnection Costs

Category	Total Cost	Base Cost	Per	Quantity
SUBSTATION AND INTERCONNECTION				
Phase 1				
Feeder 14 - 1200A Switch	$15,000	$15,000	Each	1
Phase 4				
Feeder 11 - 1200A Switch	$15,000	$15,000	Each	1
Feeder 12 - 1200A Switch	$15,000	$15,000	Each	1
Total Substation/Interconnection	**$45,000**			

Table B-10 Vestas V150-4.20 Estimation of Balance of Plant Costs

Cost Breakdown	Total Cost	Base Cost	Per	Quantity
Balance of Plant - Phase 1				
Civil & Structural Works				
Access Roads - New	$763,330	$67	LF	11,376
Access Roads - Improvements	$122,000	$24	LF	5,000
Public Road - Improvements Temp.	$300,000	$300,000	Project	1
Public Road Restoration	$250,000	$250,000	Project	1
WTG Site Prep	$360,000	$40,000	WTG	9
Crane Pads	$108,000	$12,000	WTG	9
WTG Foundations	$1,755,000	$195,000	WTG	9
O&M Building	$0	$0	Project	0
Wind Turbine Erection	$1,935,000	$215,000	WTG	9
Met Tower	$0	$0	Project	0
Electrical Works				
Cable, junction box, ground, etc.	$2,581,645	$55	LF	46,939
Misc. Cable, Connectors, Etc.	$45,000	$45,000	LS	1
Testing & Commissioning	$204,980	$204,980	LS	1
Balance of Plant - Phase 4				
Civil & Structural Works				
Access Roads - New	$848,345	$67	LF	12,643
Access Roads - Improvements	$244,000	$24	LF	10,000
Public Road Temporary	$300,000	$300,000	Project	1
Public Road Restoration	$250,000	$250,000	Project	1
WTG Site Prep	$400,000	$40,000	WTG	10
Crane Pads	$120,000	$12,000	WTG	10
WTG Foundations	$1,950,000	$195,000	WTG	10
O&M Building	$0	$0	Project	0
Wind Turbine Erection	$2,150,000	$215,000	WTG	10
Met Tower	$0	$0	Project	0
Electrical Works				
Cable, junction box, ground, etc.	$2,345,145	$55	LF	42,639
Testing & Commissioning	$163,500	$153,500	LS	1
Project Indirects				
Misc. Construction Indirects				
Temp. Construction Facilities	$732,000	$732,000	Project	1
Site Mob/Demobilization	$630,852	$630,852	Project	1
Project Indirects				
BOP Engineering & Studies	$1,200,000	$1,200,000	Project	1
Construction Management	$2,440,000	$2,440,000	Project	1
Primary Laydown Area	$732,000	$732,000	Project	1
Total Balance of Plant	**$22,930,798**			

Appendix C. Accuracy Bands of Cost Estimate

Table C-1 Vestas V126-3.45 Bounding Accuracy of Capital Cost Estimate

ESTIMATE ACCURACY	Accuracy Range (-/+)		Low	Base	High
Decommissioning	-30%	30%	$853,300	$1,219,000	$1,584,700
Project Substation	-30%	30%	$31,500	$45,000	$58,500
Balance of Plant	-30%	30%	$16,360,283	$23,371,833	$30,383,382
TOTAL PROJECT	**-34%**	**23%**	**$16,259,650**	**$24,635,833**	**$30,302,075**

Table C-11 Vestas V136-4.20 Bounding Accuracy of Capital Cost Estimate

ESTIMATE ACCURACY	Accuracy Range (-/+)		Low	Base	High
Decommissioning	-30%	30%	$853,300	$1,219,000	$1,584,700
Project Substation	-30%	30%	$31,500	$45,000	$58,500
Balance of Plant	-30%	30%	$16,648,406	$23,783,437	$30,918,469
TOTAL PROJECT	**-34%**	**23%**	**$16,679,906**	**$25,047,437**	**$30,976,969**

Table C-3 Vestas V150-4.20 Bounding Accuracy of Capital Cost Estimate

ESTIMATE ACCURACY	Accuracy Range (-/+)		Low	Base	High
Decommissioning	-30%	30%	$853,300	$1,219,000	$1,584,700
Project Substation	-30%	30%	$31,500	$45,000	$58,500
Balance of Plant	-30%	30%	$16,051,559	$22,930,798	$29,810,037
TOTAL PROJECT	**-34%**	**23%**	**$16,083,059**	**24,194,798**	**$29,868,537**

Appendix D. Recommended Vertical Wind Profile Study Sites

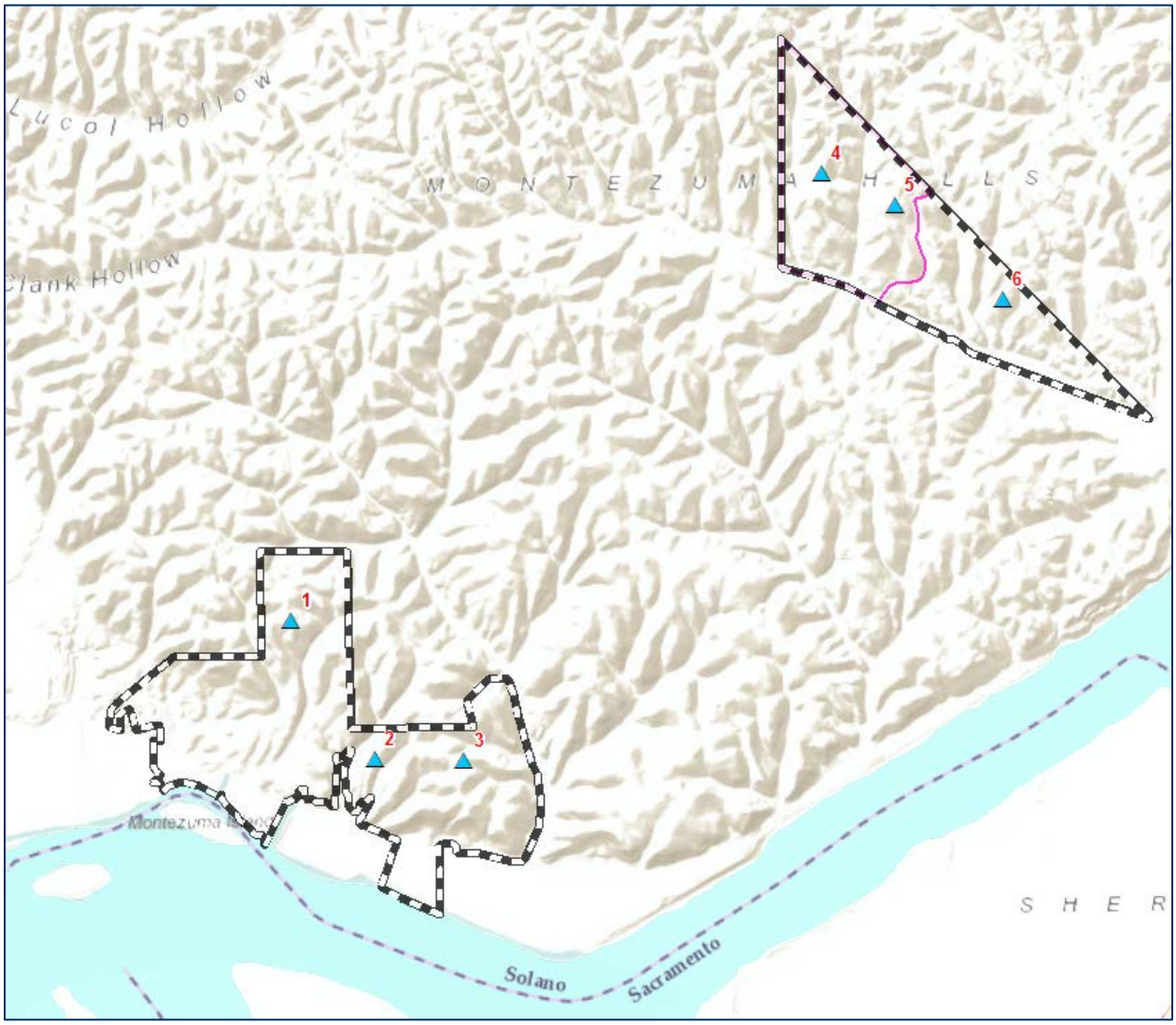


Figure D-1 Recommended Vertical Wind Profile Study Sites

Appendix E. Energy Production Loss Factors

Array Efficiency: This is a calculated value, and part of the output of the wake and energy production model. It represents the ratio of the net to gross energy yield, which only considers calculation of wake losses.

Electrical Efficiency: Losses in the electric collection system and substation prior to the plant's revenue meters are covered by this factor. Points of significant electrical losses in a wind energy project usually include electric collection system lines connecting the turbines to the project substation, the turbine step-up transformers, and the substation's main power transformer.

Turbine Availability: Turbine availability accounts for machine downtime that is either a scheduled or unscheduled outage. This value is typically estimated at 3 to 5 percent. Assumptions for turbine availability are often driven by historical turbine model track record.

Environmental: Wind turbine performance is sensitive to the cleanliness and surface condition of the turbine's blades. The site can contain airborne particulates that may contribute to blade soiling. Blade soiling and blade surface degradation, as well as inclement weather and vegetation growth are considered for this loss.

Balance of Plant (BoP) Maintenance: Substation maintenance requiring the shutdown of the project is assumed to be infrequent, averaging approximately one day out of each year.

Turbine Performance: Turbine performance losses account for sub-optimal performance experienced by turbines, including instrumentation calibration, pitch and yaw errors, and similar sub-optimal operations.

Utility Downtime: Utility downtime accounts for events that require downtime on the part of the utility. These are generally assumed to be infrequent.

Power Curve: The wind turbine manufacturer will warranty a performance level for the turbine at a percentage of the power curve values. Industry experience shows that while wind turbines historically meet power curve warranties when including measurement uncertainty, they often operate slightly under published power curves.

High Wind Hysteresis: When wind speeds exceed the operational range of a wind turbine, the turbine shuts down to protect itself. The turbine then waits to restart until wind speeds fall below a lower restart speed.

Wind Sector Management: Wind sector management is a means of protecting turbines when winds are blowing along the turbine layout direction in which turbines have been given reduced along-wind.

Solano Phase 1 & Phase 4

Westslope SMUD

Solano County, California

Obstruction Evaluation & Airspace Analysis

July 25, 2018

Capitol Airspace Group

capitolairspace.com

(703) 256 2485

5400 Shawnee Road, Suite 304
Alexandria, VA 22312

703-256-2485
capitolairspace.com

Summary

Capitol Airspace conducted an obstruction evaluation and airspace analysis for the Solano Phase 1 and Phase 4 wind projects in Solano County, California. The purpose for this analysis was to identify obstacle clearance surfaces established by the Federal Aviation Administration (FAA) that could limit increasing wind turbine heights to 493 feet above ground level (AGL) (black points, ***Figure 1***) and 591 feet AGL (blue points, ***Figure 1***). This analysis assessed height constraints overlying 19 Phase 1 and 22 Phase 4 wind turbine locations as well as an approximately 30 square mile study area (red outline, ***Figure 1***) to determine the likelihood of the FAA issuing favorable determinations of no hazard to 493 and 591 foot AGL wind turbines.

14 CFR Part 77.9 requires that that all structures exceeding 200 feet AGL be submitted to the FAA so that an aeronautical study can be conducted. The FAA's objective in conducting aeronautical studies is to ensure that proposed structures do not have an effect on the safety of air navigation and the efficient utilization of navigable airspace by aircraft. The end result of an aeronautical study is the issuance of a determination of 'hazard' or 'no hazard' that can be used by the proponent to obtain necessary local construction permits. It should be noted that the FAA has no control over land use in the United States and cannot enforce the findings of its studies.

Height constraints overlying the Solano Phase 1 and Phase 4 wind projects are a constant 749 feet above mean sea level (AMSL) and are associated with Northern California (NCT) Terminal Radar Approach Control (TRACON) minimum vectoring altitude sectors. Proposed structures that exceed these surfaces would require an increase to minimum vectoring altitudes. If the FAA determines that this impact would affect a significant volume of operations (as few as one per week), it could result in determinations of hazard.

United States Geological Survey (USGS) elevation data indicates that these surfaces could limit 493 foot AGL wind turbines on higher terrain in the northwestern and central sections of the study area. These surfaces could limit 591 foot AGL wind turbines throughout the study area including five Phase 1 wind turbines (*P1R1:4, P1N1*) and seven Phase 4 turbines (*P4N1:4, P4N7:9*).

This study did not consider electromagnetic interference on communications, navigation, or radar surveillance systems. However, a navigational aid screening surface overlies the northwestern corner of the study area. USGS elevation data indicates that 493 and 591 foot AGL wind turbines proposed in this area will exceed the screening surface. If the FAA determines that the impact on the associated navigational aid would constitute a substantial adverse effect it could result in determinations of hazard regardless of the lack of impact on the other surfaces described in this report.

Methodology

Capitol Airspace studied the proposed projects based upon location information provided by Westslope Consulting. Using this information, Capitol Airspace generated graphical overlays to determine proximity to airports (***Figure 1***), published instrument procedures, enroute airways, FAA minimum vectoring altitude and minimum instrument flight rules (IFR) altitude charts, as well as military airspace and training routes.

Capitol Airspace evaluated all 14 CFR Part 77 imaginary surfaces, published instrument approach and departure procedures, visual flight rules operations, FAA minimum vectoring altitudes, minimum IFR altitudes, and enroute operations. All formulas, headings, altitudes, bearings and coordinates used during this study were derived from the following documents and data sources:

- 14 CFR Part 77 Safe, Efficient Use, and Preservation of the Navigable Airspace
- FAA Order 7400.2L Procedures for Handling Airspace Matters
- FAA Order 8260.3D United States Standard for Terminal Instrument Procedures
- FAA Order 8260.58A United States Standard for Performance Based Navigational (PBN) Instrument Procedure Design
- United States Government Flight Information Publication, US Terminal Procedures
- National Airspace System Resource Aeronautical Data

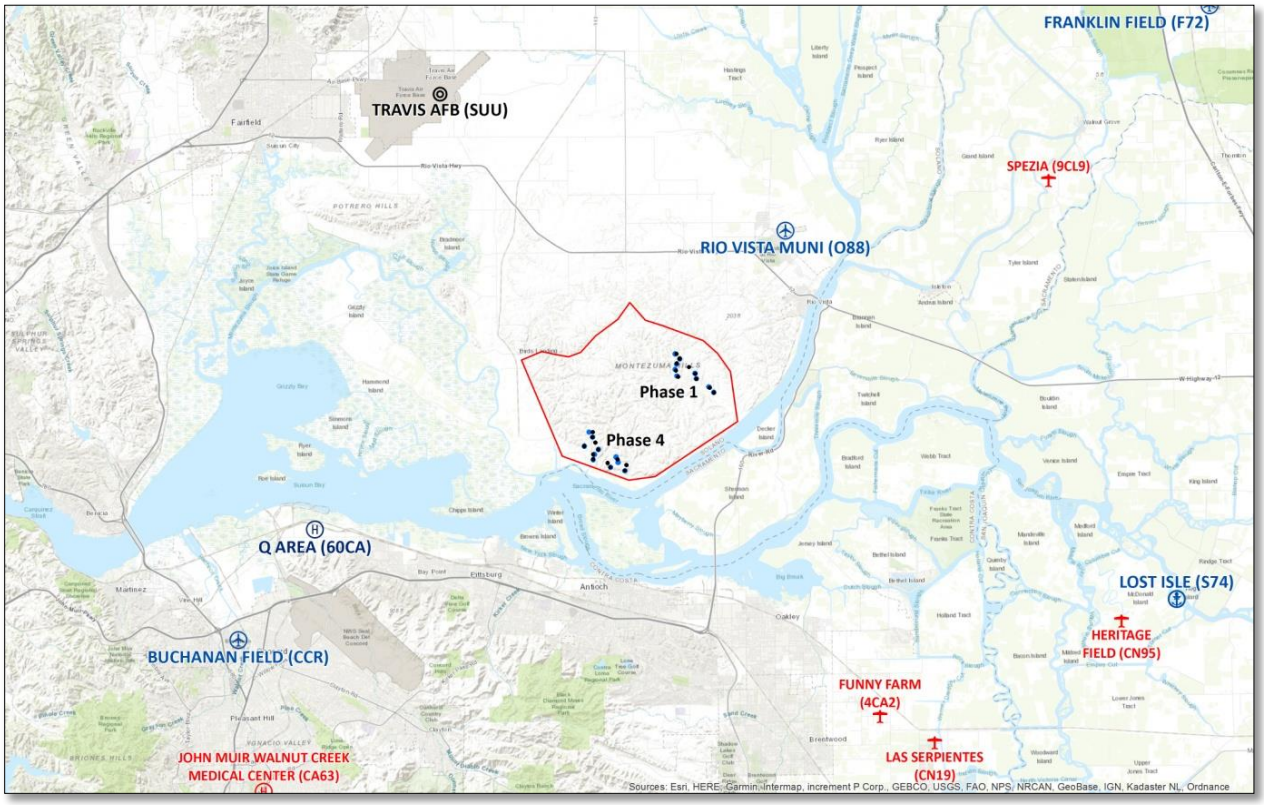


Figure 1: Public-use (blue), private-use (red), and military (navy blue and black) airports and heliports in proximity to the Solano Phase 1 and Phase 4 wind projects

Study Findings

14 CFR Part 77 Imaginary Surfaces

The FAA uses level and sloping imaginary surfaces to determine if a proposed structure is an obstruction to air navigation. Structures that are identified as obstructions are then subject to a full aeronautical study and increased scrutiny. However, exceeding a Part 77 imaginary surface does not automatically result in the issuance of a determination of hazard. Proposed structures must have airspace impacts that constitute a substantial adverse effect in order to warrant the issuance of determinations of hazard.

14 CFR Part 77 imaginary surfaces (***Figure 2***) overlying the Solano Phase 1 and Phase 4 wind projects:

Rio Vista Municipal (O88)
77.17(a)(2): 378 to 785 feet AMSL

At 493 feet AGL (orange area, ***Figure 2***) and 591 feet AGL (orange and yellow areas, ***Figure 2***), wind turbines in the northeastern section of the study area, including all of the Phase 1 wind turbines, will exceed the Rio Vista Municipal Airport (O88) 77.17(a)(2) imaginary surface and will be identified as obstructions. Additionally, at 591 feet AGL, proposed wind turbines will exceed 77.17(a)(1) – a height of 499 feet AGL at the site of the object – and will be identified as obstructions regardless of location.

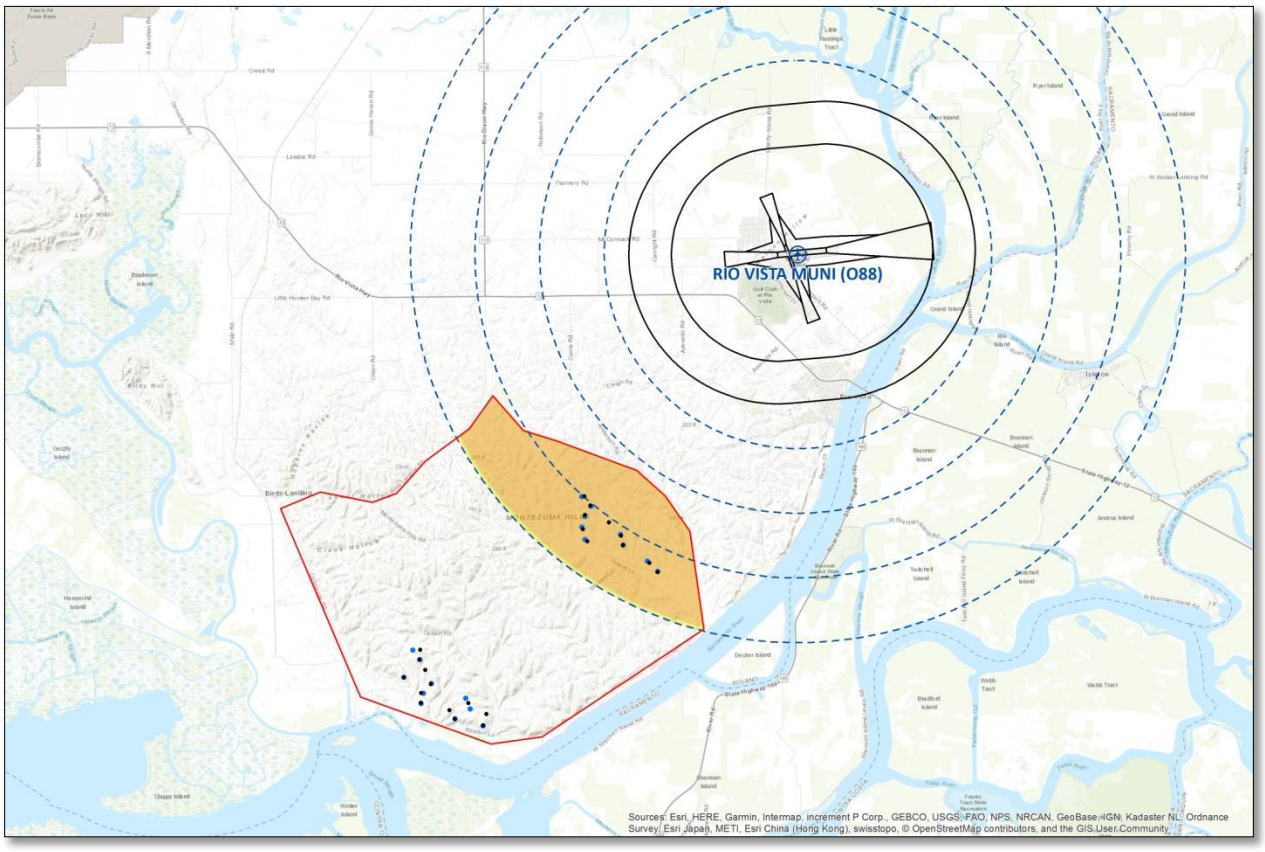


Figure 2: 77.17(a)(2) (dashed blue) and 77.19 (black) imaginary surfaces in proximity to the Solano Phase 1 and Phase 4 wind projects

Visual Flight Rules (VFR) Traffic Pattern Airspace

VFR traffic pattern airspace is used by pilots operating during visual meteorological conditions. The airspace dimensions are based upon the category of aircraft which, in turn, is based upon the approach speed of the aircraft. 14 CFR Part 77.17(a)(2) and 77.19 (as applied to a *visual* runway) imaginary surfaces establish the obstacle clearance surface heights within VFR traffic pattern airspace.

VFR traffic pattern airspace does not overlie the Solano Phase 1 and Phase 4 wind projects and should not limit 493 or 591 foot AGL wind turbines within the defined study area (***Figure 3***).

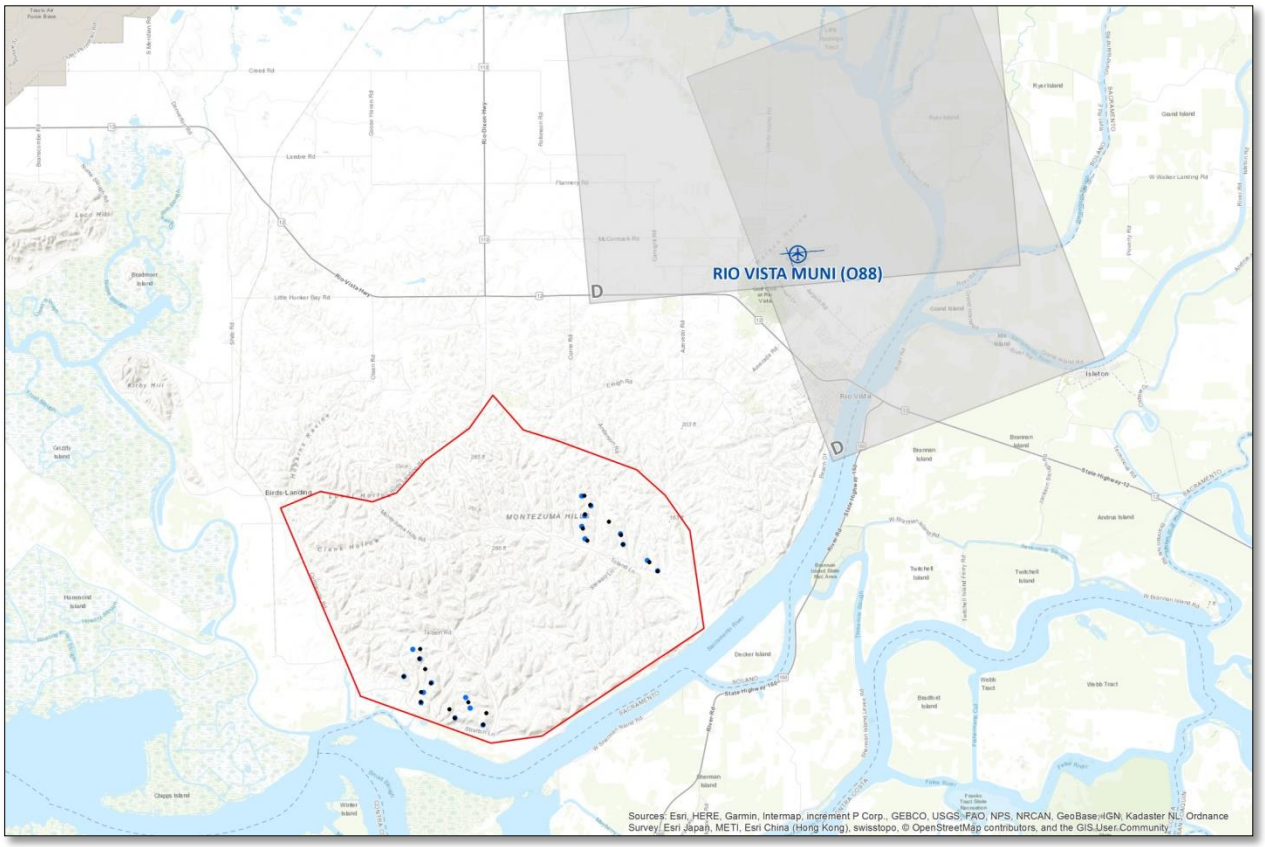


Figure 3: VFR traffic pattern airspace in proximity to the Solano Phase 1 and Phase 4 wind projects

Visual Flight Rules (VFR) Routes

During periods of marginal Visual Meteorological Conditions (VMC) – low cloud ceilings and one statute mile visibility – pilots often operate below the floor of controlled airspace. Operating under these weather conditions requires pilots to remain within one statute mile of recognizable land marks such as roads, rivers, and railroad tracks. The FAA protects for known and regularly used VFR routes by limiting structure heights within two statute miles of these routes to no greater than 14 CFR Part 77.17(a)(1) – a height of 499 feet AGL at the site of the object.

The Solano Phase 1 and Phase 4 wind projects are located in proximity to railroads, highways, and transmission lines that may be used as VFR routes (***Figure 4***). However, operational data describing the usage of these potential routes is not available. If the FAA determines that these potential VFR routes are flown regularly, it could limit wind development in excess of 499 feet AGL and within two statute miles of these landmarks (hatched orange, ***Figure 4***).

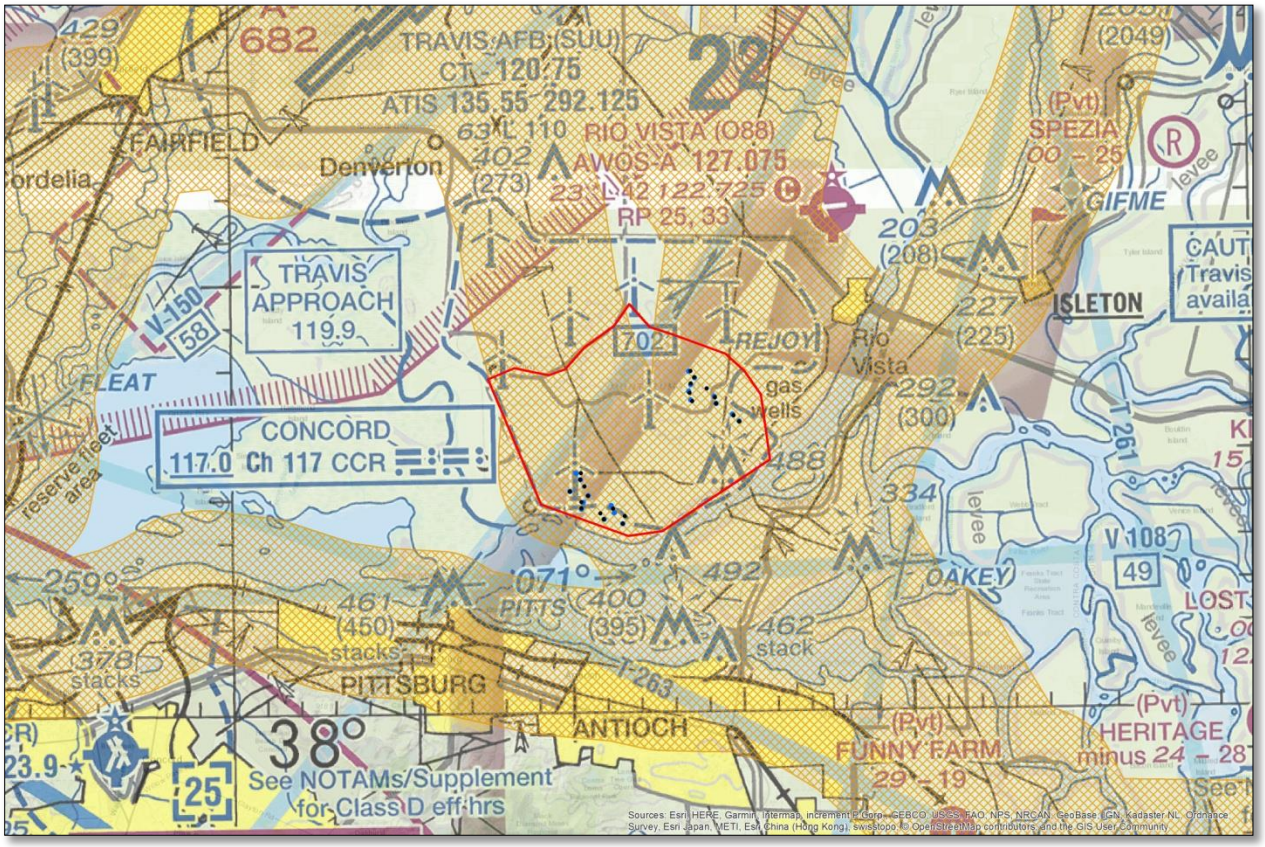


Figure 4: Potential VFR routes in proximity to the Solano Phase 1 and Phase 4 wind projects

Instrument Departures

In order to ensure that aircraft departing during marginal weather conditions do not fly into terrain or obstacles, the FAA publishes instrument departure procedures that provide obstacle clearance to pilots as they transition between the terminal and enroute environments. These procedures contain specific routing and minimum climb gradients to ensure clearance from terrain and obstacles.

Proposed structures that exceed instrument departure procedure obstacle clearance surfaces would require an increase to instrument departure procedure minimum climb gradients. If the FAA determines that this impact would constitute a substantial adverse effect, it could be used as the basis for determinations of hazard.

Instrument departure procedure obstacle clearance surfaces (e.g., ***Figure 5***) are in excess of other lower surfaces and should not 493 or 591 foot AGL wind turbines within the defined study area.

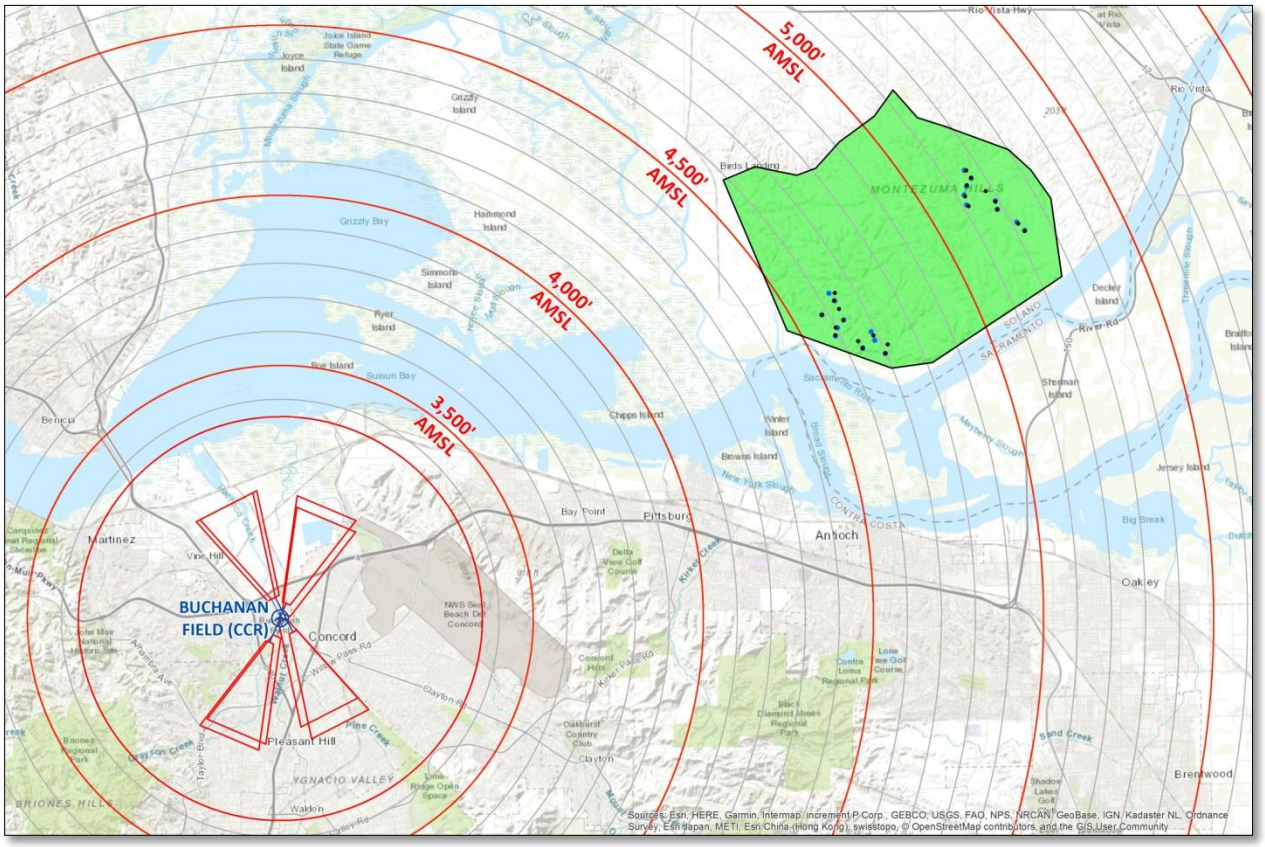


Figure 5: Buchanan Field Airport (CCR) visual climb over airport (VCOA) departure procedure assessment

Instrument Approaches

Pilots operating during periods of reduced visibility and low cloud ceilings rely on terrestrial and satellite based navigational aids (NAVAIDS) in order to navigate from one point to another and to locate runways. The FAA publishes instrument approach procedures that provide course guidance to on-board avionics that aid the pilot in locating the runway. Capitol Airspace assessed a total of 28 published instrument approach procedures at eight public-use airports and one military airport in proximity to the Solano Phase 1 and Phase 4 wind projects.

Proposed wind turbines that exceed instrument approach procedure obstacle clearance surfaces would require an increase to their minimum altitudes. Increases to these altitudes, especially critical *decision altitudes (DA)* and *minimum descent altitudes (MDA)*, can directly impact the efficiency of instrument approach procedures. If the FAA determines this impact to constitute a substantial adverse effect it could be used as the basis for determinations of hazard.

Instrument approach procedure obstacle clearance surfaces (e.g., ***Figure 6***) are in excess of other lower surfaces and should not limit 493 or 591 foot AGL wind turbines within the defined study area.

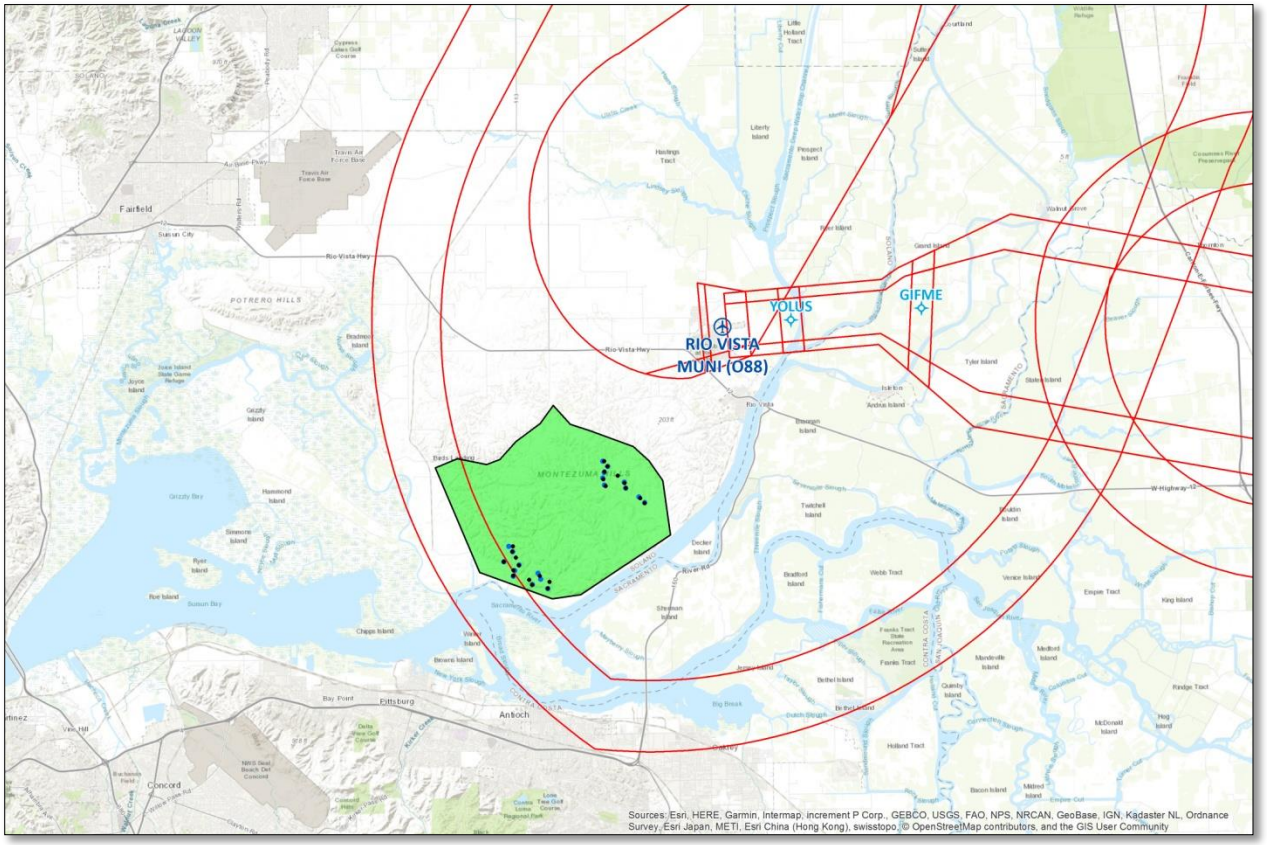


Figure 6: Rio Vista Municipal Airport (O88) RNAV (GPS) Approach to Runway 25

5400 Shawnee Road, Suite 304
Alexandria, VA 22312
703-256-2485
capitolairspace.com

Instrument approach procedures assessed:

Travis Air Force Base (SUU)
ILS or Localizer Approach to Runway 03L
ILS or Localizer Approach to Runway 21L
ILS Approach to Runway 21L (CAT II)
RNAV (GPS) Approach to Runway 03L
RNAV (GPS) Approach to Runway 21L
RNAV (GPS) Approach to Runway 21R
TACAN Approach to Runway 03L
TACAN Approach to Runway 21L
TACAN Approach to Runway 21R

Livermore Municipal (LVK)
ILS Approach to Runway 25R
RNAV (GPS) Approach to Runway 25R
Localizer Approach to Runway 25R

Lodi (1O3)
RNAV (GPS)-B Circling Approach
VOR-A Circling Approach

Rio Vista Municipal (O88)
RNAV (GPS) Approach to Runway 25
VOR/DME-A Circling Approach

Buchanan Field (CCR)
RNAV (GPS) Y Approach to Runway 19R
LDA Approach to Runway 19R
VOR Approach to Runway 19R

Napa County (APC)
ILS or Localizer Approach to Runway 36L
RNAV (GPS) Approach to Runway 06
RNAV (GPS) Y Approach to Runway 36L
RNAV (GPS) Z Approach to Runway 36L
VOR Approach to Runway 06

Byron (C83)
RNAV (GPS) Approach to Runway 30

University (EDU)
RNAV (GPS) Approach to Runway 17

Nut Tree (VCB)
RNAV (GPS) Approach to Runway 20
VOR-A Circling Approach

Enroute Airways

Enroute airways provide pilots a means of navigation when flying from airport to airport and are defined by radials between VHF omni-directional ranges (VORs). The FAA publishes minimum altitudes for airways to ensure clearance from obstacles and terrain. The FAA requires that each airway have a minimum of 1,000 feet of obstacle clearance in non-mountainous areas and normally 2,000 feet in mountainous areas.

Proposed structures that exceed enroute airway obstacle clearance surfaces would require an increase to their minimum obstruction clearance altitudes (MOCA) and/or minimum enroute altitudes (MEA). If the FAA determines that this impact would affect a significant volume of operations it could be used as the basis for determination of hazard.

Enroute airway obstacle clearance surfaces (e.g., ***Figure 7***) are in excess of other lower surfaces and should not limit increasing the wind turbine rotor diameter to 493 or 591 feet AGL at any of the proposed locations.

Figure 7: Low altitude enroute chart L-02 with V6 obstacle evaluation areas (purple)

Minimum Vectoring/IFR Altitudes

The FAA publishes minimum vectoring altitude (MVA) and minimum instrument flight rules (IFR) altitude charts that define sectors with the lowest altitudes at which air traffic controllers can issue radar vectors to aircraft based on obstacle clearance. The FAA requires that sectors have a minimum of 1,000 feet of obstacle clearance in non-mountainous areas and normally 2,000 feet in mountainous areas.

Proposed structures that exceed minimum vectoring/IFR altitude sector obstacle clearance surfaces would require an increase to the altitudes usable by air traffic control for vectoring aircraft. If the FAA determines that this impact would affect a significant volume of operations (*as few as one per week*), it could result in determinations of hazard.[1]

Northern California (NCT) Terminal Radar Approach Control (TRACON)

NCT_BAB_MVA: Sector BAB_D

The MVA is 1,700 feet AMSL. The associated obstacle clearance surface is 749 feet AMSL and is the lowest height constraint in the northeastern section of the study area. USGS elevation data indicates that this surface could limit 493 and 591 foot AGL wind turbines in the northern and northeastern sections of the study area, including five of the 591 foot AGL Phase 1 turbines (*P1R1:4, P1N1*).

NCT_MCC_MVA: Sector BAB_D

The MVA is 1,700 feet AMSL. The associated obstacle clearance surface (hatched blue, ***Figure 8***) is 749 feet AMSL and is the lowest height constraint in the northeastern section of the study area. USGS elevation data indicates that this surface could limit 493 foot AGL (red areas, ***Figure 8***) and 591 foot AGL (red and orange areas, ***Figure 8***) wind turbines in the northern and northeastern sections of the study area, including five of the 591 foot AGL Phase 1 turbines (*P1R1:4, P1N1*).

NCT_903S_MVA: 1,700 foot AMSL Sector

The MVA is 1,700 feet AMSL (***Figure 9***). The associated obstacle clearance surface is 749 feet AMSL and is the lowest height constraint overlying the entire study area. USGS elevation data indicates that this surface could limit 493 foot AGL (red areas, ***Figure 9***) in the northwestern and central sections of the study area. However, none of the proposed wind turbines are located in this area. This surface could limit 591 foot AGL (red and orange areas, ***Figure 9***) wind turbines throughout the study area including five Phase 1 turbines (*P1R1:4, P1N1*) and seven Phase 4 turbines (*P4N1:4, P4N7:9*).

[1] Capitol Airspace analyzed the Travis Air Force Base (AFB) minimum vectoring altitude chart provided through CRADA in 2011. It was determined that the associated obstacle clearance surfaces are in excess of other lower surfaces and should not limit up to 591 foot AGL wind turbines within the defined study area.

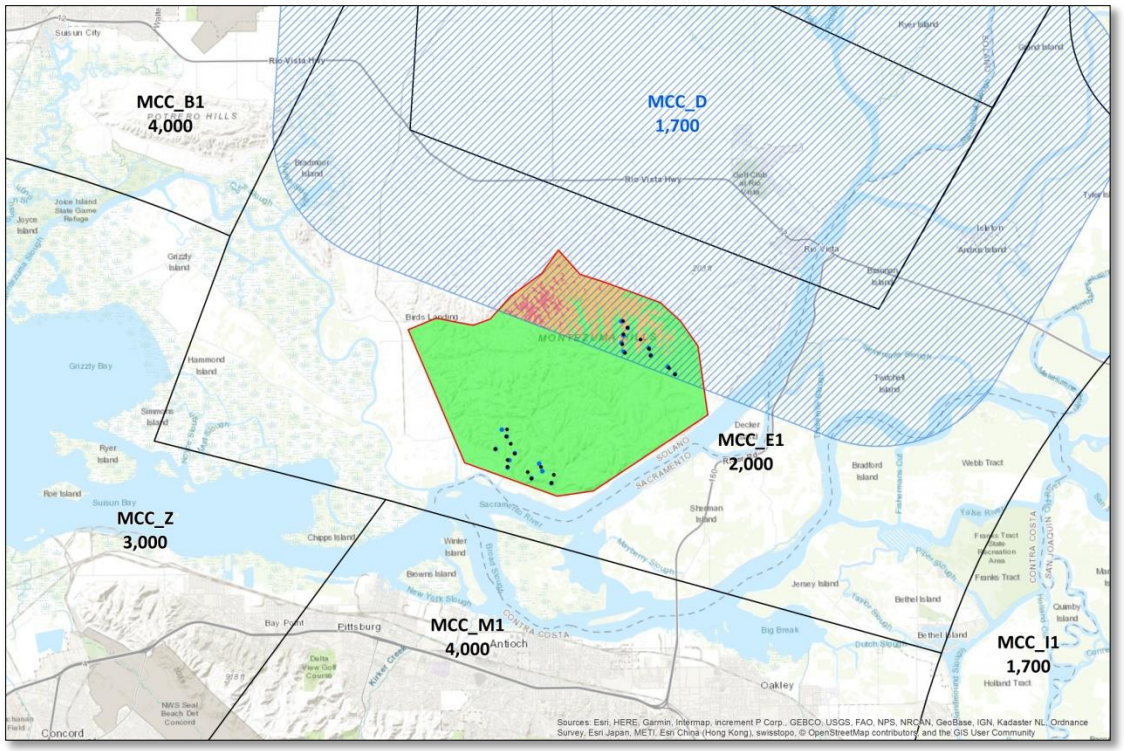


Figure 8: Northern California (NCT) TRACON "NCT_MCC_MVA" MVA sectors (black) with Sector MCC_D obstacle evaluation area (hatched blue)

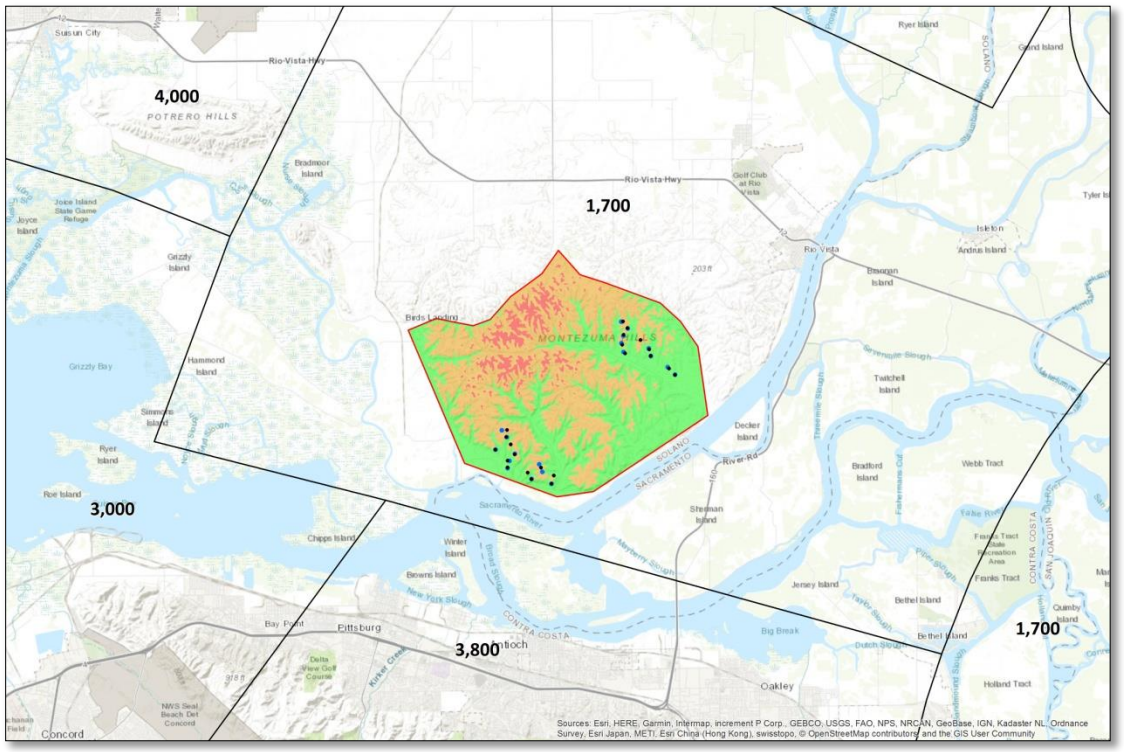


Figure 9: Northern California (NCT) TRACON "NCT_903S_MVA" MVA sectors (black) with Sector MCC_D obstacle evaluation area (hatched blue)

Very High Frequency (VHF) Omni-Directional Range (VOR)

The FAA has established 0.60° (Conventional VOR) and 0.75° (Doppler VOR) screening angles in order to identify proposed structures that may have a negative impact on VORs. This surface extends upward and outward from the VOR to a distance of up to 8 nautical miles. Proposed wind turbines that exceed this surface may interfere with the services provided by the VOR. If the FAA determines this impact to be significant it can be used as the basis for determinations of hazard.

Travis (SUU) TACAN

The 0.60° screening surface, typically applied for Conventional VORs, overlies the Solano Phase 1 and Phase 4 wind projects (***Figure 10***). The height of this surface ranges from 522 to 540 feet AMSL where it overlies the study area. USGS elevation data indicates that 493 and 591 foot AGL (orange area, ***Figure 10***) wind turbines would exceed this surface. However, none of the proposed wind turbines are located in this area.

If line of sight exists between the Travis (SUU) TACAN and wind turbines proposed in this area, FAA Technical Operations may perform further review. If further review determines that proposed wind turbines would have a substantial adverse effect on navigational aids, it could result in determinations of hazard.

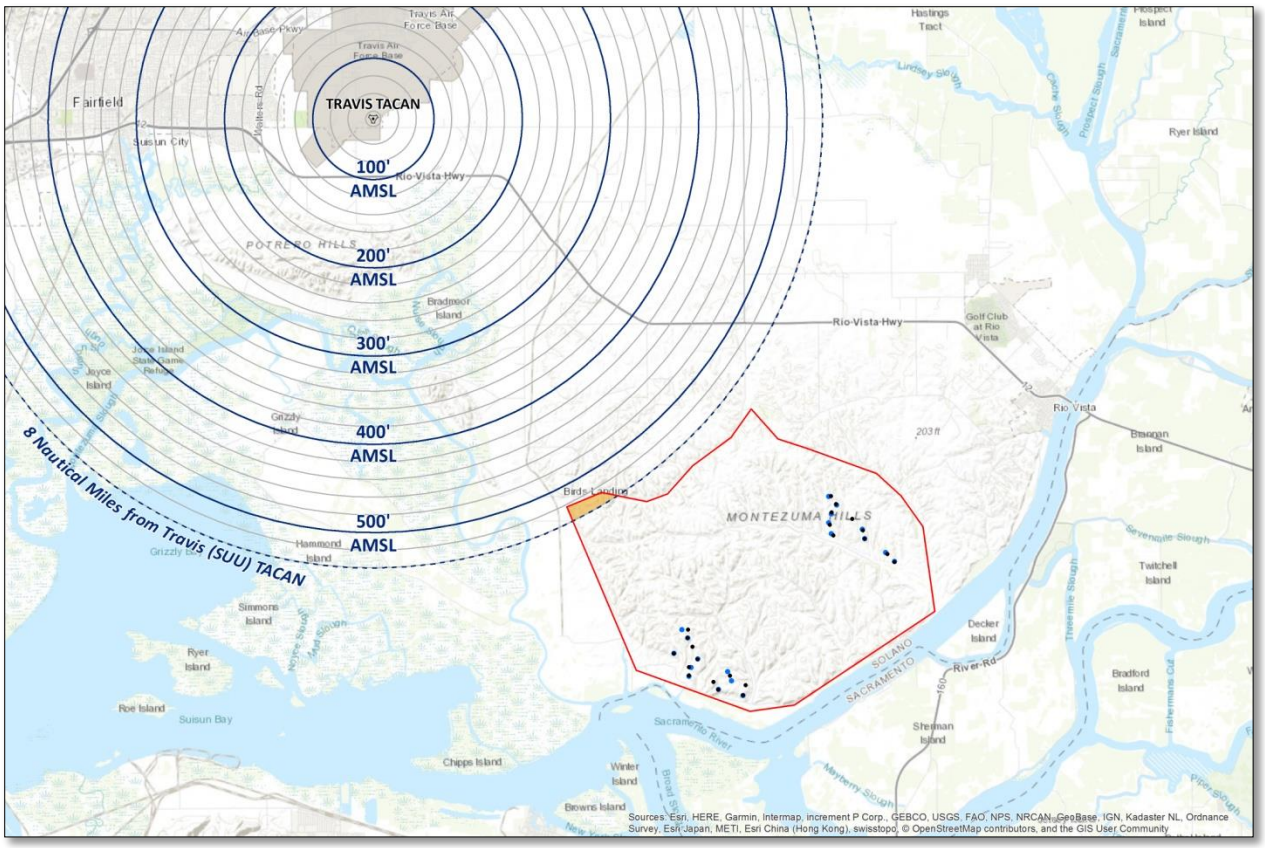


Figure 10: Travis (SUU) TACAN 0.60° screening surface

Military Airspace and Training Routes

Since the FAA does not protect for military airspace or training routes, impact on their operations cannot result in a determination of hazard. However, the FAA will notify the military of proposed wind turbines located within these segments of airspace. If the planned development area is located on federal land, impact on military airspace or training routes may result in the denial of permits by the Bureau of Land Management.

Military airspace and training routes do not overlie the Solano Phase 1 and Phase 4 wind projects (***Figure 11***). As a result, proximity to these segments of airspace should not result in military objections to proposed wind turbines.

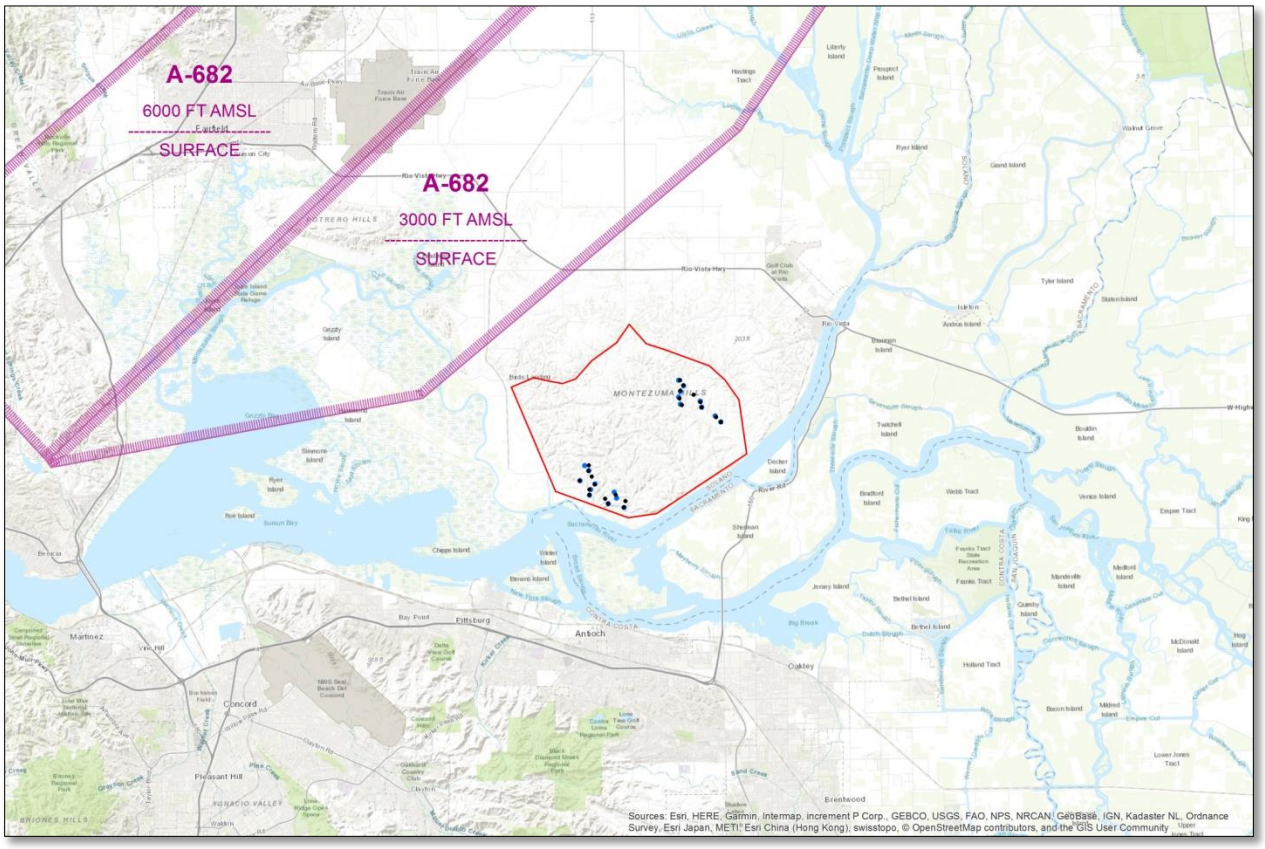


Figure 11: Alert areas in proximity to the Solano Phase 1 and Phase 4 wind projects

Conclusion

At 493 and 591 feet AGL, all of the Phase 1 wind turbines will exceed the Rio Vista Municipal Airport 14 CFR Part 77.17(a)(2) imaginary surface (***Figure 2***) and will be identified as obstructions. Additionally, at 591 feet AGL, proposed wind turbines will exceed 77.17(a)(1) – a height of 499 feet AGL at the site of the object – and will be identified as obstructions regardless of location. However, heights in excess of these surfaces are feasible provided proposed wind turbines do not exceed FAA obstacle clearance surfaces.

Obstacle clearance surfaces overlying the Solano Phase 1 and Phase 4 wind projects are a constant 749 feet AMSL (***Figure 12***) and are associated with Northern California (NCT) TRACON minimum vectoring altitude sectors (***Figure 8*** & ***Figure 9***). Proposed structures that exceed these surfaces would require an increase to minimum vectoring altitudes. If the FAA determines that this impact would affect a significant volume of operations (*as few as one per week*), it could result in determinations of hazard.

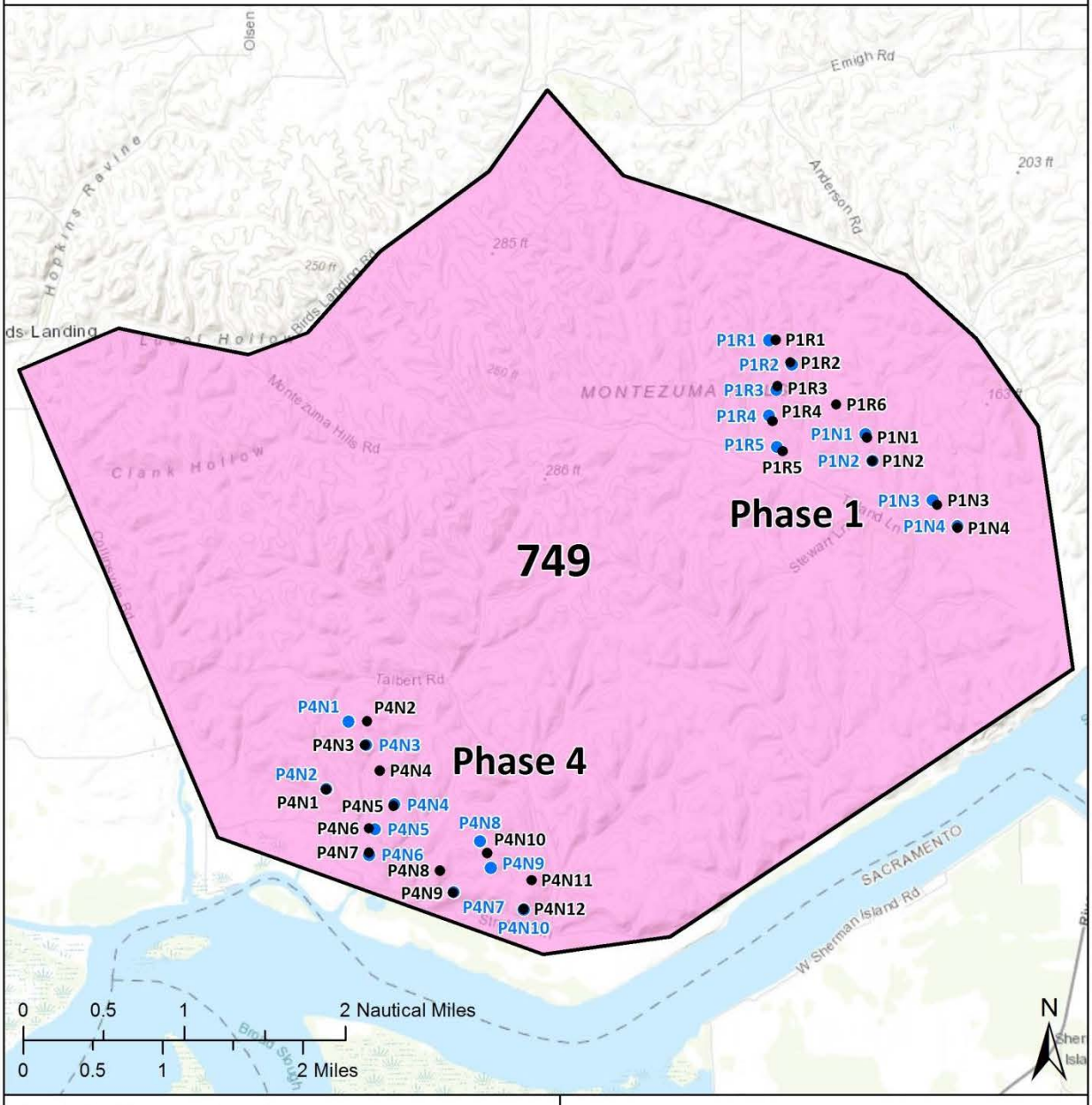
USGS elevation data indicates that these surfaces could limit 493 foot AGL wind turbines on higher terrain in the northwestern and central sections of the study area (red areas, ***Figure 13***). However, none of the proposed wind turbines are located in these areas. These surfaces could limit 591 foot AGL wind turbines throughout the study area (red and orange areas, ***Figure 13***), including five Phase 1 turbines (*P1R1:4, P1N1*) and seven Phase 4 turbines (*P4N1:4, P4N:9*) (red and orange areas, ***Figure 13***).

At 493 and 591 feet AGL, wind turbines proposed in the northwestern section of the study area would exceed the Travis (SUU) TACAN 0.60° screening surface (***Figure 10***). If further review determines that wind turbines proposed in this area would have a substantial adverse effect on navigational aids, it could result in determinations of hazard. However, none of the proposed wind turbines are located in this area.

The AGL Clearance Map (***Figure 13***) is based on USGS National Elevation Dataset (NED) 1/3 Arc Second data which has a vertical accuracy of generally +/- 7 meters. Therefore, the AGL Clearance Map should only be used for general planning purposes and not exact structure siting. In order to avoid the likelihood of determinations of hazard, proposed structure heights must adhere to the height constraints depicted in the Composite Map (***Figure 12***).

If you have any questions regarding the findings of this study, please contact ***Joe Anderson*** or ***Orlando Olivas*** at (703) 256-2485.

Proposed structures that exceed 14 CFR Part 77.17(a)(1) - a height of 499 feet AGL at the site of the object - will be identified as obstructions regardless of their location.



Obstacle Clearance Surface

749 Feet AMSL

Proposed Wind Turbine (493' feet AGL)

Proposed Wind Turbine (591' feet AGL)

All heights above mean sea level (AMSL)

Solano Phase 1 and Phase 4 Wind Project
Composite Height Constraint Map

Plot Date:
24 July 2018

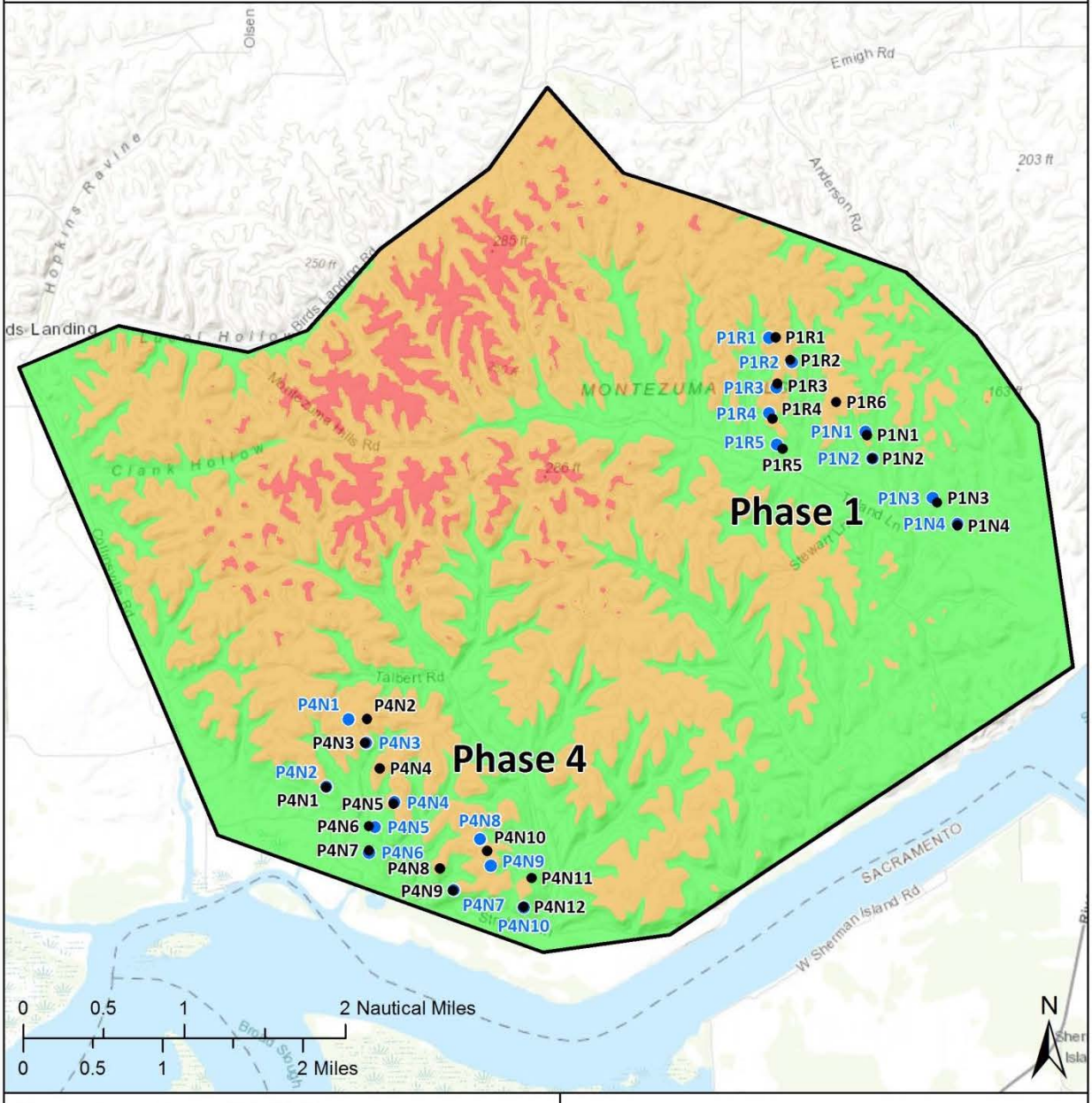
Coordinate System:
NAD 1983 UTM Zone 10N

Orlando Olivas

Figure 12

Capitol Airspace Group

The USGS 1/3 Arc Second Digital Elevation Model (DEM) data used to create this map has a vertical accuracy of +/- 7 meters. This map should only be used for general planning purposes and not exact structure siting.



Above Ground Level (AGL) Clearance

- < 493 Feet AGL
- ≥ 493 < 591 Feet AGL
- ≥ 591 Feet AGL
- Proposed Wind Turbine (493' feet AGL)
- Proposed Wind Turbine (591' feet AGL)

Solano Phase 1 and Phase 4 Wind Project
Above Ground Level (AGL) Clearance Map

Plot Date:
24 July 2018

Coordinate System:
NAD 1983 UTM Zone 10N

Orlando Olivas

Figure 13

Capitol Airspace Group

WESTSLOPE CONSULTING

SMUD Solano 4

Cumulative Impact Study and Mitigation Solution Results for 2018 Vestas V136 and V150 Wind Turbine Layouts

6 September 2018

Background

- **During the Windfarm RePower Group meeting on April 21, 2016, Westslope presented the results of an RLOS analysis and cumulative impact study for the Solano 4 wind project:**
  - **"RLOS analysis and qualitative review of radar data shows that existing 59 Kenetech wind turbines do not interfere with the Travis AFB radar**
  - **RLOS analysis and cumulative impact study indicates that Solano 4 will interfere with the Travis AFB radar**
    - **Incremental drop in primary Pd over the WRA predicted at 0.3% below 4,000 feet MSL and 0.4% below 10,000 feet MSL**
    - **Cumulative impact of other existing wind projects and Solano 4 predicted to decrease the primary Pd on the AT controllers' displays by 4.8 percent below 4,000 feet MSL and 4.4 percent below 10,000 feet MSL**
    - **Within the 5% Pd tolerance set forth under the CRADA in 2010**
    - **One occasional false primary track on the AT controllers' display**
  - **Effects not expected to be significant and should be manageable for a small 17 turbine project**
  - **No impacts to the secondary radar co-located with Travis AFB DASR"**

Change in Wind Turbine Technology

- **Solano 4 wind project in 2016 consisted of 17 Vestas V117 wind turbines at a blade-tip height of 488 feet AGL**
  - **Located on the SMUD Roberts and Collinsville properties**
- **2018 Solano 4 wind project consists of either 22 Vestas V136 wind turbines at a blade-tip height of 493 feet AGL or 19 Vestas V150 wind turbines at a blade-tip height of 591 feet AGL**
  - **New version of Solano 4 proposes wind turbines located on the SMUD Roberts and Collinsville properties (Solano 4 West) and at the Solano 1 repower site (Solano 4 East)**
- **Same as the 2016 V117 wind turbines, the 2018 V136 and V150 wind turbines will be within radar line-of-sight of and will interfere with the Travis AFB DASR**
- **Westslope updated the 2016 cumulative impact study to account for the Solano 4 V136 and V150 layouts using the same method used under CRADA No. 10-002**

Solano 4 West: Roberts and Collinsville Properties

[redacted]

wind

[redacted]

Solano 4 West: Roberts and Collinsville Properties 2018 Cumulative Impact Study Results

- **Results show that the primary Pd out of the Travis AFB DASR over the WRA will decrease by 0.3 percent for the V136 layout and by 0.2 percent for the V150 layout below 4,000 feet MSL and 10,000 feet MSL**
  - **Less than predicted for the 2016 Solano 4 V117 wind turbines**
- **Similar trend is expected for the primary Pd on the AT controllers' display based on the findings of CRADA No. 10-002's Radar Working Group**
- **Cumulative impact of existing wind projects and 2018 Solano 4 West wind project predicted to be within the 5% primary Pd tolerance set forth under the aforementioned CRADA**

Project	No. of Wind Turbines	Below 4,000 feet MSL		Below 10,000 feet MSL	
		Pd Drop	Cumulative Pd Drop	Pd Drop	Cumulative Pd Drop
Shiloh III	52	-1.3%	-1.3%	-1.2%	-1.2%
Montezuma I	16	-0.2%	-1.5%	-0.2%	-1.4%
Solano Phase 3	55	-1.3%	-2.8%	-1.3%	-2.7%
Montezuma II	37	-0.6%	-3.4%	-0.5%	-3.2%
Shiloh IV	50	-0.4%	-3.8%	-0.6%	-3.8%
Solano 4 (2016) vs.	16	-0.3%	-4.1%	-0.4%	-4.2%
Solano 4 (V136) and	12	-0.3%	-4.1%	-0.3%	-4.1%
Solano 4 (V150)	10	-0.2%	-4.0%	-0.2%	-4.0%

Pd drop out of the ASR-11 over the WRA

Description	Below 4,000 feet MSL	Below 10,000 feet MSL
Pd tolerance set forth by CRADA's Operations Working Group	5%	5%
Cumulative Pd drop		
Solano 4 West (2016) vs.	-4.1%	-4.2%
Solano 4 West (V136) and	-4.1%	-4.1%
Solano 4 West (V150)	-4.0%	-4.0%
Difference in Pd out of the ASR-11 and on the AT controllers' displays	-0.6%	-0.3%
Remaining Pd margin		
Solano 4 West (2016) vs.	0.3%	0.5%
Solano 4 West (V136) and	0.3%	0.6%
Solano 4 West (V150)	0.4%	0.7%

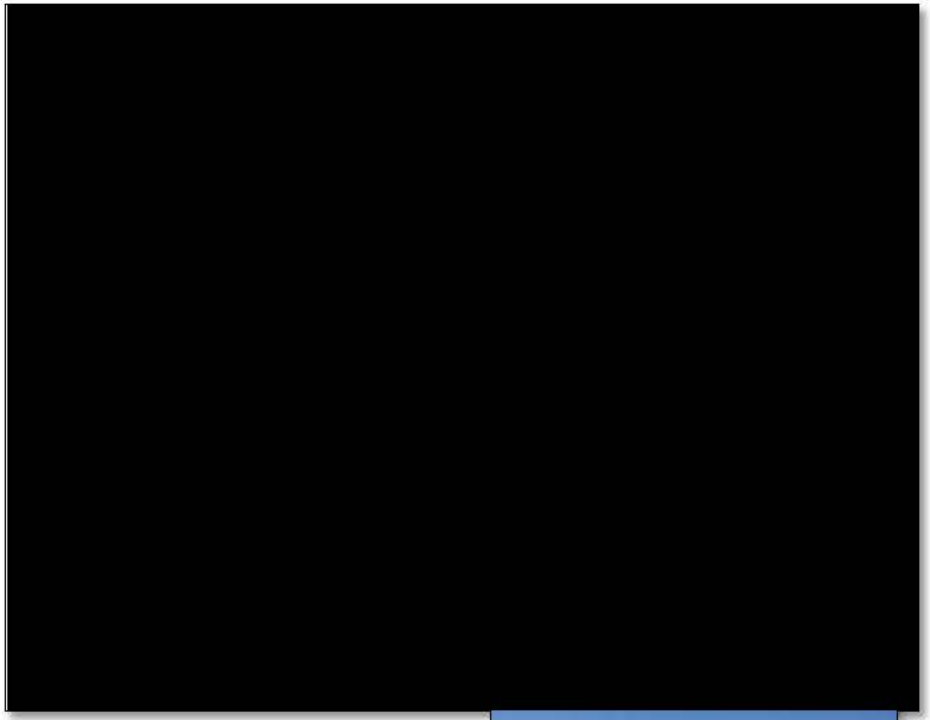
Remaining Pd margin over the WRA

WESTSLOPE CONSULTING

Mitigation Solution

- Existing Solano Phase 1 wind project consists of 23 Vestas V47 wind turbines
  - 16 wind turbines at a blade-tip height of 242 feet AGL and 7 wind turbines at a blade-tip height of 291 feet AGL
- RLOS analysis conducted by Westslope shows that the Solano Phase 1 wind turbines are within RLOS and currently interfering with the Travis AFB DASR
- Reducing the number of wind turbines within radar line-of-sight of the Travis AFB DASR should reduce the cumulative impact on primary Pd
- 2018 Solano 4 East repower consists of either 10 Vestas V136 wind turbines at a blade-tip height of 493 feet AGL or 9 Vestas V150 wind turbines at a blade-tip height of 591 feet AGL

589 wind turbines in operation in the Montezuma Hills



Solano Phase 1 Repower

Solano 4 East: Repower of Phase 1
2018 Cumulative Impact Study Results

- **Westslope conducted a Monte Carlo simulation to determine whether the Solano 4 East repower V136 wind turbines or V150 wind turbines would negate the predicted primary Pd drop as a result of the Solano 4 West V136 wind turbines or V150 wind turbines**

- **Same assumptions used to predict the drop in Pd as the simulation method used under CRADA No. 10-002**

- **Results show that the primary Pd out of the Travis AFB DASR over the WRA will increase by 0.2 percent**

Project	No. of Wind Turbines	Below 4,000 feet MSL	Below 10,000 feet MSL
		Pd Drop	
Solano 4 West (2016)	16	-0.3%	-0.4%
vs.			
Solano 4 West (V136)	12	-0.3%	-0.3%
and			
Solano 4 West (V150)	10	-0.2%	-0.2%
From previous slide for comparison purposes			
Solano 4 East (2016)	8	+0.3%	+0.3%
vs.			
Solano 4 East (V136)	10	+0.2%	+0.2%
and			
Solano 4 East (V150)	9	+0.2%	+0.2%

Pd drop out of the ASR-11 over the WRA

Combined
2018 Cumulative Impact Study Results

- **Westslope's simulations show the following:**
  - **For Solano 4 West, the primary Pd out of the Travis AFB DASR over the WRA will decrease by 0.3 percent for the V136 layout and by 0.2 percent for the V150 layout**
  - **For Solano 4 East, the primary Pd out of the Travis AFB DASR over the WRA will increase by 0.2 percent for both the V136 layout and the V150 layout**

- **Results show that the V136 layouts for both Solano 4 East and West areas will result in a 0.1 percent overall decrease in the primary Pd over the WRA**

- **Westslope does not expect that a 0.1 percent drop in the primary Pd over the WRA will result in a material difference to Travis AFB radar operations**

- **V150 layout for the Solano 4 East Repower will negate the Pd drop over the WRA as a result of the Solano 4 West V150 layout**

Conclusions

- **2018 Solano 4 East and West projects will replace 23 existing V47 wind turbines that are currently interfering with the Travis AFB DASR with either 22 Vestas V136 wind turbines or 19 Vestas V150 wind turbines**
- **Results show that the V136 wind turbines for both Solano 4 East and West will result in 0.1 percent decrease in the primary Pd over the WRA**
  - **Westslope does not expect that a 0.1 percent drop in the primary Pd over the WRA will result in a material difference to Travis AFB radar operations**
- **V150 wind turbines for the Solano 4 East will negate the Pd drop over the WRA as a result of the Solano 4 West V150 wind turbines**
- **False targets not expected to be significant and should be manageable for either 10 or 12 Solano 4 wind turbines**
- **No impacts to the secondary radar co-located with Travis AFB DASR**

Recommendations

- File 2018 Solano 4 East and West wind turbines with the FAA to start the federal government OE/AAA process
- Formalize a Mitigation Response Team
  - Further investigate the effects of replacing 23 Solano Phase 1 wind turbines with up to 22 Solano 4 East and West wind turbines
  - Determine whether radar effects will have an operational impact on Travis AFB's mission
  - Identify mitigation options
- Mitigation options:
  - SMUD to enter agreement to provide voluntary contribution to fund for an optimization update to the Travis AFB DASR

Capitol Airspace Group
5400 Shawnee Road, Suite 304
Alexandria, VA 22312
703-256-2485
capitolairspace.com

OE/AAA Aeronautical Study Process
July 31st, 2018

The United States Congress has charged the Federal Aviation Administration (FAA) with the responsibility to promote air commerce in the United States. As part of this responsibility, the FAA is tasked with ensuring air safety and preserving the National Airspace System (NAS). It is through these mandates that the FAA draws its authority to conduct aeronautical studies of tall structures including wind turbines.[1] Below is an overview of the typical process and required steps for working through the aeronautical study process. Although the Department of Defense's (DoD) formal review process occurs concurrently with FAA's aeronautical study, the DoD process is described separately.

FAA Step One: Filing

Developers intending to build structures in excess of 200 feet above ground level (AGL), or in excess of established notification standards (lower closer to airports), must submit a notice to the FAA at least 45 days prior to the start of construction.[2] Primarily, this process is conducted via an online submittal process through the FAA's OE/AAA website.[3] Prior to the FAA's establishment of the FAA OE/AAA automation system, notice was provided to the FAA by submitting FAA Form 7460-1, *Notice of Proposed Construction or Alteration*. The FAA and industry continues to refer to these filings as "7460-1" filings.

FAA 7460-1 filings require very basic information about the project to be studied. Specifically, the FAA requires that each wind turbine's location (latitude and longitude in HH:MM:SS.SS format), ground elevation (above mean sea level (AMSL)), and height (AGL) be submitted.

FAA 7460-1 filings must be submitted for each point on a project, with few exceptions. For wind and transmission line projects, individual points must be submitted for each turbine, met tower, and transmission line tower. Once the FAA receives and verifies these filings, an aeronautical study number is issued for each point. This begins the aeronautical study process.

FAA Step Two: Initial Review

Each project is assigned to a specialist within the FAA Obstruction Evaluation Group (OEG). For most projects, there are ten different government offices that take part in the study process, including: Airports, Instrument Flight Procedures Impact Team, Flight Standards, Technical Operations, Frequency Management, United States Air Force, United States Navy, United States Army, Department of Homeland Security (DHS), and the Department

[1] 14 CFR §77 – *Safe, Efficient Use, and Preservation of the Navigable Airspace*
[2] 14 CFR §77.7 – *Form and time of notice;* and §77.9 – *Construction or alteration requiring notice*
[3] https://oeaaa.faa.gov

of Defense (DoD) Military Aviation and Installation Assurance Siting Clearinghouse (hereafter referred to as the "Clearinghouse").

Technicians in each of these offices will review each point to ensure that the planned structure does not interfere with their areas of responsibility. For example, the Instrument Flight Procedures Impact Team will assess for impact on instrument approach and departure procedures at airports. The DoD will consider impacts to their training operations and defense readiness. Since the DoD review process is evolving, it is discussed separately at the end of the FAA process.

Once each office has assessed the proposed project, they submit a response of either "objection" or "no-objection" via the FAA OE/AAA system. During this preliminary review period, the project is considered to be in "work status" by the FAA. Review by all responding offices typically takes approximately 60 to 90 days. After all offices have responded, the project is moved from "work status" into "evaluation status". It is at this point that the FAA Obstruction Evaluation Specialist, typically a former air traffic controller, will assess all of the responses and determine whether to issue a Notice of Presumed Hazard (NPH) or a favorable Determination of No Hazard (DNH).

If any of the wind turbines exceed a 14 CFR Part 77 imaginary surface, then a NPH is guaranteed (e.g., all turbines taller than 499 feet AGL will exceed an imaginary surface and will be issued a NPH). Additionally, if the wind turbines have any adverse effect on the NAS, then a NPH will be issued. In contrast, if the wind turbines do not exceed an imaginary surface and have no adverse effect, then the FAA would issue favorable Determinations of No Hazard (DNH).

FAA Step Three: Preliminary Results in a Notice of Presumed Hazard (NPH)

A NPH letter is meant to be a means for the FAA to notify the developer that FAA has identified an issue that will require further aeronautical study in order to determine whether or not the structure will pose a hazard to air navigation. Typically, the FAA will also include in this letter any objections received by the various responding offices in the FAA, DoD, and DHS.

FAA Step Four: Responding to a Notice of Presumed Hazard (NPH)

While there are many methods to resolve objections received on a project, nearly all NPH cases must be circularized to the public for comment. Public notices should be distributed to any party that can provide information relevant to FAA's aeronautical study. The distribution list typically includes the following:[4]

[4] As described in FAA Order 7400.2L Paragraph 6-3-17, "Circularization"

- All public-use airports within 13 nautical miles (NM) of the proposed wind turbines
- All private-use airports within 5 NM of the proposed wind turbines
- Any affected airport
- The air traffic facility that provides radar vectoring services in the vicinity of the proposed wind turbines
- FAA Flight Standards
- All known aviation interested persons such as state, city, and local aviation authorities
- Flying clubs and organizations

It is through this 37 day public comment period that the FAA solicits feedback from the flying community. Once the comment period closes, the FAA will discard comments that are not of a valid aeronautical nature. During this time, Capitol Airspace may propose mitigation options that would strike a balance between the needs of the development project and FAA's need to preserve the NAS.

FAA Step Five: Final Determinations

At the end of the further aeronautical study and public comment period, the FAA will make a final decision and issue either a Determination of No Hazard or a Determination of Hazard.

Favorable determinations are valid for 18 months. A one-time extension can be requested. This request is further reviewed by the FAA and may result in the issuance of an extension letter for an additional 18 months.

FAA Step Six: After Construction

Supplemental notice may require notification to the FAA both prior to, and shortly after, construction. This allows the FAA to chart each wind turbine so that pilots are aware of the new, taller structures.

Capitol Airspace anticipates that the project's proximity to Travis Air Force Base will result in DoD objections based on the potential for impact on radar surveillance systems. In the past, this impact would likely result in the formation of a Mitigation Response Team (MRT) which would include representatives from the Air Force Base. Although the DoD review process is continuing to evolve, it is possible that the MRT will be utilized for review of these wind projects. The MRT conducts detailed analyses and negotiates mitigation options with the wind developer. If mitigation options are identified and agreed upon, the Mitigation Oversight Committee will review the solutions. This committee is chaired by the Executive Director of the DoD Clearinghouse. This process could add significant time to the overall review of the proposed project.

On December 12th, 2017, the United States Congress passed the 2018 National Defense Authorization Act (NDAA). This law modified the Clearinghouse and the DoD's review process of mission obstructions. At this time, it is not clear how these changes will be implemented by the

FAA and the DoD. Additionally, the United States Congress is considering revisions which may further change the process. It is therefore recommended to consult early with the DoD Clearinghouse and local military bases for all new wind projects.

Below is an overview of the process described in the 2018 NDAA. This is intended to be updated as the process is amended and evolved.

DoD Step One: Filing

When an aeronautical study is submitted to the FAA, the DoD review process is automatically initiated. The NDAA mandates that the DoD Clearinghouse shall establish procedures so that notification can occur at least one year prior to the start of construction for any project that is within radar line of sight.[5]

DoD Step Two: Initial Review

The DoD Clearinghouse will assess the scope, duration, and level of risk associated with adverse impacts on DoD operations and readiness.

DoD Step Three: Notice of Presumed Risk

If an adverse impact on DoD operations and readiness is identified, the DoD Clearinghouse would issue a "Notice of Presumed Risk." This document outlines concerns identified by the DoD during their preliminary review. Capitol Airspace has yet to see the issuance of a Notice of Presumed Risk by the DoD.

If a Notice of Presumed Risk is issued, the DoD Clearinghouse shall also provide notice to the governor of California. The DoD Clearinghouse must consider any comments received by the governor.

DoD Step Four: Identify Feasible and Affordable Long-Term Mitigation Options

The DoD Clearinghouse should identify "feasible and affordable" mitigation options that can be taken by the DoD and/or the wind developer. Options can include modifications to DoD operations, upgrades or modifications to existing systems, acquiring new systems, or modifying the proposed wind project to include changing size, location, or technology.

DoD Step Five: Finding of Unacceptable Risk

The Secretary of Defense can only object to a project if the adverse impacts would result in an "unacceptable risk to the national security of the United States." Unacceptable risk is defined as a proposed project that would endanger safety in air commerce directly related to DoD operations, would interfere with efficient use of navigable airspace directly related to DoD

[5] 2018 NDAA Section 311 §183(a)(c)(6)

operations, or would significantly impair or degrade the capability of the DoD to conduct training, research, development, testing, or to maintain military readiness.

Within 30 days of making this determination, the Secretary of Defense must submit a report to the United States Congress, including multiple committees. The report should describe the basis for the finding as well as a discussion of why mitigation options were not feasible. Only unclassified reports will be released to the wind developer.

SMUD®

Date: February 9, 2021
Subject: Radar and Airspace Obstruction Evaluation Studies Update

The intent of this memorandum is to clarify the project name, Solano 4 Wind Project (Project), and the Project configuration presented in the following documents:

- Solano 4 Radar Line of Site Studies.pdf
- Solano 4 Obstruction Evaluation Studies.pdf

The Solano 4 Wind Project consists of Solano 4 West and Solano 4 East. Within the documents Solano 4 West is referred to as Solano Phase 4 and Solano 4 East is referred to as Solano Phase 1 Repower.

The Solano 4 Wind Project, as presented in our FAA aeronautical studies filings, consists of only one wind turbine configuration: (19) 591-foot above ground level (AGL) turbines. While considered in the following studies, the (22) 493-foot AGL option for the project was not pursued due to the negative impacts on radar.

WESTSLOPE CONSULTING

SOLANO PHASE 1 REPOWER WIND PROJECT

BASIC RADAR LINE-OF-SIGHT STUDY

APRIL 16, 2018

Westslope Consulting, LLC
3960 West Tecumseh Road
Suite 100
Norman, Oklahoma 73072
(405) 310-6058

INTRODUCTION

The Solano Phase 1 Repower Wind Project (Project) will consist of 10 Vestas V136 (V136) wind turbines at a blade-tip height of 493 feet above ground level (AGL) or nine Vestas V150 (V150) wind turbines at a blade-tip height of 591 feet AGL.[1] Development of this Project will include a repower of the 23 existing Vestas V47 (V47) wind turbines at blade-tip heights of 242 feet AGL and 291 feet AGL.

Westslope Consulting, LLC (Westslope) prepared this report to determine whether this repower initiative will have an effect on nearby radar sites. Westslope conducted a radar line-of-sight (RLOS) analysis or Next Generation Radar (NEXRAD) weather radar screening analysis as appropriate for each of the proposed wind turbine heights and included analyses of the existing V47 wind turbines for comparison purposes.

This report provides the results of a Basic Radar Line-of-Sight Study conducted by Westslope, which includes the following:

- An initial analysis using the Department of Defense (DoD) Preliminary Screening Tool (PST);
- Research into other radar sites near the Project;
- A RLOS analysis for each radar site identified by Westslope using wind turbine blade-tip heights of 242 feet AGL, 291 feet AGL, 493 feet AGL, and 591 feet AGL; and
- A NEXRAD weather radar screening analysis using wind turbine blade-tip heights of 242 feet AGL, 291 feet AGL, 493 feet AGL, and 591 feet AGL.

ANALYSIS

Preliminary Screening Tool

Westslope conducted an initial analysis for Long Range Radar (LRR) and NEXRAD weather radar using the PST on the Federal Aviation Administration (FAA) Obstruction Evaluation/Airport Airspace Analysis website.[2] This analysis provides a cursory indication whether wind turbines may be visible, that is, within radar line-of-sight to one or more radar sites, and likely to affect radar performance.

The PST LRR analysis accounts for Air Route Surveillance Radar sites and a few select Airport Surveillance Radar sites used for air defense and homeland security.[3] The PST does not account for all DoD, Department of Homeland Security (DHS), and/or FAA surface-based or tethered aerostat radar sites. Further, the PST NEXRAD analysis accounts for Weather Surveillance Radar model-88D (WSR-88D) radar sites but does not account for FAA Terminal Doppler Weather Radar sites.[4]

[1] SMUD_Phase4_Turbine Location and Height Data 2.20.18.xlsx.
[2] See http://oeaaa.faa.gov.
[3] For LRR, the PST uses a buffered radar line-of-sight analysis at a blade-tip height of 750 feet AGL.
[4] For NEXRAD, the PST uses a blade-tip height of 160 meters AGL (525 feet AGL).

The PST is helpful for identifying potential impacts to LRR and NEXRAD; however, the results are preliminary, as suggested by the title of the PST, and do not provide an official decision as to whether impacts are acceptable to operations.

It should be noted that the PST NEXRAD analysis does not reflect the wind farm impact zone scheme recently updated by the National Oceanic and Atmospheric Administration (NOAA) WSR-88D Radar Operations Center (ROC). The updated scheme expands the red area, or "No Build Zone", from three to four kilometers (km) and to areas where wind turbines penetrate the third elevation angle scanned by a WSR-88D.

Based on the location of the existing V47 wind turbines and the proposed V136 and V150 wind turbine layouts, Westslope created a single point and a polygon for analysis purposes.

The PST analysis results for LRR show that the single point and the polygon fall within yellow areas. Yellow indicates that impacts are likely to air defense and homeland security radar. See Figure 1, where the black rotor represents the single point and the black lines represent the polygon, both created by Westslope, the black dots represent the 23 existing V47 wind turbines, the green dots represent the 10 V136 wind turbines, and the red dots represent the nine V150 wind turbines.

Westslope identified the radar sites in the PST LRR results as the Mill Valley Air Route Surveillance Radar model-4 (ARSR-4), McClellan Airport Surveillance Radar model-9 (ASR-9), and the Stockton Airport Surveillance Radar model-11 (ASR-11). In addition to the DoD and DHS using these radar sites for national defense, the FAA uses these radar sites for air traffic control at multiple facilities including Northern California Terminal Radar Approach Control (TRACON), Oakland Air Route Traffic Control Center, and Travis Air Force Base (AFB) Air Traffic Control Tower (ATCT)/Radar Approach Control (RAPCON).

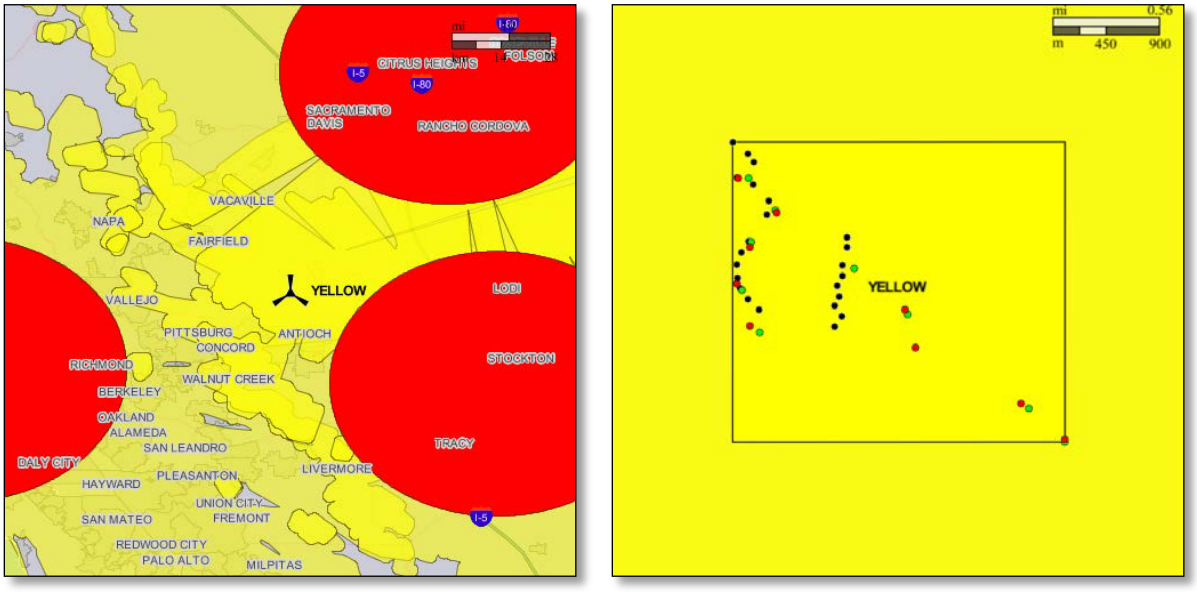


Figure 1 Long Range Radar Results for the Single Point (left) and for the Polygon (right)

For NEXRAD, the PST analysis results show that the single point and the polygon fall within a dark green area, or "Notification Zone", which indicates that some impacts are possible to WSR-88D operations and that consultation with NOAA is optional. See Figure 2. Westslope identified the radar site in the PST NEXRAD analysis as the Sacramento WSR-88D.

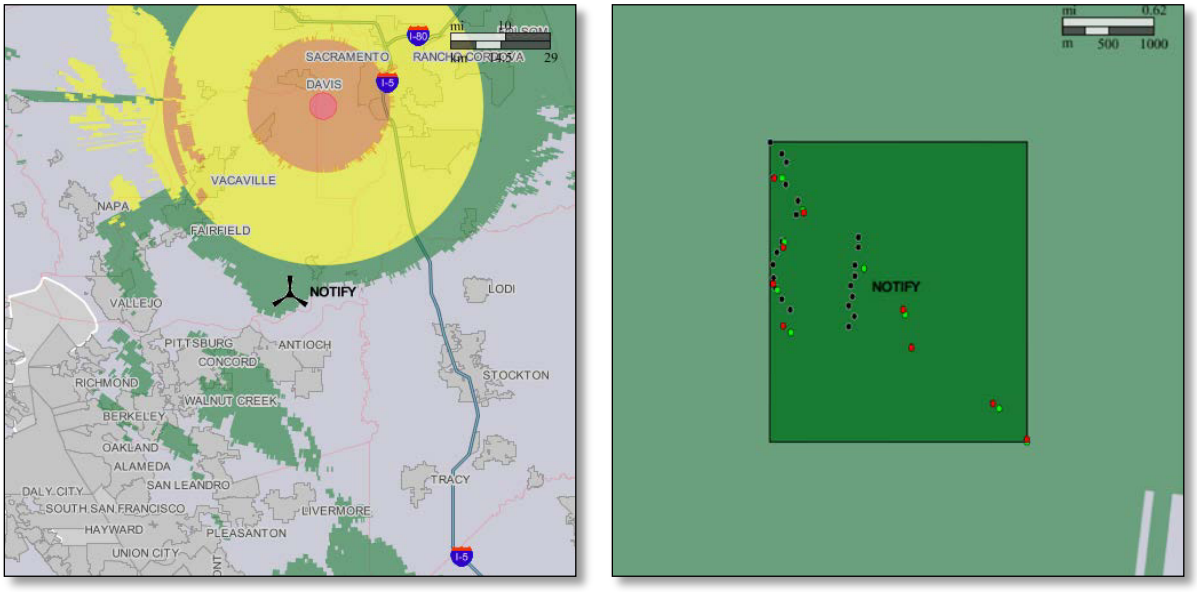


Figure 2 NEXRAD results for the Single Point (left) and for the Polygon (right)

Other Radar Sites

Research performed by Westslope shows four additional radar sites near the Project: the Moffett ASR-9, Oakland ASR-9, Travis AFB Digital Airport Surveillance Radar (DASR), and the San Francisco WSR-88D.

The DoD uses the Travis AFB DASR for air traffic control at Travis AFB ATCT/RAPCON facilities. The FAA uses the Moffett ASR-9 and Oakland ASR-9 for air traffic control at multiple facilities including Oakland TRACON and Northern California TRACON.

Co-Located Secondary Surveillance Radar

A secondary surveillance radar is co-located with each primary surveillance radar. Specifically, an Air Traffic Control Beacon Interrogator model-6 (ATCBI-6) is co-located with the Mill Valley ARSR-4; a Mode S is co-located with the Moffett ASR-9, the Oakland ASR-9, and the McClellan ASR-9; and a Monopulse Secondary Surveillance Radar is co-located with the Stockton ASR-11 and the Travis AFB DASR.

In general, secondary surveillance radar (SSR) are less susceptible to interference from wind turbines than primary surveillance radar.

SSR Only Radar Sites

Westslope also located a SSR only radar site near the Project: the Sacramento ATCBI-6.

Basic RLOS Analysis

Westslope conducted a basic radar line-of-sight analysis using the United States Geological Survey 10-meter National Elevation Dataset (NED). This analysis shows whether the 10 proposed V136 wind turbines at a blade-tip height of 493 feet AGL or the nine proposed V150 wind turbines at a blade-tip height of 591 feet AGL will be visible to one or more radar sites. Westslope also conducted a radar line-of-sight analysis for the existing 23 V47 wind turbines at blade-tip heights of 242 feet AGL and 291 feet AGL for comparison purposes.

Westslope performed the radar line-of-sight analysis for the following seven radar sites:

- McClellan ASR-9;
- Mill Valley ARSR-4;
- Moffett ASR-9;
- Oakland ASR-9;
- Sacramento ATCBI-6;
- Stockton ASR-11; and
- Travis AFB DASR.

McClellan ASR-9

The radar line-of-sight analysis results show that 11 of the 23 existing V47 wind turbines at a blade-tip height of 242 feet AGL and 19 of the 23 V47 wind turbines at a blade-tip height of 291 feet AGL are visible to the McClellan ASR-9. See Figure 3. Existing radar effects include unwanted primary radar returns (clutter) resulting in a partial loss of primary radar target detection and a number of primary radar false targets over and in the immediate vicinity of the 11 to 19 V47 wind turbines within radar line-of-sight. Other possible radar effects include a partial loss of weather detection and false weather indications over and in the immediate vicinity of the 11 to 19 V47 wind turbines within radar line-of-sight.

Further, the radar line-of-sight analysis results show that all 10 proposed V136 wind turbines at a blade-tip height of 493 feet AGL and all nine proposed V150 wind turbines at a blade-tip height of 591 feet AGL will be visible to the McClellan ASR-9. See Figure 4.

Based on the fact that between 11 and 19 of the 23 existing V47 wind turbines are visible to and interfering with the McClellan ASR-9 and up to 10 proposed wind turbines will be visible to and will interfere with the McClellan ASR-9, Westslope does not expect that the V136 or V150 wind turbines will result in a material difference to the existing radar effects.

Mill Valley ARSR-4

The radar line-of-sight analysis results show that two of the 23 existing V47 wind turbines are visible to the Mill Valley ARSR-4 at blade-tip heights of 242 feet AGL and 291 feet AGL. See Figure 5. Existing radar effects include an occasional loss of primary radar target detection and an occasional primary radar false target over and in the immediate vicinity of the two V47 wind turbines within radar line-of-sight.

Further, the radar line-of-sight analysis results show that five of the 10 proposed V136 wind turbines at a blade-tip height of 493 feet AGL and four of the nine proposed V150 wind turbines at a blade-tip height of 591 feet AGL will be visible to the Mill Valley ARSR-4. See Figure 6.

Based on the fact that the two of the existing V47 wind turbines are visible to and interfering with the Mill Valley ARSR-4 and up to five of the proposed wind turbines will be visible to and will interfere with the Mill Valley ARSR-4, Westslope does not expect that the V136 or V150 wind turbines will result in a material difference to the existing radar effects.

Moffett ASR-9

The radar line-of-sight analysis results show that wind turbines up to 591 feet AGL will not be visible to the Moffett ASR-9. As a result, Westslope does not expect any radar effects at this height or below.

Oakland ASR-9

The radar line-of-sight analysis results show that wind turbines up to 591 feet AGL will not be visible to the Oakland ASR-9. As a result, Westslope does not expect any radar effects at this height or below.

Sacramento ATCBI-6

The radar line-of-sight analysis results show that all 23 existing V47 wind turbines are visible to the Sacramento ATCBI-6 at blade-tip heights of 242 feet AGL and 291 feet AGL. See Figure 7. The radar line-of-sight analysis results show that all 10 proposed V136 wind turbines at a blade-tip height of 493 feet AGL and all nine proposed V150 wind turbines at a blade-tip height of 591 feet AGL will be visible to the Sacramento ATCBI-6. See Figure 8.

As noted above, secondary surveillance radar, such as the ATCBI-6, are less susceptible to interference from wind turbines. As such, Westslope does not expect any effects from the proposed V136 or V150 wind turbines to the Sacramento ATCBI-6.

Stockton ASR-11

The radar line-of-sight analysis results show that all 23 existing V47 wind turbines are visible to the Stockton ASR-11 at blade-tip heights of 242 feet AGL and 291 feet AGL. See Figure 9. Existing radar

effects include a partial loss of primary radar target detection and a number of primary radar false targets over and in the immediate vicinity of the V47 wind turbines. Other possible radar effects include a partial loss of weather detection and false weather indications over and in the immediate vicinity of the existing V47 wind turbines.

Further, the radar line-of-sight analysis results show that all 10 proposed V136 wind turbines at a blade-tip height of 493 feet AGL and all nine proposed V150 wind turbines at a blade-tip height of 591 feet AGL will be visible to the Stockton ASR-11. See Figure 10.

Based on the fact that all 23 existing V47 wind turbines are visible to and interfering with the Stockton ASR-11 and up to 10 proposed wind turbines will be visible to and will interfere with the Stockton ASR-11, Westslope expects a decrease to the existing radar effects with the V136 or V150 wind turbines.

Travis AFB DASR

The radar line-of-sight analysis results show that all 23 existing V47 wind turbines are visible to the Travis AFB DASR at blade-tip heights of 242 feet AGL and 291 feet AGL. See Figure 11. Existing radar effects include a partial loss of primary radar target detection and a number of primary radar false targets over and in the immediate vicinity of the V47 wind turbines. Other possible radar effects include a partial loss of weather detection and false weather indications over and in the immediate vicinity of the existing V47 wind turbines.

Further, the radar line-of-sight analysis results show that all 10 proposed V136 wind turbines at a blade-tip height of 493 feet AGL and all nine proposed V150 wind turbines at a blade-tip height of 591 feet AGL will be visible to the Travis AFB DASR. See Figure 12.

Based on the fact that all 23 existing V47 wind turbines are visible to and interfering with the Travis AFB DASR and up to 10 proposed wind turbines will be visible to and will interfere with the Travis AFB DASR, Westslope expects a decrease to the existing radar effects with the V136 or V150 wind turbines.

NEXRAD Weather Radar Screening Analysis

The PST NEXRAD analysis does not reflect the wind farm impact zone scheme recently updated by the NOAA WSR-88D ROC. The updated scheme expands the red area, or "No Build Zone", from three to four km and to areas where wind turbines penetrate the third elevation angle scanned by a WSR-88D.

Westslope conducted a NEXRAD weather radar screening analysis using the 10-meter NED. This analysis shows whether wind turbines at blade-tip heights of 493 feet AGL and 591 feet AGL will be within radar line-of-sight to one or more WSR-88D radar sites and incorporates the updated wind farm impact zone scheme. Westslope also conducted a NEXRAD weather radar screening analysis for the existing 23 V47 wind turbines at blade-tip heights of 242 feet AGL and 291 feet AGL for comparison purposes.

Westslope performed the NEXRAD weather radar screening analysis for the following two radar sites:

- Sacramento WSR-88D; and
- San Francisco WSR-88D.

Sacramento WSR-88D

Westslope's NEXRAD weather radar screening analysis for the Sacramento WSR-88D shows that the 23 existing V47 wind turbines at blade-tip heights of 242 feet AGL and 291 feet AGL are visible to the Sacramento WSR-88D. See Figure 13. Although all 23 V47 wind turbines are within radar line-of-sight, the screening analysis results show that these wind turbines at blade-tip heights of 242 feet AGL and 291 feet AGL fall within a green area. A green area, or "No Impact Zone", indicates that impacts are not likely to WSR-88D operations. See Figures 14 and 15.

As such, Westslope assumes there are no existing impacts to Sacramento WSR-88D operations as a result of the existing V47 wind turbines.

The NEXRAD weather radar screening analysis for the Sacramento WSR-88D shows that all 10 proposed V136 wind turbines at a blade-tip height of 493 feet AGL and all nine proposed V150 wind turbines at a blade-tip height of 591 feet AGL will be visible to the Sacramento WSR-88D. See Figure 16. The screening analysis results also show that at a blade-tip height of 493 feet AGL, seven of the 10 proposed V136 wind turbines fall within a dark green area and the remaining three wind turbines fall within a green area. A dark green area, or "Notification Zone", indicates that some impacts are possible to WSR-88D operations and that consultation with NOAA is optional. See Figure 17. Further, at a blade-tip height of 591 feet AGL, all nine proposed V150 wind turbines fall within a dark green area. See Figure 18.

Additional radar effects as a result of the proposed V136 or V150 wind turbines will include Doppler contamination and false weather indications over and in the immediate vicinity of the Project due to clutter; however, based on the screening analysis results, impacts to Sacramento WSR-88D operations

are both possible and not likely depending upon the location and blade-tip height of the proposed wind turbines within the Project.

San Francisco WSR-88D

Westslope's NEXRAD weather radar screening analysis for the San Francisco WSR-88D shows that the 23 existing V47 wind turbines at blade-tip heights of 242 feet AGL or 291 feet AGL are not visible to the San Francisco WSR-88D. The screening analysis results also show that at blade-tip heights of 242 feet AGL and 291 feet AGL, all 23 existing V47 wind turbines fall within a green area. See Figures 19 and 20.

As such, Westslope assumes there are no existing impacts to San Francisco WSR-88D operations as a result of the existing V47 wind turbines.

The NEXRAD weather radar screening analysis for the San Francisco WSR-88D shows that the 10 proposed V136 wind turbines at a blade-tip height of 493 feet AGL and the nine proposed V150 wind turbines at a blade-tip height of 591 feet AGL will not be visible to the San Francisco WSR-88D. Further, the screening analysis results show that all 10 proposed V136 wind turbines at a blade-tip height of 493 feet AGL and all nine V150 proposed wind turbines at a blade-tip height of 591 feet AGL fall within a green area. See Figures 21 and 22.

Westslope does not expect impacts to San Francisco WSR-88D operations for the V136 or V150 wind turbines.

CONCLUSIONS

The DoD PST analysis results for the Project indicate the following:

- Impacts to air defense and homeland security radar are likely; and
- Impacts to nearby WSR-88D weather radar are possible.

In total, Westslope identified and conducted a basic radar line-of-sight analysis for the following seven radar sites:

- McClellan ASR-9;
- Mill Valley ARSR-4;
- Moffett ASR-9;
- Oakland ASR-9;
- Sacramento ATCBI-6;
- Stockton ASR-11; and
- Travis AFB DASR.

The basic radar line-of-sight analyses conducted by Westslope show the following:

- For the McClellan ASR-9, between 11 and 19 of the 23 existing V47 wind turbines at blade-tip heights of 242 feet AGL and 291 feet AGL are visible to and interfering with this radar site. All 10 proposed V136 wind turbines at a blade-tip height of 493 feet AGL and all nine proposed V150 wind turbines at a blade-tip height of 591 feet AGL will be visible to and will interfere with this radar site.
- For the Mill Valley ARSR-4, two of the 23 existing V47 wind turbines at blade-tip heights of 242 feet AGL and 291 feet AGL are visible to and interfering with this radar site. Five of the 10 proposed V136 wind turbines at a blade-tip height of 493 feet AGL and four of the nine proposed V150 wind turbines at a blade-tip height of 591 feet AGL will be visible to and will interfere with this radar.
- For the Sacramento ATCBI-6, all 23 existing V47 wind turbines at blade-tip heights of 242 feet AGL and 291 feet AGL are visible to this radar site. All 10 proposed V136 wind turbines at a blade-tip height of 493 feet AGL and all nine proposed V150 wind turbines at a blade-tip height of 591 feet AGL will be visible to this radar site; however, Westslope does not expect any effects from the proposed V136 or V150 wind turbines.
- For the Stockton ASR-11 and the Travis AFB DASR, all 23 existing V47 wind turbines at blade-tip heights of 242 feet AGL and 291 feet AGL are visible to and interfering with this radar site. All 10 proposed V136 wind turbines at a blade-tip height of 493 feet AGL and all nine proposed V150 wind turbines at a blade-tip height of 591 feet AGL will be visible to and will interfere with this radar site.

- For the Moffett ASR-9 and Oakland ASR-9, wind turbines up to 591 feet AGL in the Project will not be visible to these radar sites. As a result, Westslope does not expect any radar effects at this height or below.

For the McClellan ASR-9, based on the fact that between 11 and 19 of the 23 existing V47 wind turbines are visible to and interfering with this radar site and up to 10 proposed wind turbines will be visible to and will interfere with this radar site, Westslope does not expect that the V136 or V150 wind turbines will result in a material difference to the existing radar effects.

For the Mill Valley ARSR-4, based on the fact that the two of the existing V47 wind turbines are visible to and interfering with this radar site and up to five of the proposed wind turbines will be visible to and will interfere with this radar site, Westslope does not expect that the V136 or V150 wind turbines will result in a material difference to the existing radar effects.

For the Stockton ASR-11 and the Travis AFB DASR, based on the fact that all 23 existing V47 wind turbines are visible to and interfering with these radar sites and up to 10 proposed wind turbines will be visible to and will interfere with these radar sites, Westslope expects a decrease to the existing radar effects with the V136 or V150 wind turbines.

Because wind turbines will be visible to the McClellan ASR-9, Mill Valley ARSR-4, Stockton ASR-11, and Travis AFB DASR, Westslope expects that the FAA and DoD will initially object to the proposed V136 or V150 wind turbines based on electromagnetic interference to air navigation facilities. As such, Westslope expects that the FAA will issue Notices of Presumed Hazard for the Project. The FAA and DoD will likely require further study to determine whether the radar effects are acceptable to operations or not. The DoD may also setup a Mitigation Response Team to conduct further study. Although possible, Westslope does not expect that the DHS will object to the proposed V136 or V150 wind turbines.

It is important to note that radar effects do not always translate into operational impacts.

Westslope's NEXRAD weather radar screening analysis for the Sacramento WSR-88D shows that the 23 existing V47 wind turbines at blade-tip heights of 242 feet AGL and 291 feet AGL are visible to the Sacramento WSR-88D and that the existing V47 wind turbines fall within a No Impact Zone. As such, Westslope assumes there are no existing impacts to Sacramento WSR-88D operations as a result of the existing V47 wind turbines.

The NEXRAD weather radar screening analysis results also show that all 10 proposed V136 wind turbines at a blade-tip height of 493 feet AGL and all nine proposed V150 wind turbines at a blade-tip height of 591 feet AGL will be visible to the Sacramento WSR-88D. Further, the screening analysis results show that at a blade-tip height of 493 feet AGL, seven of the 10 proposed V136 wind turbines fall within a Notification Zone and the remaining three V136 wind turbines fall within a No Impact Zone. At a blade-tip height of 591 feet AGL, all nine proposed V150 wind turbines fall within a Notification Zone. Additional radar effects as a result of the proposed V136 or V150 wind turbines will include Doppler

contamination and false weather indications over and in the immediate vicinity of the Project due to clutter; however, based on the screening analysis results, impacts to Sacramento WSR-88D operations are both possible and not likely depending upon the location and blade-tip height of the proposed wind turbines within the Project.

Westslope's NEXRAD weather radar screening analysis for the San Francisco WSR-88D shows that the 23 existing V47 wind turbines at blade-tip heights of 242 feet AGL and 291 feet AGL are not visible to the San Francisco WSR-88D and that the existing V47 wind turbines fall within a No Impact Zone. As such, Westslope assumes there are no existing radar effects or impacts to San Francisco WSR-88D operations as a result of the existing V47 wind turbines.

The NEXRAD weather radar screening analysis also shows that the 10 proposed V136 wind turbines at a blade-tip height of 493 feet AGL and the nine proposed V150 wind turbines will not be visible to the San Francisco WSR-88D. The screening analysis results also show that all 10 proposed V136 wind turbines at a blade-tip height of 493 feet AGL and all nine proposed V150 proposed wind turbines at a blade-tip height of 591 feet AGL fall within a No Impact Zone. As such, Westslope does not expect any radar effects or impacts to San Francisco WSR-88D operations for the V136 or V150 wind turbines.

Westslope recommends that the Project details be submitted to the NOAA or the National Telecommunications Information Administration (NTIA) for a detailed review. The NTIA is essentially a clearinghouse for other federal agencies including NOAA.

If you have any questions regarding this analysis, please contact Geoff Blackman at (405) 816-2604 or via email at gnblackman@westslopeconsulting.com.

SOLANO PHASE 4 WIND PROJECT

BASIC RADAR LINE-OF-SIGHT STUDY

APRIL 16, 2018

Westslope Consulting, LLC
3960 West Tecumseh Road
Suite 100
Norman, Oklahoma 73072
(405) 310-6058

INTRODUCTION

The proposed Solano Phase 4 Wind Project (Project) will consist of 12 Vestas V136 (V136) wind turbines at a blade-tip height of 493 feet above ground level (AGL) or 10 Vestas V150 (V150) wind turbines at a blade-tip height of 591 feet AGL.[1] Development of this Project will include the removal of the remaining legacy wind turbines in the Solano Wind Resource Area. Specifically, the 59 existing Kenetech 56/100-kilowatt (Kenetech) wind turbines at a blade-tip height of 107 feet AGL.

Westslope Consulting, LLC (Westslope) prepared this report to determine whether the proposed V136 or V150 wind turbines will have an effect on nearby radar sites. Westslope conducted a radar line-of-sight (RLOS) analysis or Next Generation Radar (NEXRAD) weather radar screening analysis as appropriate for each of the proposed wind turbine heights and included analyses of the existing Kenetech wind turbines for comparison purposes.

This report provides the results of a Basic Radar Line-of-Sight Study conducted by Westslope, which includes the following:

- An initial analysis using the Department of Defense (DoD) Preliminary Screening Tool (PST);
- Research into other radar sites near the Project;
- A RLOS analysis for each radar site identified by Westslope using wind turbine blade-tip heights of 107 feet AGL, 493 feet AGL, and 591 feet AGL; and
- A NEXRAD weather radar screening analysis using wind turbine blade-tip heights of 107 feet AGL, 493 feet AGL, and 591 feet AGL.

ANALYSIS

Preliminary Screening Tool

Westslope conducted an initial analysis for Long Range Radar (LRR) and NEXRAD weather radar using the PST on the Federal Aviation Administration (FAA) Obstruction Evaluation/Airport Airspace Analysis website.[2] This analysis provides a cursory indication whether wind turbines may be visible, that is, within radar line-of-sight to one or more radar sites, and likely to affect radar performance.

The PST LRR analysis accounts for Air Route Surveillance Radar sites and a few select Airport Surveillance Radar sites used for air defense and homeland security.[3] The PST does not account for all DoD, Department of Homeland Security (DHS), and/or FAA surface-based or tethered aerostat radar sites.

[1] SMUD_Phase4_Turbine Location and Height Data 2.20.18.xlsx.
[2] See http://oeaaa.faa.gov.
[3] For LRR, the PST uses a buffered radar line-of-sight analysis at a blade-tip height of 750 feet AGL.

Further, the PST NEXRAD analysis accounts for Weather Surveillance Radar model-88D (WSR-88D) radar sites but does not account for Terminal Doppler Weather Radar sites.[4]

The PST is helpful for identifying potential impacts to LRR and NEXRAD; however, the results are preliminary, as suggested by the title of the PST, and do not provide an official decision as to whether impacts are acceptable to operations.

It should be noted that the PST NEXRAD analysis does not reflect the wind farm impact zone scheme recently updated by the National Oceanic and Atmospheric Administration (NOAA) WSR-88D Radar Operations Center (ROC). The updated scheme expands the red area, or "No Build Zone", from three to four kilometers (km) and to areas where wind turbines penetrate the third elevation angle scanned by a WSR-88D.

Based on the location of the existing Kenetech wind turbines and the proposed V136 and V150 wind turbine layouts, Westslope created a single point and a polygon for analysis purposes.

The PST analysis results for LRR show that the single point and the polygon fall within yellow areas. Yellow indicates that impacts are likely to air defense and homeland security radar. See Figure 1, where the black rotor represents the single point and the black lines represent the polygon, both created by Westslope, the black dots represent the 59 existing Kenetech wind turbines, the green dots represent the 12 V136 wind turbines, and the red dots represent the 10 V150 wind turbines.

Westslope identified the radar sites in the PST LRR results as the Mill Valley Air Route Surveillance Radar model-4 (ARSR-4), McClellan Airport Surveillance Radar model-9 (ASR-9), and the Stockton Airport Surveillance Radar model-11 (ASR-11). In addition to the DoD and DHS using these radar sites for national defense, the FAA uses these radar sites for air traffic control at multiple facilities including Northern California Terminal Radar Approach Control (TRACON), Oakland Air Route Traffic Control Center, and Travis Air Force Base (AFB) Air Traffic Control Tower (ATCT)/Radar Approach Control (RAPCON).

[4] For NEXRAD, the PST uses a blade-tip height of 160 meters AGL (525 feet AGL).

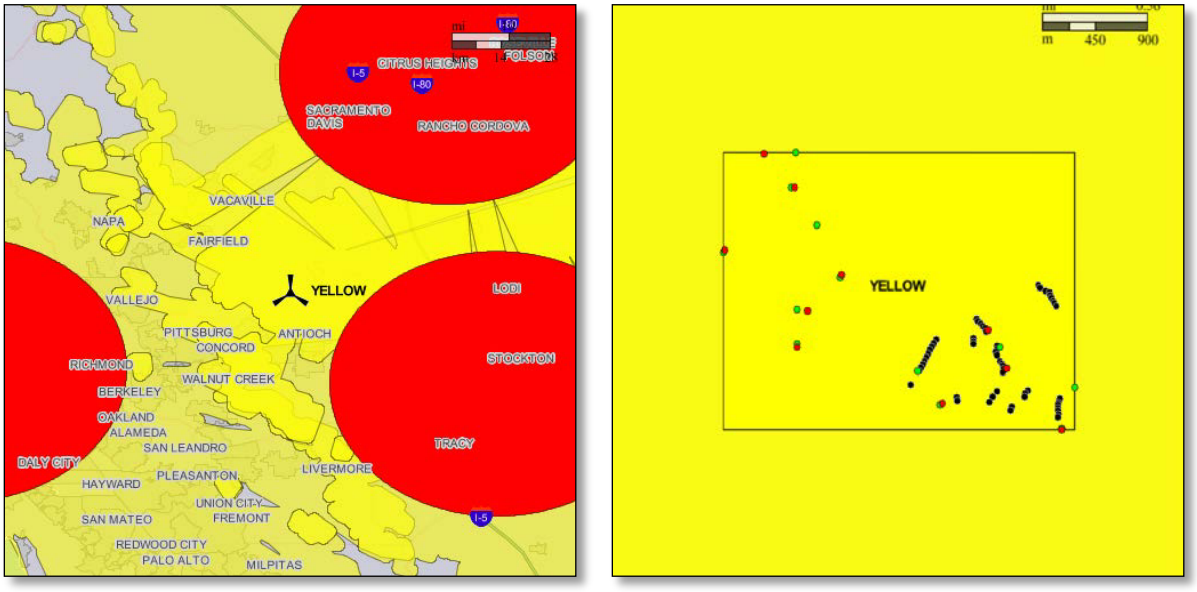


Figure 1 Long Range Radar Results for the Single Point (left) and for the Polygon (right)

For NEXRAD, the PST analysis results show that the single point falls within a dark green area, or "Notification Zone", which indicates that some impacts are possible to WSR-88D operations and that consultation with NOAA is optional. The polygon falls with a dark green area and green areas. A green area, or "No Impact Zone", indicates that impacts are not likely to WSR-88D operations. See Figure 2. Westslope identified the radar site in the PST NEXRAD analysis as the Sacramento WSR-88D.

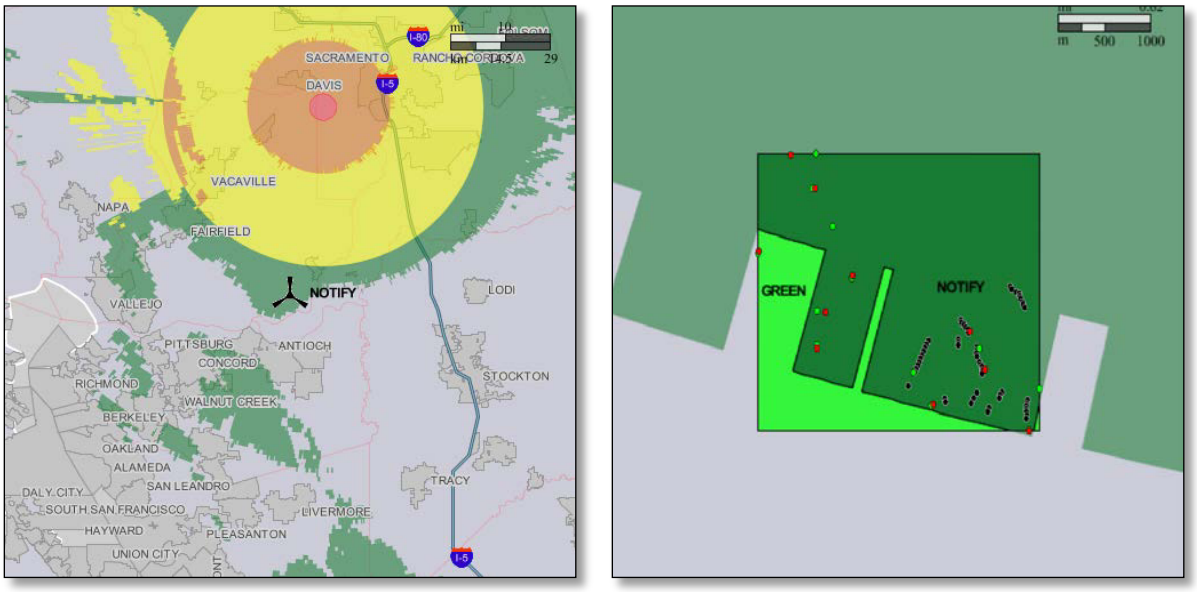


Figure 2 NEXRAD results for the Single Point (left) and for the Polygon (right)

Other Radar Sites

Research performed by Westslope shows four additional radar sites near the Project: the Moffett ASR-9, Oakland ASR-9, Travis AFB Digital Airport Surveillance Radar (DASR), and the San Francisco WSR-88D.

The DoD uses the Travis AFB DASR for air traffic control at Travis AFB ATCT/RAPCON facilities. The FAA uses the Moffett ASR-9 and Oakland ASR-9 for air traffic control at multiple facilities including Oakland TRACON and Northern California TRACON.

Co-Located Secondary Surveillance Radar

A secondary surveillance radar is co-located with each primary surveillance radar. Specifically, an Air Traffic Control Beacon Interrogator model-6 (ATCBI-6) is co-located with Mill Valley ARSR-4; a Mode S is co-located with the Moffett ASR-9, the Oakland ASR-9, and the McClellan ASR-9; and a Monopulse Secondary Surveillance Radar is co-located with the Stockton ASR-11 and the Travis AFB DASR.

In general, secondary surveillance radar (SSR) are less susceptible to interference from wind turbines than primary surveillance radar.

SSR Only Radar Sites

Westslope also located a SSR only radar site near the Project: the Sacramento ATCBI-6.

Basic RLOS Analysis

Westslope conducted a basic radar line-of-sight analysis using the United States Geological Survey 10-meter National Elevation Dataset (NED). This analysis shows whether the 12 proposed V136 wind turbines at a blade-tip height of 493 feet AGL or the 10 proposed V150 wind turbines at a blade-tip height of 591 feet AGL will be visible to one or more radar sites. Westslope also conducted a radar line-of-sight analysis for the existing Kenetech wind turbines at a blade-tip height of 107 feet AGL for comparison purposes.

Westslope performed the radar line-of-sight analysis for the following seven radar sites:

- McClellan ASR-9;
- Mill Valley ARSR-4;
- Moffett ASR-9;
- Oakland ASR-9;
- Sacramento ATCBI-6;
- Stockton ASR-11; and
- Travis AFB DASR.

McClellan ASR-9

The radar line-of-sight analysis results show that the 59 existing Kenetech wind turbines are not visible to the McClellan ASR-9 at a blade-tip height of 107 feet AGL. As such, Westslope assumes there are no existing radar effects to the McClellan ASR-9 as a result of these legacy wind turbines.

The radar line-of-sight analysis results also show that all 12 proposed V136 wind turbines at a blade-tip height of 493 feet AGL and all 10 proposed V150 wind turbines at a blade-tip height of 591 feet AGL will be visible to the McClellan ASR-9. See Figure 3. Additional radar effects will include unwanted primary radar returns (clutter) resulting in a partial loss of primary radar target detection and a number of primary radar false targets over and in the immediate vicinity of the Project. Other possible radar effects include a partial loss of weather detection and false weather indications over and in the immediate vicinity of the Project.

Mill Valley ARSR-4

The radar line-of-sight analysis results show that all 59 existing Kenetech wind turbines are visible to the Mill Valley ARSR-4 at a blade-tip height of 107 feet AGL. See Figure 4. Existing radar effects include a partial loss of primary radar target detection and a number of primary radar false targets over and in the immediate vicinity of the existing Kenetech wind turbines due to clutter.

Further, the radar line-of-sight analysis results show that all 12 proposed V136 wind turbines at a blade-tip height of 493 feet AGL and all 10 proposed V150 wind turbines at a blade-tip height of 591 feet AGL will be visible to the Mill Valley ARSR-4. See Figure 5.

Based on the fact that the existing Kenetech wind turbines are visible to and interfering with the Mill Valley ARSR-4, the proposed V136 or V150 wind turbines will be visible to and will interfere with the Mill Valley ARSR-4, and the development of the Project will include the removal of the existing Kenetech wind turbines, Westslope does not expect that the V136 or V150 wind turbines will result in a material difference to the existing radar effects.

Moffett ASR-9

The radar line-of-sight analysis results show that wind turbines up to 591 feet AGL will not be visible to the Moffett ASR-9. As a result, Westslope does not expect any radar effects at this height or below.

Oakland ASR-9

The radar line-of-sight analysis results show that wind turbines up to 591 feet AGL will not be visible to the Oakland ASR-9. As a result, Westslope does not expect any radar effects at this height or below.

Sacramento ATCBI-6

The radar line-of-sight analysis results show that the 59 existing Kenetech wind turbines are not visible to the Sacramento ATCBI-6 at a blade-tip height of 107 feet AGL. The radar line-of-sight analysis results also show that all 12 proposed V136 wind turbines at a blade-tip height of 493 feet AGL and all 10 proposed V150 wind turbines at a blade-tip height of 591 feet AGL will be visible to the Sacramento ATCBI-6. See Figure 6.

As noted above, secondary surveillance radar, such as the ATCBI-6, are less susceptible to interference from wind turbines. As such, Westslope does not expect any effects from the proposed V136 or V150 wind turbines to the Sacramento ATCBI-6.

Stockton ASR-11

The radar line-of-sight analysis results show that 51 of the 59 existing Kenetech wind turbines are visible to the Stockton ASR-11 at a blade-tip height of 107 feet AGL. See Figure 7. Existing radar effects include a partial loss of primary radar target detection and a number of primary radar false targets over and in the immediate vicinity of the 51 Kenetech wind turbines within radar line-of-sight. Other possible radar effects include a partial loss of weather detection and false weather indications over and in the immediate vicinity of the 51 Kenetech wind turbines within radar line-of-sight.

Further, the radar line-of-sight analysis results show that all 12 proposed V136 wind turbines at a blade-tip height of 493 feet AGL and all 10 proposed V150 wind turbines at a blade-tip height of 591 feet AGL will be visible to the Stockton ASR-11. See Figure 8.

Based on the fact that 51 of the 59 existing Kenetech wind turbines are visible to and interfering with the Stockton ASR-11, the proposed V136 or V150 wind turbines will be visible to and will interfere with the Stockton ASR-11, and the development of the Project will include the removal of the existing Kenetech wind turbines, Westslope does not expect that the V136 or V150 wind turbines will result in a material difference to the existing radar effects.

Travis AFB DASR

The radar line-of-sight analysis results show that the 59 existing Kenetech wind turbines are not visible to the Travis AFB DASR at a blade-tip height of 107 feet AGL. As such, Westslope assumes there are no existing radar effects to the Travis AFB DASR as a result of these legacy wind turbines. A qualitative review of radar data collected under Cooperative Research and Development Agreement confirms that the 59 Kenetech wind turbines do not interfere with the Travis AFB DASR.[5]

The radar line-of-sight analysis results also show that all 12 proposed V136 wind turbines at a blade-tip height of 493 feet AGL and all 10 proposed V150 wind turbines at a blade-tip height of 591 feet AGL will be visible to the Travis AFB DASR. See Figure 9. Additional radar effects will include a partial loss of primary radar target detection and a number of primary radar false targets over and in the immediate vicinity of the Project due to clutter. Other possible radar effects due to clutter include a partial loss of weather detection and false weather indications over and in the immediate vicinity of the Project.

[5] See Westslope Solano Phase 4 23 February 2017.pptx

NEXRAD Weather Radar Screening Analysis

The PST NEXRAD analysis does not reflect the wind farm impact zone scheme recently updated by the NOAA WSR-88D ROC. The updated scheme expands the red area, or "No Build Zone", from three to four km and to areas where wind turbines penetrate the third elevation angle scanned by a WSR-88D.

Westslope conducted a NEXRAD weather radar screening analysis using the 10-meter NED. This analysis shows whether wind turbines at blade-tip heights of 493 feet AGL and 591 feet AGL will be within radar line-of-sight to one or more WSR-88D radar sites and incorporates the updated wind farm impact zone scheme. Westslope also conducted a NEXRAD weather radar screening analysis for the existing Kenetech wind turbines at a blade-tip height of 107 feet AGL for comparison purposes.

Westslope performed the NEXRAD weather radar screening analysis for the following two radar sites:

- Sacramento WSR-88D; and
- San Francisco WSR-88D.

Sacramento WSR-88D

Westslope's NEXRAD weather radar screening analysis for the Sacramento WSR-88D shows that the 59 existing Kenetech wind turbines at a blade-tip height of 107 feet AGL are visible to the Sacramento WSR-88D. See Figure 10. Although all 59 existing Kenetech wind turbines are within radar line-of-sight, the screening analysis results show that these wind turbines fall within a green area. A green area, or "No Impact Zone", indicates that impacts are not likely to WSR-88D operations. See Figure 11.

As such, Westslope assumes there are no existing impacts to the Sacramento WSR-88D operations as a result of these legacy wind turbines.

The NEXRAD weather radar screening analysis for the Sacramento WSR-88D shows that all 12 proposed V136 wind turbines at a blade-tip height of 493 feet AGL and all 10 proposed V150 wind turbines at a blade-tip height of 591 feet AGL will be visible to the Sacramento WSR-88D. See Figure 12. The screening analysis results also show that at a blade-tip height of 493 feet AGL, two of the 12 proposed V136 wind turbines fall within a dark green area and the remaining 10 V136 wind turbines fall within a green area. A dark green area, or "Notification Zone", indicates that some impacts are possible to WSR-88D operations and that consultation with NOAA is optional. See Figure 13. Further, at a blade-tip height of 591 feet AGL, seven of the 10 proposed V150 wind turbines fall within a dark green area and the remaining three V150 wind turbines fall within a green area. See Figure 14.

Additional radar effects as a result of the proposed V136 or V150 wind turbines will include Doppler contamination and false weather indications over and in the immediate vicinity of the Project due to clutter; however, based on the screening analysis results, impacts to Sacramento WSR-88D operations

are both possible and not likely depending upon the location and blade-tip height of the proposed wind turbines within the Project.

San Francisco WSR-88D

Westslope's NEXRAD weather radar screening analysis for the San Francisco WSR-88D shows that the 59 existing Kenetech wind turbines at a blade-tip height of 107 feet AGL are not visible to the San Francisco WSR-88D. The screening analysis results also show that the 59 existing Kenetech wind turbines at a blade-tip height of 107 feet AGL fall within a green area. See Figure 15.

As such, Westslope assumes there are no existing radar effects or impacts to San Francisco WSR-88D operations as a result of these legacy wind turbines.

The NEXRAD weather radar screening analysis for the San Francisco WSR-88D shows that the 12 proposed V136 wind turbines at a blade-tip height of 493 feet AGL will not be visible to the San Francisco WSR-88D. At a blade-tip height of 591 feet AGL, two of the 10 proposed V150 wind turbines will be visible to the San Francisco WSR-88D. See Figure 16. The screening analysis results also show that all 12 proposed V136 wind turbines at a blade-tip height of 493 feet AGL and all 10 proposed V150 proposed wind turbines at a blade-tip height of 591 feet AGL fall within a green area. See Figures 17 and 18.

For the V136 wind turbines, Westslope does not expect any radar effects or impacts to San Francisco WSR-88D operations.

For two of the 10 proposed V150 wind turbines, additional radar effects will include Doppler contamination and false weather indications over and in the immediate vicinity of these two V150 wind turbines due to clutter; however, impacts to WSR-88D operations are not likely based on the WSR-88D ROC wind farm impact zone scheme.

CONCLUSIONS

The DoD PST analysis results for the Project indicate the following:

- Impacts to air defense and homeland security radar are likely; and
- Impacts to nearby WSR-88D weather radar are possible.

In total, Westslope identified and conducted a basic radar line-of-sight analysis for the following seven radar sites:

- McClellan ASR-9;
- Mill Valley ARSR-4;
- Moffett ASR-9;
- Oakland ASR-9;
- Sacramento ATCBI-6;
- Stockton ASR-11; and
- Travis AFB DASR.

The basic radar line-of-sight analyses conducted by Westslope show the following:

- For the McClellan ASR-9, the 59 existing Kenetech wind turbines are not visible to and are not interfering with this radar site. All 12 proposed V136 wind turbines at a blade-tip height of 493 feet AGL and all 10 proposed V150 wind turbines at a blade-tip height of 591 feet AGL will be visible to and will interfere with this radar site.
- For the Mill Valley ARSR-4, all 59 existing Kenetech wind turbines are visible to and are interfering with this radar site. All 12 proposed V136 wind turbines at a blade-tip height of 493 feet AGL and all 10 proposed V150 wind turbines at a blade-tip height of 591 feet AGL will be visible to and will interfere with this radar site.
- For the Sacramento ATCBI-6, the 59 existing Kenetech wind turbines are not visible to this radar site. All 12 proposed V136 wind turbines at a blade-tip height of 493 feet AGL and all 10 proposed V150 wind turbines at a blade-tip height of 591 feet AGL will be visible to this radar site; however, Westslope does not expect any effects from the proposed V136 or V150 wind turbines.
- For the Stockton ASR-11, 51 of the 59 existing Kenetech wind turbines are visible to and are interfering with this radar site. All 12 proposed V136 wind turbines at a blade-tip height of 493 feet AGL and all 10 proposed V150 wind turbines at a blade-tip height of 591 feet AGL will be visible to and will interfere with this radar site.
- For the Travis AFB DASR, the 59 existing Kenetech wind turbines are not visible to this radar site. All 12 proposed V136 wind turbines at a blade-tip height of 493 feet AGL and all 10 proposed V150 wind turbines at a blade-tip height of 591 feet AGL will be visible to and will interfere with this radar site.

- For the Moffett ASR-9 and the Oakland ASR-9, the proposed V136 and V150 wind turbines will not be visible to these radar sites. As a result, Westslope does not expect any radar effects to these radar sites.

For the Mill Valley ARSR-4 and the Stockton ASR-11, based on the fact that the existing Kenetech wind turbines are visible to and interfering with these radar sites, the proposed V136 or V150 wind turbines will be visible to and will interfere with these radar sites, and the development of the Project will include the removal of the existing Kenetech wind turbines, Westslope does not expect that the proposed V136 or V150 wind turbines will result in a material difference to the existing radar effects to these radar sites.

For the McClellan ASR-9 and the Travis AFB DASR, without mitigation, additional radar effects as a result of the proposed V136 or V150 wind turbines will include unwanted primary radar returns (clutter) resulting in a partial loss of primary radar target detection and a number of primary radar false targets over and in the immediate vicinity of the Project. Other possible radar effects include a partial loss of weather detection and false weather indications over and in the immediate vicinity of the Project. It is possible that mitigation techniques presently in use for the other 530 existing wind turbines in the Solano Wind Resource Area may be sufficient to address any concerns of the FAA or DoD.

Because wind turbines will be visible to the McClellan ASR-9, Mill Valley ARSR-4, Stockton ASR-11, and Travis AFB DASR, Westslope expects that the FAA and DoD will initially object to the proposed V136 or V150 wind turbines based on electromagnetic interference to air navigation facilities. As such, Westslope expects that the FAA will issue Notices of Presumed Hazard for the Project. The FAA and DoD will likely require further study to determine whether the radar effects are acceptable to operations or not. The DoD may also setup a Mitigation Response Team to conduct further study. Although possible, Westslope does not expect that the DHS will object to the proposed V136 or V150 wind turbines.

It is important to note that radar effects do not always translate into operational impacts.

Westslope's NEXRAD weather radar screening analysis for the Sacramento WSR-88D shows that the 59 existing Kenetech wind turbines at a blade-tip height of 107 feet AGL are visible to the Sacramento WSR-88D and that the existing Kenetech wind turbines fall within a No Impact Zone. As such, Westslope assumes there are no existing impacts to Sacramento WSR-88D operations as a result of these legacy wind turbines.

The NEXRAD weather radar screening analysis results also show that all 12 proposed V136 wind turbines at a blade-tip height of 493 feet AGL and all 10 proposed V150 wind turbines at a blade-tip height of 591 feet AGL will be visible to the Sacramento WSR-88D. Further, the screening analysis results show that at a blade-tip height of 493 feet AGL, two of the 12 proposed V136 wind turbines fall within a Notification Zone and the remaining 10 V136 wind turbines fall within a No Impact Zone. At a blade-tip height of 591 feet AGL, seven of the 10 proposed V150 wind turbines fall within a Notification Zone and the remaining

three V150 wind turbines fall within a No Impact Zone. Additional radar effects as a result of the proposed V136 or V150 wind turbines will include Doppler contamination and false weather indications over and in the immediate vicinity of the Project due to clutter; however, based on the screening analysis results, impacts to Sacramento WSR-88D operations are both possible and not likely depending upon the location and blade-tip height of the proposed wind turbines within the Project.

Westslope's NEXRAD weather radar screening analysis for the San Francisco WSR-88D shows that the 59 existing Kenetech wind turbines at a blade-tip height of 107 feet AGL are not visible to the San Francisco WSR-88D and that the existing Kenetech wind turbines fall within a No Impact Zone. As such, Westslope assumes there are no existing radar effects or impacts to San Francisco WSR-88D operations as a result of these legacy wind turbines.

The NEXRAD weather radar screening analysis also shows that the 12 proposed V136 wind turbines at a blade-tip height of 493 feet AGL will not be visible to the San Francisco WSR-88D. At a blade-tip height of 591 feet AGL, two of the 10 proposed V150 wind turbines will be visible to the San Francisco WSR-88D. The screening analysis results also show that all 12 proposed V136 wind turbines at a blade-tip height of 493 feet AGL and all 10 proposed V150 proposed wind turbines at a blade-tip height of 591 feet AGL fall within No Impact Zone. For the V136 wind turbines, Westslope does not expect any radar effects or impacts to San Francisco WSR-88D operations. For two of the 10 proposed V150 wind turbines, additional radar effects will include Doppler contamination and false weather indications over and in the immediate vicinity of these two V150 wind turbines due to clutter; however, impacts to WSR-88D operations are not likely based on the WSR-88D ROC wind farm impact zone scheme.

Westslope recommends that the Project details be submitted to the NOAA or the National Telecommunications Information Administration (NTIA) for a detailed review. The NTIA is essentially a clearinghouse for other federal agencies including NOAA.

If you have any questions regarding this analysis, please contact Geoff Blackman at (405) 816-2604 or via email at gnblackman@westslopeconsulting.com.

Appendix B

FAA DNH Forms, DNH Extensions, Associated Correspondence

Letter from Colonel Corey A. Simmons, USAF, Commander

January 11, 2021

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 60TH AIR MOBILITY WING (AMC)

11 January 2021

MEMORANDUM FOR SAF/IEI
AMC/A3A

FROM: 60 AMW/CC
400 Brennan Circle
Travis AFB CA 94535-5000

SUBJECT: 60 AMW Solano 4 Wind Project Operational Risk Assessment

1. We have carefully evaluated Sacramento Municipal Utility District's proposed Solano 4 Wind Project located within the Wind Resource Area located southeast of Travis AFB. My team determined the following during their evaluation of the project:

- Solano 4 does not meet the wind turbine facility requirements outlined in the local Airport Land Use Commission *Travis Air Force Base Land Use Compatibility Plan* adopted in October 2015.

- Air Traffic Control radar interference studies conducted by the Air Force Flight Standards Agency and the North American Aerospace Defense Command indicate the proposed replacement of 82 aging wind turbines with 19 newer turbines will not improve our Digital Airport Surveillance Radar's probability of detection capability within the Wind Resource Area.

- As proposed, Solano 4 Wind Project should have minimal negative impact on Travis AFB operations.

- Any changes to the Solano 4 Wind Project will require a new operational risk analysis.

2. Thank you for your collaboration with Travis AFB on this project. Please contact Mr. Scott McLaughlin, 60th Operations Group, at (707) 424-1067, or by e-mail at scott.mclaughlin.1@us.af.mil, if you have any questions regarding this risk assessment.

COREY A. SIMMONS, Colonel, USAF
Commander

Letter from Steven Sample, Executive Director, Military Aviation and Installation Assurance Siting Clearinghouse, Department of Defense

February 9, 2021

OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE
3500 DEFENSE PENTAGON
WASHINGTON, DC 20301-3500

SUSTAINMENT

February 9, 2021

Ms. Amanda Beck
Solano 4
6201 S St., MS MD-2
Sacramento, CA 95817

Reference: Federal Aviation Administration (FAA) Study Number: 2018-WTW-13388-OE and 18 associated structures

Dear Ms. Beck,

Thank you for your participation in the Mitigation Response Team (MRT) to assess and overcome military impacts from your proposed Solano 4 wind farm project in Rio Vista, California. In a letter dated May 11th, 2020, the Department of Defense (DoD) described the potential impacts to military operations for the project.

As a result of discussions between Sacramento Municipal Utility District and the U.S. Air Force, the construction of the Solano 4 wind project, submitted to the Federal Aviation Administration on 04/17/2020, will not present an adverse impact to military operations.

Our response to the FAA included a notification that further expansion beyond the current project area may present an adverse impact. We encourage you to engage DoD prior to any proposed expansion.

If you have any further concerns, please contact Mr. Michael Lignowski, Military Aviation and Installation Assurance Siting Clearinghouse, at 571-372-6853.

Sincerely,

Steven J. Sample
Executive Director
Military Aviation and Installation
Assurance Siting Clearinghouse

FAA Determinations

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTW-13388-OE

Issued Date: 12/04/2018

Amanda Beck
Sacramento Municipal Utility District
6201 S St., MS MD-2
Sacramento, CA 95817

**** PUBLIC NOTICE ****

The Federal Aviation Administration is conducting an aeronautical study concerning the following:

Structure:	Wind Turbine P1R1
Location:	Rio Vista, CA
Latitude:	38-07-54.16N NAD 83
Longitude:	121-46-31.47W
Heights:	208 feet site elevation (SE)
	591 feet above ground level (AGL)
	799 feet above mean sea level (AMSL)

The structure above exceeds obstruction standards. To determine its effect upon the safe and efficient use of navigable airspace by aircraft and on the operation of air navigation facilities, the FAA is conducting an aeronautical study under the provisions of 49 U.S.C., Section 44718 and, if applicable, Title 14 of the Code of Federal Regulations, part 77.

** SEE REVERSE SIDE FOR ADDITIONAL INFORMATION **

In the study, consideration will be given to all facts relevant to the effect of the structure on existing and planned airspace use, air navigation facilities, airports, aircraft operations, procedures and minimum flight altitudes, and the air traffic control system.

Interested persons are invited to participate in the aeronautical study by submitting comments to the above FAA address or through the electronic notification system. To be eligible for consideration, comments must be relevant to the effect the structure would have on aviation, must provide sufficient detail to permit a clear understanding, must contain the aeronautical study number printed in the upper right hand corner of this notice, and must be received on or before 01/10/2019.

This notice may be reproduced and circulated by any interested person. Airport managers are encouraged to post this notice.

If we can be of further assistance, please contact our office at (816) 329-2523, or steve.phillips@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTW-13388-OE.

Steve Phillips
Specialist

Attachment(s)
Part 77
Additional Information
Map(s)

Additional Information for ASN 2018-WTW-13388-OE

Proposal: To construct and/or operate a(n) Wind Turbine to a height of 591 feet above ground level, 799 feet above mean sea level.

Location: The structure will be located * nautical miles * of * Airport reference point.

Part 77 Obstruction Standard(s) Exceeded:

Preliminary FAA study indicates that the above mentioned structure would:
not exceed traffic pattern airspace

Abbreviations:
AGL, Above Ground Level
AMSL, Above Mean Sea Level
ASN, Aeronautical Study Number
CFR, Code of Federal Regulations
NM, Nautical Mile

The proposed structures are part of a proposed wind farm that would be located approximately 5.02 - 9.07 NM southwest of the Airport Reference Point for the Rio Vista Municipal Airport (O88), Rio Vista, CA. In order to facilitate the public comment process, all 19 studies are being circularized under ASN 2018-WTW-13388-OE. All comments received from this circularization will be considered in completing the separate determinations for each study. The ASNs with coordinates, AGL heights, and AMSL heights are as follows:

ASN / Latitude / Longitude / AGL / AMSL

2018-WTW-13388-OE / 38-07-54.16N / 121-46-31.47W / 591 / 799
2018-WTW-13389-OE / 38-07-44.90N / 121-46-20.90W / 591 / 774
2018-WTW-13390-OE / 38-07-35.49N / 121-46-28.29W / 591 / 780
2018-WTW-13391-OE / 38-07-25.84N / 121-46-31.86W / 591 / 778
2018-WTW-13392-OE / 38-07-14.14N / 121-46-28.35W / 591 / 707

2018-WTW-13393-OE / 38-07-18.49N / 121-45-46.46W / 591 / 757
2018-WTW-13394-OE / 38-07-08.51N / 121-45-43.44W / 591 / 748
2018-WTW-13395-OE / 38-06-53.36N / 121-45-15.19W / 591 / 706
2018-WTW-13396-OE / 38-06-43.69N / 121-45-03.40W / 591 / 645
2018-WTW-13397-OE / 38-05-33.53N / 121-49-52.57W / 591 / 833

2018-WTW-13398-OE / 38-05-08.34N / 121-50-03.54W / 591 / 764
2018-WTW-13399-OE / 38-05-24.68N / 121-49-44.45W / 591 / 805
2018-WTW-13400-OE / 38-05-02.29N / 121-49-31.33W / 591 / 799
2018-WTW-13401-OE / 38-04-53.15N / 121-49-40.77W / 591 / 694
2018-WTW-13402-OE / 38-04-43.66N / 121-49-43.80W / 591 / 707

2018-WTW-13403-OE / 38-04-29.29N / 121-49-03.88W / 591 / 771
2018-WTW-13404-OE / 38-04-48.12N / 121-48-51.19W / 591 / 802
2018-WTW-13405-OE / 38-04-38.20N / 121-48-46.20W / 591 / 807
2018-WTW-13406-OE / 38-04-22.44N / 121-48-30.99W / 591 / 739

These would exceed the obstruction standards of 14 CFR Part 77 as follows:

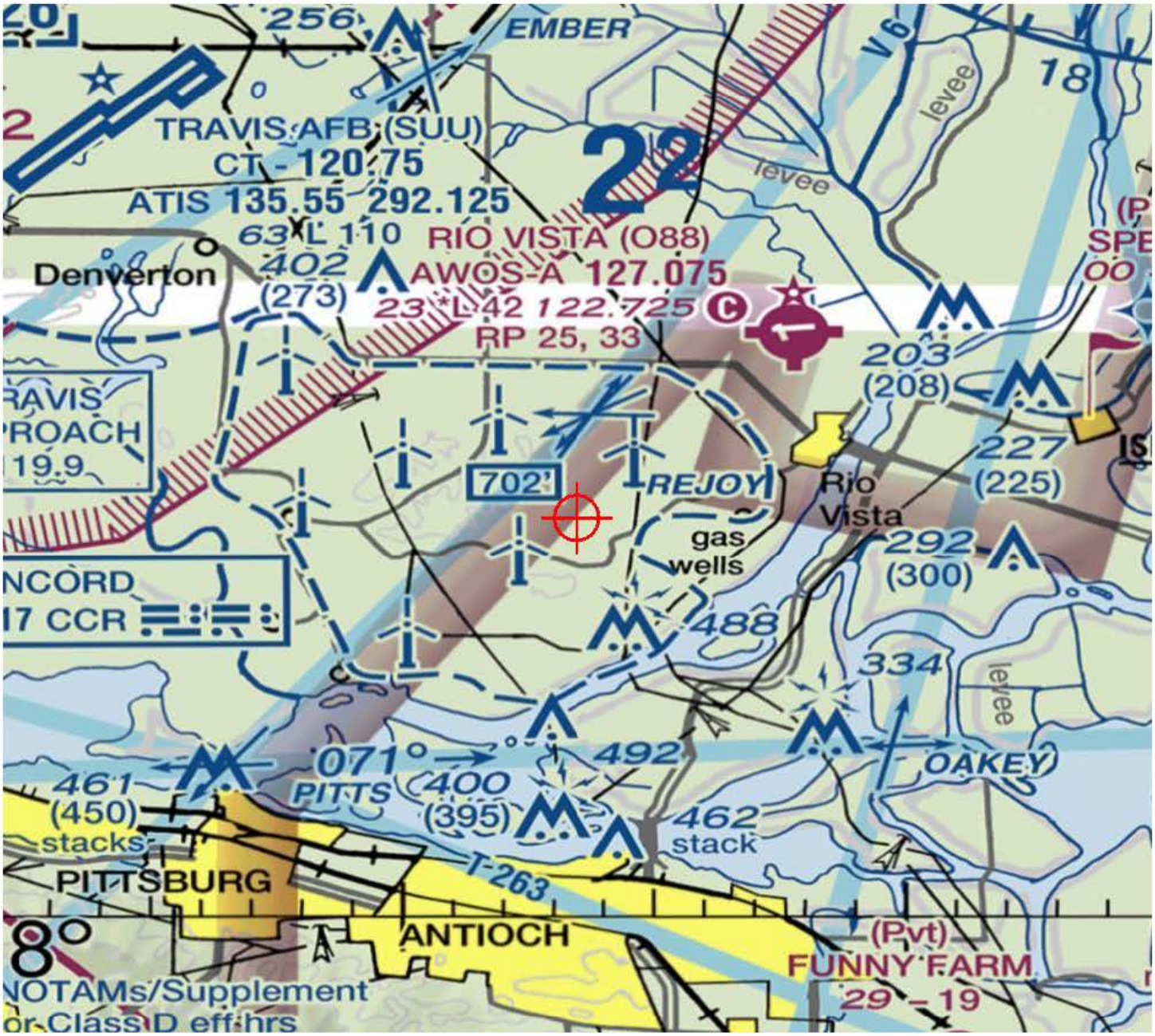
Section 77.17(a)(1): by 92 feet; a height that exceeds 499 feet AGL.

Section 77.17(a)(2): A height that is 200 feet AGL, or above the established airport elevation, whichever is higher, within 3 NM miles of the established reference point of O88 and that height increases in the proportion of 100 feet for each additional NM from the airport up to a maximum of 499 feet. The following would exceed:

2018-WTW-13388-OE by 190 feet
2018-WTW-13389-OE by 187 feet
2018-WTW-13390-OE by 169 feet
2018-WTW-13391-OE by 154 feet
2018-WTW-13392-OE by 141 feet

2018-WTW-13393-OE by 179 feet
2018-WTW-13394-OE by 167 feet
2018-WTW-13395-OE by 163 feet
2018-WTW-13396-OE by 156 feet

Map for ASN 2018-WTW-13388-OE



Federal Aviation Administration

« OE / AAA

Project Submission Success
Project Name: SACRA-000491271-18

Project SACRA-000491271-18 has been submitted successfully to the FAA.

Your filing is assigned Aeronautical Study Number (ASN):

2018-WTW-13388-OE
2018-WTW-13389-OE
2018-WTW-13390-OE
2018-WTW-13391-OE
2018-WTW-13392-OE
2018-WTW-13393-OE
2018-WTW-13394-OE
2018-WTW-13395-OE
2018-WTW-13396-OE
2018-WTW-13397-OE
2018-WTW-13398-OE
2018-WTW-13399-OE
2018-WTW-13400-OE
2018-WTW-13401-OE
2018-WTW-13402-OE
2018-WTW-13403-OE
2018-WTW-13404-OE
2018-WTW-13405-OE
2018-WTW-13406-OE

Please refer to the assigned ASN on all future inquiries regarding this filing.

Please return to the system at a later date for status updates.

It is the responsibility of each e-filer to exercise due diligence to determine if coordination of the proposed construction or alteration is necessary with their state aviation department. Please use the link below to contact your state aviation department to determine their requirements:
State Aviation Contacts

To ensure e-mail notifications are delivered to your inbox please add noreply@faa.gov to your address book. Notifications sent from this address are system generated FAA e-mails and replies to this address will NOT be read or forwarded for review. Each system generated e-mail will contain specific FAA contact information in the text of the message.

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTW-13388-OE

Issued Date: 02/01/2019

Amanda Beck
Sacramento Municipal Utility District
6201 S St., MS MD-2
Sacramento, CA 95817

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine P1R1
Location:	Rio Vista, CA
Latitude:	38-07-54.16N NAD 83
Longitude:	121-46-31.47W
Heights:	208 feet site elevation (SE)
	591 feet above ground level (AGL)
	799 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 60 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

This determination expires on 08/01/2020 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 03, 2019. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 13, 2019 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be

used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

If we can be of further assistance, please contact Steve Phillips, at (816) 329-2523, or steve.phillips@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTW-13388-OE.

Signature Control No: 387140385-395150226 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

Abbreviations:
AGL, Above Ground Level
AMSL, Above Mean Sea Level
ARSR, Air Route Surveillance Radar
ASN, Aeronautical Study Number
ASR, Airport Surveillance Radar
ATC, Air Traffic Control
CAT, Category
CFR, Code of Federal Regulations
DASR, Digital Airport Surveillance Radar
IFR, Instrument Flight Rules
MVA, Minimum Vectoring Altitude
NM, Nautical Mile
RWY, Runway
TPA, Traffic Pattern Airspace
TRACON, Terminal Radar Approach Control
VFR, Visual Flight Rules

The proposed structures are part of a proposed wind farm that would be located approximately 5.02 - 9.07 NM southwest of the Airport Reference Point for the Rio Vista Municipal Airport (O88), Rio Vista, CA. The ASNs with coordinates, AGL heights, and AMSL heights are as shown on page one. They would exceed the obstruction standards of 14 CFR Part 77 as follows:

Section 77.17(a)(1): by 92 feet; a height that exceeds 499 feet AGL.

Section 77.17(a)(2): A height that is 200 feet AGL, or above the established airport elevation, whichever is higher, within 3 NM miles of the established reference point of O88 and that height increases in the proportion of 100 feet for each additional NM from the airport up to a maximum of 499 feet. The following would exceed:

2018-WTW-13388-OE by 190 feet
2018-WTW-13389-OE by 187 feet
2018-WTW-13390-OE by 169 feet
2018-WTW-13391-OE by 154 feet
2018-WTW-13392-OE by 141 feet

2018-WTW-13393-OE by 179 feet
2018-WTW-13394-OE by 167 feet
2018-WTW-13395-OE by 163 feet
2018-WTW-13396-OE by 156 feet

Section 77.17(a)(3): A height that increases a minimum instrument flight altitude within a terminal area;

The following would increase the Northern California TRACON (NCT) MVA for NCT_MVA_FUS3_2017 Sector MCC_B from 1,700 feet AMSL to 1,800 feet AMSL.

2018-WTW-13388-OE
2018-WTW-13389-OE
2018-WTW-13390-OE
2018-WTW-13391-OE
2018-WTW-13393-OE

2018-WTW-13397-OE
2018-WTW-13398-OE
2018-WTW-13399-OE
2018-WTW-13400-OE
2018-WTW-13403-OE

2018-WTW-13404-OE
2018-WTW-13405-OE

The turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. The proposals will affect the quality and/or availability of radar signals. The effects would be unwanted primary returns (clutter) and primary target drops, all in the area of the turbines. Tracked primary targets could diverge from the aircraft path and follow wind turbines, when the aircraft is over or near the turbines.

In order to facilitate the public comment process, the studies were circularized under ASN 2018-WTW-13388-OE on December 04, 2018, to all known aviation interests and to non-aeronautical interests that may be affected by the proposal. One letter of objection was received as a result of the circularization.

The Solano County Airport Land Use Commission (County) submitted comments that may not necessarily be an "objection" but rather statements. Some of their statements are simply repeating applicable law / rule / orders. They stated that these would be the tallest wind turbines in the area and larger than other onshore turbines elsewhere. Also stated was a belief that these have electromagnetic effects on radar. One statement said they "have seen information that conflicts" with the preliminary analysis of not exceeding TPA. Instead of submitting that stated information, a request was made for the FAA to see if any other obstruction standard was exceeded.

We are not sure what to make of the statement about these being the tallest in the area. Simply being taller than other structures has never been, nor will it ever be, the sole indicator of whether the structure would present an unacceptable impact upon the safe and efficient use of the navigable airspace.

The letter left the impression that the County believes exceeding one or more of the obstruction standards of 14 CFR Part 77 is reason enough to determine the proposal to be a hazard. That is not the case. It is the result of the aeronautical study that determines whether the structure would be a hazard or no hazard to air navigation. We will always compare proposed structures against all of the obstruction standards but will not circularize the standards that are not exceeded nor any standards and/or effects that are beyond the scope of the public to provide information about.

Records indicate that O88 has approximately 35,000 operations per year primarily from CAT A and B general aviation aircraft. All except one of the proposed turbines lie beyond the TPA for all RWYs and aircraft categories. That one proposal is on the edge of the RWY 15/33 TPA for CAT D, but at 2,199 feet long, this

RWY is incapable of sustaining CAT D aircraft operations. The size of the TPA is based upon the aircraft that regularly use a particular RWY. The preliminary assessment of not exceeding TPA has been confirmed.

Note: Aircraft categories are based on approach speed, CAT A = less than 91 knots, CAT B = 91- 120 knots, CAT C = 121-140 knots, CAT D = 141-165 knots.

The County submitted a lot about radar effects. Wind turbines rarely, if ever create "electromagnetic" interference. If they are within the line of sight of a radar sensor, they may be detected by that sensor and may therefore be a physical interference. Simply being "seen" by the radar is not the real issue though. How that target (in this case, the wind turbine) is processed and displayed for ATC is the key. The users of the system (ATC) is the sole decider on whether the system is acceptable to be able to perform their duties. Although there may be others entities using these radar systems, the responsibility and authority of the FAA is the safe and efficient use of the navigable airspace, including the impact of the radar effects on air navigation.

The turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. However, this would not cause an unacceptable adverse impact on ATC operations at this time.

The aeronautical study disclosed that the proposed structures would have the adverse effect as described above on the NCT MVA. MVAs are solely used by ATC and not published for public use and are not circulated for public comment. The study disclosed that increasing the MVA in the area of the turbines would not impact a significant number of operations. The proposed structures would have no other effect on any existing or proposed arrival, departure, or en route IFR operations or procedures.

Study for possible VFR effect disclosed that the proposals would have no effect on existing or proposed VFR arrival or departure operations. As stated above, the proposals are beyond normal traffic pattern airspace. Therefore, the proposal would not have an adverse effect on VFR traffic pattern operations at O88, or any other known public use or military airports. At 591 feet AGL, the structures would extend upwards into altitudes commonly used for en route VFR flight; however, no information was received to indicate they would be located along a regularly used VFR route or that they would pose a problem for pilots operating en route. Therefore, they would not have a substantial adverse effect on en route VFR flight operations.

The proposed structures would be appropriately obstruction marked/lighted to make them more conspicuous to airmen should circumnavigation be necessary.

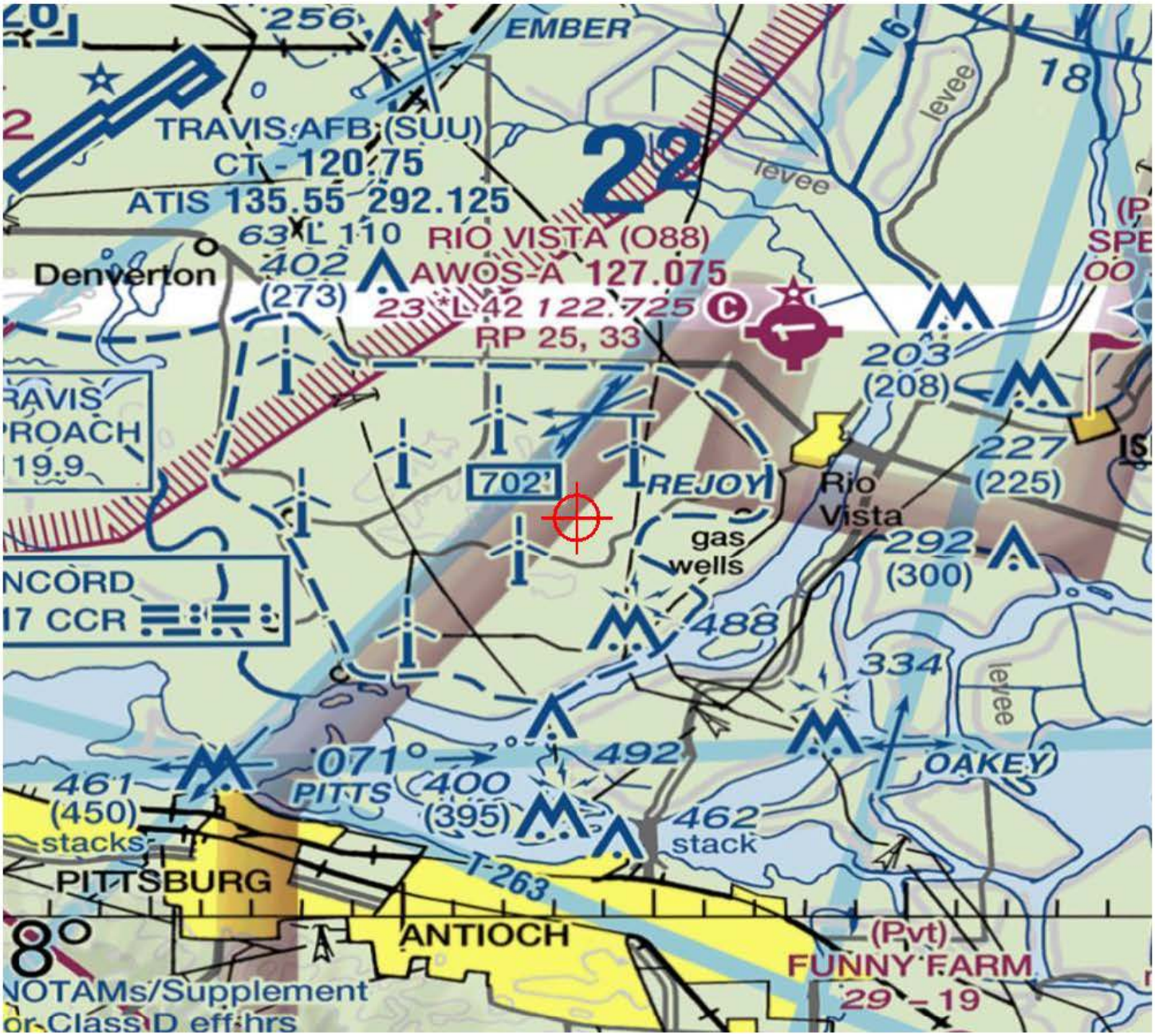
The cumulative impact of the proposed structures, when combined with other proposed and existing structures, is not considered to be significant. Study did not disclose any significant adverse effect on existing or proposed public-use or military airports or navigational facilities, nor would the proposals affect the capacity of any known existing or planned public-use or military airport.

Therefore, it is determined that the proposed construction would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation providing the conditions set forth in this determination are met.

Additional conditions:

As a condition of this determination it is required that Notice of Actual Construction or Alteration (7460-2 Part 1) be E-filed at least 60 full days prior to the start of construction so that appropriate action can be taken to amend the effected procedure(s) and/or altitude(s).

Sectional Map for ASN 2018-WTW-13388-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTW-13389-OE

Issued Date: 02/01/2019

Amanda Beck
Sacramento Municipal Utility District
6201 S St., MS MD-2
Sacramento, CA 95817

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine P1R2
Location:	Rio Vista, CA
Latitude:	38-07-44.90N NAD 83
Longitude:	121-46-20.90W
Heights:	183 feet site elevation (SE)
	591 feet above ground level (AGL)
	774 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 60 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

This determination expires on 08/01/2020 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 03, 2019. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 13, 2019 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be

used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

If we can be of further assistance, please contact Steve Phillips, at (816) 329-2523, or steve.phillips@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTW-13389-OE.

Signature Control No: 387140386-395150229 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

Abbreviations:
AGL, Above Ground Level
AMSL, Above Mean Sea Level
ARSR, Air Route Surveillance Radar
ASN, Aeronautical Study Number
ASR, Airport Surveillance Radar
ATC, Air Traffic Control
CAT, Category
CFR, Code of Federal Regulations
DASR, Digital Airport Surveillance Radar
IFR, Instrument Flight Rules
MVA, Minimum Vectoring Altitude
NM, Nautical Mile
RWY, Runway
TPA, Traffic Pattern Airspace
TRACON, Terminal Radar Approach Control
VFR, Visual Flight Rules

The proposed structures are part of a proposed wind farm that would be located approximately 5.02 - 9.07 NM southwest of the Airport Reference Point for the Rio Vista Municipal Airport (O88), Rio Vista, CA. The ASNs with coordinates, AGL heights, and AMSL heights are as shown on page one. They would exceed the obstruction standards of 14 CFR Part 77 as follows:

Section 77.17(a)(1): by 92 feet; a height that exceeds 499 feet AGL.

Section 77.17(a)(2): A height that is 200 feet AGL, or above the established airport elevation, whichever is higher, within 3 NM miles of the established reference point of O88 and that height increases in the proportion of 100 feet for each additional NM from the airport up to a maximum of 499 feet. The following would exceed:

2018-WTW-13388-OE by 190 feet
2018-WTW-13389-OE by 187 feet
2018-WTW-13390-OE by 169 feet
2018-WTW-13391-OE by 154 feet
2018-WTW-13392-OE by 141 feet

2018-WTW-13393-OE by 179 feet
2018-WTW-13394-OE by 167 feet
2018-WTW-13395-OE by 163 feet
2018-WTW-13396-OE by 156 feet

Section 77.17(a)(3): A height that increases a minimum instrument flight altitude within a terminal area;

The following would increase the Northern California TRACON (NCT) MVA for NCT_MVA_FUS3_2017 Sector MCC_B from 1,700 feet AMSL to 1,800 feet AMSL.

2018-WTW-13388-OE
2018-WTW-13389-OE
2018-WTW-13390-OE
2018-WTW-13391-OE
2018-WTW-13393-OE

2018-WTW-13397-OE
2018-WTW-13398-OE
2018-WTW-13399-OE
2018-WTW-13400-OE
2018-WTW-13403-OE

2018-WTW-13404-OE
2018-WTW-13405-OE

The turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. The proposals will affect the quality and/or availability of radar signals. The effects would be unwanted primary returns (clutter) and primary target drops, all in the area of the turbines. Tracked primary targets could diverge from the aircraft path and follow wind turbines, when the aircraft is over or near the turbines.

In order to facilitate the public comment process, the studies were circularized under ASN 2018-WTW-13388-OE on December 04, 2018, to all known aviation interests and to non-aeronautical interests that may be affected by the proposal. One letter of objection was received as a result of the circularization.

The Solano County Airport Land Use Commission (County) submitted comments that may not necessarily be an "objection" but rather statements. Some of their statements are simply repeating applicable law / rule / orders. They stated that these would be the tallest wind turbines in the area and larger than other onshore turbines elsewhere. Also stated was a belief that these have electromagnetic effects on radar. One statement said they "have seen information that conflicts" with the preliminary analysis of not exceeding TPA. Instead of submitting that stated information, a request was made for the FAA to see if any other obstruction standard was exceeded.

We are not sure what to make of the statement about these being the tallest in the area. Simply being taller than other structures has never been, nor will it ever be, the sole indicator of whether the structure would present an unacceptable impact upon the safe and efficient use of the navigable airspace.

The letter left the impression that the County believes exceeding one or more of the obstruction standards of 14 CFR Part 77 is reason enough to determine the proposal to be a hazard. That is not the case. It is the result of the aeronautical study that determines whether the structure would be a hazard or no hazard to air navigation. We will always compare proposed structures against all of the obstruction standards but will not circularize the standards that are not exceeded nor any standards and/or effects that are beyond the scope of the public to provide information about.

Records indicate that O88 has approximately 35,000 operations per year primarily from CAT A and B general aviation aircraft. All except one of the proposed turbines lie beyond the TPA for all RWYs and aircraft categories. That one proposal is on the edge of the RWY 15/33 TPA for CAT D, but at 2,199 feet long, this

RWY is incapable of sustaining CAT D aircraft operations. The size of the TPA is based upon the aircraft that regularly use a particular RWY. The preliminary assessment of not exceeding TPA has been confirmed.

Note: Aircraft categories are based on approach speed, CAT A = less than 91 knots, CAT B = 91- 120 knots, CAT C = 121-140 knots, CAT D = 141-165 knots.

The County submitted a lot about radar effects. Wind turbines rarely, if ever create "electromagnetic" interference. If they are within the line of sight of a radar sensor, they may be detected by that sensor and may therefore be a physical interference. Simply being "seen" by the radar is not the real issue though. How that target (in this case, the wind turbine) is processed and displayed for ATC is the key. The users of the system (ATC) is the sole decider on whether the system is acceptable to be able to perform their duties. Although there may be others entities using these radar systems, the responsibility and authority of the FAA is the safe and efficient use of the navigable airspace, including the impact of the radar effects on air navigation.

The turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. However, this would not cause an unacceptable adverse impact on ATC operations at this time.

The aeronautical study disclosed that the proposed structures would have the adverse effect as described above on the NCT MVA. MVAs are solely used by ATC and not published for public use and are not circulated for public comment. The study disclosed that increasing the MVA in the area of the turbines would not impact a significant number of operations. The proposed structures would have no other effect on any existing or proposed arrival, departure, or en route IFR operations or procedures.

Study for possible VFR effect disclosed that the proposals would have no effect on existing or proposed VFR arrival or departure operations. As stated above, the proposals are beyond normal traffic pattern airspace. Therefore, the proposal would not have an adverse effect on VFR traffic pattern operations at O88, or any other known public use or military airports. At 591 feet AGL, the structures would extend upwards into altitudes commonly used for en route VFR flight; however, no information was received to indicate they would be located along a regularly used VFR route or that they would pose a problem for pilots operating en route. Therefore, they would not have a substantial adverse effect on en route VFR flight operations.

The proposed structures would be appropriately obstruction marked/lighted to make them more conspicuous to airmen should circumnavigation be necessary.

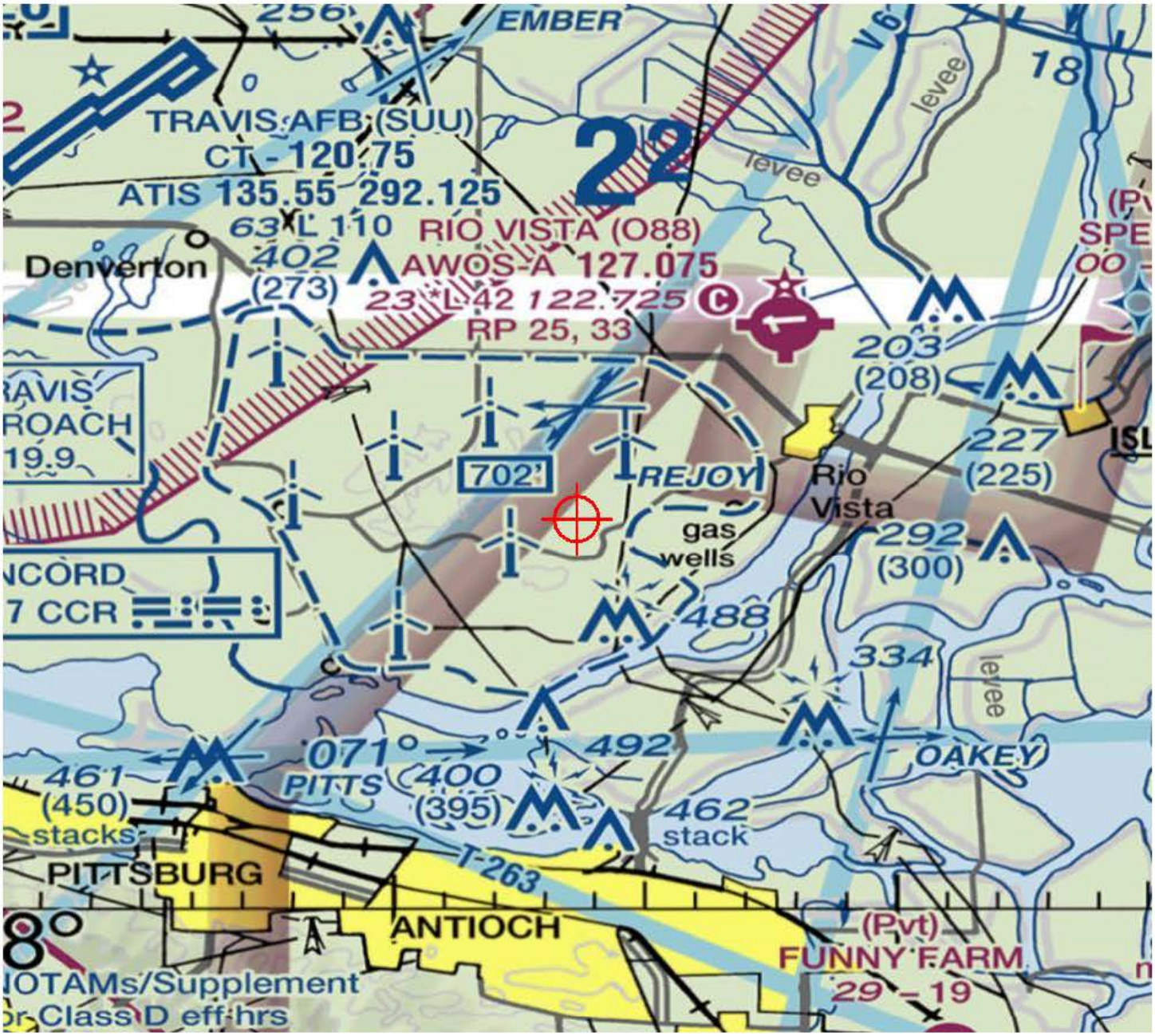
The cumulative impact of the proposed structures, when combined with other proposed and existing structures, is not considered to be significant. Study did not disclose any significant adverse effect on existing or proposed public-use or military airports or navigational facilities, nor would the proposals affect the capacity of any known existing or planned public-use or military airport.

Therefore, it is determined that the proposed construction would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation providing the conditions set forth in this determination are met.

Additional conditions:

As a condition of this determination it is required that Notice of Actual Construction or Alteration (7460-2 Part 1) be E-filed at least 60 full days prior to the start of construction so that appropriate action can be taken to amend the effected procedure(s) and/or altitude(s).

Sectional Map for ASN 2018-WTW-13389-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTW-13390-OE

Issued Date: 02/01/2019

Amanda Beck
Sacramento Municipal Utility District
6201 S St., MS MD-2
Sacramento, CA 95817

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine P1R3
Location:	Rio Vista, CA
Latitude:	38-07-35.49N NAD 83
Longitude:	121-46-28.29W
Heights:	189 feet site elevation (SE)
	591 feet above ground level (AGL)
	780 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 60 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

This determination expires on 08/01/2020 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 03, 2019. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 13, 2019 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be

used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

If we can be of further assistance, please contact Steve Phillips, at (816) 329-2523, or steve.phillips@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTW-13390-OE.

Signature Control No: 387140387-395150225 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

Abbreviations:
AGL, Above Ground Level
AMSL, Above Mean Sea Level
ARSR, Air Route Surveillance Radar
ASN, Aeronautical Study Number
ASR, Airport Surveillance Radar
ATC, Air Traffic Control
CAT, Category
CFR, Code of Federal Regulations
DASR, Digital Airport Surveillance Radar
IFR, Instrument Flight Rules
MVA, Minimum Vectoring Altitude
NM, Nautical Mile
RWY, Runway
TPA, Traffic Pattern Airspace
TRACON, Terminal Radar Approach Control
VFR, Visual Flight Rules

The proposed structures are part of a proposed wind farm that would be located approximately 5.02 - 9.07 NM southwest of the Airport Reference Point for the Rio Vista Municipal Airport (O88), Rio Vista, CA. The ASNs with coordinates, AGL heights, and AMSL heights are as shown on page one. They would exceed the obstruction standards of 14 CFR Part 77 as follows:

Section 77.17(a)(1): by 92 feet; a height that exceeds 499 feet AGL.

Section 77.17(a)(2): A height that is 200 feet AGL, or above the established airport elevation, whichever is higher, within 3 NM miles of the established reference point of O88 and that height increases in the proportion of 100 feet for each additional NM from the airport up to a maximum of 499 feet. The following would exceed:

2018-WTW-13388-OE by 190 feet
2018-WTW-13389-OE by 187 feet
2018-WTW-13390-OE by 169 feet
2018-WTW-13391-OE by 154 feet
2018-WTW-13392-OE by 141 feet

2018-WTW-13393-OE by 179 feet
2018-WTW-13394-OE by 167 feet
2018-WTW-13395-OE by 163 feet
2018-WTW-13396-OE by 156 feet

Section 77.17(a)(3): A height that increases a minimum instrument flight altitude within a terminal area;

The following would increase the Northern California TRACON (NCT) MVA for NCT_MVA_FUS3_2017 Sector MCC_B from 1,700 feet AMSL to 1,800 feet AMSL.

2018-WTW-13388-OE
2018-WTW-13389-OE
2018-WTW-13390-OE
2018-WTW-13391-OE
2018-WTW-13393-OE

2018-WTW-13397-OE
2018-WTW-13398-OE
2018-WTW-13399-OE
2018-WTW-13400-OE
2018-WTW-13403-OE

2018-WTW-13404-OE
2018-WTW-13405-OE

The turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. The proposals will affect the quality and/or availability of radar signals. The effects would be unwanted primary returns (clutter) and primary target drops, all in the area of the turbines. Tracked primary targets could diverge from the aircraft path and follow wind turbines, when the aircraft is over or near the turbines.

In order to facilitate the public comment process, the studies were circularized under ASN 2018-WTW-13388-OE on December 04, 2018, to all known aviation interests and to non-aeronautical interests that may be affected by the proposal. One letter of objection was received as a result of the circularization.

The Solano County Airport Land Use Commission (County) submitted comments that may not necessarily be an "objection" but rather statements. Some of their statements are simply repeating applicable law / rule / orders. They stated that these would be the tallest wind turbines in the area and larger than other onshore turbines elsewhere. Also stated was a belief that these have electromagnetic effects on radar. One statement said they "have seen information that conflicts" with the preliminary analysis of not exceeding TPA. Instead of submitting that stated information, a request was made for the FAA to see if any other obstruction standard was exceeded.

We are not sure what to make of the statement about these being the tallest in the area. Simply being taller than other structures has never been, nor will it ever be, the sole indicator of whether the structure would present an unacceptable impact upon the safe and efficient use of the navigable airspace.

The letter left the impression that the County believes exceeding one or more of the obstruction standards of 14 CFR Part 77 is reason enough to determine the proposal to be a hazard. That is not the case. It is the result of the aeronautical study that determines whether the structure would be a hazard or no hazard to air navigation. We will always compare proposed structures against all of the obstruction standards but will not circularize the standards that are not exceeded nor any standards and/or effects that are beyond the scope of the public to provide information about.

Records indicate that O88 has approximately 35,000 operations per year primarily from CAT A and B general aviation aircraft. All except one of the proposed turbines lie beyond the TPA for all RWYs and aircraft categories. That one proposal is on the edge of the RWY 15/33 TPA for CAT D, but at 2,199 feet long, this

RWY is incapable of sustaining CAT D aircraft operations. The size of the TPA is based upon the aircraft that regularly use a particular RWY. The preliminary assessment of not exceeding TPA has been confirmed.

Note: Aircraft categories are based on approach speed, CAT A = less than 91 knots, CAT B = 91- 120 knots, CAT C = 121-140 knots, CAT D = 141-165 knots.

The County submitted a lot about radar effects. Wind turbines rarely, if ever create "electromagnetic" interference. If they are within the line of sight of a radar sensor, they may be detected by that sensor and may therefore be a physical interference. Simply being "seen" by the radar is not the real issue though. How that target (in this case, the wind turbine) is processed and displayed for ATC is the key. The users of the system (ATC) is the sole decider on whether the system is acceptable to be able to perform their duties. Although there may be others entities using these radar systems, the responsibility and authority of the FAA is the safe and efficient use of the navigable airspace, including the impact of the radar effects on air navigation.

The turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. However, this would not cause an unacceptable adverse impact on ATC operations at this time.

The aeronautical study disclosed that the proposed structures would have the adverse effect as described above on the NCT MVA. MVAs are solely used by ATC and not published for public use and are not circulated for public comment. The study disclosed that increasing the MVA in the area of the turbines would not impact a significant number of operations. The proposed structures would have no other effect on any existing or proposed arrival, departure, or en route IFR operations or procedures.

Study for possible VFR effect disclosed that the proposals would have no effect on existing or proposed VFR arrival or departure operations. As stated above, the proposals are beyond normal traffic pattern airspace. Therefore, the proposal would not have an adverse effect on VFR traffic pattern operations at O88, or any other known public use or military airports. At 591 feet AGL, the structures would extend upwards into altitudes commonly used for en route VFR flight; however, no information was received to indicate they would be located along a regularly used VFR route or that they would pose a problem for pilots operating en route. Therefore, they would not have a substantial adverse effect on en route VFR flight operations.

The proposed structures would be appropriately obstruction marked/lighted to make them more conspicuous to airmen should circumnavigation be necessary.

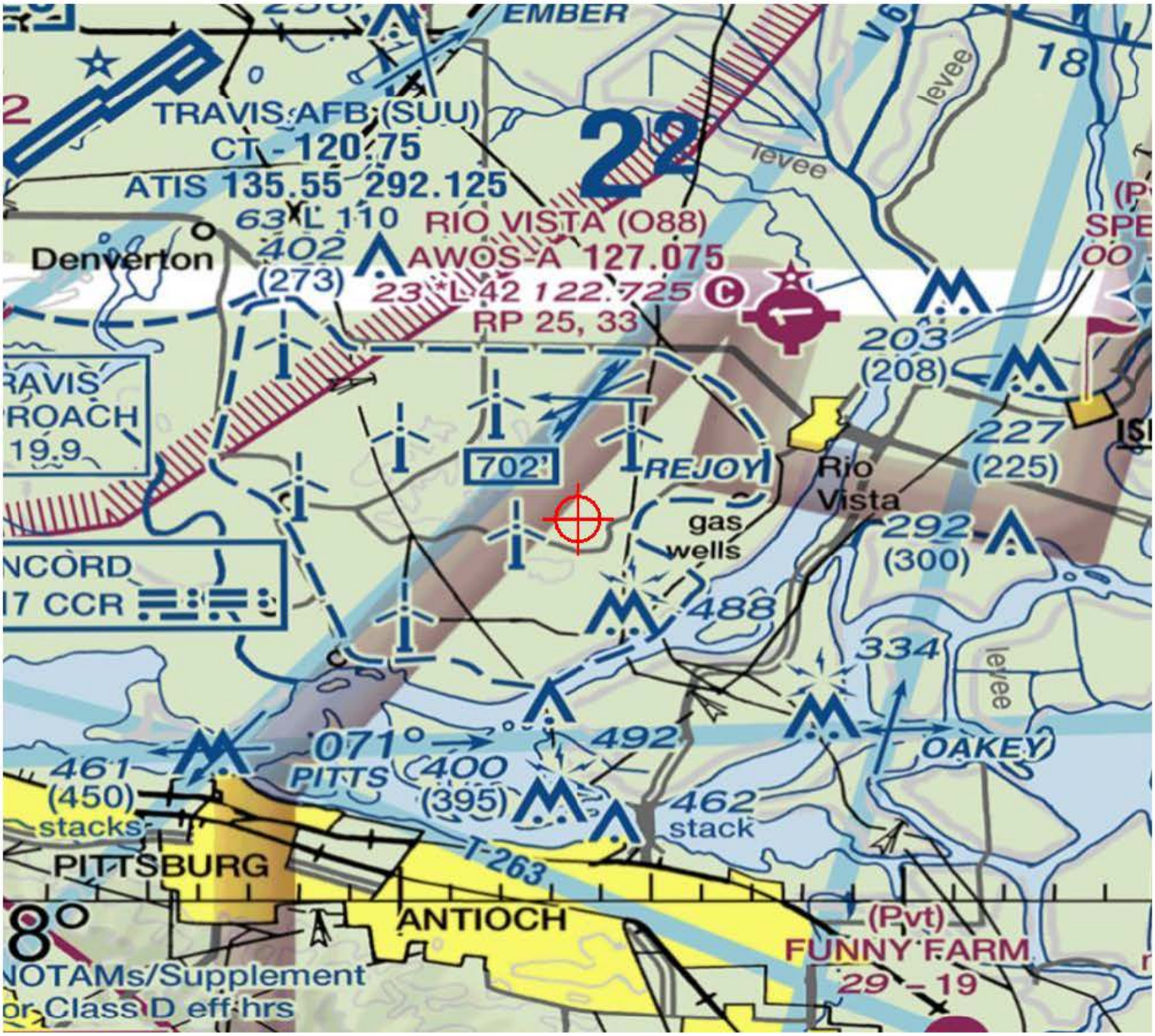
The cumulative impact of the proposed structures, when combined with other proposed and existing structures, is not considered to be significant. Study did not disclose any significant adverse effect on existing or proposed public-use or military airports or navigational facilities, nor would the proposals affect the capacity of any known existing or planned public-use or military airport.

Therefore, it is determined that the proposed construction would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation providing the conditions set forth in this determination are met.

Additional conditions:

As a condition of this determination it is required that Notice of Actual Construction or Alteration (7460-2 Part 1) be E-filed at least 60 full days prior to the start of construction so that appropriate action can be taken to amend the effected procedure(s) and/or altitude(s).

Sectional Map for ASN 2018-WTW-13390-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTW-13391-OE

Issued Date: 02/01/2019

Amanda Beck
Sacramento Municipal Utility District
6201 S St., MS MD-2
Sacramento, CA 95817

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine P1R4
Location:	Rio Vista, CA
Latitude:	38-07-25.84N NAD 83
Longitude:	121-46-31.86W
Heights:	187 feet site elevation (SE)
	591 feet above ground level (AGL)
	778 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 60 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

This determination expires on 08/01/2020 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 03, 2019. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 13, 2019 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be

used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

If we can be of further assistance, please contact Steve Phillips, at (816) 329-2523, or steve.phillips@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTW-13391-OE.

Signature Control No: 387140388-395150224 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

Abbreviations:
AGL, Above Ground Level
AMSL, Above Mean Sea Level
ARSR, Air Route Surveillance Radar
ASN, Aeronautical Study Number
ASR, Airport Surveillance Radar
ATC, Air Traffic Control
CAT, Category
CFR, Code of Federal Regulations
DASR, Digital Airport Surveillance Radar
IFR, Instrument Flight Rules
MVA, Minimum Vectoring Altitude
NM, Nautical Mile
RWY, Runway
TPA, Traffic Pattern Airspace
TRACON, Terminal Radar Approach Control
VFR, Visual Flight Rules

The proposed structures are part of a proposed wind farm that would be located approximately 5.02 - 9.07 NM southwest of the Airport Reference Point for the Rio Vista Municipal Airport (O88), Rio Vista, CA. The ASNs with coordinates, AGL heights, and AMSL heights are as shown on page one. They would exceed the obstruction standards of 14 CFR Part 77 as follows:

Section 77.17(a)(1): by 92 feet; a height that exceeds 499 feet AGL.

Section 77.17(a)(2): A height that is 200 feet AGL, or above the established airport elevation, whichever is higher, within 3 NM miles of the established reference point of O88 and that height increases in the proportion of 100 feet for each additional NM from the airport up to a maximum of 499 feet. The following would exceed:

2018-WTW-13388-OE by 190 feet
2018-WTW-13389-OE by 187 feet
2018-WTW-13390-OE by 169 feet
2018-WTW-13391-OE by 154 feet
2018-WTW-13392-OE by 141 feet

2018-WTW-13393-OE by 179 feet
2018-WTW-13394-OE by 167 feet
2018-WTW-13395-OE by 163 feet
2018-WTW-13396-OE by 156 feet

Section 77.17(a)(3): A height that increases a minimum instrument flight altitude within a terminal area;

The following would increase the Northern California TRACON (NCT) MVA for NCT_MVA_FUS3_2017 Sector MCC_B from 1,700 feet AMSL to 1,800 feet AMSL.

2018-WTW-13388-OE
2018-WTW-13389-OE
2018-WTW-13390-OE
2018-WTW-13391-OE
2018-WTW-13393-OE

2018-WTW-13397-OE
2018-WTW-13398-OE
2018-WTW-13399-OE
2018-WTW-13400-OE
2018-WTW-13403-OE

2018-WTW-13404-OE
2018-WTW-13405-OE

The turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. The proposals will affect the quality and/or availability of radar signals. The effects would be unwanted primary returns (clutter) and primary target drops, all in the area of the turbines. Tracked primary targets could diverge from the aircraft path and follow wind turbines, when the aircraft is over or near the turbines.

In order to facilitate the public comment process, the studies were circularized under ASN 2018-WTW-13388-OE on December 04, 2018, to all known aviation interests and to non-aeronautical interests that may be affected by the proposal. One letter of objection was received as a result of the circularization.

The Solano County Airport Land Use Commission (County) submitted comments that may not necessarily be an "objection" but rather statements. Some of their statements are simply repeating applicable law / rule / orders. They stated that these would be the tallest wind turbines in the area and larger than other onshore turbines elsewhere. Also stated was a belief that these have electromagnetic effects on radar. One statement said they "have seen information that conflicts" with the preliminary analysis of not exceeding TPA. Instead of submitting that stated information, a request was made for the FAA to see if any other obstruction standard was exceeded.

We are not sure what to make of the statement about these being the tallest in the area. Simply being taller than other structures has never been, nor will it ever be, the sole indicator of whether the structure would present an unacceptable impact upon the safe and efficient use of the navigable airspace.

The letter left the impression that the County believes exceeding one or more of the obstruction standards of 14 CFR Part 77 is reason enough to determine the proposal to be a hazard. That is not the case. It is the result of the aeronautical study that determines whether the structure would be a hazard or no hazard to air navigation. We will always compare proposed structures against all of the obstruction standards but will not circularize the standards that are not exceeded nor any standards and/or effects that are beyond the scope of the public to provide information about.

Records indicate that O88 has approximately 35,000 operations per year primarily from CAT A and B general aviation aircraft. All except one of the proposed turbines lie beyond the TPA for all RWYs and aircraft categories. That one proposal is on the edge of the RWY 15/33 TPA for CAT D, but at 2,199 feet long, this

RWY is incapable of sustaining CAT D aircraft operations. The size of the TPA is based upon the aircraft that regularly use a particular RWY. The preliminary assessment of not exceeding TPA has been confirmed.

Note: Aircraft categories are based on approach speed, CAT A = less than 91 knots, CAT B = 91- 120 knots, CAT C = 121-140 knots, CAT D = 141-165 knots.

The County submitted a lot about radar effects. Wind turbines rarely, if ever create "electromagnetic" interference. If they are within the line of sight of a radar sensor, they may be detected by that sensor and may therefore be a physical interference. Simply being "seen" by the radar is not the real issue though. How that target (in this case, the wind turbine) is processed and displayed for ATC is the key. The users of the system (ATC) is the sole decider on whether the system is acceptable to be able to perform their duties. Although there may be others entities using these radar systems, the responsibility and authority of the FAA is the safe and efficient use of the navigable airspace, including the impact of the radar effects on air navigation.

The turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. However, this would not cause an unacceptable adverse impact on ATC operations at this time.

The aeronautical study disclosed that the proposed structures would have the adverse effect as described above on the NCT MVA. MVAs are solely used by ATC and not published for public use and are not circulated for public comment. The study disclosed that increasing the MVA in the area of the turbines would not impact a significant number of operations. The proposed structures would have no other effect on any existing or proposed arrival, departure, or en route IFR operations or procedures.

Study for possible VFR effect disclosed that the proposals would have no effect on existing or proposed VFR arrival or departure operations. As stated above, the proposals are beyond normal traffic pattern airspace. Therefore, the proposal would not have an adverse effect on VFR traffic pattern operations at O88, or any other known public use or military airports. At 591 feet AGL, the structures would extend upwards into altitudes commonly used for en route VFR flight; however, no information was received to indicate they would be located along a regularly used VFR route or that they would pose a problem for pilots operating en route. Therefore, they would not have a substantial adverse effect on en route VFR flight operations.

The proposed structures would be appropriately obstruction marked/lighted to make them more conspicuous to airmen should circumnavigation be necessary.

The cumulative impact of the proposed structures, when combined with other proposed and existing structures, is not considered to be significant. Study did not disclose any significant adverse effect on existing or proposed public-use or military airports or navigational facilities, nor would the proposals affect the capacity of any known existing or planned public-use or military airport.

Therefore, it is determined that the proposed construction would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation providing the conditions set forth in this determination are met.

Additional conditions:

As a condition of this determination it is required that Notice of Actual Construction or Alteration (7460-2 Part 1) be E-filed at least 60 full days prior to the start of construction so that appropriate action can be taken to amend the effected procedure(s) and/or altitude(s).

Sectional Map for ASN 2018-WTW-13391-OE

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTW-13392-OE

Issued Date: 02/01/2019

Amanda Beck
Sacramento Municipal Utility District
6201 S St., MS MD-2
Sacramento, CA 95817

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine P1R5
Location:	Rio Vista, CA
Latitude:	38-07-14.14N NAD 83
Longitude:	121-46-28.35W
Heights:	116 feet site elevation (SE)
	591 feet above ground level (AGL)
	707 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 60 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

This determination expires on 08/01/2020 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 03, 2019. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 13, 2019 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be

used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

If we can be of further assistance, please contact Steve Phillips, at (816) 329-2523, or steve.phillips@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTW-13392-OE.

Signature Control No: 387140389-395150228 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

Abbreviations:
AGL, Above Ground Level
AMSL, Above Mean Sea Level
ARSR, Air Route Surveillance Radar
ASN, Aeronautical Study Number
ASR, Airport Surveillance Radar
ATC, Air Traffic Control
CAT, Category
CFR, Code of Federal Regulations
DASR, Digital Airport Surveillance Radar
IFR, Instrument Flight Rules
MVA, Minimum Vectoring Altitude
NM, Nautical Mile
RWY, Runway
TPA, Traffic Pattern Airspace
TRACON, Terminal Radar Approach Control
VFR, Visual Flight Rules

The proposed structures are part of a proposed wind farm that would be located approximately 5.02 - 9.07 NM southwest of the Airport Reference Point for the Rio Vista Municipal Airport (O88), Rio Vista, CA. The ASNs with coordinates, AGL heights, and AMSL heights are as shown on page one. They would exceed the obstruction standards of 14 CFR Part 77 as follows:

Section 77.17(a)(1): by 92 feet; a height that exceeds 499 feet AGL.

Section 77.17(a)(2): A height that is 200 feet AGL, or above the established airport elevation, whichever is higher, within 3 NM miles of the established reference point of O88 and that height increases in the proportion of 100 feet for each additional NM from the airport up to a maximum of 499 feet. The following would exceed:

2018-WTW-13388-OE by 190 feet
2018-WTW-13389-OE by 187 feet
2018-WTW-13390-OE by 169 feet
2018-WTW-13391-OE by 154 feet
2018-WTW-13392-OE by 141 feet

2018-WTW-13393-OE by 179 feet
2018-WTW-13394-OE by 167 feet
2018-WTW-13395-OE by 163 feet
2018-WTW-13396-OE by 156 feet

Section 77.17(a)(3): A height that increases a minimum instrument flight altitude within a terminal area;

The following would increase the Northern California TRACON (NCT) MVA for NCT_MVA_FUS3_2017 Sector MCC_B from 1,700 feet AMSL to 1,800 feet AMSL.

2018-WTW-13388-OE
2018-WTW-13389-OE
2018-WTW-13390-OE
2018-WTW-13391-OE
2018-WTW-13393-OE

2018-WTW-13397-OE
2018-WTW-13398-OE
2018-WTW-13399-OE
2018-WTW-13400-OE
2018-WTW-13403-OE

2018-WTW-13404-OE
2018-WTW-13405-OE

The turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. The proposals will affect the quality and/or availability of radar signals. The effects would be unwanted primary returns (clutter) and primary target drops, all in the area of the turbines. Tracked primary targets could diverge from the aircraft path and follow wind turbines, when the aircraft is over or near the turbines.

In order to facilitate the public comment process, the studies were circularized under ASN 2018-WTW-13388-OE on December 04, 2018, to all known aviation interests and to non-aeronautical interests that may be affected by the proposal. One letter of objection was received as a result of the circularization.

The Solano County Airport Land Use Commission (County) submitted comments that may not necessarily be an "objection" but rather statements. Some of their statements are simply repeating applicable law / rule / orders. They stated that these would be the tallest wind turbines in the area and larger than other onshore turbines elsewhere. Also stated was a belief that these have electromagnetic effects on radar. One statement said they "have seen information that conflicts" with the preliminary analysis of not exceeding TPA. Instead of submitting that stated information, a request was made for the FAA to see if any other obstruction standard was exceeded.

We are not sure what to make of the statement about these being the tallest in the area. Simply being taller than other structures has never been, nor will it ever be, the sole indicator of whether the structure would present an unacceptable impact upon the safe and efficient use of the navigable airspace.

The letter left the impression that the County believes exceeding one or more of the obstruction standards of 14 CFR Part 77 is reason enough to determine the proposal to be a hazard. That is not the case. It is the result of the aeronautical study that determines whether the structure would be a hazard or no hazard to air navigation. We will always compare proposed structures against all of the obstruction standards but will not circularize the standards that are not exceeded nor any standards and/or effects that are beyond the scope of the public to provide information about.

Records indicate that O88 has approximately 35,000 operations per year primarily from CAT A and B general aviation aircraft. All except one of the proposed turbines lie beyond the TPA for all RWYs and aircraft categories. That one proposal is on the edge of the RWY 15/33 TPA for CAT D, but at 2,199 feet long, this

RWY is incapable of sustaining CAT D aircraft operations. The size of the TPA is based upon the aircraft that regularly use a particular RWY. The preliminary assessment of not exceeding TPA has been confirmed.

Note: Aircraft categories are based on approach speed, CAT A = less than 91 knots, CAT B = 91- 120 knots, CAT C = 121-140 knots, CAT D = 141-165 knots.

The County submitted a lot about radar effects. Wind turbines rarely, if ever create "electromagnetic" interference. If they are within the line of sight of a radar sensor, they may be detected by that sensor and may therefore be a physical interference. Simply being "seen" by the radar is not the real issue though. How that target (in this case, the wind turbine) is processed and displayed for ATC is the key. The users of the system (ATC) is the sole decider on whether the system is acceptable to be able to perform their duties. Although there may be others entities using these radar systems, the responsibility and authority of the FAA is the safe and efficient use of the navigable airspace, including the impact of the radar effects on air navigation.

The turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. However, this would not cause an unacceptable adverse impact on ATC operations at this time.

The aeronautical study disclosed that the proposed structures would have the adverse effect as described above on the NCT MVA. MVAs are solely used by ATC and not published for public use and are not circulated for public comment. The study disclosed that increasing the MVA in the area of the turbines would not impact a significant number of operations. The proposed structures would have no other effect on any existing or proposed arrival, departure, or en route IFR operations or procedures.

Study for possible VFR effect disclosed that the proposals would have no effect on existing or proposed VFR arrival or departure operations. As stated above, the proposals are beyond normal traffic pattern airspace. Therefore, the proposal would not have an adverse effect on VFR traffic pattern operations at O88, or any other known public use or military airports. At 591 feet AGL, the structures would extend upwards into altitudes commonly used for en route VFR flight; however, no information was received to indicate they would be located along a regularly used VFR route or that they would pose a problem for pilots operating en route. Therefore, they would not have a substantial adverse effect on en route VFR flight operations.

The proposed structures would be appropriately obstruction marked/lighted to make them more conspicuous to airmen should circumnavigation be necessary.

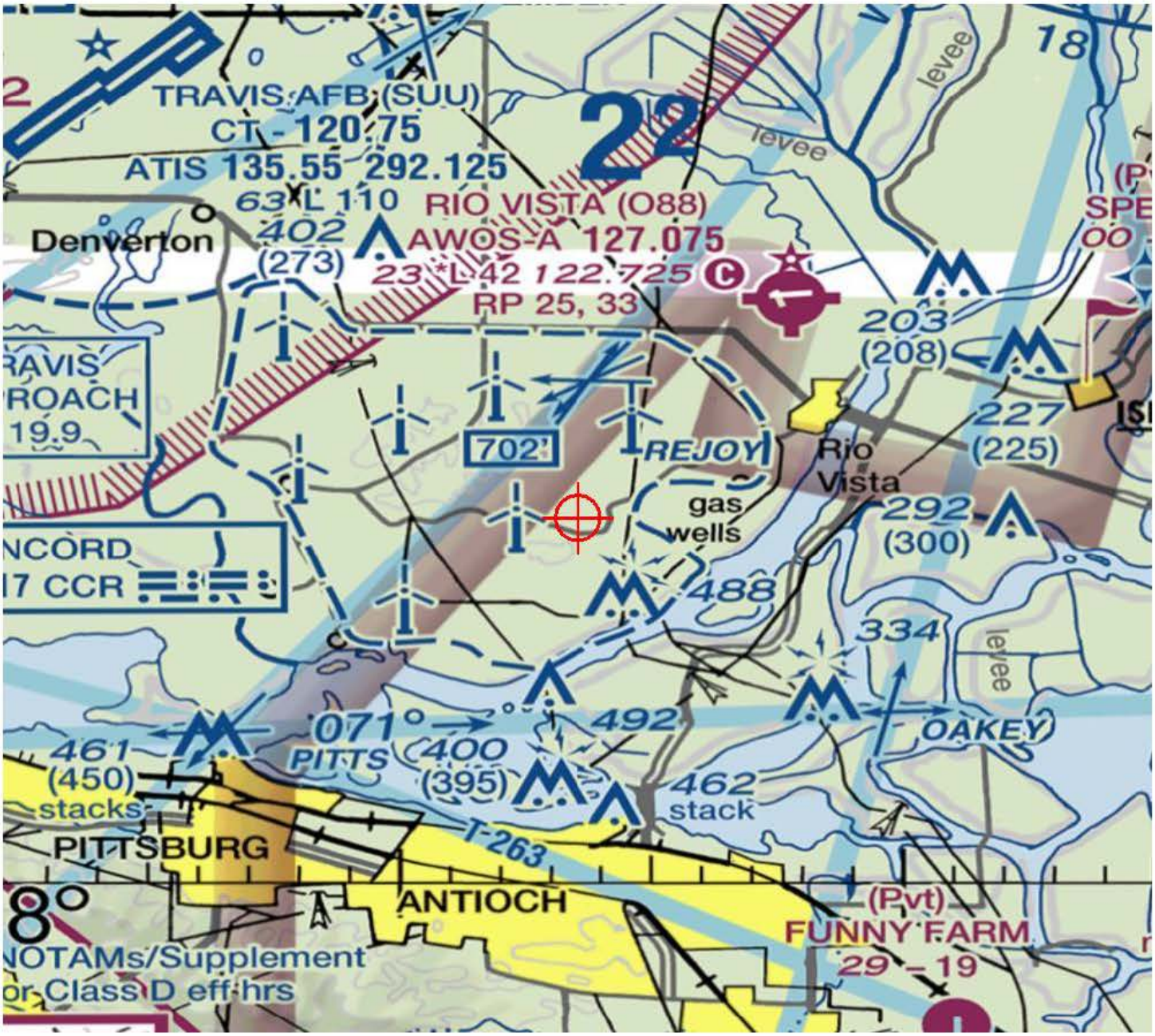
The cumulative impact of the proposed structures, when combined with other proposed and existing structures, is not considered to be significant. Study did not disclose any significant adverse effect on existing or proposed public-use or military airports or navigational facilities, nor would the proposals affect the capacity of any known existing or planned public-use or military airport.

Therefore, it is determined that the proposed construction would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation providing the conditions set forth in this determination are met.

Additional conditions:

As a condition of this determination it is required that Notice of Actual Construction or Alteration (7460-2 Part 1) be E-filed at least 60 full days prior to the start of construction so that appropriate action can be taken to amend the effected procedure(s) and/or altitude(s).

Sectional Map for ASN 2018-WTW-13392-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTW-13393-OE

Issued Date: 02/01/2019

Amanda Beck
Sacramento Municipal Utility District
6201 S St., MS MD-2
Sacramento, CA 95817

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine P1N1
Location:	Rio Vista, CA
Latitude:	38-07-18.49N NAD 83
Longitude:	121-45-46.46W
Heights:	166 feet site elevation (SE)
	591 feet above ground level (AGL)
	757 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 60 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

This determination expires on 08/01/2020 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 03, 2019. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 13, 2019 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be

used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

If we can be of further assistance, please contact Steve Phillips, at (816) 329-2523, or steve.phillips@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTW-13393-OE.

Signature Control No: 387140390-395150231 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

Abbreviations:
AGL, Above Ground Level
AMSL, Above Mean Sea Level
ARSR, Air Route Surveillance Radar
ASN, Aeronautical Study Number
ASR, Airport Surveillance Radar
ATC, Air Traffic Control
CAT, Category
CFR, Code of Federal Regulations
DASR, Digital Airport Surveillance Radar
IFR, Instrument Flight Rules
MVA, Minimum Vectoring Altitude
NM, Nautical Mile
RWY, Runway
TPA, Traffic Pattern Airspace
TRACON, Terminal Radar Approach Control
VFR, Visual Flight Rules

The proposed structures are part of a proposed wind farm that would be located approximately 5.02 - 9.07 NM southwest of the Airport Reference Point for the Rio Vista Municipal Airport (O88), Rio Vista, CA. The ASNs with coordinates, AGL heights, and AMSL heights are as shown on page one. They would exceed the obstruction standards of 14 CFR Part 77 as follows:

Section 77.17(a)(1): by 92 feet; a height that exceeds 499 feet AGL.

Section 77.17(a)(2): A height that is 200 feet AGL, or above the established airport elevation, whichever is higher, within 3 NM miles of the established reference point of O88 and that height increases in the proportion of 100 feet for each additional NM from the airport up to a maximum of 499 feet. The following would exceed:

2018-WTW-13388-OE by 190 feet
2018-WTW-13389-OE by 187 feet
2018-WTW-13390-OE by 169 feet
2018-WTW-13391-OE by 154 feet
2018-WTW-13392-OE by 141 feet

2018-WTW-13393-OE by 179 feet
2018-WTW-13394-OE by 167 feet
2018-WTW-13395-OE by 163 feet
2018-WTW-13396-OE by 156 feet

Section 77.17(a)(3): A height that increases a minimum instrument flight altitude within a terminal area;

The following would increase the Northern California TRACON (NCT) MVA for NCT_MVA_FUS3_2017 Sector MCC_B from 1,700 feet AMSL to 1,800 feet AMSL.

2018-WTW-13388-OE
2018-WTW-13389-OE
2018-WTW-13390-OE
2018-WTW-13391-OE
2018-WTW-13393-OE

2018-WTW-13397-OE
2018-WTW-13398-OE
2018-WTW-13399-OE
2018-WTW-13400-OE
2018-WTW-13403-OE

2018-WTW-13404-OE
2018-WTW-13405-OE

The turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. The proposals will affect the quality and/or availability of radar signals. The effects would be unwanted primary returns (clutter) and primary target drops, all in the area of the turbines. Tracked primary targets could diverge from the aircraft path and follow wind turbines, when the aircraft is over or near the turbines.

In order to facilitate the public comment process, the studies were circularized under ASN 2018-WTW-13388-OE on December 04, 2018, to all known aviation interests and to non-aeronautical interests that may be affected by the proposal. One letter of objection was received as a result of the circularization.

The Solano County Airport Land Use Commission (County) submitted comments that may not necessarily be an "objection" but rather statements. Some of their statements are simply repeating applicable law / rule / orders. They stated that these would be the tallest wind turbines in the area and larger than other onshore turbines elsewhere. Also stated was a belief that these have electromagnetic effects on radar. One statement said they "have seen information that conflicts" with the preliminary analysis of not exceeding TPA. Instead of submitting that stated information, a request was made for the FAA to see if any other obstruction standard was exceeded.

We are not sure what to make of the statement about these being the tallest in the area. Simply being taller than other structures has never been, nor will it ever be, the sole indicator of whether the structure would present an unacceptable impact upon the safe and efficient use of the navigable airspace.

The letter left the impression that the County believes exceeding one or more of the obstruction standards of 14 CFR Part 77 is reason enough to determine the proposal to be a hazard. That is not the case. It is the result of the aeronautical study that determines whether the structure would be a hazard or no hazard to air navigation. We will always compare proposed structures against all of the obstruction standards but will not circularize the standards that are not exceeded nor any standards and/or effects that are beyond the scope of the public to provide information about.

Records indicate that O88 has approximately 35,000 operations per year primarily from CAT A and B general aviation aircraft. All except one of the proposed turbines lie beyond the TPA for all RWYs and aircraft categories. That one proposal is on the edge of the RWY 15/33 TPA for CAT D, but at 2,199 feet long, this

RWY is incapable of sustaining CAT D aircraft operations. The size of the TPA is based upon the aircraft that regularly use a particular RWY. The preliminary assessment of not exceeding TPA has been confirmed.

Note: Aircraft categories are based on approach speed, CAT A = less than 91 knots, CAT B = 91- 120 knots, CAT C = 121-140 knots, CAT D = 141-165 knots.

The County submitted a lot about radar effects. Wind turbines rarely, if ever create "electromagnetic" interference. If they are within the line of sight of a radar sensor, they may be detected by that sensor and may therefore be a physical interference. Simply being "seen" by the radar is not the real issue though. How that target (in this case, the wind turbine) is processed and displayed for ATC is the key. The users of the system (ATC) is the sole decider on whether the system is acceptable to be able to perform their duties. Although there may be others entities using these radar systems, the responsibility and authority of the FAA is the safe and efficient use of the navigable airspace, including the impact of the radar effects on air navigation.

The turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. However, this would not cause an unacceptable adverse impact on ATC operations at this time.

The aeronautical study disclosed that the proposed structures would have the adverse effect as described above on the NCT MVA. MVAs are solely used by ATC and not published for public use and are not circulated for public comment. The study disclosed that increasing the MVA in the area of the turbines would not impact a significant number of operations. The proposed structures would have no other effect on any existing or proposed arrival, departure, or en route IFR operations or procedures.

Study for possible VFR effect disclosed that the proposals would have no effect on existing or proposed VFR arrival or departure operations. As stated above, the proposals are beyond normal traffic pattern airspace. Therefore, the proposal would not have an adverse effect on VFR traffic pattern operations at O88, or any other known public use or military airports. At 591 feet AGL, the structures would extend upwards into altitudes commonly used for en route VFR flight; however, no information was received to indicate they would be located along a regularly used VFR route or that they would pose a problem for pilots operating en route. Therefore, they would not have a substantial adverse effect on en route VFR flight operations.

The proposed structures would be appropriately obstruction marked/lighted to make them more conspicuous to airmen should circumnavigation be necessary.

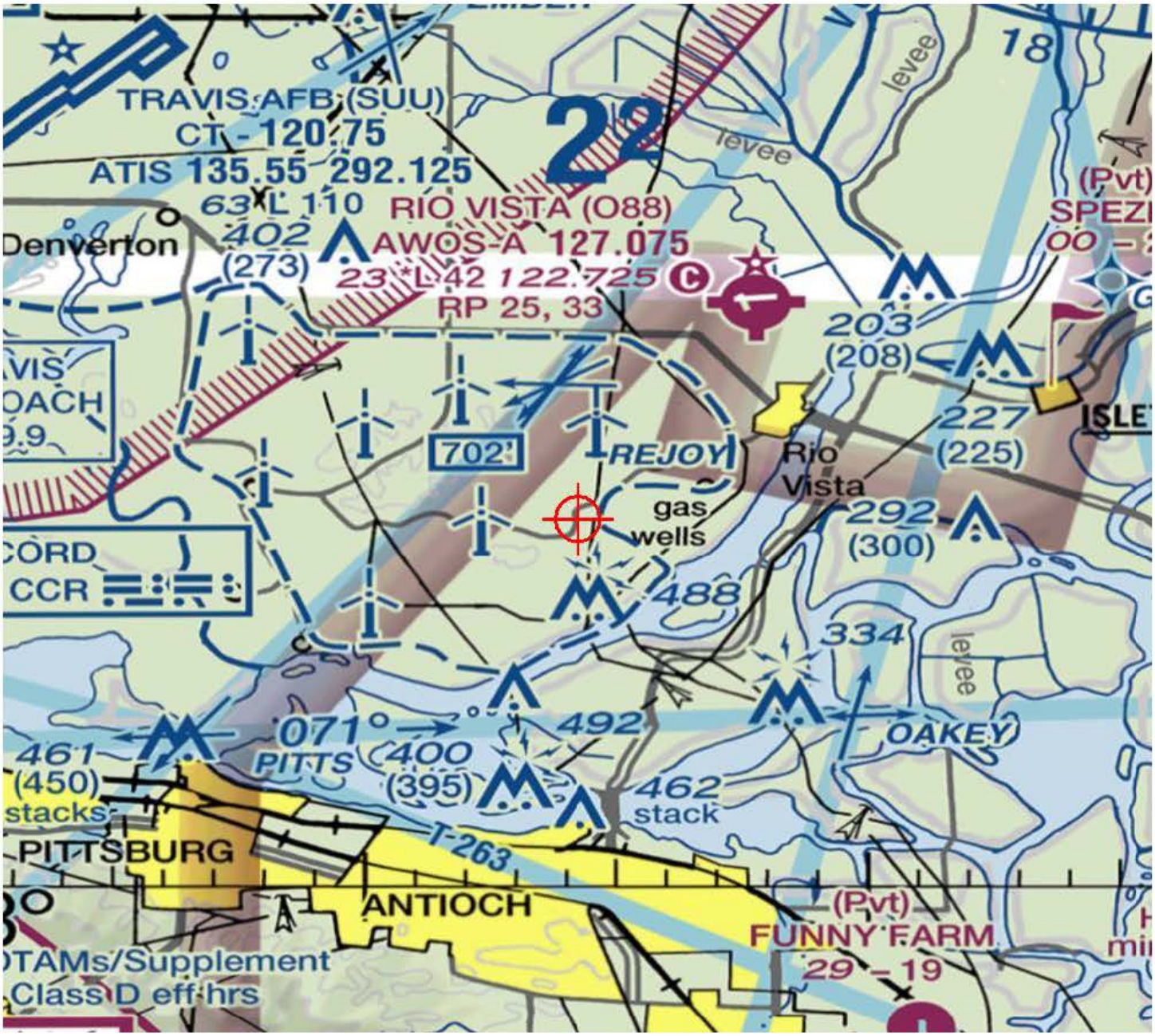
The cumulative impact of the proposed structures, when combined with other proposed and existing structures, is not considered to be significant. Study did not disclose any significant adverse effect on existing or proposed public-use or military airports or navigational facilities, nor would the proposals affect the capacity of any known existing or planned public-use or military airport.

Therefore, it is determined that the proposed construction would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation providing the conditions set forth in this determination are met.

Additional conditions:

As a condition of this determination it is required that Notice of Actual Construction or Alteration (7460-2 Part 1) be E-filed at least 60 full days prior to the start of construction so that appropriate action can be taken to amend the effected procedure(s) and/or altitude(s).

Sectional Map for ASN 2018-WTW-13393-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTW-13394-OE

Issued Date: 02/01/2019

Amanda Beck
Sacramento Municipal Utility District
6201 S St., MS MD-2
Sacramento, CA 95817

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine P1N2
Location:	Rio Vista, CA
Latitude:	38-07-08.51N NAD 83
Longitude:	121-45-43.44W
Heights:	157 feet site elevation (SE)
	591 feet above ground level (AGL)
	748 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 60 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

This determination expires on 08/01/2020 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 03, 2019. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 13, 2019 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be

used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

If we can be of further assistance, please contact Steve Phillips, at (816) 329-2523, or steve.phillips@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTW-13394-OE.

Signature Control No: 387140391-395150230 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

Abbreviations:
AGL, Above Ground Level
AMSL, Above Mean Sea Level
ARSR, Air Route Surveillance Radar
ASN, Aeronautical Study Number
ASR, Airport Surveillance Radar
ATC, Air Traffic Control
CAT, Category
CFR, Code of Federal Regulations
DASR, Digital Airport Surveillance Radar
IFR, Instrument Flight Rules
MVA, Minimum Vectoring Altitude
NM, Nautical Mile
RWY, Runway
TPA, Traffic Pattern Airspace
TRACON, Terminal Radar Approach Control
VFR, Visual Flight Rules

The proposed structures are part of a proposed wind farm that would be located approximately 5.02 - 9.07 NM southwest of the Airport Reference Point for the Rio Vista Municipal Airport (O88), Rio Vista, CA. The ASNs with coordinates, AGL heights, and AMSL heights are as shown on page one. They would exceed the obstruction standards of 14 CFR Part 77 as follows:

Section 77.17(a)(1): by 92 feet; a height that exceeds 499 feet AGL.

Section 77.17(a)(2): A height that is 200 feet AGL, or above the established airport elevation, whichever is higher, within 3 NM miles of the established reference point of O88 and that height increases in the proportion of 100 feet for each additional NM from the airport up to a maximum of 499 feet. The following would exceed:

2018-WTW-13388-OE by 190 feet
2018-WTW-13389-OE by 187 feet
2018-WTW-13390-OE by 169 feet
2018-WTW-13391-OE by 154 feet
2018-WTW-13392-OE by 141 feet

2018-WTW-13393-OE by 179 feet
2018-WTW-13394-OE by 167 feet
2018-WTW-13395-OE by 163 feet
2018-WTW-13396-OE by 156 feet

Section 77.17(a)(3): A height that increases a minimum instrument flight altitude within a terminal area;

The following would increase the Northern California TRACON (NCT) MVA for NCT_MVA_FUS3_2017 Sector MCC_B from 1,700 feet AMSL to 1,800 feet AMSL.

2018-WTW-13388-OE
2018-WTW-13389-OE
2018-WTW-13390-OE
2018-WTW-13391-OE
2018-WTW-13393-OE

2018-WTW-13397-OE
2018-WTW-13398-OE
2018-WTW-13399-OE
2018-WTW-13400-OE
2018-WTW-13403-OE

2018-WTW-13404-OE
2018-WTW-13405-OE

The turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. The proposals will affect the quality and/or availability of radar signals. The effects would be unwanted primary returns (clutter) and primary target drops, all in the area of the turbines. Tracked primary targets could diverge from the aircraft path and follow wind turbines, when the aircraft is over or near the turbines.

In order to facilitate the public comment process, the studies were circularized under ASN 2018-WTW-13388-OE on December 04, 2018, to all known aviation interests and to non-aeronautical interests that may be affected by the proposal. One letter of objection was received as a result of the circularization.

The Solano County Airport Land Use Commission (County) submitted comments that may not necessarily be an "objection" but rather statements. Some of their statements are simply repeating applicable law / rule / orders. They stated that these would be the tallest wind turbines in the area and larger than other onshore turbines elsewhere. Also stated was a belief that these have electromagnetic effects on radar. One statement said they "have seen information that conflicts" with the preliminary analysis of not exceeding TPA. Instead of submitting that stated information, a request was made for the FAA to see if any other obstruction standard was exceeded.

We are not sure what to make of the statement about these being the tallest in the area. Simply being taller than other structures has never been, nor will it ever be, the sole indicator of whether the structure would present an unacceptable impact upon the safe and efficient use of the navigable airspace.

The letter left the impression that the County believes exceeding one or more of the obstruction standards of 14 CFR Part 77 is reason enough to determine the proposal to be a hazard. That is not the case. It is the result of the aeronautical study that determines whether the structure would be a hazard or no hazard to air navigation. We will always compare proposed structures against all of the obstruction standards but will not circularize the standards that are not exceeded nor any standards and/or effects that are beyond the scope of the public to provide information about.

Records indicate that O88 has approximately 35,000 operations per year primarily from CAT A and B general aviation aircraft. All except one of the proposed turbines lie beyond the TPA for all RWYs and aircraft categories. That one proposal is on the edge of the RWY 15/33 TPA for CAT D, but at 2,199 feet long, this

RWY is incapable of sustaining CAT D aircraft operations. The size of the TPA is based upon the aircraft that regularly use a particular RWY. The preliminary assessment of not exceeding TPA has been confirmed.

Note: Aircraft categories are based on approach speed, CAT A = less than 91 knots, CAT B = 91- 120 knots, CAT C = 121-140 knots, CAT D = 141-165 knots.

The County submitted a lot about radar effects. Wind turbines rarely, if ever create "electromagnetic" interference. If they are within the line of sight of a radar sensor, they may be detected by that sensor and may therefore be a physical interference. Simply being "seen" by the radar is not the real issue though. How that target (in this case, the wind turbine) is processed and displayed for ATC is the key. The users of the system (ATC) is the sole decider on whether the system is acceptable to be able to perform their duties. Although there may be others entities using these radar systems, the responsibility and authority of the FAA is the safe and efficient use of the navigable airspace, including the impact of the radar effects on air navigation.

The turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. However, this would not cause an unacceptable adverse impact on ATC operations at this time.

The aeronautical study disclosed that the proposed structures would have the adverse effect as described above on the NCT MVA. MVAs are solely used by ATC and not published for public use and are not circulated for public comment. The study disclosed that increasing the MVA in the area of the turbines would not impact a significant number of operations. The proposed structures would have no other effect on any existing or proposed arrival, departure, or en route IFR operations or procedures.

Study for possible VFR effect disclosed that the proposals would have no effect on existing or proposed VFR arrival or departure operations. As stated above, the proposals are beyond normal traffic pattern airspace. Therefore, the proposal would not have an adverse effect on VFR traffic pattern operations at O88, or any other known public use or military airports. At 591 feet AGL, the structures would extend upwards into altitudes commonly used for en route VFR flight; however, no information was received to indicate they would be located along a regularly used VFR route or that they would pose a problem for pilots operating en route. Therefore, they would not have a substantial adverse effect on en route VFR flight operations.

The proposed structures would be appropriately obstruction marked/lighted to make them more conspicuous to airmen should circumnavigation be necessary.

The cumulative impact of the proposed structures, when combined with other proposed and existing structures, is not considered to be significant. Study did not disclose any significant adverse effect on existing or proposed public-use or military airports or navigational facilities, nor would the proposals affect the capacity of any known existing or planned public-use or military airport.

Therefore, it is determined that the proposed construction would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation providing the conditions set forth in this determination are met.

Additional conditions:

As a condition of this determination it is required that Notice of Actual Construction or Alteration (7460-2 Part 1) be E-filed at least 60 full days prior to the start of construction so that appropriate action can be taken to amend the effected procedure(s) and/or altitude(s).

Sectional Map for ASN 2018-WTW-13394-OE

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTW-13395-OE

Issued Date: 02/01/2019

Amanda Beck
Sacramento Municipal Utility District
6201 S St., MS MD-2
Sacramento, CA 95817

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine P1N3
Location:	Rio Vista, CA
Latitude:	38-06-53.36N NAD 83
Longitude:	121-45-15.19W
Heights:	115 feet site elevation (SE)
	591 feet above ground level (AGL)
	706 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 60 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

This determination expires on 08/01/2020 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 03, 2019. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 13, 2019 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be

used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

If we can be of further assistance, please contact Steve Phillips, at (816) 329-2523, or steve.phillips@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTW-13395-OE.

Signature Control No: 387140392-395150233 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

Abbreviations:
AGL, Above Ground Level
AMSL, Above Mean Sea Level
ARSR, Air Route Surveillance Radar
ASN, Aeronautical Study Number
ASR, Airport Surveillance Radar
ATC, Air Traffic Control
CAT, Category
CFR, Code of Federal Regulations
DASR, Digital Airport Surveillance Radar
IFR, Instrument Flight Rules
MVA, Minimum Vectoring Altitude
NM, Nautical Mile
RWY, Runway
TPA, Traffic Pattern Airspace
TRACON, Terminal Radar Approach Control
VFR, Visual Flight Rules

The proposed structures are part of a proposed wind farm that would be located approximately 5.02 - 9.07 NM southwest of the Airport Reference Point for the Rio Vista Municipal Airport (O88), Rio Vista, CA. The ASNs with coordinates, AGL heights, and AMSL heights are as shown on page one. They would exceed the obstruction standards of 14 CFR Part 77 as follows:

Section 77.17(a)(1): by 92 feet; a height that exceeds 499 feet AGL.

Section 77.17(a)(2): A height that is 200 feet AGL, or above the established airport elevation, whichever is higher, within 3 NM miles of the established reference point of O88 and that height increases in the proportion of 100 feet for each additional NM from the airport up to a maximum of 499 feet. The following would exceed:

2018-WTW-13388-OE by 190 feet
2018-WTW-13389-OE by 187 feet
2018-WTW-13390-OE by 169 feet
2018-WTW-13391-OE by 154 feet
2018-WTW-13392-OE by 141 feet

2018-WTW-13393-OE by 179 feet
2018-WTW-13394-OE by 167 feet
2018-WTW-13395-OE by 163 feet
2018-WTW-13396-OE by 156 feet

Section 77.17(a)(3): A height that increases a minimum instrument flight altitude within a terminal area;

The following would increase the Northern California TRACON (NCT) MVA for NCT_MVA_FUS3_2017 Sector MCC_B from 1,700 feet AMSL to 1,800 feet AMSL.

2018-WTW-13388-OE
2018-WTW-13389-OE
2018-WTW-13390-OE
2018-WTW-13391-OE
2018-WTW-13393-OE

2018-WTW-13397-OE
2018-WTW-13398-OE
2018-WTW-13399-OE
2018-WTW-13400-OE
2018-WTW-13403-OE

2018-WTW-13404-OE
2018-WTW-13405-OE

The turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. The proposals will affect the quality and/or availability of radar signals. The effects would be unwanted primary returns (clutter) and primary target drops, all in the area of the turbines. Tracked primary targets could diverge from the aircraft path and follow wind turbines, when the aircraft is over or near the turbines.

In order to facilitate the public comment process, the studies were circularized under ASN 2018-WTW-13388-OE on December 04, 2018, to all known aviation interests and to non-aeronautical interests that may be affected by the proposal. One letter of objection was received as a result of the circularization.

The Solano County Airport Land Use Commission (County) submitted comments that may not necessarily be an "objection" but rather statements. Some of their statements are simply repeating applicable law / rule / orders. They stated that these would be the tallest wind turbines in the area and larger than other onshore turbines elsewhere. Also stated was a belief that these have electromagnetic effects on radar. One statement said they "have seen information that conflicts" with the preliminary analysis of not exceeding TPA. Instead of submitting that stated information, a request was made for the FAA to see if any other obstruction standard was exceeded.

We are not sure what to make of the statement about these being the tallest in the area. Simply being taller than other structures has never been, nor will it ever be, the sole indicator of whether the structure would present an unacceptable impact upon the safe and efficient use of the navigable airspace.

The letter left the impression that the County believes exceeding one or more of the obstruction standards of 14 CFR Part 77 is reason enough to determine the proposal to be a hazard. That is not the case. It is the result of the aeronautical study that determines whether the structure would be a hazard or no hazard to air navigation. We will always compare proposed structures against all of the obstruction standards but will not circularize the standards that are not exceeded nor any standards and/or effects that are beyond the scope of the public to provide information about.

Records indicate that O88 has approximately 35,000 operations per year primarily from CAT A and B general aviation aircraft. All except one of the proposed turbines lie beyond the TPA for all RWYs and aircraft categories. That one proposal is on the edge of the RWY 15/33 TPA for CAT D, but at 2,199 feet long, this

RWY is incapable of sustaining CAT D aircraft operations. The size of the TPA is based upon the aircraft that regularly use a particular RWY. The preliminary assessment of not exceeding TPA has been confirmed.

Note: Aircraft categories are based on approach speed, CAT A = less than 91 knots, CAT B = 91- 120 knots, CAT C = 121-140 knots, CAT D = 141-165 knots.

The County submitted a lot about radar effects. Wind turbines rarely, if ever create "electromagnetic" interference. If they are within the line of sight of a radar sensor, they may be detected by that sensor and may therefore be a physical interference. Simply being "seen" by the radar is not the real issue though. How that target (in this case, the wind turbine) is processed and displayed for ATC is the key. The users of the system (ATC) is the sole decider on whether the system is acceptable to be able to perform their duties. Although there may be others entities using these radar systems, the responsibility and authority of the FAA is the safe and efficient use of the navigable airspace, including the impact of the radar effects on air navigation.

The turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. However, this would not cause an unacceptable adverse impact on ATC operations at this time.

The aeronautical study disclosed that the proposed structures would have the adverse effect as described above on the NCT MVA. MVAs are solely used by ATC and not published for public use and are not circulated for public comment. The study disclosed that increasing the MVA in the area of the turbines would not impact a significant number of operations. The proposed structures would have no other effect on any existing or proposed arrival, departure, or en route IFR operations or procedures.

Study for possible VFR effect disclosed that the proposals would have no effect on existing or proposed VFR arrival or departure operations. As stated above, the proposals are beyond normal traffic pattern airspace. Therefore, the proposal would not have an adverse effect on VFR traffic pattern operations at O88, or any other known public use or military airports. At 591 feet AGL, the structures would extend upwards into altitudes commonly used for en route VFR flight; however, no information was received to indicate they would be located along a regularly used VFR route or that they would pose a problem for pilots operating en route. Therefore, they would not have a substantial adverse effect on en route VFR flight operations.

The proposed structures would be appropriately obstruction marked/lighted to make them more conspicuous to airmen should circumnavigation be necessary.

The cumulative impact of the proposed structures, when combined with other proposed and existing structures, is not considered to be significant. Study did not disclose any significant adverse effect on existing or proposed public-use or military airports or navigational facilities, nor would the proposals affect the capacity of any known existing or planned public-use or military airport.

Therefore, it is determined that the proposed construction would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation providing the conditions set forth in this determination are met.

Additional conditions:

As a condition of this determination it is required that Notice of Actual Construction or Alteration (7460-2 Part 1) be E-filed at least 60 full days prior to the start of construction so that appropriate action can be taken to amend the effected procedure(s) and/or altitude(s).

Sectional Map for ASN 2018-WTW-13395-OE

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTW-13396-OE

Issued Date: 02/01/2019

Amanda Beck
Sacramento Municipal Utility District
6201 S St., MS MD-2
Sacramento, CA 95817

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine P1N4
Location:	Rio Vista, CA
Latitude:	38-06-43.69N NAD 83
Longitude:	121-45-03.40W
Heights:	54 feet site elevation (SE)
	591 feet above ground level (AGL)
	645 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 60 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

This determination expires on 08/01/2020 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 03, 2019. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 13, 2019 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be

used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

If we can be of further assistance, please contact Steve Phillips, at (816) 329-2523, or steve.phillips@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTW-13396-OE.

Signature Control No: 387140393-395150245 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

Abbreviations:
AGL, Above Ground Level
AMSL, Above Mean Sea Level
ARSR, Air Route Surveillance Radar
ASN, Aeronautical Study Number
ASR, Airport Surveillance Radar
ATC, Air Traffic Control
CAT, Category
CFR, Code of Federal Regulations
DASR, Digital Airport Surveillance Radar
IFR, Instrument Flight Rules
MVA, Minimum Vectoring Altitude
NM, Nautical Mile
RWY, Runway
TPA, Traffic Pattern Airspace
TRACON, Terminal Radar Approach Control
VFR, Visual Flight Rules

The proposed structures are part of a proposed wind farm that would be located approximately 5.02 - 9.07 NM southwest of the Airport Reference Point for the Rio Vista Municipal Airport (O88), Rio Vista, CA. The ASNs with coordinates, AGL heights, and AMSL heights are as shown on page one. They would exceed the obstruction standards of 14 CFR Part 77 as follows:

Section 77.17(a)(1): by 92 feet; a height that exceeds 499 feet AGL.

Section 77.17(a)(2): A height that is 200 feet AGL, or above the established airport elevation, whichever is higher, within 3 NM miles of the established reference point of O88 and that height increases in the proportion of 100 feet for each additional NM from the airport up to a maximum of 499 feet. The following would exceed:

2018-WTW-13388-OE by 190 feet
2018-WTW-13389-OE by 187 feet
2018-WTW-13390-OE by 169 feet
2018-WTW-13391-OE by 154 feet
2018-WTW-13392-OE by 141 feet

2018-WTW-13393-OE by 179 feet
2018-WTW-13394-OE by 167 feet
2018-WTW-13395-OE by 163 feet
2018-WTW-13396-OE by 156 feet

Section 77.17(a)(3): A height that increases a minimum instrument flight altitude within a terminal area;

The following would increase the Northern California TRACON (NCT) MVA for NCT_MVA_FUS3_2017 Sector MCC_B from 1,700 feet AMSL to 1,800 feet AMSL.

2018-WTW-13388-OE
2018-WTW-13389-OE
2018-WTW-13390-OE
2018-WTW-13391-OE
2018-WTW-13393-OE

2018-WTW-13397-OE
2018-WTW-13398-OE
2018-WTW-13399-OE
2018-WTW-13400-OE
2018-WTW-13403-OE

2018-WTW-13404-OE
2018-WTW-13405-OE

The turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. The proposals will affect the quality and/or availability of radar signals. The effects would be unwanted primary returns (clutter) and primary target drops, all in the area of the turbines. Tracked primary targets could diverge from the aircraft path and follow wind turbines, when the aircraft is over or near the turbines.

In order to facilitate the public comment process, the studies were circularized under ASN 2018-WTW-13388-OE on December 04, 2018, to all known aviation interests and to non-aeronautical interests that may be affected by the proposal. One letter of objection was received as a result of the circularization.

The Solano County Airport Land Use Commission (County) submitted comments that may not necessarily be an "objection" but rather statements. Some of their statements are simply repeating applicable law / rule / orders. They stated that these would be the tallest wind turbines in the area and larger than other onshore turbines elsewhere. Also stated was a belief that these have electromagnetic effects on radar. One statement said they "have seen information that conflicts" with the preliminary analysis of not exceeding TPA. Instead of submitting that stated information, a request was made for the FAA to see if any other obstruction standard was exceeded.

We are not sure what to make of the statement about these being the tallest in the area. Simply being taller than other structures has never been, nor will it ever be, the sole indicator of whether the structure would present an unacceptable impact upon the safe and efficient use of the navigable airspace.

The letter left the impression that the County believes exceeding one or more of the obstruction standards of 14 CFR Part 77 is reason enough to determine the proposal to be a hazard. That is not the case. It is the result of the aeronautical study that determines whether the structure would be a hazard or no hazard to air navigation. We will always compare proposed structures against all of the obstruction standards but will not circularize the standards that are not exceeded nor any standards and/or effects that are beyond the scope of the public to provide information about.

Records indicate that O88 has approximately 35,000 operations per year primarily from CAT A and B general aviation aircraft. All except one of the proposed turbines lie beyond the TPA for all RWYs and aircraft categories. That one proposal is on the edge of the RWY 15/33 TPA for CAT D, but at 2,199 feet long, this

RWY is incapable of sustaining CAT D aircraft operations. The size of the TPA is based upon the aircraft that regularly use a particular RWY. The preliminary assessment of not exceeding TPA has been confirmed.

Note: Aircraft categories are based on approach speed, CAT A = less than 91 knots, CAT B = 91- 120 knots, CAT C = 121-140 knots, CAT D = 141-165 knots.

The County submitted a lot about radar effects. Wind turbines rarely, if ever create "electromagnetic" interference. If they are within the line of sight of a radar sensor, they may be detected by that sensor and may therefore be a physical interference. Simply being "seen" by the radar is not the real issue though. How that target (in this case, the wind turbine) is processed and displayed for ATC is the key. The users of the system (ATC) is the sole decider on whether the system is acceptable to be able to perform their duties. Although there may be others entities using these radar systems, the responsibility and authority of the FAA is the safe and efficient use of the navigable airspace, including the impact of the radar effects on air navigation.

The turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. However, this would not cause an unacceptable adverse impact on ATC operations at this time.

The aeronautical study disclosed that the proposed structures would have the adverse effect as described above on the NCT MVA. MVAs are solely used by ATC and not published for public use and are not circulated for public comment. The study disclosed that increasing the MVA in the area of the turbines would not impact a significant number of operations. The proposed structures would have no other effect on any existing or proposed arrival, departure, or en route IFR operations or procedures.

Study for possible VFR effect disclosed that the proposals would have no effect on existing or proposed VFR arrival or departure operations. As stated above, the proposals are beyond normal traffic pattern airspace. Therefore, the proposal would not have an adverse effect on VFR traffic pattern operations at O88, or any other known public use or military airports. At 591 feet AGL, the structures would extend upwards into altitudes commonly used for en route VFR flight; however, no information was received to indicate they would be located along a regularly used VFR route or that they would pose a problem for pilots operating en route. Therefore, they would not have a substantial adverse effect on en route VFR flight operations.

The proposed structures would be appropriately obstruction marked/lighted to make them more conspicuous to airmen should circumnavigation be necessary.

The cumulative impact of the proposed structures, when combined with other proposed and existing structures, is not considered to be significant. Study did not disclose any significant adverse effect on existing or proposed public-use or military airports or navigational facilities, nor would the proposals affect the capacity of any known existing or planned public-use or military airport.

Therefore, it is determined that the proposed construction would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation providing the conditions set forth in this determination are met.

Additional conditions:

As a condition of this determination it is required that Notice of Actual Construction or Alteration (7460-2 Part 1) be E-filed at least 60 full days prior to the start of construction so that appropriate action can be taken to amend the effected procedure(s) and/or altitude(s).

Sectional Map for ASN 2018-WTW-13396-OE

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTW-13397-OE

Issued Date: 02/01/2019

Amanda Beck
Sacramento Municipal Utility District
6201 S St., MS MD-2
Sacramento, CA 95817

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine P4N1
Location:	Rio Vista, CA
Latitude:	38-05-33.53N NAD 83
Longitude:	121-49-52.57W
Heights:	242 feet site elevation (SE)
	591 feet above ground level (AGL)
	833 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 60 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

This determination expires on 08/01/2020 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 03, 2019. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 13, 2019 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be

used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

If we can be of further assistance, please contact Steve Phillips, at (816) 329-2523, or steve.phillips@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTW-13397-OE.

Signature Control No: 387140394-395150234 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

Abbreviations:
AGL, Above Ground Level
AMSL, Above Mean Sea Level
ARSR, Air Route Surveillance Radar
ASN, Aeronautical Study Number
ASR, Airport Surveillance Radar
ATC, Air Traffic Control
CAT, Category
CFR, Code of Federal Regulations
DASR, Digital Airport Surveillance Radar
IFR, Instrument Flight Rules
MVA, Minimum Vectoring Altitude
NM, Nautical Mile
RWY, Runway
TPA, Traffic Pattern Airspace
TRACON, Terminal Radar Approach Control
VFR, Visual Flight Rules

The proposed structures are part of a proposed wind farm that would be located approximately 5.02 - 9.07 NM southwest of the Airport Reference Point for the Rio Vista Municipal Airport (O88), Rio Vista, CA. The ASNs with coordinates, AGL heights, and AMSL heights are as shown on page one. They would exceed the obstruction standards of 14 CFR Part 77 as follows:

Section 77.17(a)(1): by 92 feet; a height that exceeds 499 feet AGL.

Section 77.17(a)(2): A height that is 200 feet AGL, or above the established airport elevation, whichever is higher, within 3 NM miles of the established reference point of O88 and that height increases in the proportion of 100 feet for each additional NM from the airport up to a maximum of 499 feet. The following would exceed:

2018-WTW-13388-OE by 190 feet
2018-WTW-13389-OE by 187 feet
2018-WTW-13390-OE by 169 feet
2018-WTW-13391-OE by 154 feet
2018-WTW-13392-OE by 141 feet

2018-WTW-13393-OE by 179 feet
2018-WTW-13394-OE by 167 feet
2018-WTW-13395-OE by 163 feet
2018-WTW-13396-OE by 156 feet

Section 77.17(a)(3): A height that increases a minimum instrument flight altitude within a terminal area;

The following would increase the Northern California TRACON (NCT) MVA for NCT_MVA_FUS3_2017 Sector MCC_B from 1,700 feet AMSL to 1,800 feet AMSL.

2018-WTW-13388-OE
2018-WTW-13389-OE
2018-WTW-13390-OE
2018-WTW-13391-OE
2018-WTW-13393-OE

2018-WTW-13397-OE
2018-WTW-13398-OE
2018-WTW-13399-OE
2018-WTW-13400-OE
2018-WTW-13403-OE

2018-WTW-13404-OE
2018-WTW-13405-OE

The turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. The proposals will affect the quality and/or availability of radar signals. The effects would be unwanted primary returns (clutter) and primary target drops, all in the area of the turbines. Tracked primary targets could diverge from the aircraft path and follow wind turbines, when the aircraft is over or near the turbines.

In order to facilitate the public comment process, the studies were circularized under ASN 2018-WTW-13388-OE on December 04, 2018, to all known aviation interests and to non-aeronautical interests that may be affected by the proposal. One letter of objection was received as a result of the circularization.

The Solano County Airport Land Use Commission (County) submitted comments that may not necessarily be an "objection" but rather statements. Some of their statements are simply repeating applicable law / rule / orders. They stated that these would be the tallest wind turbines in the area and larger than other onshore turbines elsewhere. Also stated was a belief that these have electromagnetic effects on radar. One statement said they "have seen information that conflicts" with the preliminary analysis of not exceeding TPA. Instead of submitting that stated information, a request was made for the FAA to see if any other obstruction standard was exceeded.

We are not sure what to make of the statement about these being the tallest in the area. Simply being taller than other structures has never been, nor will it ever be, the sole indicator of whether the structure would present an unacceptable impact upon the safe and efficient use of the navigable airspace.

The letter left the impression that the County believes exceeding one or more of the obstruction standards of 14 CFR Part 77 is reason enough to determine the proposal to be a hazard. That is not the case. It is the result of the aeronautical study that determines whether the structure would be a hazard or no hazard to air navigation. We will always compare proposed structures against all of the obstruction standards but will not circularize the standards that are not exceeded nor any standards and/or effects that are beyond the scope of the public to provide information about.

Records indicate that O88 has approximately 35,000 operations per year primarily from CAT A and B general aviation aircraft. All except one of the proposed turbines lie beyond the TPA for all RWYs and aircraft categories. That one proposal is on the edge of the RWY 15/33 TPA for CAT D, but at 2,199 feet long, this

RWY is incapable of sustaining CAT D aircraft operations. The size of the TPA is based upon the aircraft that regularly use a particular RWY. The preliminary assessment of not exceeding TPA has been confirmed.

Note: Aircraft categories are based on approach speed, CAT A = less than 91 knots, CAT B = 91- 120 knots, CAT C = 121-140 knots, CAT D = 141-165 knots.

The County submitted a lot about radar effects. Wind turbines rarely, if ever create "electromagnetic" interference. If they are within the line of sight of a radar sensor, they may be detected by that sensor and may therefore be a physical interference. Simply being "seen" by the radar is not the real issue though. How that target (in this case, the wind turbine) is processed and displayed for ATC is the key. The users of the system (ATC) is the sole decider on whether the system is acceptable to be able to perform their duties. Although there may be others entities using these radar systems, the responsibility and authority of the FAA is the safe and efficient use of the navigable airspace, including the impact of the radar effects on air navigation.

The turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. However, this would not cause an unacceptable adverse impact on ATC operations at this time.

The aeronautical study disclosed that the proposed structures would have the adverse effect as described above on the NCT MVA. MVAs are solely used by ATC and not published for public use and are not circulated for public comment. The study disclosed that increasing the MVA in the area of the turbines would not impact a significant number of operations. The proposed structures would have no other effect on any existing or proposed arrival, departure, or en route IFR operations or procedures.

Study for possible VFR effect disclosed that the proposals would have no effect on existing or proposed VFR arrival or departure operations. As stated above, the proposals are beyond normal traffic pattern airspace. Therefore, the proposal would not have an adverse effect on VFR traffic pattern operations at O88, or any other known public use or military airports. At 591 feet AGL, the structures would extend upwards into altitudes commonly used for en route VFR flight; however, no information was received to indicate they would be located along a regularly used VFR route or that they would pose a problem for pilots operating en route. Therefore, they would not have a substantial adverse effect on en route VFR flight operations.

The proposed structures would be appropriately obstruction marked/lighted to make them more conspicuous to airmen should circumnavigation be necessary.

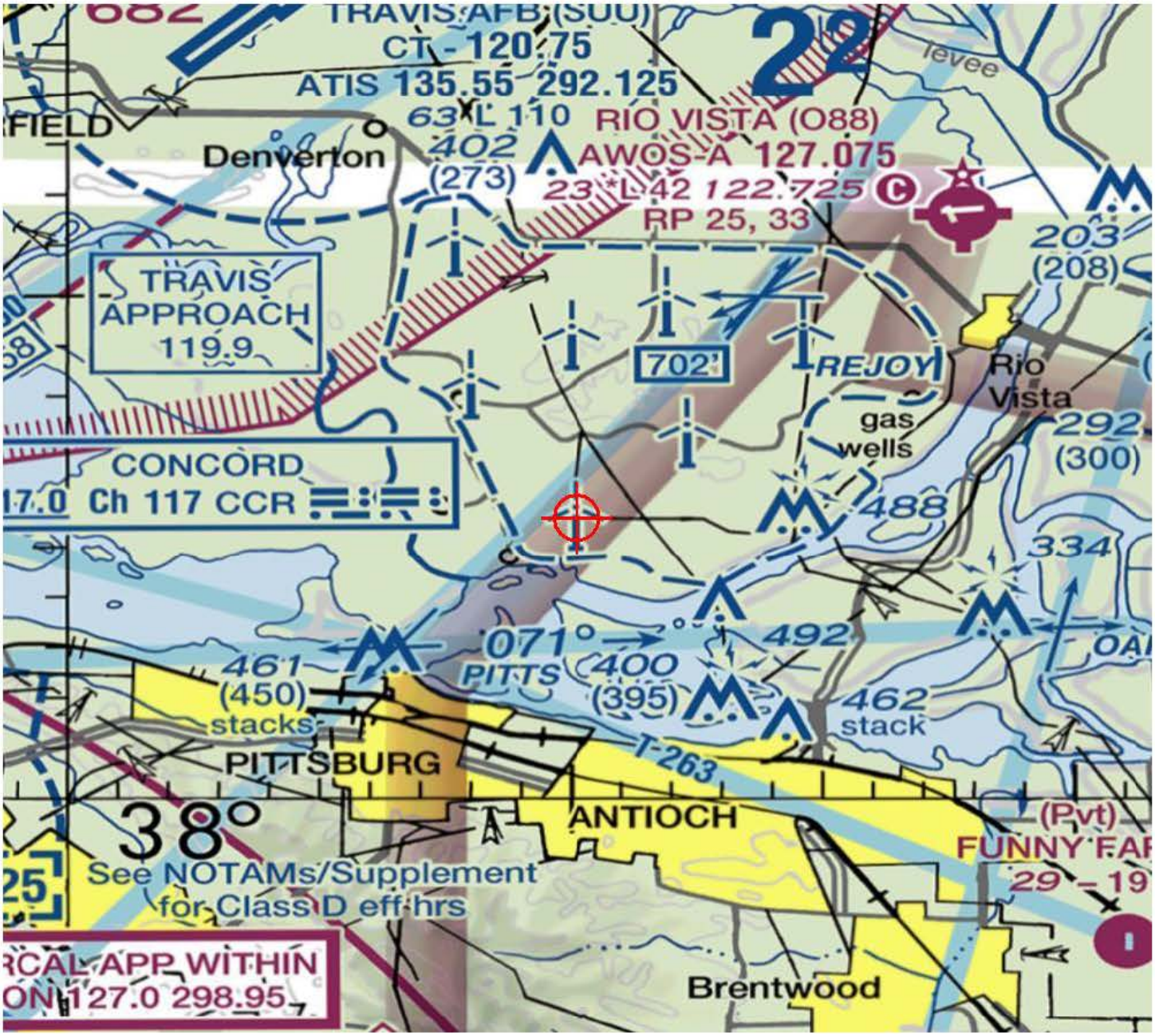
The cumulative impact of the proposed structures, when combined with other proposed and existing structures, is not considered to be significant. Study did not disclose any significant adverse effect on existing or proposed public-use or military airports or navigational facilities, nor would the proposals affect the capacity of any known existing or planned public-use or military airport.

Therefore, it is determined that the proposed construction would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation providing the conditions set forth in this determination are met.

Additional conditions:

As a condition of this determination it is required that Notice of Actual Construction or Alteration (7460-2 Part 1) be E-filed at least 60 full days prior to the start of construction so that appropriate action can be taken to amend the effected procedure(s) and/or altitude(s).

Sectional Map for ASN 2018-WTW-13397-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTW-13398-OE

Issued Date: 02/01/2019

Amanda Beck
Sacramento Municipal Utility District
6201 S St., MS MD-2
Sacramento, CA 95817

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine P4N2
Location:	Rio Vista, CA
Latitude:	38-05-08.34N NAD 83
Longitude:	121-50-03.54W
Heights:	173 feet site elevation (SE)
	591 feet above ground level (AGL)
	764 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 60 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

This determination expires on 08/01/2020 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 03, 2019. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 13, 2019 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be

used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

If we can be of further assistance, please contact Steve Phillips, at (816) 329-2523, or steve.phillips@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTW-13398-OE.

Signature Control No: 387140395-395150227 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

Abbreviations:
AGL, Above Ground Level
AMSL, Above Mean Sea Level
ARSR, Air Route Surveillance Radar
ASN, Aeronautical Study Number
ASR, Airport Surveillance Radar
ATC, Air Traffic Control
CAT, Category
CFR, Code of Federal Regulations
DASR, Digital Airport Surveillance Radar
IFR, Instrument Flight Rules
MVA, Minimum Vectoring Altitude
NM, Nautical Mile
RWY, Runway
TPA, Traffic Pattern Airspace
TRACON, Terminal Radar Approach Control
VFR, Visual Flight Rules

The proposed structures are part of a proposed wind farm that would be located approximately 5.02 - 9.07 NM southwest of the Airport Reference Point for the Rio Vista Municipal Airport (O88), Rio Vista, CA. The ASNs with coordinates, AGL heights, and AMSL heights are as shown on page one. They would exceed the obstruction standards of 14 CFR Part 77 as follows:

Section 77.17(a)(1): by 92 feet; a height that exceeds 499 feet AGL.

Section 77.17(a)(2): A height that is 200 feet AGL, or above the established airport elevation, whichever is higher, within 3 NM miles of the established reference point of O88 and that height increases in the proportion of 100 feet for each additional NM from the airport up to a maximum of 499 feet. The following would exceed:

2018-WTW-13388-OE by 190 feet
2018-WTW-13389-OE by 187 feet
2018-WTW-13390-OE by 169 feet
2018-WTW-13391-OE by 154 feet
2018-WTW-13392-OE by 141 feet

2018-WTW-13393-OE by 179 feet
2018-WTW-13394-OE by 167 feet
2018-WTW-13395-OE by 163 feet
2018-WTW-13396-OE by 156 feet

Section 77.17(a)(3): A height that increases a minimum instrument flight altitude within a terminal area;

The following would increase the Northern California TRACON (NCT) MVA for NCT_MVA_FUS3_2017 Sector MCC_B from 1,700 feet AMSL to 1,800 feet AMSL.

2018-WTW-13388-OE
2018-WTW-13389-OE
2018-WTW-13390-OE
2018-WTW-13391-OE
2018-WTW-13393-OE

2018-WTW-13397-OE
2018-WTW-13398-OE
2018-WTW-13399-OE
2018-WTW-13400-OE
2018-WTW-13403-OE

2018-WTW-13404-OE
2018-WTW-13405-OE

The turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. The proposals will affect the quality and/or availability of radar signals. The effects would be unwanted primary returns (clutter) and primary target drops, all in the area of the turbines. Tracked primary targets could diverge from the aircraft path and follow wind turbines, when the aircraft is over or near the turbines.

In order to facilitate the public comment process, the studies were circularized under ASN 2018-WTW-13388-OE on December 04, 2018, to all known aviation interests and to non-aeronautical interests that may be affected by the proposal. One letter of objection was received as a result of the circularization.

The Solano County Airport Land Use Commission (County) submitted comments that may not necessarily be an "objection" but rather statements. Some of their statements are simply repeating applicable law / rule / orders. They stated that these would be the tallest wind turbines in the area and larger than other onshore turbines elsewhere. Also stated was a belief that these have electromagnetic effects on radar. One statement said they "have seen information that conflicts" with the preliminary analysis of not exceeding TPA. Instead of submitting that stated information, a request was made for the FAA to see if any other obstruction standard was exceeded.

We are not sure what to make of the statement about these being the tallest in the area. Simply being taller than other structures has never been, nor will it ever be, the sole indicator of whether the structure would present an unacceptable impact upon the safe and efficient use of the navigable airspace.

The letter left the impression that the County believes exceeding one or more of the obstruction standards of 14 CFR Part 77 is reason enough to determine the proposal to be a hazard. That is not the case. It is the result of the aeronautical study that determines whether the structure would be a hazard or no hazard to air navigation. We will always compare proposed structures against all of the obstruction standards but will not circularize the standards that are not exceeded nor any standards and/or effects that are beyond the scope of the public to provide information about.

Records indicate that O88 has approximately 35,000 operations per year primarily from CAT A and B general aviation aircraft. All except one of the proposed turbines lie beyond the TPA for all RWYs and aircraft categories. That one proposal is on the edge of the RWY 15/33 TPA for CAT D, but at 2,199 feet long, this

RWY is incapable of sustaining CAT D aircraft operations. The size of the TPA is based upon the aircraft that regularly use a particular RWY. The preliminary assessment of not exceeding TPA has been confirmed.

Note: Aircraft categories are based on approach speed, CAT A = less than 91 knots, CAT B = 91- 120 knots, CAT C = 121-140 knots, CAT D = 141-165 knots.

The County submitted a lot about radar effects. Wind turbines rarely, if ever create "electromagnetic" interference. If they are within the line of sight of a radar sensor, they may be detected by that sensor and may therefore be a physical interference. Simply being "seen" by the radar is not the real issue though. How that target (in this case, the wind turbine) is processed and displayed for ATC is the key. The users of the system (ATC) is the sole decider on whether the system is acceptable to be able to perform their duties. Although there may be others entities using these radar systems, the responsibility and authority of the FAA is the safe and efficient use of the navigable airspace, including the impact of the radar effects on air navigation.

The turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. However, this would not cause an unacceptable adverse impact on ATC operations at this time.

The aeronautical study disclosed that the proposed structures would have the adverse effect as described above on the NCT MVA. MVAs are solely used by ATC and not published for public use and are not circulated for public comment. The study disclosed that increasing the MVA in the area of the turbines would not impact a significant number of operations. The proposed structures would have no other effect on any existing or proposed arrival, departure, or en route IFR operations or procedures.

Study for possible VFR effect disclosed that the proposals would have no effect on existing or proposed VFR arrival or departure operations. As stated above, the proposals are beyond normal traffic pattern airspace. Therefore, the proposal would not have an adverse effect on VFR traffic pattern operations at O88, or any other known public use or military airports. At 591 feet AGL, the structures would extend upwards into altitudes commonly used for en route VFR flight; however, no information was received to indicate they would be located along a regularly used VFR route or that they would pose a problem for pilots operating en route. Therefore, they would not have a substantial adverse effect on en route VFR flight operations.

The proposed structures would be appropriately obstruction marked/lighted to make them more conspicuous to airmen should circumnavigation be necessary.

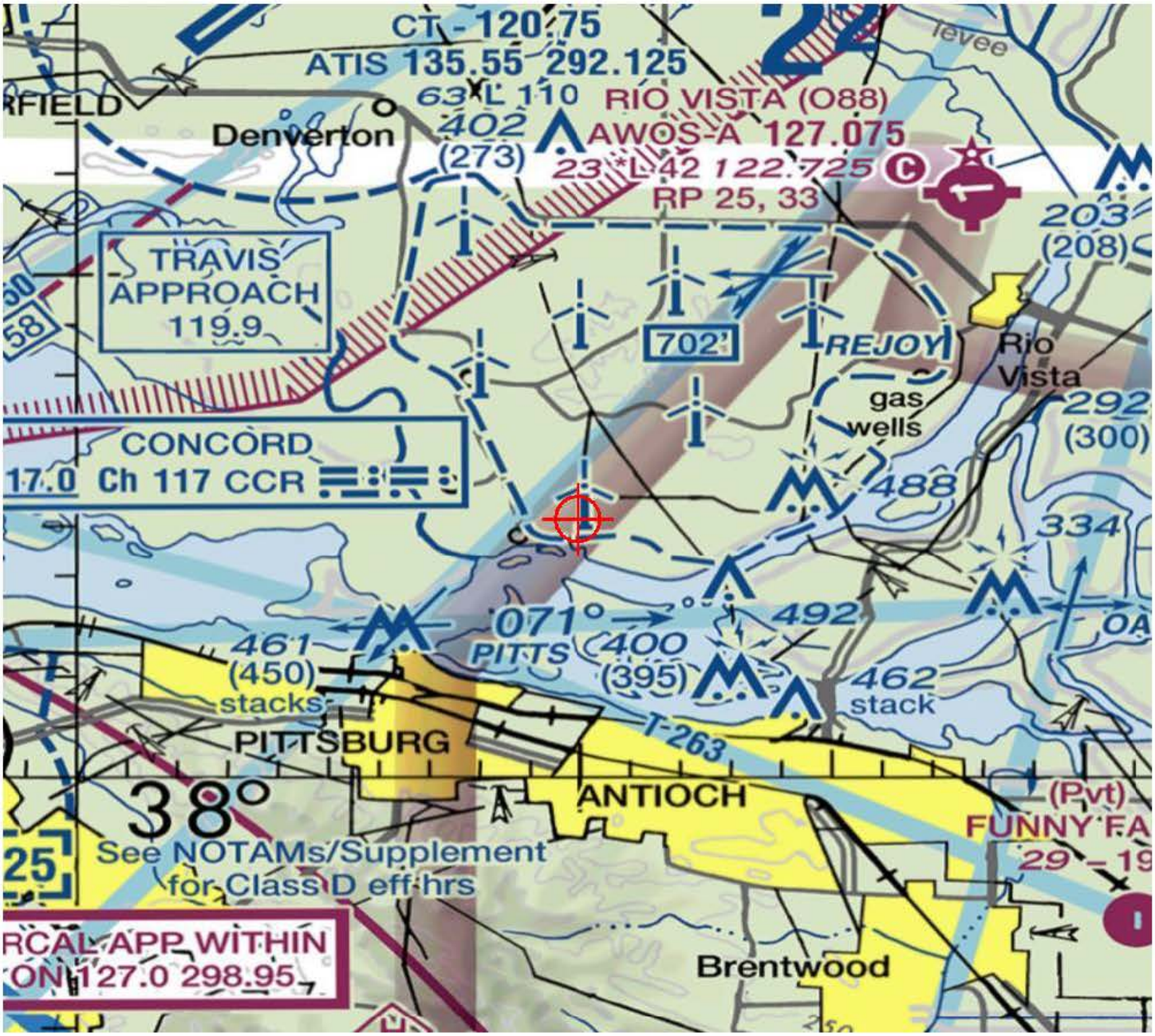
The cumulative impact of the proposed structures, when combined with other proposed and existing structures, is not considered to be significant. Study did not disclose any significant adverse effect on existing or proposed public-use or military airports or navigational facilities, nor would the proposals affect the capacity of any known existing or planned public-use or military airport.

Therefore, it is determined that the proposed construction would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation providing the conditions set forth in this determination are met.

Additional conditions:

As a condition of this determination it is required that Notice of Actual Construction or Alteration (7460-2 Part 1) be E-filed at least 60 full days prior to the start of construction so that appropriate action can be taken to amend the effected procedure(s) and/or altitude(s).

Sectional Map for ASN 2018-WTW-13398-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTW-13399-OE

Issued Date: 02/01/2019

Amanda Beck
Sacramento Municipal Utility District
6201 S St., MS MD-2
Sacramento, CA 95817

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine P4N3
Location:	Rio Vista, CA
Latitude:	38-05-24.68N NAD 83
Longitude:	121-49-44.45W
Heights:	214 feet site elevation (SE)
	591 feet above ground level (AGL)
	805 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 60 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

This determination expires on 08/01/2020 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 03, 2019. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 13, 2019 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be

used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

If we can be of further assistance, please contact Steve Phillips, at (816) 329-2523, or steve.phillips@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTW-13399-OE.

Signature Control No: 387140396-395150242 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

Abbreviations:
AGL, Above Ground Level
AMSL, Above Mean Sea Level
ARSR, Air Route Surveillance Radar
ASN, Aeronautical Study Number
ASR, Airport Surveillance Radar
ATC, Air Traffic Control
CAT, Category
CFR, Code of Federal Regulations
DASR, Digital Airport Surveillance Radar
IFR, Instrument Flight Rules
MVA, Minimum Vectoring Altitude
NM, Nautical Mile
RWY, Runway
TPA, Traffic Pattern Airspace
TRACON, Terminal Radar Approach Control
VFR, Visual Flight Rules

The proposed structures are part of a proposed wind farm that would be located approximately 5.02 - 9.07 NM southwest of the Airport Reference Point for the Rio Vista Municipal Airport (O88), Rio Vista, CA. The ASNs with coordinates, AGL heights, and AMSL heights are as shown on page one. They would exceed the obstruction standards of 14 CFR Part 77 as follows:

Section 77.17(a)(1): by 92 feet; a height that exceeds 499 feet AGL.

Section 77.17(a)(2): A height that is 200 feet AGL, or above the established airport elevation, whichever is higher, within 3 NM miles of the established reference point of O88 and that height increases in the proportion of 100 feet for each additional NM from the airport up to a maximum of 499 feet. The following would exceed:

2018-WTW-13388-OE by 190 feet
2018-WTW-13389-OE by 187 feet
2018-WTW-13390-OE by 169 feet
2018-WTW-13391-OE by 154 feet
2018-WTW-13392-OE by 141 feet

2018-WTW-13393-OE by 179 feet
2018-WTW-13394-OE by 167 feet
2018-WTW-13395-OE by 163 feet
2018-WTW-13396-OE by 156 feet

Section 77.17(a)(3): A height that increases a minimum instrument flight altitude within a terminal area;

The following would increase the Northern California TRACON (NCT) MVA for NCT_MVA_FUS3_2017 Sector MCC_B from 1,700 feet AMSL to 1,800 feet AMSL.

2018-WTW-13388-OE
2018-WTW-13389-OE
2018-WTW-13390-OE
2018-WTW-13391-OE
2018-WTW-13393-OE

2018-WTW-13397-OE
2018-WTW-13398-OE
2018-WTW-13399-OE
2018-WTW-13400-OE
2018-WTW-13403-OE

2018-WTW-13404-OE
2018-WTW-13405-OE

The turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. The proposals will affect the quality and/or availability of radar signals. The effects would be unwanted primary returns (clutter) and primary target drops, all in the area of the turbines. Tracked primary targets could diverge from the aircraft path and follow wind turbines, when the aircraft is over or near the turbines.

In order to facilitate the public comment process, the studies were circularized under ASN 2018-WTW-13388-OE on December 04, 2018, to all known aviation interests and to non-aeronautical interests that may be affected by the proposal. One letter of objection was received as a result of the circularization.

The Solano County Airport Land Use Commission (County) submitted comments that may not necessarily be an "objection" but rather statements. Some of their statements are simply repeating applicable law / rule / orders. They stated that these would be the tallest wind turbines in the area and larger than other onshore turbines elsewhere. Also stated was a belief that these have electromagnetic effects on radar. One statement said they "have seen information that conflicts" with the preliminary analysis of not exceeding TPA. Instead of submitting that stated information, a request was made for the FAA to see if any other obstruction standard was exceeded.

We are not sure what to make of the statement about these being the tallest in the area. Simply being taller than other structures has never been, nor will it ever be, the sole indicator of whether the structure would present an unacceptable impact upon the safe and efficient use of the navigable airspace.

The letter left the impression that the County believes exceeding one or more of the obstruction standards of 14 CFR Part 77 is reason enough to determine the proposal to be a hazard. That is not the case. It is the result of the aeronautical study that determines whether the structure would be a hazard or no hazard to air navigation. We will always compare proposed structures against all of the obstruction standards but will not circularize the standards that are not exceeded nor any standards and/or effects that are beyond the scope of the public to provide information about.

Records indicate that O88 has approximately 35,000 operations per year primarily from CAT A and B general aviation aircraft. All except one of the proposed turbines lie beyond the TPA for all RWYs and aircraft categories. That one proposal is on the edge of the RWY 15/33 TPA for CAT D, but at 2,199 feet long, this

RWY is incapable of sustaining CAT D aircraft operations. The size of the TPA is based upon the aircraft that regularly use a particular RWY. The preliminary assessment of not exceeding TPA has been confirmed.

Note: Aircraft categories are based on approach speed, CAT A = less than 91 knots, CAT B = 91- 120 knots, CAT C = 121-140 knots, CAT D = 141-165 knots.

The County submitted a lot about radar effects. Wind turbines rarely, if ever create "electromagnetic" interference. If they are within the line of sight of a radar sensor, they may be detected by that sensor and may therefore be a physical interference. Simply being "seen" by the radar is not the real issue though. How that target (in this case, the wind turbine) is processed and displayed for ATC is the key. The users of the system (ATC) is the sole decider on whether the system is acceptable to be able to perform their duties. Although there may be others entities using these radar systems, the responsibility and authority of the FAA is the safe and efficient use of the navigable airspace, including the impact of the radar effects on air navigation.

The turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. However, this would not cause an unacceptable adverse impact on ATC operations at this time.

The aeronautical study disclosed that the proposed structures would have the adverse effect as described above on the NCT MVA. MVAs are solely used by ATC and not published for public use and are not circulated for public comment. The study disclosed that increasing the MVA in the area of the turbines would not impact a significant number of operations. The proposed structures would have no other effect on any existing or proposed arrival, departure, or en route IFR operations or procedures.

Study for possible VFR effect disclosed that the proposals would have no effect on existing or proposed VFR arrival or departure operations. As stated above, the proposals are beyond normal traffic pattern airspace. Therefore, the proposal would not have an adverse effect on VFR traffic pattern operations at O88, or any other known public use or military airports. At 591 feet AGL, the structures would extend upwards into altitudes commonly used for en route VFR flight; however, no information was received to indicate they would be located along a regularly used VFR route or that they would pose a problem for pilots operating en route. Therefore, they would not have a substantial adverse effect on en route VFR flight operations.

The proposed structures would be appropriately obstruction marked/lighted to make them more conspicuous to airmen should circumnavigation be necessary.

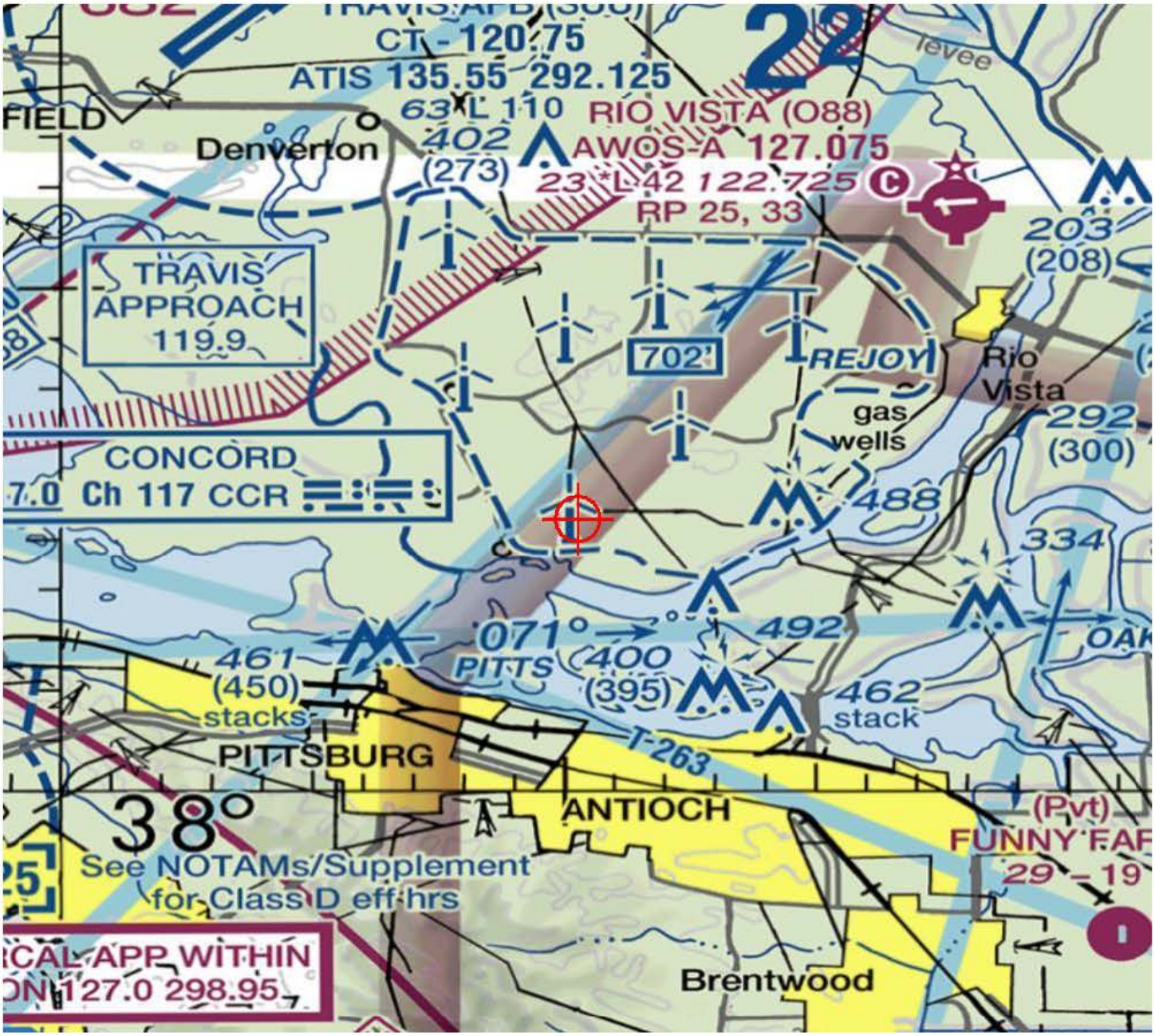
The cumulative impact of the proposed structures, when combined with other proposed and existing structures, is not considered to be significant. Study did not disclose any significant adverse effect on existing or proposed public-use or military airports or navigational facilities, nor would the proposals affect the capacity of any known existing or planned public-use or military airport.

Therefore, it is determined that the proposed construction would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation providing the conditions set forth in this determination are met.

Additional conditions:

As a condition of this determination it is required that Notice of Actual Construction or Alteration (7460-2 Part 1) be E-filed at least 60 full days prior to the start of construction so that appropriate action can be taken to amend the effected procedure(s) and/or altitude(s).

Sectional Map for ASN 2018-WTW-13399-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTW-13400-OE

Issued Date: 02/01/2019

Amanda Beck
Sacramento Municipal Utility District
6201 S St., MS MD-2
Sacramento, CA 95817

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine P4N4
Location:	Rio Vista, CA
Latitude:	38-05-02.29N NAD 83
Longitude:	121-49-31.33W
Heights:	208 feet site elevation (SE)
	591 feet above ground level (AGL)
	799 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 60 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

This determination expires on 08/01/2020 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 03, 2019. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 13, 2019 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be

used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

If we can be of further assistance, please contact Steve Phillips, at (816) 329-2523, or steve.phillips@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTW-13400-OE.

Signature Control No: 387140399-395150237 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

Abbreviations:
AGL, Above Ground Level
AMSL, Above Mean Sea Level
ARSR, Air Route Surveillance Radar
ASN, Aeronautical Study Number
ASR, Airport Surveillance Radar
ATC, Air Traffic Control
CAT, Category
CFR, Code of Federal Regulations
DASR, Digital Airport Surveillance Radar
IFR, Instrument Flight Rules
MVA, Minimum Vectoring Altitude
NM, Nautical Mile
RWY, Runway
TPA, Traffic Pattern Airspace
TRACON, Terminal Radar Approach Control
VFR, Visual Flight Rules

The proposed structures are part of a proposed wind farm that would be located approximately 5.02 - 9.07 NM southwest of the Airport Reference Point for the Rio Vista Municipal Airport (O88), Rio Vista, CA. The ASNs with coordinates, AGL heights, and AMSL heights are as shown on page one. They would exceed the obstruction standards of 14 CFR Part 77 as follows:

Section 77.17(a)(1): by 92 feet; a height that exceeds 499 feet AGL.

Section 77.17(a)(2): A height that is 200 feet AGL, or above the established airport elevation, whichever is higher, within 3 NM miles of the established reference point of O88 and that height increases in the proportion of 100 feet for each additional NM from the airport up to a maximum of 499 feet. The following would exceed:

2018-WTW-13388-OE by 190 feet
2018-WTW-13389-OE by 187 feet
2018-WTW-13390-OE by 169 feet
2018-WTW-13391-OE by 154 feet
2018-WTW-13392-OE by 141 feet

2018-WTW-13393-OE by 179 feet
2018-WTW-13394-OE by 167 feet
2018-WTW-13395-OE by 163 feet
2018-WTW-13396-OE by 156 feet

Section 77.17(a)(3): A height that increases a minimum instrument flight altitude within a terminal area;

The following would increase the Northern California TRACON (NCT) MVA for NCT_MVA_FUS3_2017 Sector MCC_B from 1,700 feet AMSL to 1,800 feet AMSL.

2018-WTW-13388-OE
2018-WTW-13389-OE
2018-WTW-13390-OE
2018-WTW-13391-OE
2018-WTW-13393-OE

2018-WTW-13397-OE
2018-WTW-13398-OE
2018-WTW-13399-OE
2018-WTW-13400-OE
2018-WTW-13403-OE

2018-WTW-13404-OE
2018-WTW-13405-OE

The turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. The proposals will affect the quality and/or availability of radar signals. The effects would be unwanted primary returns (clutter) and primary target drops, all in the area of the turbines. Tracked primary targets could diverge from the aircraft path and follow wind turbines, when the aircraft is over or near the turbines.

In order to facilitate the public comment process, the studies were circularized under ASN 2018-WTW-13388-OE on December 04, 2018, to all known aviation interests and to non-aeronautical interests that may be affected by the proposal. One letter of objection was received as a result of the circularization.

The Solano County Airport Land Use Commission (County) submitted comments that may not necessarily be an "objection" but rather statements. Some of their statements are simply repeating applicable law / rule / orders. They stated that these would be the tallest wind turbines in the area and larger than other onshore turbines elsewhere. Also stated was a belief that these have electromagnetic effects on radar. One statement said they "have seen information that conflicts" with the preliminary analysis of not exceeding TPA. Instead of submitting that stated information, a request was made for the FAA to see if any other obstruction standard was exceeded.

We are not sure what to make of the statement about these being the tallest in the area. Simply being taller than other structures has never been, nor will it ever be, the sole indicator of whether the structure would present an unacceptable impact upon the safe and efficient use of the navigable airspace.

The letter left the impression that the County believes exceeding one or more of the obstruction standards of 14 CFR Part 77 is reason enough to determine the proposal to be a hazard. That is not the case. It is the result of the aeronautical study that determines whether the structure would be a hazard or no hazard to air navigation. We will always compare proposed structures against all of the obstruction standards but will not circularize the standards that are not exceeded nor any standards and/or effects that are beyond the scope of the public to provide information about.

Records indicate that O88 has approximately 35,000 operations per year primarily from CAT A and B general aviation aircraft. All except one of the proposed turbines lie beyond the TPA for all RWYs and aircraft categories. That one proposal is on the edge of the RWY 15/33 TPA for CAT D, but at 2,199 feet long, this

RWY is incapable of sustaining CAT D aircraft operations. The size of the TPA is based upon the aircraft that regularly use a particular RWY. The preliminary assessment of not exceeding TPA has been confirmed.

Note: Aircraft categories are based on approach speed, CAT A = less than 91 knots, CAT B = 91- 120 knots, CAT C = 121-140 knots, CAT D = 141-165 knots.

The County submitted a lot about radar effects. Wind turbines rarely, if ever create "electromagnetic" interference. If they are within the line of sight of a radar sensor, they may be detected by that sensor and may therefore be a physical interference. Simply being "seen" by the radar is not the real issue though. How that target (in this case, the wind turbine) is processed and displayed for ATC is the key. The users of the system (ATC) is the sole decider on whether the system is acceptable to be able to perform their duties. Although there may be others entities using these radar systems, the responsibility and authority of the FAA is the safe and efficient use of the navigable airspace, including the impact of the radar effects on air navigation.

The turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. However, this would not cause an unacceptable adverse impact on ATC operations at this time.

The aeronautical study disclosed that the proposed structures would have the adverse effect as described above on the NCT MVA. MVAs are solely used by ATC and not published for public use and are not circulated for public comment. The study disclosed that increasing the MVA in the area of the turbines would not impact a significant number of operations. The proposed structures would have no other effect on any existing or proposed arrival, departure, or en route IFR operations or procedures.

Study for possible VFR effect disclosed that the proposals would have no effect on existing or proposed VFR arrival or departure operations. As stated above, the proposals are beyond normal traffic pattern airspace. Therefore, the proposal would not have an adverse effect on VFR traffic pattern operations at O88, or any other known public use or military airports. At 591 feet AGL, the structures would extend upwards into altitudes commonly used for en route VFR flight; however, no information was received to indicate they would be located along a regularly used VFR route or that they would pose a problem for pilots operating en route. Therefore, they would not have a substantial adverse effect on en route VFR flight operations.

The proposed structures would be appropriately obstruction marked/lighted to make them more conspicuous to airmen should circumnavigation be necessary.

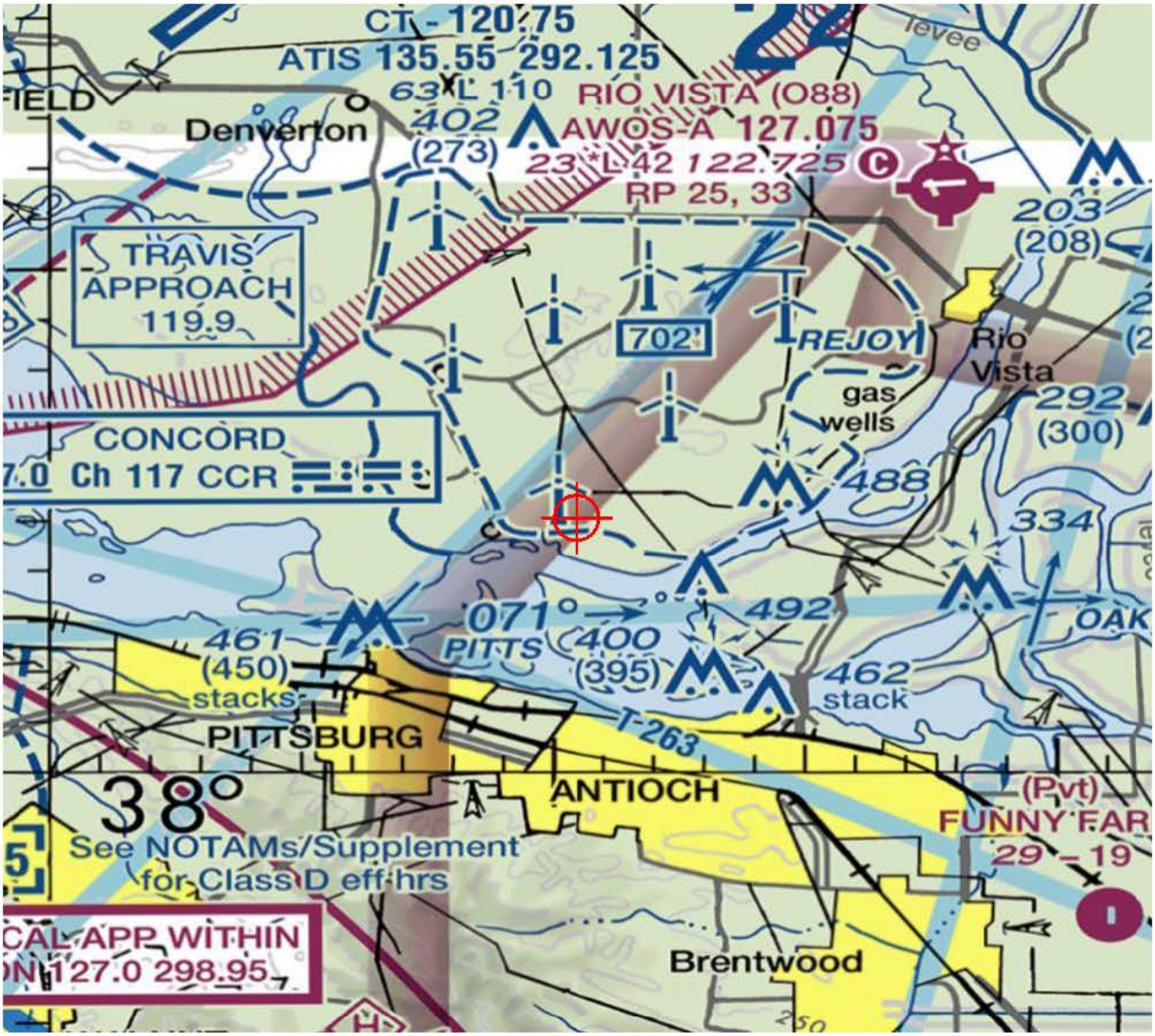
The cumulative impact of the proposed structures, when combined with other proposed and existing structures, is not considered to be significant. Study did not disclose any significant adverse effect on existing or proposed public-use or military airports or navigational facilities, nor would the proposals affect the capacity of any known existing or planned public-use or military airport.

Therefore, it is determined that the proposed construction would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation providing the conditions set forth in this determination are met.

Additional conditions:

As a condition of this determination it is required that Notice of Actual Construction or Alteration (7460-2 Part 1) be E-filed at least 60 full days prior to the start of construction so that appropriate action can be taken to amend the effected procedure(s) and/or altitude(s).

Sectional Map for ASN 2018-WTW-13400-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTW-13401-OE

Issued Date: 02/01/2019

Amanda Beck
Sacramento Municipal Utility District
6201 S St., MS MD-2
Sacramento, CA 95817

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine P4N5
Location:	Rio Vista, CA
Latitude:	38-04-53.15N NAD 83
Longitude:	121-49-40.77W
Heights:	103 feet site elevation (SE)
	591 feet above ground level (AGL)
	694 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 60 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

This determination expires on 08/01/2020 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 03, 2019. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 13, 2019 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be

used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

If we can be of further assistance, please contact Steve Phillips, at (816) 329-2523, or steve.phillips@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTW-13401-OE.

Signature Control No: 387140402-395150240 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

Abbreviations:
AGL, Above Ground Level
AMSL, Above Mean Sea Level
ARSR, Air Route Surveillance Radar
ASN, Aeronautical Study Number
ASR, Airport Surveillance Radar
ATC, Air Traffic Control
CAT, Category
CFR, Code of Federal Regulations
DASR, Digital Airport Surveillance Radar
IFR, Instrument Flight Rules
MVA, Minimum Vectoring Altitude
NM, Nautical Mile
RWY, Runway
TPA, Traffic Pattern Airspace
TRACON, Terminal Radar Approach Control
VFR, Visual Flight Rules

The proposed structures are part of a proposed wind farm that would be located approximately 5.02 - 9.07 NM southwest of the Airport Reference Point for the Rio Vista Municipal Airport (O88), Rio Vista, CA. The ASNs with coordinates, AGL heights, and AMSL heights are as shown on page one. They would exceed the obstruction standards of 14 CFR Part 77 as follows:

Section 77.17(a)(1): by 92 feet; a height that exceeds 499 feet AGL.

Section 77.17(a)(2): A height that is 200 feet AGL, or above the established airport elevation, whichever is higher, within 3 NM miles of the established reference point of O88 and that height increases in the proportion of 100 feet for each additional NM from the airport up to a maximum of 499 feet. The following would exceed:

2018-WTW-13388-OE by 190 feet
2018-WTW-13389-OE by 187 feet
2018-WTW-13390-OE by 169 feet
2018-WTW-13391-OE by 154 feet
2018-WTW-13392-OE by 141 feet

2018-WTW-13393-OE by 179 feet
2018-WTW-13394-OE by 167 feet
2018-WTW-13395-OE by 163 feet
2018-WTW-13396-OE by 156 feet

Section 77.17(a)(3): A height that increases a minimum instrument flight altitude within a terminal area;

The following would increase the Northern California TRACON (NCT) MVA for NCT_MVA_FUS3_2017 Sector MCC_B from 1,700 feet AMSL to 1,800 feet AMSL.

2018-WTW-13388-OE
2018-WTW-13389-OE
2018-WTW-13390-OE
2018-WTW-13391-OE
2018-WTW-13393-OE

2018-WTW-13397-OE
2018-WTW-13398-OE
2018-WTW-13399-OE
2018-WTW-13400-OE
2018-WTW-13403-OE

2018-WTW-13404-OE
2018-WTW-13405-OE

The turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. The proposals will affect the quality and/or availability of radar signals. The effects would be unwanted primary returns (clutter) and primary target drops, all in the area of the turbines. Tracked primary targets could diverge from the aircraft path and follow wind turbines, when the aircraft is over or near the turbines.

In order to facilitate the public comment process, the studies were circularized under ASN 2018-WTW-13388-OE on December 04, 2018, to all known aviation interests and to non-aeronautical interests that may be affected by the proposal. One letter of objection was received as a result of the circularization.

The Solano County Airport Land Use Commission (County) submitted comments that may not necessarily be an "objection" but rather statements. Some of their statements are simply repeating applicable law / rule / orders. They stated that these would be the tallest wind turbines in the area and larger than other onshore turbines elsewhere. Also stated was a belief that these have electromagnetic effects on radar. One statement said they "have seen information that conflicts" with the preliminary analysis of not exceeding TPA. Instead of submitting that stated information, a request was made for the FAA to see if any other obstruction standard was exceeded.

We are not sure what to make of the statement about these being the tallest in the area. Simply being taller than other structures has never been, nor will it ever be, the sole indicator of whether the structure would present an unacceptable impact upon the safe and efficient use of the navigable airspace.

The letter left the impression that the County believes exceeding one or more of the obstruction standards of 14 CFR Part 77 is reason enough to determine the proposal to be a hazard. That is not the case. It is the result of the aeronautical study that determines whether the structure would be a hazard or no hazard to air navigation. We will always compare proposed structures against all of the obstruction standards but will not circularize the standards that are not exceeded nor any standards and/or effects that are beyond the scope of the public to provide information about.

Records indicate that O88 has approximately 35,000 operations per year primarily from CAT A and B general aviation aircraft. All except one of the proposed turbines lie beyond the TPA for all RWYs and aircraft categories. That one proposal is on the edge of the RWY 15/33 TPA for CAT D, but at 2,199 feet long, this

RWY is incapable of sustaining CAT D aircraft operations. The size of the TPA is based upon the aircraft that regularly use a particular RWY. The preliminary assessment of not exceeding TPA has been confirmed.

Note: Aircraft categories are based on approach speed, CAT A = less than 91 knots, CAT B = 91- 120 knots, CAT C = 121-140 knots, CAT D = 141-165 knots.

The County submitted a lot about radar effects. Wind turbines rarely, if ever create "electromagnetic" interference. If they are within the line of sight of a radar sensor, they may be detected by that sensor and may therefore be a physical interference. Simply being "seen" by the radar is not the real issue though. How that target (in this case, the wind turbine) is processed and displayed for ATC is the key. The users of the system (ATC) is the sole decider on whether the system is acceptable to be able to perform their duties. Although there may be others entities using these radar systems, the responsibility and authority of the FAA is the safe and efficient use of the navigable airspace, including the impact of the radar effects on air navigation.

The turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. However, this would not cause an unacceptable adverse impact on ATC operations at this time.

The aeronautical study disclosed that the proposed structures would have the adverse effect as described above on the NCT MVA. MVAs are solely used by ATC and not published for public use and are not circulated for public comment. The study disclosed that increasing the MVA in the area of the turbines would not impact a significant number of operations. The proposed structures would have no other effect on any existing or proposed arrival, departure, or en route IFR operations or procedures.

Study for possible VFR effect disclosed that the proposals would have no effect on existing or proposed VFR arrival or departure operations. As stated above, the proposals are beyond normal traffic pattern airspace. Therefore, the proposal would not have an adverse effect on VFR traffic pattern operations at O88, or any other known public use or military airports. At 591 feet AGL, the structures would extend upwards into altitudes commonly used for en route VFR flight; however, no information was received to indicate they would be located along a regularly used VFR route or that they would pose a problem for pilots operating en route. Therefore, they would not have a substantial adverse effect on en route VFR flight operations.

The proposed structures would be appropriately obstruction marked/lighted to make them more conspicuous to airmen should circumnavigation be necessary.

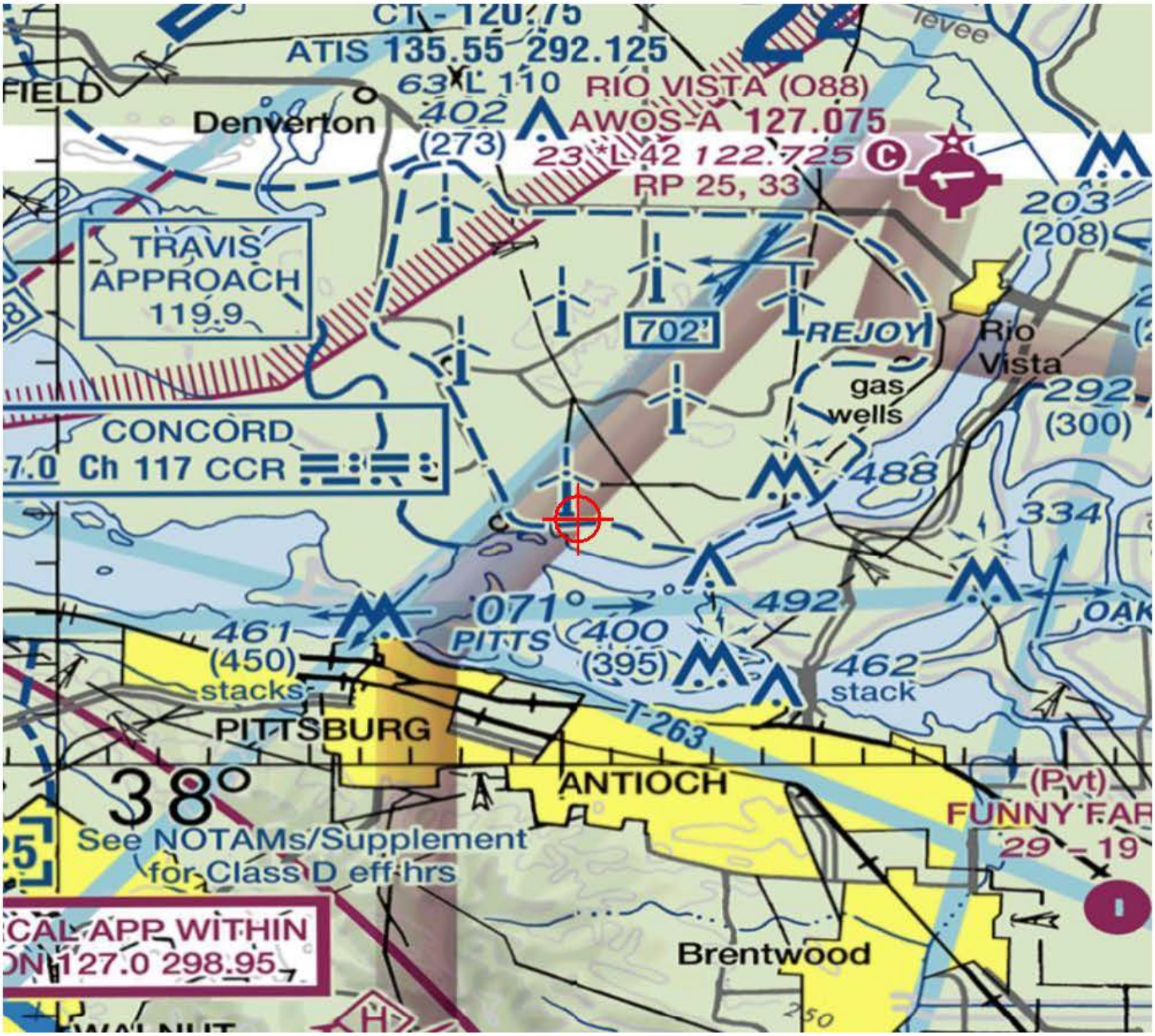
The cumulative impact of the proposed structures, when combined with other proposed and existing structures, is not considered to be significant. Study did not disclose any significant adverse effect on existing or proposed public-use or military airports or navigational facilities, nor would the proposals affect the capacity of any known existing or planned public-use or military airport.

Therefore, it is determined that the proposed construction would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation providing the conditions set forth in this determination are met.

Additional conditions:

As a condition of this determination it is required that Notice of Actual Construction or Alteration (7460-2 Part 1) be E-filed at least 60 full days prior to the start of construction so that appropriate action can be taken to amend the effected procedure(s) and/or altitude(s).

Sectional Map for ASN 2018-WTW-13401-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTW-13402-OE

Issued Date: 02/01/2019

Amanda Beck
Sacramento Municipal Utility District
6201 S St., MS MD-2
Sacramento, CA 95817

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine P4N6
Location:	Rio Vista, CA
Latitude:	38-04-43.66N NAD 83
Longitude:	121-49-43.80W
Heights:	116 feet site elevation (SE)
	591 feet above ground level (AGL)
	707 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 60 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

This determination expires on 08/01/2020 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 03, 2019. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 13, 2019 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be

used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

If we can be of further assistance, please contact Steve Phillips, at (816) 329-2523, or steve.phillips@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTW-13402-OE.

Signature Control No: 387140406-395150243 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

Abbreviations:
AGL, Above Ground Level
AMSL, Above Mean Sea Level
ARSR, Air Route Surveillance Radar
ASN, Aeronautical Study Number
ASR, Airport Surveillance Radar
ATC, Air Traffic Control
CAT, Category
CFR, Code of Federal Regulations
DASR, Digital Airport Surveillance Radar
IFR, Instrument Flight Rules
MVA, Minimum Vectoring Altitude
NM, Nautical Mile
RWY, Runway
TPA, Traffic Pattern Airspace
TRACON, Terminal Radar Approach Control
VFR, Visual Flight Rules

The proposed structures are part of a proposed wind farm that would be located approximately 5.02 - 9.07 NM southwest of the Airport Reference Point for the Rio Vista Municipal Airport (O88), Rio Vista, CA. The ASNs with coordinates, AGL heights, and AMSL heights are as shown on page one. They would exceed the obstruction standards of 14 CFR Part 77 as follows:

Section 77.17(a)(1): by 92 feet; a height that exceeds 499 feet AGL.

Section 77.17(a)(2): A height that is 200 feet AGL, or above the established airport elevation, whichever is higher, within 3 NM miles of the established reference point of O88 and that height increases in the proportion of 100 feet for each additional NM from the airport up to a maximum of 499 feet. The following would exceed:

2018-WTW-13388-OE by 190 feet
2018-WTW-13389-OE by 187 feet
2018-WTW-13390-OE by 169 feet
2018-WTW-13391-OE by 154 feet
2018-WTW-13392-OE by 141 feet

2018-WTW-13393-OE by 179 feet
2018-WTW-13394-OE by 167 feet
2018-WTW-13395-OE by 163 feet
2018-WTW-13396-OE by 156 feet

Section 77.17(a)(3): A height that increases a minimum instrument flight altitude within a terminal area;

The following would increase the Northern California TRACON (NCT) MVA for NCT_MVA_FUS3_2017 Sector MCC_B from 1,700 feet AMSL to 1,800 feet AMSL.

2018-WTW-13388-OE
2018-WTW-13389-OE
2018-WTW-13390-OE
2018-WTW-13391-OE
2018-WTW-13393-OE

2018-WTW-13397-OE
2018-WTW-13398-OE
2018-WTW-13399-OE
2018-WTW-13400-OE
2018-WTW-13403-OE

2018-WTW-13404-OE
2018-WTW-13405-OE

The turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. The proposals will affect the quality and/or availability of radar signals. The effects would be unwanted primary returns (clutter) and primary target drops, all in the area of the turbines. Tracked primary targets could diverge from the aircraft path and follow wind turbines, when the aircraft is over or near the turbines.

In order to facilitate the public comment process, the studies were circularized under ASN 2018-WTW-13388-OE on December 04, 2018, to all known aviation interests and to non-aeronautical interests that may be affected by the proposal. One letter of objection was received as a result of the circularization.

The Solano County Airport Land Use Commission (County) submitted comments that may not necessarily be an "objection" but rather statements. Some of their statements are simply repeating applicable law / rule / orders. They stated that these would be the tallest wind turbines in the area and larger than other onshore turbines elsewhere. Also stated was a belief that these have electromagnetic effects on radar. One statement said they "have seen information that conflicts" with the preliminary analysis of not exceeding TPA. Instead of submitting that stated information, a request was made for the FAA to see if any other obstruction standard was exceeded.

We are not sure what to make of the statement about these being the tallest in the area. Simply being taller than other structures has never been, nor will it ever be, the sole indicator of whether the structure would present an unacceptable impact upon the safe and efficient use of the navigable airspace.

The letter left the impression that the County believes exceeding one or more of the obstruction standards of 14 CFR Part 77 is reason enough to determine the proposal to be a hazard. That is not the case. It is the result of the aeronautical study that determines whether the structure would be a hazard or no hazard to air navigation. We will always compare proposed structures against all of the obstruction standards but will not circularize the standards that are not exceeded nor any standards and/or effects that are beyond the scope of the public to provide information about.

Records indicate that O88 has approximately 35,000 operations per year primarily from CAT A and B general aviation aircraft. All except one of the proposed turbines lie beyond the TPA for all RWYs and aircraft categories. That one proposal is on the edge of the RWY 15/33 TPA for CAT D, but at 2,199 feet long, this

RWY is incapable of sustaining CAT D aircraft operations. The size of the TPA is based upon the aircraft that regularly use a particular RWY. The preliminary assessment of not exceeding TPA has been confirmed.

Note: Aircraft categories are based on approach speed, CAT A = less than 91 knots, CAT B = 91- 120 knots, CAT C = 121-140 knots, CAT D = 141-165 knots.

The County submitted a lot about radar effects. Wind turbines rarely, if ever create "electromagnetic" interference. If they are within the line of sight of a radar sensor, they may be detected by that sensor and may therefore be a physical interference. Simply being "seen" by the radar is not the real issue though. How that target (in this case, the wind turbine) is processed and displayed for ATC is the key. The users of the system (ATC) is the sole decider on whether the system is acceptable to be able to perform their duties. Although there may be others entities using these radar systems, the responsibility and authority of the FAA is the safe and efficient use of the navigable airspace, including the impact of the radar effects on air navigation.

The turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. However, this would not cause an unacceptable adverse impact on ATC operations at this time.

The aeronautical study disclosed that the proposed structures would have the adverse effect as described above on the NCT MVA. MVAs are solely used by ATC and not published for public use and are not circulated for public comment. The study disclosed that increasing the MVA in the area of the turbines would not impact a significant number of operations. The proposed structures would have no other effect on any existing or proposed arrival, departure, or en route IFR operations or procedures.

Study for possible VFR effect disclosed that the proposals would have no effect on existing or proposed VFR arrival or departure operations. As stated above, the proposals are beyond normal traffic pattern airspace. Therefore, the proposal would not have an adverse effect on VFR traffic pattern operations at O88, or any other known public use or military airports. At 591 feet AGL, the structures would extend upwards into altitudes commonly used for en route VFR flight; however, no information was received to indicate they would be located along a regularly used VFR route or that they would pose a problem for pilots operating en route. Therefore, they would not have a substantial adverse effect on en route VFR flight operations.

The proposed structures would be appropriately obstruction marked/lighted to make them more conspicuous to airmen should circumnavigation be necessary.

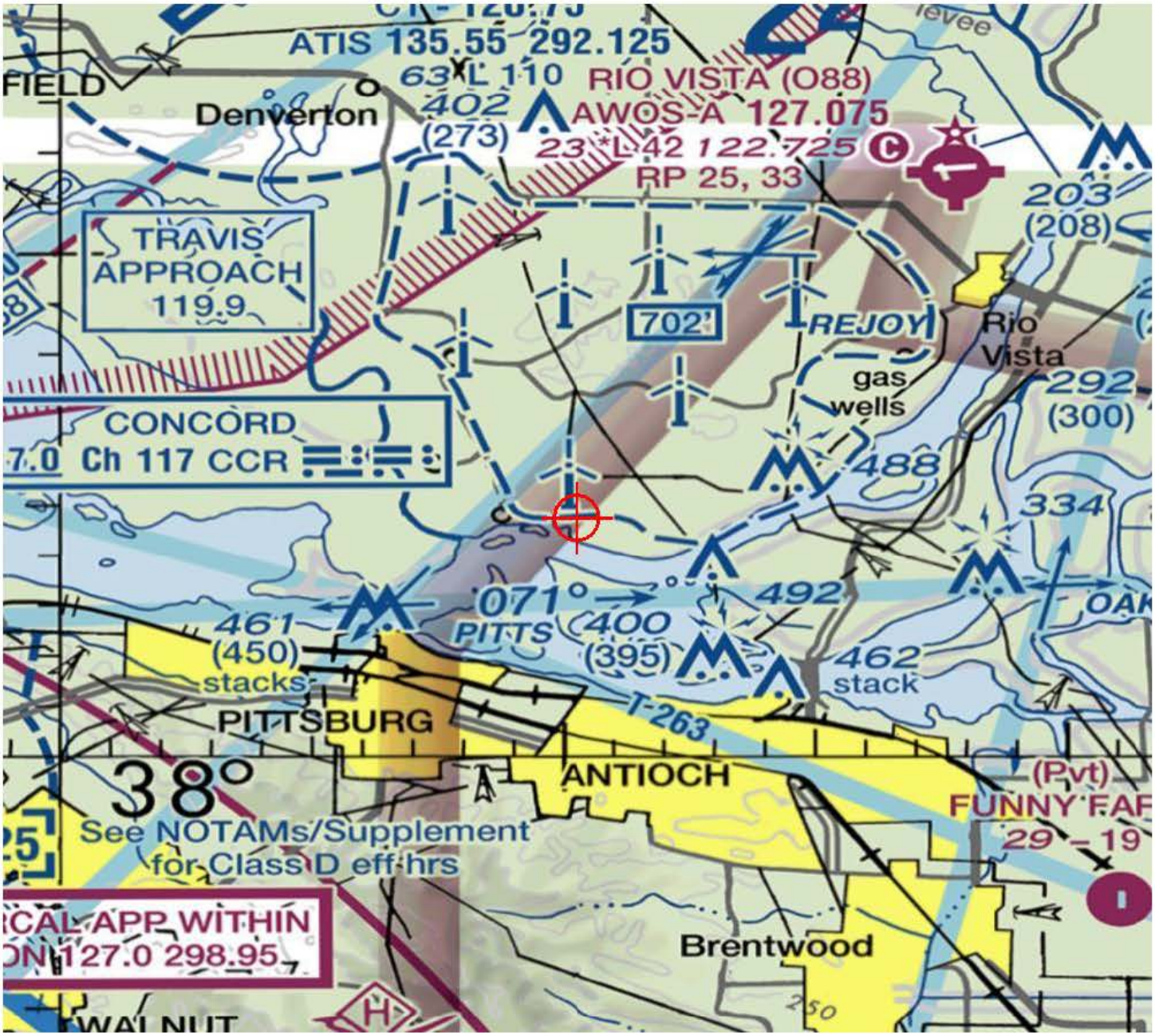
The cumulative impact of the proposed structures, when combined with other proposed and existing structures, is not considered to be significant. Study did not disclose any significant adverse effect on existing or proposed public-use or military airports or navigational facilities, nor would the proposals affect the capacity of any known existing or planned public-use or military airport.

Therefore, it is determined that the proposed construction would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation providing the conditions set forth in this determination are met.

Additional conditions:

As a condition of this determination it is required that Notice of Actual Construction or Alteration (7460-2 Part 1) be E-filed at least 60 full days prior to the start of construction so that appropriate action can be taken to amend the effected procedure(s) and/or altitude(s).

Sectional Map for ASN 2018-WTW-13402-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTW-13403-OE

Issued Date: 02/01/2019

Amanda Beck
Sacramento Municipal Utility District
6201 S St., MS MD-2
Sacramento, CA 95817

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine P4N7
Location:	Rio Vista, CA
Latitude:	38-04-29.29N NAD 83
Longitude:	121-49-03.88W
Heights:	180 feet site elevation (SE)
	591 feet above ground level (AGL)
	771 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 60 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

This determination expires on 08/01/2020 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 03, 2019. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 13, 2019 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be

used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

If we can be of further assistance, please contact Steve Phillips, at (816) 329-2523, or steve.phillips@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTW-13403-OE.

Signature Control No: 387140407-395150244 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

Abbreviations:
AGL, Above Ground Level
AMSL, Above Mean Sea Level
ARSR, Air Route Surveillance Radar
ASN, Aeronautical Study Number
ASR, Airport Surveillance Radar
ATC, Air Traffic Control
CAT, Category
CFR, Code of Federal Regulations
DASR, Digital Airport Surveillance Radar
IFR, Instrument Flight Rules
MVA, Minimum Vectoring Altitude
NM, Nautical Mile
RWY, Runway
TPA, Traffic Pattern Airspace
TRACON, Terminal Radar Approach Control
VFR, Visual Flight Rules

The proposed structures are part of a proposed wind farm that would be located approximately 5.02 - 9.07 NM southwest of the Airport Reference Point for the Rio Vista Municipal Airport (O88), Rio Vista, CA. The ASNs with coordinates, AGL heights, and AMSL heights are as shown on page one. They would exceed the obstruction standards of 14 CFR Part 77 as follows:

Section 77.17(a)(1): by 92 feet; a height that exceeds 499 feet AGL.

Section 77.17(a)(2): A height that is 200 feet AGL, or above the established airport elevation, whichever is higher, within 3 NM miles of the established reference point of O88 and that height increases in the proportion of 100 feet for each additional NM from the airport up to a maximum of 499 feet. The following would exceed:

2018-WTW-13388-OE by 190 feet
2018-WTW-13389-OE by 187 feet
2018-WTW-13390-OE by 169 feet
2018-WTW-13391-OE by 154 feet
2018-WTW-13392-OE by 141 feet

2018-WTW-13393-OE by 179 feet
2018-WTW-13394-OE by 167 feet
2018-WTW-13395-OE by 163 feet
2018-WTW-13396-OE by 156 feet

Section 77.17(a)(3): A height that increases a minimum instrument flight altitude within a terminal area;

The following would increase the Northern California TRACON (NCT) MVA for NCT_MVA_FUS3_2017 Sector MCC_B from 1,700 feet AMSL to 1,800 feet AMSL.

2018-WTW-13388-OE
2018-WTW-13389-OE
2018-WTW-13390-OE
2018-WTW-13391-OE
2018-WTW-13393-OE

2018-WTW-13397-OE
2018-WTW-13398-OE
2018-WTW-13399-OE
2018-WTW-13400-OE
2018-WTW-13403-OE

2018-WTW-13404-OE
2018-WTW-13405-OE

The turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. The proposals will affect the quality and/or availability of radar signals. The effects would be unwanted primary returns (clutter) and primary target drops, all in the area of the turbines. Tracked primary targets could diverge from the aircraft path and follow wind turbines, when the aircraft is over or near the turbines.

In order to facilitate the public comment process, the studies were circularized under ASN 2018-WTW-13388-OE on December 04, 2018, to all known aviation interests and to non-aeronautical interests that may be affected by the proposal. One letter of objection was received as a result of the circularization.

The Solano County Airport Land Use Commission (County) submitted comments that may not necessarily be an "objection" but rather statements. Some of their statements are simply repeating applicable law / rule / orders. They stated that these would be the tallest wind turbines in the area and larger than other onshore turbines elsewhere. Also stated was a belief that these have electromagnetic effects on radar. One statement said they "have seen information that conflicts" with the preliminary analysis of not exceeding TPA. Instead of submitting that stated information, a request was made for the FAA to see if any other obstruction standard was exceeded.

We are not sure what to make of the statement about these being the tallest in the area. Simply being taller than other structures has never been, nor will it ever be, the sole indicator of whether the structure would present an unacceptable impact upon the safe and efficient use of the navigable airspace.

The letter left the impression that the County believes exceeding one or more of the obstruction standards of 14 CFR Part 77 is reason enough to determine the proposal to be a hazard. That is not the case. It is the result of the aeronautical study that determines whether the structure would be a hazard or no hazard to air navigation. We will always compare proposed structures against all of the obstruction standards but will not circularize the standards that are not exceeded nor any standards and/or effects that are beyond the scope of the public to provide information about.

Records indicate that O88 has approximately 35,000 operations per year primarily from CAT A and B general aviation aircraft. All except one of the proposed turbines lie beyond the TPA for all RWYs and aircraft categories. That one proposal is on the edge of the RWY 15/33 TPA for CAT D, but at 2,199 feet long, this

RWY is incapable of sustaining CAT D aircraft operations. The size of the TPA is based upon the aircraft that regularly use a particular RWY. The preliminary assessment of not exceeding TPA has been confirmed.

Note: Aircraft categories are based on approach speed, CAT A = less than 91 knots, CAT B = 91- 120 knots, CAT C = 121-140 knots, CAT D = 141-165 knots.

The County submitted a lot about radar effects. Wind turbines rarely, if ever create "electromagnetic" interference. If they are within the line of sight of a radar sensor, they may be detected by that sensor and may therefore be a physical interference. Simply being "seen" by the radar is not the real issue though. How that target (in this case, the wind turbine) is processed and displayed for ATC is the key. The users of the system (ATC) is the sole decider on whether the system is acceptable to be able to perform their duties. Although there may be others entities using these radar systems, the responsibility and authority of the FAA is the safe and efficient use of the navigable airspace, including the impact of the radar effects on air navigation.

The turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. However, this would not cause an unacceptable adverse impact on ATC operations at this time.

The aeronautical study disclosed that the proposed structures would have the adverse effect as described above on the NCT MVA. MVAs are solely used by ATC and not published for public use and are not circulated for public comment. The study disclosed that increasing the MVA in the area of the turbines would not impact a significant number of operations. The proposed structures would have no other effect on any existing or proposed arrival, departure, or en route IFR operations or procedures.

Study for possible VFR effect disclosed that the proposals would have no effect on existing or proposed VFR arrival or departure operations. As stated above, the proposals are beyond normal traffic pattern airspace. Therefore, the proposal would not have an adverse effect on VFR traffic pattern operations at O88, or any other known public use or military airports. At 591 feet AGL, the structures would extend upwards into altitudes commonly used for en route VFR flight; however, no information was received to indicate they would be located along a regularly used VFR route or that they would pose a problem for pilots operating en route. Therefore, they would not have a substantial adverse effect on en route VFR flight operations.

The proposed structures would be appropriately obstruction marked/lighted to make them more conspicuous to airmen should circumnavigation be necessary.

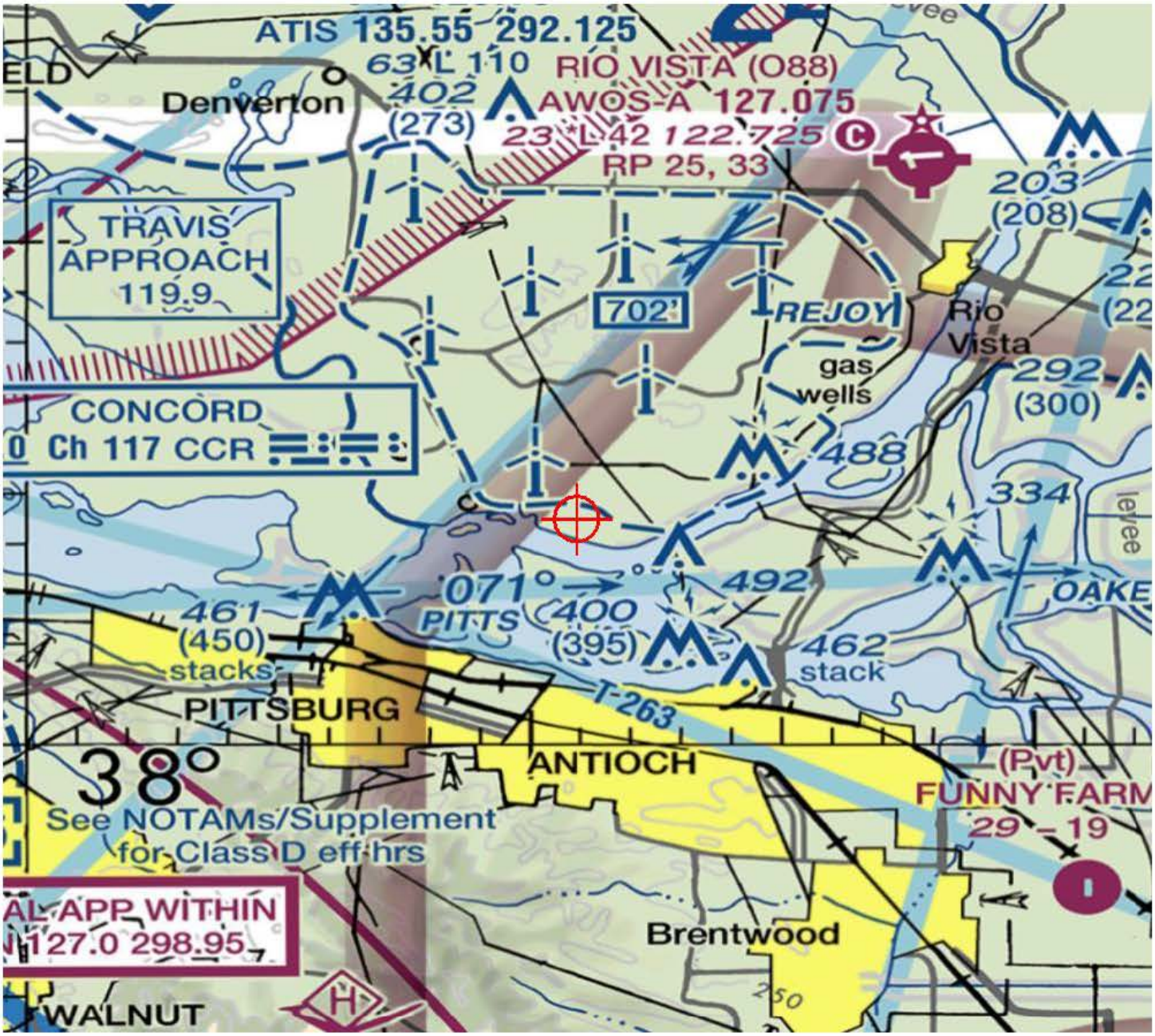
The cumulative impact of the proposed structures, when combined with other proposed and existing structures, is not considered to be significant. Study did not disclose any significant adverse effect on existing or proposed public-use or military airports or navigational facilities, nor would the proposals affect the capacity of any known existing or planned public-use or military airport.

Therefore, it is determined that the proposed construction would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation providing the conditions set forth in this determination are met.

Additional conditions:

As a condition of this determination it is required that Notice of Actual Construction or Alteration (7460-2 Part 1) be E-filed at least 60 full days prior to the start of construction so that appropriate action can be taken to amend the effected procedure(s) and/or altitude(s).

Sectional Map for ASN 2018-WTW-13403-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTW-13404-OE

Issued Date: 02/01/2019

Amanda Beck
Sacramento Municipal Utility District
6201 S St., MS MD-2
Sacramento, CA 95817

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine P4N8
Location:	Rio Vista, CA
Latitude:	38-04-48.12N NAD 83
Longitude:	121-48-51.19W
Heights:	211 feet site elevation (SE)
	591 feet above ground level (AGL)
	802 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 60 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

This determination expires on 08/01/2020 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 03, 2019. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 13, 2019 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be

used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

If we can be of further assistance, please contact Steve Phillips, at (816) 329-2523, or steve.phillips@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTW-13404-OE.

Signature Control No: 387140408-395150232 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

Abbreviations:
AGL, Above Ground Level
AMSL, Above Mean Sea Level
ARSR, Air Route Surveillance Radar
ASN, Aeronautical Study Number
ASR, Airport Surveillance Radar
ATC, Air Traffic Control
CAT, Category
CFR, Code of Federal Regulations
DASR, Digital Airport Surveillance Radar
IFR, Instrument Flight Rules
MVA, Minimum Vectoring Altitude
NM, Nautical Mile
RWY, Runway
TPA, Traffic Pattern Airspace
TRACON, Terminal Radar Approach Control
VFR, Visual Flight Rules

The proposed structures are part of a proposed wind farm that would be located approximately 5.02 - 9.07 NM southwest of the Airport Reference Point for the Rio Vista Municipal Airport (O88), Rio Vista, CA. The ASNs with coordinates, AGL heights, and AMSL heights are as shown on page one. They would exceed the obstruction standards of 14 CFR Part 77 as follows:

Section 77.17(a)(1): by 92 feet; a height that exceeds 499 feet AGL.

Section 77.17(a)(2): A height that is 200 feet AGL, or above the established airport elevation, whichever is higher, within 3 NM miles of the established reference point of O88 and that height increases in the proportion of 100 feet for each additional NM from the airport up to a maximum of 499 feet. The following would exceed:

2018-WTW-13388-OE by 190 feet
2018-WTW-13389-OE by 187 feet
2018-WTW-13390-OE by 169 feet
2018-WTW-13391-OE by 154 feet
2018-WTW-13392-OE by 141 feet

2018-WTW-13393-OE by 179 feet
2018-WTW-13394-OE by 167 feet
2018-WTW-13395-OE by 163 feet
2018-WTW-13396-OE by 156 feet

Section 77.17(a)(3): A height that increases a minimum instrument flight altitude within a terminal area;

The following would increase the Northern California TRACON (NCT) MVA for NCT_MVA_FUS3_2017 Sector MCC_B from 1,700 feet AMSL to 1,800 feet AMSL.

2018-WTW-13388-OE
2018-WTW-13389-OE
2018-WTW-13390-OE
2018-WTW-13391-OE
2018-WTW-13393-OE

2018-WTW-13397-OE
2018-WTW-13398-OE
2018-WTW-13399-OE
2018-WTW-13400-OE
2018-WTW-13403-OE

2018-WTW-13404-OE
2018-WTW-13405-OE

The turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. The proposals will affect the quality and/or availability of radar signals. The effects would be unwanted primary returns (clutter) and primary target drops, all in the area of the turbines. Tracked primary targets could diverge from the aircraft path and follow wind turbines, when the aircraft is over or near the turbines.

In order to facilitate the public comment process, the studies were circularized under ASN 2018-WTW-13388-OE on December 04, 2018, to all known aviation interests and to non-aeronautical interests that may be affected by the proposal. One letter of objection was received as a result of the circularization.

The Solano County Airport Land Use Commission (County) submitted comments that may not necessarily be an "objection" but rather statements. Some of their statements are simply repeating applicable law / rule / orders. They stated that these would be the tallest wind turbines in the area and larger than other onshore turbines elsewhere. Also stated was a belief that these have electromagnetic effects on radar. One statement said they "have seen information that conflicts" with the preliminary analysis of not exceeding TPA. Instead of submitting that stated information, a request was made for the FAA to see if any other obstruction standard was exceeded.

We are not sure what to make of the statement about these being the tallest in the area. Simply being taller than other structures has never been, nor will it ever be, the sole indicator of whether the structure would present an unacceptable impact upon the safe and efficient use of the navigable airspace.

The letter left the impression that the County believes exceeding one or more of the obstruction standards of 14 CFR Part 77 is reason enough to determine the proposal to be a hazard. That is not the case. It is the result of the aeronautical study that determines whether the structure would be a hazard or no hazard to air navigation. We will always compare proposed structures against all of the obstruction standards but will not circularize the standards that are not exceeded nor any standards and/or effects that are beyond the scope of the public to provide information about.

Records indicate that O88 has approximately 35,000 operations per year primarily from CAT A and B general aviation aircraft. All except one of the proposed turbines lie beyond the TPA for all RWYs and aircraft categories. That one proposal is on the edge of the RWY 15/33 TPA for CAT D, but at 2,199 feet long, this

RWY is incapable of sustaining CAT D aircraft operations. The size of the TPA is based upon the aircraft that regularly use a particular RWY. The preliminary assessment of not exceeding TPA has been confirmed.

Note: Aircraft categories are based on approach speed, CAT A = less than 91 knots, CAT B = 91- 120 knots, CAT C = 121-140 knots, CAT D = 141-165 knots.

The County submitted a lot about radar effects. Wind turbines rarely, if ever create "electromagnetic" interference. If they are within the line of sight of a radar sensor, they may be detected by that sensor and may therefore be a physical interference. Simply being "seen" by the radar is not the real issue though. How that target (in this case, the wind turbine) is processed and displayed for ATC is the key. The users of the system (ATC) is the sole decider on whether the system is acceptable to be able to perform their duties. Although there may be others entities using these radar systems, the responsibility and authority of the FAA is the safe and efficient use of the navigable airspace, including the impact of the radar effects on air navigation.

The turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. However, this would not cause an unacceptable adverse impact on ATC operations at this time.

The aeronautical study disclosed that the proposed structures would have the adverse effect as described above on the NCT MVA. MVAs are solely used by ATC and not published for public use and are not circulated for public comment. The study disclosed that increasing the MVA in the area of the turbines would not impact a significant number of operations. The proposed structures would have no other effect on any existing or proposed arrival, departure, or en route IFR operations or procedures.

Study for possible VFR effect disclosed that the proposals would have no effect on existing or proposed VFR arrival or departure operations. As stated above, the proposals are beyond normal traffic pattern airspace. Therefore, the proposal would not have an adverse effect on VFR traffic pattern operations at O88, or any other known public use or military airports. At 591 feet AGL, the structures would extend upwards into altitudes commonly used for en route VFR flight; however, no information was received to indicate they would be located along a regularly used VFR route or that they would pose a problem for pilots operating en route. Therefore, they would not have a substantial adverse effect on en route VFR flight operations.

The proposed structures would be appropriately obstruction marked/lighted to make them more conspicuous to airmen should circumnavigation be necessary.

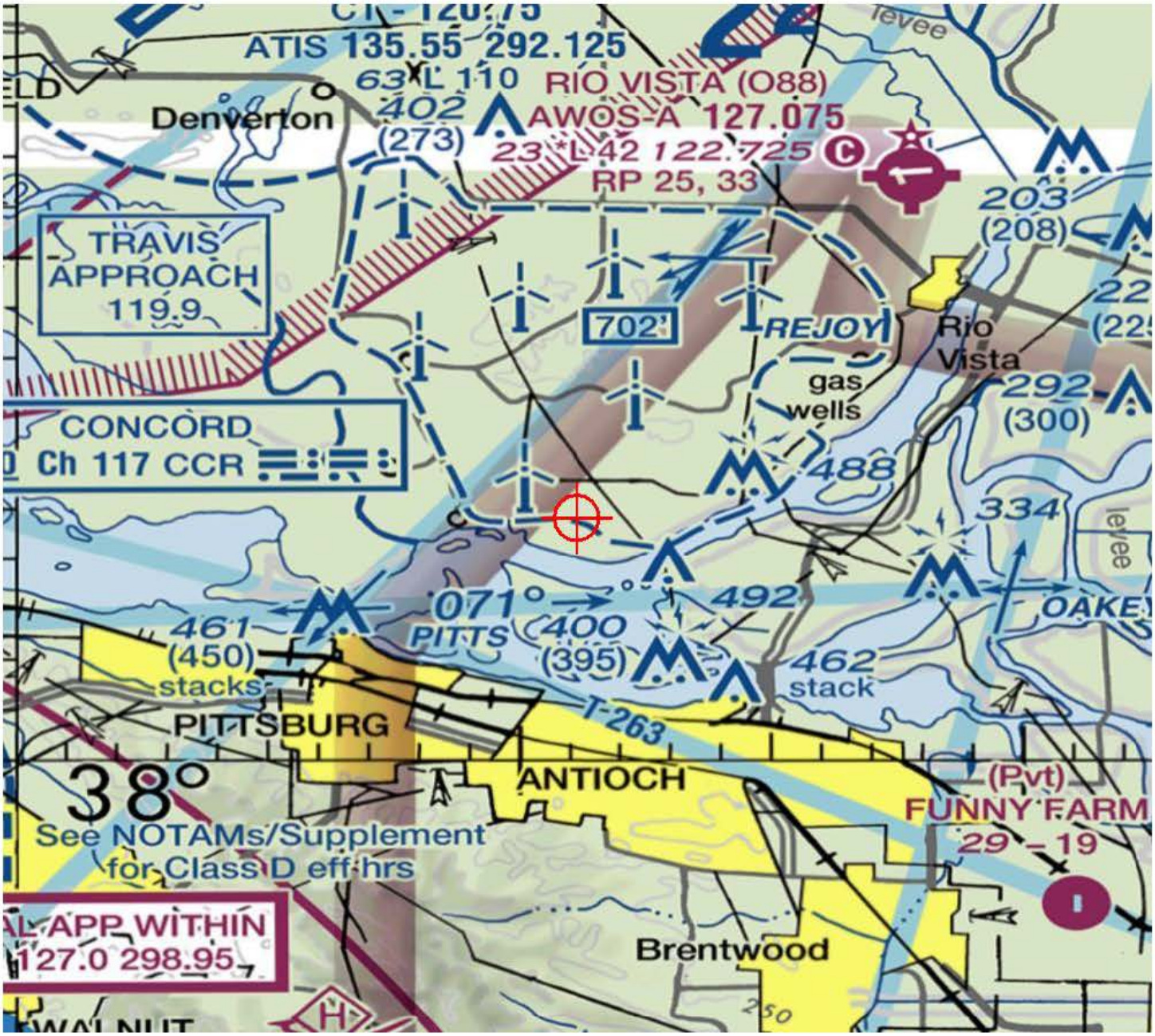
The cumulative impact of the proposed structures, when combined with other proposed and existing structures, is not considered to be significant. Study did not disclose any significant adverse effect on existing or proposed public-use or military airports or navigational facilities, nor would the proposals affect the capacity of any known existing or planned public-use or military airport.

Therefore, it is determined that the proposed construction would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation providing the conditions set forth in this determination are met.

Additional conditions:

As a condition of this determination it is required that Notice of Actual Construction or Alteration (7460-2 Part 1) be E-filed at least 60 full days prior to the start of construction so that appropriate action can be taken to amend the effected procedure(s) and/or altitude(s).

Sectional Map for ASN 2018-WTW-13404-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTW-13405-OE

Issued Date: 02/01/2019

Amanda Beck
Sacramento Municipal Utility District
6201 S St., MS MD-2
Sacramento, CA 95817

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine P4N9
Location:	Rio Vista, CA
Latitude:	38-04-38.20N NAD 83
Longitude:	121-48-46.20W
Heights:	216 feet site elevation (SE)
	591 feet above ground level (AGL)
	807 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 60 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

This determination expires on 08/01/2020 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 03, 2019. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 13, 2019 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be

used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

If we can be of further assistance, please contact Steve Phillips, at (816) 329-2523, or steve.phillips@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTW-13405-OE.

Signature Control No: 387140409-395150238 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

Abbreviations:
AGL, Above Ground Level
AMSL, Above Mean Sea Level
ARSR, Air Route Surveillance Radar
ASN, Aeronautical Study Number
ASR, Airport Surveillance Radar
ATC, Air Traffic Control
CAT, Category
CFR, Code of Federal Regulations
DASR, Digital Airport Surveillance Radar
IFR, Instrument Flight Rules
MVA, Minimum Vectoring Altitude
NM, Nautical Mile
RWY, Runway
TPA, Traffic Pattern Airspace
TRACON, Terminal Radar Approach Control
VFR, Visual Flight Rules

The proposed structures are part of a proposed wind farm that would be located approximately 5.02 - 9.07 NM southwest of the Airport Reference Point for the Rio Vista Municipal Airport (O88), Rio Vista, CA. The ASNs with coordinates, AGL heights, and AMSL heights are as shown on page one. They would exceed the obstruction standards of 14 CFR Part 77 as follows:

Section 77.17(a)(1): by 92 feet; a height that exceeds 499 feet AGL.

Section 77.17(a)(2): A height that is 200 feet AGL, or above the established airport elevation, whichever is higher, within 3 NM miles of the established reference point of O88 and that height increases in the proportion of 100 feet for each additional NM from the airport up to a maximum of 499 feet. The following would exceed:

2018-WTW-13388-OE by 190 feet
2018-WTW-13389-OE by 187 feet
2018-WTW-13390-OE by 169 feet
2018-WTW-13391-OE by 154 feet
2018-WTW-13392-OE by 141 feet

2018-WTW-13393-OE by 179 feet
2018-WTW-13394-OE by 167 feet
2018-WTW-13395-OE by 163 feet
2018-WTW-13396-OE by 156 feet

Section 77.17(a)(3): A height that increases a minimum instrument flight altitude within a terminal area;

The following would increase the Northern California TRACON (NCT) MVA for NCT_MVA_FUS3_2017 Sector MCC_B from 1,700 feet AMSL to 1,800 feet AMSL.

2018-WTW-13388-OE
2018-WTW-13389-OE
2018-WTW-13390-OE
2018-WTW-13391-OE
2018-WTW-13393-OE

2018-WTW-13397-OE
2018-WTW-13398-OE
2018-WTW-13399-OE
2018-WTW-13400-OE
2018-WTW-13403-OE

2018-WTW-13404-OE
2018-WTW-13405-OE

The turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. The proposals will affect the quality and/or availability of radar signals. The effects would be unwanted primary returns (clutter) and primary target drops, all in the area of the turbines. Tracked primary targets could diverge from the aircraft path and follow wind turbines, when the aircraft is over or near the turbines.

In order to facilitate the public comment process, the studies were circularized under ASN 2018-WTW-13388-OE on December 04, 2018, to all known aviation interests and to non-aeronautical interests that may be affected by the proposal. One letter of objection was received as a result of the circularization.

The Solano County Airport Land Use Commission (County) submitted comments that may not necessarily be an "objection" but rather statements. Some of their statements are simply repeating applicable law / rule / orders. They stated that these would be the tallest wind turbines in the area and larger than other onshore turbines elsewhere. Also stated was a belief that these have electromagnetic effects on radar. One statement said they "have seen information that conflicts" with the preliminary analysis of not exceeding TPA. Instead of submitting that stated information, a request was made for the FAA to see if any other obstruction standard was exceeded.

We are not sure what to make of the statement about these being the tallest in the area. Simply being taller than other structures has never been, nor will it ever be, the sole indicator of whether the structure would present an unacceptable impact upon the safe and efficient use of the navigable airspace.

The letter left the impression that the County believes exceeding one or more of the obstruction standards of 14 CFR Part 77 is reason enough to determine the proposal to be a hazard. That is not the case. It is the result of the aeronautical study that determines whether the structure would be a hazard or no hazard to air navigation. We will always compare proposed structures against all of the obstruction standards but will not circularize the standards that are not exceeded nor any standards and/or effects that are beyond the scope of the public to provide information about.

Records indicate that O88 has approximately 35,000 operations per year primarily from CAT A and B general aviation aircraft. All except one of the proposed turbines lie beyond the TPA for all RWYs and aircraft categories. That one proposal is on the edge of the RWY 15/33 TPA for CAT D, but at 2,199 feet long, this

RWY is incapable of sustaining CAT D aircraft operations. The size of the TPA is based upon the aircraft that regularly use a particular RWY. The preliminary assessment of not exceeding TPA has been confirmed.

Note: Aircraft categories are based on approach speed, CAT A = less than 91 knots, CAT B = 91- 120 knots, CAT C = 121-140 knots, CAT D = 141-165 knots.

The County submitted a lot about radar effects. Wind turbines rarely, if ever create "electromagnetic" interference. If they are within the line of sight of a radar sensor, they may be detected by that sensor and may therefore be a physical interference. Simply being "seen" by the radar is not the real issue though. How that target (in this case, the wind turbine) is processed and displayed for ATC is the key. The users of the system (ATC) is the sole decider on whether the system is acceptable to be able to perform their duties. Although there may be others entities using these radar systems, the responsibility and authority of the FAA is the safe and efficient use of the navigable airspace, including the impact of the radar effects on air navigation.

The turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. However, this would not cause an unacceptable adverse impact on ATC operations at this time.

The aeronautical study disclosed that the proposed structures would have the adverse effect as described above on the NCT MVA. MVAs are solely used by ATC and not published for public use and are not circulated for public comment. The study disclosed that increasing the MVA in the area of the turbines would not impact a significant number of operations. The proposed structures would have no other effect on any existing or proposed arrival, departure, or en route IFR operations or procedures.

Study for possible VFR effect disclosed that the proposals would have no effect on existing or proposed VFR arrival or departure operations. As stated above, the proposals are beyond normal traffic pattern airspace. Therefore, the proposal would not have an adverse effect on VFR traffic pattern operations at O88, or any other known public use or military airports. At 591 feet AGL, the structures would extend upwards into altitudes commonly used for en route VFR flight; however, no information was received to indicate they would be located along a regularly used VFR route or that they would pose a problem for pilots operating en route. Therefore, they would not have a substantial adverse effect on en route VFR flight operations.

The proposed structures would be appropriately obstruction marked/lighted to make them more conspicuous to airmen should circumnavigation be necessary.

The cumulative impact of the proposed structures, when combined with other proposed and existing structures, is not considered to be significant. Study did not disclose any significant adverse effect on existing or proposed public-use or military airports or navigational facilities, nor would the proposals affect the capacity of any known existing or planned public-use or military airport.

Therefore, it is determined that the proposed construction would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation providing the conditions set forth in this determination are met.

Additional conditions:

As a condition of this determination it is required that Notice of Actual Construction or Alteration (7460-2 Part 1) be E-filed at least 60 full days prior to the start of construction so that appropriate action can be taken to amend the effected procedure(s) and/or altitude(s).

Sectional Map for ASN 2018-WTW-13405-OE

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTW-13406-OE

Issued Date: 02/01/2019

Amanda Beck
Sacramento Municipal Utility District
6201 S St., MS MD-2
Sacramento, CA 95817

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine P4N10
Location:	Rio Vista, CA
Latitude:	38-04-22.44N NAD 83
Longitude:	121-48-30.99W
Heights:	148 feet site elevation (SE)
	591 feet above ground level (AGL)
	739 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 60 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

This determination expires on 08/01/2020 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 03, 2019. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 13, 2019 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be

used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

If we can be of further assistance, please contact Steve Phillips, at (816) 329-2523, or steve.phillips@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTW-13406-OE.

Signature Control No: 387140410-395150239 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

Abbreviations:
AGL, Above Ground Level
AMSL, Above Mean Sea Level
ARSR, Air Route Surveillance Radar
ASN, Aeronautical Study Number
ASR, Airport Surveillance Radar
ATC, Air Traffic Control
CAT, Category
CFR, Code of Federal Regulations
DASR, Digital Airport Surveillance Radar
IFR, Instrument Flight Rules
MVA, Minimum Vectoring Altitude
NM, Nautical Mile
RWY, Runway
TPA, Traffic Pattern Airspace
TRACON, Terminal Radar Approach Control
VFR, Visual Flight Rules

The proposed structures are part of a proposed wind farm that would be located approximately 5.02 - 9.07 NM southwest of the Airport Reference Point for the Rio Vista Municipal Airport (O88), Rio Vista, CA. The ASNs with coordinates, AGL heights, and AMSL heights are as shown on page one. They would exceed the obstruction standards of 14 CFR Part 77 as follows:

Section 77.17(a)(1): by 92 feet; a height that exceeds 499 feet AGL.

Section 77.17(a)(2): A height that is 200 feet AGL, or above the established airport elevation, whichever is higher, within 3 NM miles of the established reference point of O88 and that height increases in the proportion of 100 feet for each additional NM from the airport up to a maximum of 499 feet. The following would exceed:

2018-WTW-13388-OE by 190 feet
2018-WTW-13389-OE by 187 feet
2018-WTW-13390-OE by 169 feet
2018-WTW-13391-OE by 154 feet
2018-WTW-13392-OE by 141 feet

2018-WTW-13393-OE by 179 feet
2018-WTW-13394-OE by 167 feet
2018-WTW-13395-OE by 163 feet
2018-WTW-13396-OE by 156 feet

Section 77.17(a)(3): A height that increases a minimum instrument flight altitude within a terminal area;

The following would increase the Northern California TRACON (NCT) MVA for NCT_MVA_FUS3_2017 Sector MCC_B from 1,700 feet AMSL to 1,800 feet AMSL.

2018-WTW-13388-OE
2018-WTW-13389-OE
2018-WTW-13390-OE
2018-WTW-13391-OE
2018-WTW-13393-OE

2018-WTW-13397-OE
2018-WTW-13398-OE
2018-WTW-13399-OE
2018-WTW-13400-OE
2018-WTW-13403-OE

2018-WTW-13404-OE
2018-WTW-13405-OE

The turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. The proposals will affect the quality and/or availability of radar signals. The effects would be unwanted primary returns (clutter) and primary target drops, all in the area of the turbines. Tracked primary targets could diverge from the aircraft path and follow wind turbines, when the aircraft is over or near the turbines.

In order to facilitate the public comment process, the studies were circularized under ASN 2018-WTW-13388-OE on December 04, 2018, to all known aviation interests and to non-aeronautical interests that may be affected by the proposal. One letter of objection was received as a result of the circularization.

The Solano County Airport Land Use Commission (County) submitted comments that may not necessarily be an "objection" but rather statements. Some of their statements are simply repeating applicable law / rule / orders. They stated that these would be the tallest wind turbines in the area and larger than other onshore turbines elsewhere. Also stated was a belief that these have electromagnetic effects on radar. One statement said they "have seen information that conflicts" with the preliminary analysis of not exceeding TPA. Instead of submitting that stated information, a request was made for the FAA to see if any other obstruction standard was exceeded.

We are not sure what to make of the statement about these being the tallest in the area. Simply being taller than other structures has never been, nor will it ever be, the sole indicator of whether the structure would present an unacceptable impact upon the safe and efficient use of the navigable airspace.

The letter left the impression that the County believes exceeding one or more of the obstruction standards of 14 CFR Part 77 is reason enough to determine the proposal to be a hazard. That is not the case. It is the result of the aeronautical study that determines whether the structure would be a hazard or no hazard to air navigation. We will always compare proposed structures against all of the obstruction standards but will not circularize the standards that are not exceeded nor any standards and/or effects that are beyond the scope of the public to provide information about.

Records indicate that O88 has approximately 35,000 operations per year primarily from CAT A and B general aviation aircraft. All except one of the proposed turbines lie beyond the TPA for all RWYs and aircraft categories. That one proposal is on the edge of the RWY 15/33 TPA for CAT D, but at 2,199 feet long, this

RWY is incapable of sustaining CAT D aircraft operations. The size of the TPA is based upon the aircraft that regularly use a particular RWY. The preliminary assessment of not exceeding TPA has been confirmed.

Note: Aircraft categories are based on approach speed, CAT A = less than 91 knots, CAT B = 91- 120 knots, CAT C = 121-140 knots, CAT D = 141-165 knots.

The County submitted a lot about radar effects. Wind turbines rarely, if ever create "electromagnetic" interference. If they are within the line of sight of a radar sensor, they may be detected by that sensor and may therefore be a physical interference. Simply being "seen" by the radar is not the real issue though. How that target (in this case, the wind turbine) is processed and displayed for ATC is the key. The users of the system (ATC) is the sole decider on whether the system is acceptable to be able to perform their duties. Although there may be others entities using these radar systems, the responsibility and authority of the FAA is the safe and efficient use of the navigable airspace, including the impact of the radar effects on air navigation.

The turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. However, this would not cause an unacceptable adverse impact on ATC operations at this time.

The aeronautical study disclosed that the proposed structures would have the adverse effect as described above on the NCT MVA. MVAs are solely used by ATC and not published for public use and are not circulated for public comment. The study disclosed that increasing the MVA in the area of the turbines would not impact a significant number of operations. The proposed structures would have no other effect on any existing or proposed arrival, departure, or en route IFR operations or procedures.

Study for possible VFR effect disclosed that the proposals would have no effect on existing or proposed VFR arrival or departure operations. As stated above, the proposals are beyond normal traffic pattern airspace. Therefore, the proposal would not have an adverse effect on VFR traffic pattern operations at O88, or any other known public use or military airports. At 591 feet AGL, the structures would extend upwards into altitudes commonly used for en route VFR flight; however, no information was received to indicate they would be located along a regularly used VFR route or that they would pose a problem for pilots operating en route. Therefore, they would not have a substantial adverse effect on en route VFR flight operations.

The proposed structures would be appropriately obstruction marked/lighted to make them more conspicuous to airmen should circumnavigation be necessary.

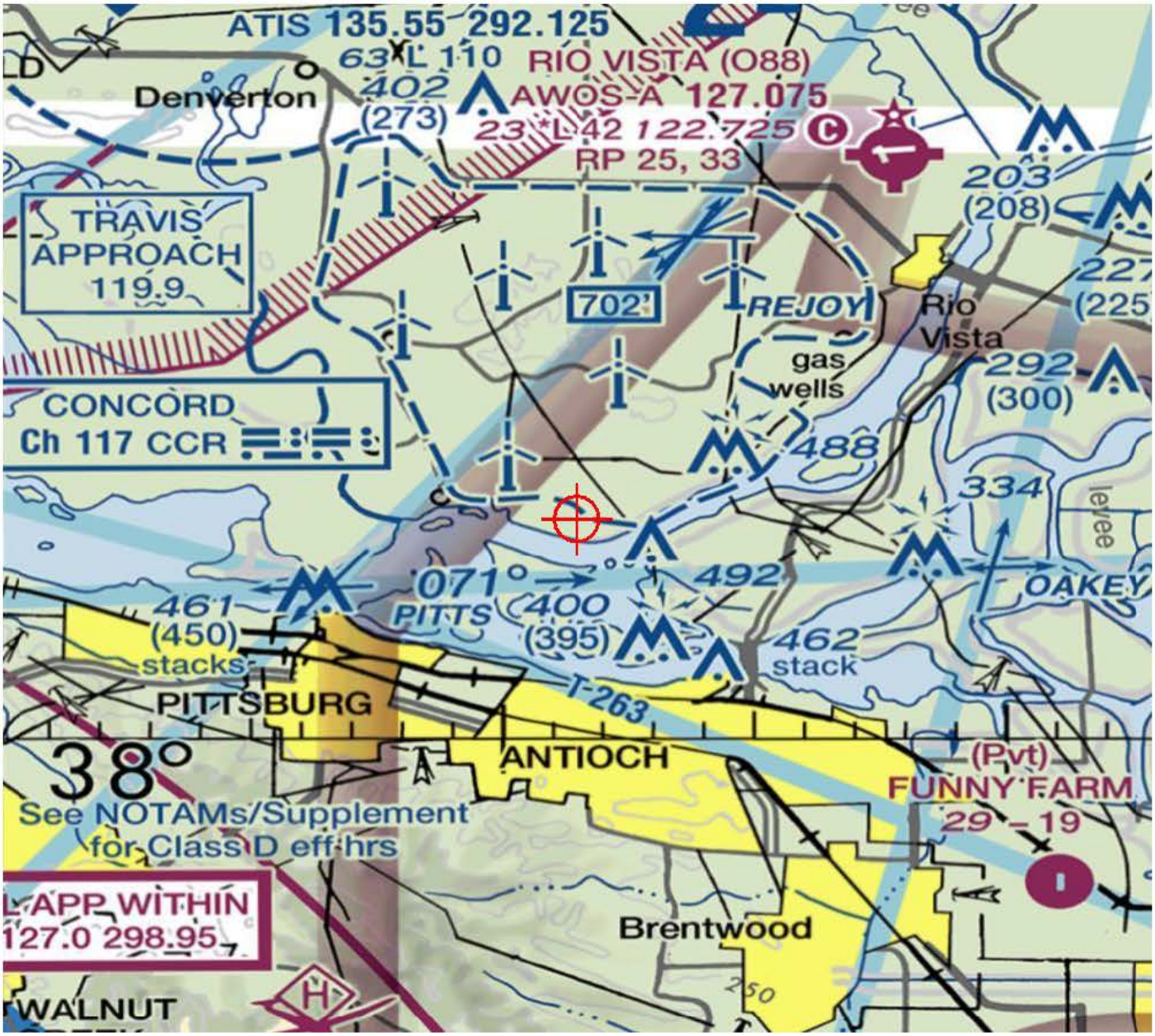
The cumulative impact of the proposed structures, when combined with other proposed and existing structures, is not considered to be significant. Study did not disclose any significant adverse effect on existing or proposed public-use or military airports or navigational facilities, nor would the proposals affect the capacity of any known existing or planned public-use or military airport.

Therefore, it is determined that the proposed construction would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation providing the conditions set forth in this determination are met.

Additional conditions:

As a condition of this determination it is required that Notice of Actual Construction or Alteration (7460-2 Part 1) be E-filed at least 60 full days prior to the start of construction so that appropriate action can be taken to amend the effected procedure(s) and/or altitude(s).

Sectional Map for ASN 2018-WTW-13406-OE



FAA Determinations Extensions

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTW-13394-OE

Issued Date: 01/28/2021

Amanda Beck
Sacramento Municipal Utility District
6201 S St., MS MD-2
Sacramento, CA 95817

**** Extension ****

A Determination was issued by the Federal Aviation Administration (FAA) concerning:

Structure:	Wind Turbine P1N2
Location:	Rio Vista, CA
Latitude:	38-07-08.51N NAD 83
Longitude:	121-45-43.44W
Heights:	157 feet site elevation (SE)
	591 feet above ground level (AGL)
	748 feet above mean sea level (AMSL)

In response to your request for an extension of the effective period of the determination, the FAA has reviewed the aeronautical study in light of current aeronautical operations in the area of the structure and finds that no significant aeronautical changes have occurred which would alter the determination issued for this structure.

This extension is subject to review if an interested party files a petition that is received by the FAA on or before February 27, 2021. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Rules and Regulations Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This extension becomes final on March 09, 2021 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Rules and Regulations Group via telephone – 202-267-8783.

Accordingly, pursuant to the authority delegated to me, the effective period of the determination issued under the above cited aeronautical study number is hereby extended and will expire on 02/01/2022 unless otherwise extended, revised, or terminated by this office. You must adhere to all conditions identified in the original determination.

This extension issued in accordance with 49 U.S.C., Section 44718 and, if applicable, Title 14 of the Code of Federal Regulations, part 77, concerns the effect of the structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

If we can be of further assistance, please contact our office at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTW-13394-OE.

Signature Control No: 387140391-466582664 (EXT -WT)
Paul Holmquist
Specialist

Attachment(s)
Additional Information

Additional information for ASN 2018-WTW-13394-OE

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTW-13392-OE

Issued Date: 01/28/2021

Amanda Beck
Sacramento Municipal Utility District
6201 S St., MS MD-2
Sacramento, CA 95817

**** Extension ****

A Determination was issued by the Federal Aviation Administration (FAA) concerning:

Structure:	Wind Turbine P1R5
Location:	Rio Vista, CA
Latitude:	38-07-14.14N NAD 83
Longitude:	121-46-28.35W
Heights:	116 feet site elevation (SE)
	591 feet above ground level (AGL)
	707 feet above mean sea level (AMSL)

In response to your request for an extension of the effective period of the determination, the FAA has reviewed the aeronautical study in light of current aeronautical operations in the area of the structure and finds that no significant aeronautical changes have occurred which would alter the determination issued for this structure.

This extension is subject to review if an interested party files a petition that is received by the FAA on or before February 27, 2021. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Rules and Regulations Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This extension becomes final on March 09, 2021 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Rules and Regulations Group via telephone – 202-267-8783.

Accordingly, pursuant to the authority delegated to me, the effective period of the determination issued under the above cited aeronautical study number is hereby extended and will expire on 02/01/2022 unless otherwise extended, revised, or terminated by this office. You must adhere to all conditions identified in the original determination.

This extension issued in accordance with 49 U.S.C., Section 44718 and, if applicable, Title 14 of the Code of Federal Regulations, part 77, concerns the effect of the structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

If we can be of further assistance, please contact our office at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTW-13392-OE.

Signature Control No: 387140389-466582665 (EXT -WT)
Paul Holmquist
Specialist

Attachment(s)
Additional Information

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTW-13388-OE

Issued Date: 01/28/2021

Amanda Beck
Sacramento Municipal Utility District
6201 S St., MS MD-2
Sacramento, CA 95817

**** Extension ****

A Determination was issued by the Federal Aviation Administration (FAA) concerning:

Structure:	Wind Turbine P1R1
Location:	Rio Vista, CA
Latitude:	38-07-54.16N NAD 83
Longitude:	121-46-31.47W
Heights:	208 feet site elevation (SE)
	591 feet above ground level (AGL)
	799 feet above mean sea level (AMSL)

In response to your request for an extension of the effective period of the determination, the FAA has reviewed the aeronautical study in light of current aeronautical operations in the area of the structure and finds that no significant aeronautical changes have occurred which would alter the determination issued for this structure.

This extension is subject to review if an interested party files a petition that is received by the FAA on or before February 27, 2021. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Rules and Regulations Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This extension becomes final on March 09, 2021 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Rules and Regulations Group via telephone – 202-267-8783.

Accordingly, pursuant to the authority delegated to me, the effective period of the determination issued under the above cited aeronautical study number is hereby extended and will expire on 02/01/2022 unless otherwise extended, revised, or terminated by this office. You must adhere to all conditions identified in the original determination.

This extension issued in accordance with 49 U.S.C., Section 44718 and, if applicable, Title 14 of the Code of Federal Regulations, part 77, concerns the effect of the structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

If we can be of further assistance, please contact our office at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTW-13388-OE.

Signature Control No: 387140385-466582666 (EXT -WT)
Paul Holmquist
Specialist

Attachment(s)
Additional Information

Additional information for ASN 2018-WTW-13388-OE

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTW-13390-OE

Issued Date: 01/28/2021

Amanda Beck
Sacramento Municipal Utility District
6201 S St., MS MD-2
Sacramento, CA 95817

**** Extension ****

A Determination was issued by the Federal Aviation Administration (FAA) concerning:

Structure:	Wind Turbine P1R3
Location:	Rio Vista, CA
Latitude:	38-07-35.49N NAD 83
Longitude:	121-46-28.29W
Heights:	189 feet site elevation (SE)
	591 feet above ground level (AGL)
	780 feet above mean sea level (AMSL)

In response to your request for an extension of the effective period of the determination, the FAA has reviewed the aeronautical study in light of current aeronautical operations in the area of the structure and finds that no significant aeronautical changes have occurred which would alter the determination issued for this structure.

This extension is subject to review if an interested party files a petition that is received by the FAA on or before February 27, 2021. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Rules and Regulations Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This extension becomes final on March 09, 2021 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Rules and Regulations Group via telephone – 202-267-8783.

Accordingly, pursuant to the authority delegated to me, the effective period of the determination issued under the above cited aeronautical study number is hereby extended and will expire on 02/01/2022 unless otherwise extended, revised, or terminated by this office. You must adhere to all conditions identified in the original determination.

This extension issued in accordance with 49 U.S.C., Section 44718 and, if applicable, Title 14 of the Code of Federal Regulations, part 77, concerns the effect of the structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

If we can be of further assistance, please contact our office at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTW-13390-OE.

Signature Control No: 387140387-466582667 (EXT -WT)
Paul Holmquist
Specialist

Attachment(s)
Additional Information

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTW-13399-OE

Issued Date: 01/28/2021

Amanda Beck
Sacramento Municipal Utility District
6201 S St., MS MD-2
Sacramento, CA 95817

**** Extension ****

A Determination was issued by the Federal Aviation Administration (FAA) concerning:

Structure:	Wind Turbine P4N3
Location:	Rio Vista, CA
Latitude:	38-05-24.68N NAD 83
Longitude:	121-49-44.45W
Heights:	214 feet site elevation (SE)
	591 feet above ground level (AGL)
	805 feet above mean sea level (AMSL)

In response to your request for an extension of the effective period of the determination, the FAA has reviewed the aeronautical study in light of current aeronautical operations in the area of the structure and finds that no significant aeronautical changes have occurred which would alter the determination issued for this structure.

This extension is subject to review if an interested party files a petition that is received by the FAA on or before February 27, 2021. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Rules and Regulations Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This extension becomes final on March 09, 2021 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Rules and Regulations Group via telephone – 202-267-8783.

Accordingly, pursuant to the authority delegated to me, the effective period of the determination issued under the above cited aeronautical study number is hereby extended and will expire on 02/01/2022 unless otherwise extended, revised, or terminated by this office. You must adhere to all conditions identified in the original determination.

This extension issued in accordance with 49 U.S.C., Section 44718 and, if applicable, Title 14 of the Code of Federal Regulations, part 77, concerns the effect of the structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

If we can be of further assistance, please contact our office at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTW-13399-OE.

Signature Control No: 387140396-466582668 (EXT -WT)
Paul Holmquist
Specialist

Attachment(s)
Additional Information

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTW-13395-OE

Issued Date: 01/28/2021

Amanda Beck
Sacramento Municipal Utility District
6201 S St., MS MD-2
Sacramento, CA 95817

**** Extension ****

A Determination was issued by the Federal Aviation Administration (FAA) concerning:

Structure:	Wind Turbine P1N3
Location:	Rio Vista, CA
Latitude:	38-06-53.36N NAD 83
Longitude:	121-45-15.19W
Heights:	115 feet site elevation (SE)
	591 feet above ground level (AGL)
	706 feet above mean sea level (AMSL)

In response to your request for an extension of the effective period of the determination, the FAA has reviewed the aeronautical study in light of current aeronautical operations in the area of the structure and finds that no significant aeronautical changes have occurred which would alter the determination issued for this structure.

This extension is subject to review if an interested party files a petition that is received by the FAA on or before February 27, 2021. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Rules and Regulations Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This extension becomes final on March 09, 2021 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Rules and Regulations Group via telephone – 202-267-8783.

Accordingly, pursuant to the authority delegated to me, the effective period of the determination issued under the above cited aeronautical study number is hereby extended and will expire on 02/01/2022 unless otherwise extended, revised, or terminated by this office. You must adhere to all conditions identified in the original determination.

This extension issued in accordance with 49 U.S.C., Section 44718 and, if applicable, Title 14 of the Code of Federal Regulations, part 77, concerns the effect of the structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

If we can be of further assistance, please contact our office at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTW-13395-OE.

Signature Control No: 387140392-466582669 (EXT -WT)
Paul Holmquist
Specialist

Attachment(s)
Additional Information

Additional information for ASN 2018-WTW-13395-OE

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTW-13397-OE

Issued Date: 01/28/2021

Amanda Beck
Sacramento Municipal Utility District
6201 S St., MS MD-2
Sacramento, CA 95817

**** Extension ****

A Determination was issued by the Federal Aviation Administration (FAA) concerning:

Structure:	Wind Turbine P4N1
Location:	Rio Vista, CA
Latitude:	38-05-33.53N NAD 83
Longitude:	121-49-52.57W
Heights:	242 feet site elevation (SE)
	591 feet above ground level (AGL)
	833 feet above mean sea level (AMSL)

In response to your request for an extension of the effective period of the determination, the FAA has reviewed the aeronautical study in light of current aeronautical operations in the area of the structure and finds that no significant aeronautical changes have occurred which would alter the determination issued for this structure.

This extension is subject to review if an interested party files a petition that is received by the FAA on or before February 27, 2021. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Rules and Regulations Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This extension becomes final on March 09, 2021 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Rules and Regulations Group via telephone – 202-267-8783.

Accordingly, pursuant to the authority delegated to me, the effective period of the determination issued under the above cited aeronautical study number is hereby extended and will expire on 02/01/2022 unless otherwise extended, revised, or terminated by this office. You must adhere to all conditions identified in the original determination.

This extension issued in accordance with 49 U.S.C., Section 44718 and, if applicable, Title 14 of the Code of Federal Regulations, part 77, concerns the effect of the structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

If we can be of further assistance, please contact our office at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTW-13397-OE.

Signature Control No: 387140394-466582670 (EXT -WT)
Paul Holmquist
Specialist

Attachment(s)
Additional Information

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTW-13391-OE

Issued Date: 01/28/2021

Amanda Beck
Sacramento Municipal Utility District
6201 S St., MS MD-2
Sacramento, CA 95817

**** Extension ****

A Determination was issued by the Federal Aviation Administration (FAA) concerning:

Structure:	Wind Turbine P1R4
Location:	Rio Vista, CA
Latitude:	38-07-25.84N NAD 83
Longitude:	121-46-31.86W
Heights:	187 feet site elevation (SE)
	591 feet above ground level (AGL)
	778 feet above mean sea level (AMSL)

In response to your request for an extension of the effective period of the determination, the FAA has reviewed the aeronautical study in light of current aeronautical operations in the area of the structure and finds that no significant aeronautical changes have occurred which would alter the determination issued for this structure.

This extension is subject to review if an interested party files a petition that is received by the FAA on or before February 27, 2021. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Rules and Regulations Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This extension becomes final on March 09, 2021 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Rules and Regulations Group via telephone – 202-267-8783.

Accordingly, pursuant to the authority delegated to me, the effective period of the determination issued under the above cited aeronautical study number is hereby extended and will expire on 02/01/2022 unless otherwise extended, revised, or terminated by this office. You must adhere to all conditions identified in the original determination.

This extension issued in accordance with 49 U.S.C., Section 44718 and, if applicable, Title 14 of the Code of Federal Regulations, part 77, concerns the effect of the structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

If we can be of further assistance, please contact our office at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTW-13391-OE.

Signature Control No: 387140388-466582671 (EXT -WT)
Paul Holmquist
Specialist

Attachment(s)
Additional Information

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTW-13393-OE

Issued Date: 01/28/2021

Amanda Beck
Sacramento Municipal Utility District
6201 S St., MS MD-2
Sacramento, CA 95817

**** Extension ****

A Determination was issued by the Federal Aviation Administration (FAA) concerning:

Structure:	Wind Turbine P1N1
Location:	Rio Vista, CA
Latitude:	38-07-18.49N NAD 83
Longitude:	121-45-46.46W
Heights:	166 feet site elevation (SE)
	591 feet above ground level (AGL)
	757 feet above mean sea level (AMSL)

In response to your request for an extension of the effective period of the determination, the FAA has reviewed the aeronautical study in light of current aeronautical operations in the area of the structure and finds that no significant aeronautical changes have occurred which would alter the determination issued for this structure.

This extension is subject to review if an interested party files a petition that is received by the FAA on or before February 27, 2021. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Rules and Regulations Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This extension becomes final on March 09, 2021 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Rules and Regulations Group via telephone – 202-267-8783.

Accordingly, pursuant to the authority delegated to me, the effective period of the determination issued under the above cited aeronautical study number is hereby extended and will expire on 02/01/2022 unless otherwise extended, revised, or terminated by this office. You must adhere to all conditions identified in the original determination.

This extension issued in accordance with 49 U.S.C., Section 44718 and, if applicable, Title 14 of the Code of Federal Regulations, part 77, concerns the effect of the structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

If we can be of further assistance, please contact our office at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTW-13393-OE.

Signature Control No: 387140390-466582672 (EXT -WT)
Paul Holmquist
Specialist

Attachment(s)
Additional Information

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTW-13398-OE

Issued Date: 01/28/2021

Amanda Beck
Sacramento Municipal Utility District
6201 S St., MS MD-2
Sacramento, CA 95817

**** Extension ****

A Determination was issued by the Federal Aviation Administration (FAA) concerning:

Structure:	Wind Turbine P4N2
Location:	Rio Vista, CA
Latitude:	38-05-08.34N NAD 83
Longitude:	121-50-03.54W
Heights:	173 feet site elevation (SE)
	591 feet above ground level (AGL)
	764 feet above mean sea level (AMSL)

In response to your request for an extension of the effective period of the determination, the FAA has reviewed the aeronautical study in light of current aeronautical operations in the area of the structure and finds that no significant aeronautical changes have occurred which would alter the determination issued for this structure.

This extension is subject to review if an interested party files a petition that is received by the FAA on or before February 27, 2021. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Rules and Regulations Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This extension becomes final on March 09, 2021 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Rules and Regulations Group via telephone – 202-267-8783.

Accordingly, pursuant to the authority delegated to me, the effective period of the determination issued under the above cited aeronautical study number is hereby extended and will expire on 02/01/2022 unless otherwise extended, revised, or terminated by this office. You must adhere to all conditions identified in the original determination.

This extension issued in accordance with 49 U.S.C., Section 44718 and, if applicable, Title 14 of the Code of Federal Regulations, part 77, concerns the effect of the structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

If we can be of further assistance, please contact our office at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTW-13398-OE.

Signature Control No: 387140395-466582673 (EXT -WT)
Paul Holmquist
Specialist

Attachment(s)
Additional Information

Additional information for ASN 2018-WTW-13398-OE

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTW-13402-OE

Issued Date: 01/28/2021

Amanda Beck
Sacramento Municipal Utility District
6201 S St., MS MD-2
Sacramento, CA 95817

**** Extension ****

A Determination was issued by the Federal Aviation Administration (FAA) concerning:

Structure:	Wind Turbine P4N6
Location:	Rio Vista, CA
Latitude:	38-04-43.66N NAD 83
Longitude:	121-49-43.80W
Heights:	116 feet site elevation (SE)
	591 feet above ground level (AGL)
	707 feet above mean sea level (AMSL)

In response to your request for an extension of the effective period of the determination, the FAA has reviewed the aeronautical study in light of current aeronautical operations in the area of the structure and finds that no significant aeronautical changes have occurred which would alter the determination issued for this structure.

This extension is subject to review if an interested party files a petition that is received by the FAA on or before February 27, 2021. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Rules and Regulations Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This extension becomes final on March 09, 2021 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Rules and Regulations Group via telephone – 202-267-8783.

Accordingly, pursuant to the authority delegated to me, the effective period of the determination issued under the above cited aeronautical study number is hereby extended and will expire on 02/01/2022 unless otherwise extended, revised, or terminated by this office. You must adhere to all conditions identified in the original determination.

This extension issued in accordance with 49 U.S.C., Section 44718 and, if applicable, Title 14 of the Code of Federal Regulations, part 77, concerns the effect of the structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

If we can be of further assistance, please contact our office at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTW-13402-OE.

Signature Control No: 387140406-466582674 (EXT -WT)
Paul Holmquist
Specialist

Attachment(s)
Additional Information

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTW-13406-OE

Issued Date: 01/28/2021

Amanda Beck
Sacramento Municipal Utility District
6201 S St., MS MD-2
Sacramento, CA 95817

**** Extension ****

A Determination was issued by the Federal Aviation Administration (FAA) concerning:

Structure:	Wind Turbine P4N10
Location:	Rio Vista, CA
Latitude:	38-04-22.44N NAD 83
Longitude:	121-48-30.99W
Heights:	148 feet site elevation (SE)
	591 feet above ground level (AGL)
	739 feet above mean sea level (AMSL)

In response to your request for an extension of the effective period of the determination, the FAA has reviewed the aeronautical study in light of current aeronautical operations in the area of the structure and finds that no significant aeronautical changes have occurred which would alter the determination issued for this structure.

This extension is subject to review if an interested party files a petition that is received by the FAA on or before February 27, 2021. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Rules and Regulations Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This extension becomes final on March 09, 2021 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Rules and Regulations Group via telephone – 202-267-8783.

Accordingly, pursuant to the authority delegated to me, the effective period of the determination issued under the above cited aeronautical study number is hereby extended and will expire on 02/01/2022 unless otherwise extended, revised, or terminated by this office. You must adhere to all conditions identified in the original determination.

This extension issued in accordance with 49 U.S.C., Section 44718 and, if applicable, Title 14 of the Code of Federal Regulations, part 77, concerns the effect of the structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

If we can be of further assistance, please contact our office at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTW-13406-OE.

Signature Control No: 387140410-466582675 (EXT -WT)
Paul Holmquist
Specialist

Attachment(s)
Additional Information

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTW-13396-OE

Issued Date: 01/28/2021

Amanda Beck
Sacramento Municipal Utility District
6201 S St., MS MD-2
Sacramento, CA 95817

**** Extension ****

A Determination was issued by the Federal Aviation Administration (FAA) concerning:

Structure:	Wind Turbine P1N4
Location:	Rio Vista, CA
Latitude:	38-06-43.69N NAD 83
Longitude:	121-45-03.40W
Heights:	54 feet site elevation (SE)
	591 feet above ground level (AGL)
	645 feet above mean sea level (AMSL)

In response to your request for an extension of the effective period of the determination, the FAA has reviewed the aeronautical study in light of current aeronautical operations in the area of the structure and finds that no significant aeronautical changes have occurred which would alter the determination issued for this structure.

This extension is subject to review if an interested party files a petition that is received by the FAA on or before February 27, 2021. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Rules and Regulations Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This extension becomes final on March 09, 2021 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Rules and Regulations Group via telephone – 202-267-8783.

Accordingly, pursuant to the authority delegated to me, the effective period of the determination issued under the above cited aeronautical study number is hereby extended and will expire on 02/01/2022 unless otherwise extended, revised, or terminated by this office. You must adhere to all conditions identified in the original determination.

This extension issued in accordance with 49 U.S.C., Section 44718 and, if applicable, Title 14 of the Code of Federal Regulations, part 77, concerns the effect of the structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

If we can be of further assistance, please contact our office at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTW-13396-OE.

Signature Control No: 387140393-466582676 (EXT -WT)
Paul Holmquist
Specialist

Attachment(s)
Additional Information

Additional information for ASN 2018-WTW-13396-OE

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTW-13389-OE

Issued Date: 01/28/2021

Amanda Beck
Sacramento Municipal Utility District
6201 S St., MS MD-2
Sacramento, CA 95817

**** Extension ****

A Determination was issued by the Federal Aviation Administration (FAA) concerning:

Structure:	Wind Turbine P1R2
Location:	Rio Vista, CA
Latitude:	38-07-44.90N NAD 83
Longitude:	121-46-20.90W
Heights:	183 feet site elevation (SE)
	591 feet above ground level (AGL)
	774 feet above mean sea level (AMSL)

In response to your request for an extension of the effective period of the determination, the FAA has reviewed the aeronautical study in light of current aeronautical operations in the area of the structure and finds that no significant aeronautical changes have occurred which would alter the determination issued for this structure.

This extension is subject to review if an interested party files a petition that is received by the FAA on or before February 27, 2021. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Rules and Regulations Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This extension becomes final on March 09, 2021 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Rules and Regulations Group via telephone – 202-267-8783.

Accordingly, pursuant to the authority delegated to me, the effective period of the determination issued under the above cited aeronautical study number is hereby extended and will expire on 02/01/2022 unless otherwise extended, revised, or terminated by this office. You must adhere to all conditions identified in the original determination.

This extension issued in accordance with 49 U.S.C., Section 44718 and, if applicable, Title 14 of the Code of Federal Regulations, part 77, concerns the effect of the structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

If we can be of further assistance, please contact our office at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTW-13389-OE.

Signature Control No: 387140386-466582677 (EXT -WT)
Paul Holmquist
Specialist

Attachment(s)
Additional Information

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTW-13403-OE

Issued Date: 01/28/2021

Amanda Beck
Sacramento Municipal Utility District
6201 S St., MS MD-2
Sacramento, CA 95817

**** Extension ****

A Determination was issued by the Federal Aviation Administration (FAA) concerning:

Structure:	Wind Turbine P4N7
Location:	Rio Vista, CA
Latitude:	38-04-29.29N NAD 83
Longitude:	121-49-03.88W
Heights:	180 feet site elevation (SE)
	591 feet above ground level (AGL)
	771 feet above mean sea level (AMSL)

In response to your request for an extension of the effective period of the determination, the FAA has reviewed the aeronautical study in light of current aeronautical operations in the area of the structure and finds that no significant aeronautical changes have occurred which would alter the determination issued for this structure.

This extension is subject to review if an interested party files a petition that is received by the FAA on or before February 27, 2021. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Rules and Regulations Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This extension becomes final on March 09, 2021 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Rules and Regulations Group via telephone – 202-267-8783.

Accordingly, pursuant to the authority delegated to me, the effective period of the determination issued under the above cited aeronautical study number is hereby extended and will expire on 02/01/2022 unless otherwise extended, revised, or terminated by this office. You must adhere to all conditions identified in the original determination.

This extension issued in accordance with 49 U.S.C., Section 44718 and, if applicable, Title 14 of the Code of Federal Regulations, part 77, concerns the effect of the structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

If we can be of further assistance, please contact our office at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTW-13403-OE.

Signature Control No: 387140407-466582678 (EXT -WT)
Paul Holmquist
Specialist

Attachment(s)
Additional Information

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTW-13404-OE

Issued Date: 01/28/2021

Amanda Beck
Sacramento Municipal Utility District
6201 S St., MS MD-2
Sacramento, CA 95817

**** Extension ****

A Determination was issued by the Federal Aviation Administration (FAA) concerning:

Structure:	Wind Turbine P4N8
Location:	Rio Vista, CA
Latitude:	38-04-48.12N NAD 83
Longitude:	121-48-51.19W
Heights:	211 feet site elevation (SE)
	591 feet above ground level (AGL)
	802 feet above mean sea level (AMSL)

In response to your request for an extension of the effective period of the determination, the FAA has reviewed the aeronautical study in light of current aeronautical operations in the area of the structure and finds that no significant aeronautical changes have occurred which would alter the determination issued for this structure.

This extension is subject to review if an interested party files a petition that is received by the FAA on or before February 27, 2021. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Rules and Regulations Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This extension becomes final on March 09, 2021 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Rules and Regulations Group via telephone – 202-267-8783.

Accordingly, pursuant to the authority delegated to me, the effective period of the determination issued under the above cited aeronautical study number is hereby extended and will expire on 02/01/2022 unless otherwise extended, revised, or terminated by this office. You must adhere to all conditions identified in the original determination.

This extension issued in accordance with 49 U.S.C., Section 44718 and, if applicable, Title 14 of the Code of Federal Regulations, part 77, concerns the effect of the structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

If we can be of further assistance, please contact our office at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTW-13404-OE.

Signature Control No: 387140408-466582679 (EXT -WT)
Paul Holmquist
Specialist

Attachment(s)
Additional Information

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTW-13405-OE

Issued Date: 01/28/2021

Amanda Beck
Sacramento Municipal Utility District
6201 S St., MS MD-2
Sacramento, CA 95817

**** Extension ****

A Determination was issued by the Federal Aviation Administration (FAA) concerning:

Structure:	Wind Turbine P4N9
Location:	Rio Vista, CA
Latitude:	38-04-38.20N NAD 83
Longitude:	121-48-46.20W
Heights:	216 feet site elevation (SE)
	591 feet above ground level (AGL)
	807 feet above mean sea level (AMSL)

In response to your request for an extension of the effective period of the determination, the FAA has reviewed the aeronautical study in light of current aeronautical operations in the area of the structure and finds that no significant aeronautical changes have occurred which would alter the determination issued for this structure.

This extension is subject to review if an interested party files a petition that is received by the FAA on or before February 27, 2021. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Rules and Regulations Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This extension becomes final on March 09, 2021 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Rules and Regulations Group via telephone – 202-267-8783.

Accordingly, pursuant to the authority delegated to me, the effective period of the determination issued under the above cited aeronautical study number is hereby extended and will expire on 02/01/2022 unless otherwise extended, revised, or terminated by this office. You must adhere to all conditions identified in the original determination.

This extension issued in accordance with 49 U.S.C., Section 44718 and, if applicable, Title 14 of the Code of Federal Regulations, part 77, concerns the effect of the structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

If we can be of further assistance, please contact our office at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTW-13405-OE.

Signature Control No: 387140409-466582680 (EXT -WT)
Paul Holmquist
Specialist

Attachment(s)
Additional Information

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTW-13401-OE

Issued Date: 01/28/2021

Amanda Beck
Sacramento Municipal Utility District
6201 S St., MS MD-2
Sacramento, CA 95817

**** Extension ****

A Determination was issued by the Federal Aviation Administration (FAA) concerning:

Structure:	Wind Turbine P4N5
Location:	Rio Vista, CA
Latitude:	38-04-53.15N NAD 83
Longitude:	121-49-40.77W
Heights:	103 feet site elevation (SE)
	591 feet above ground level (AGL)
	694 feet above mean sea level (AMSL)

In response to your request for an extension of the effective period of the determination, the FAA has reviewed the aeronautical study in light of current aeronautical operations in the area of the structure and finds that no significant aeronautical changes have occurred which would alter the determination issued for this structure.

This extension is subject to review if an interested party files a petition that is received by the FAA on or before February 27, 2021. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Rules and Regulations Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This extension becomes final on March 09, 2021 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Rules and Regulations Group via telephone – 202-267-8783.

Accordingly, pursuant to the authority delegated to me, the effective period of the determination issued under the above cited aeronautical study number is hereby extended and will expire on 02/01/2022 unless otherwise extended, revised, or terminated by this office. You must adhere to all conditions identified in the original determination.

This extension issued in accordance with 49 U.S.C., Section 44718 and, if applicable, Title 14 of the Code of Federal Regulations, part 77, concerns the effect of the structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

If we can be of further assistance, please contact our office at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTW-13401-OE.

Signature Control No: 387140402-466582681 (EXT -WT)
Paul Holmquist
Specialist

Attachment(s)
Additional Information

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTW-13400-OE

Issued Date: 01/28/2021

Amanda Beck
Sacramento Municipal Utility District
6201 S St., MS MD-2
Sacramento, CA 95817

**** Extension ****

A Determination was issued by the Federal Aviation Administration (FAA) concerning:

Structure:	Wind Turbine P4N4
Location:	Rio Vista, CA
Latitude:	38-05-02.29N NAD 83
Longitude:	121-49-31.33W
Heights:	208 feet site elevation (SE)
	591 feet above ground level (AGL)
	799 feet above mean sea level (AMSL)

In response to your request for an extension of the effective period of the determination, the FAA has reviewed the aeronautical study in light of current aeronautical operations in the area of the structure and finds that no significant aeronautical changes have occurred which would alter the determination issued for this structure.

This extension is subject to review if an interested party files a petition that is received by the FAA on or before February 27, 2021. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Rules and Regulations Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This extension becomes final on March 09, 2021 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Rules and Regulations Group via telephone – 202-267-8783.

Accordingly, pursuant to the authority delegated to me, the effective period of the determination issued under the above cited aeronautical study number is hereby extended and will expire on 02/01/2022 unless otherwise extended, revised, or terminated by this office. You must adhere to all conditions identified in the original determination.

This extension issued in accordance with 49 U.S.C., Section 44718 and, if applicable, Title 14 of the Code of Federal Regulations, part 77, concerns the effect of the structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

If we can be of further assistance, please contact our office at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTW-13400-OE.

Signature Control No: 387140399-466582682 (EXT -WT)
Paul Holmquist
Specialist

Attachment(s)
Additional Information

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

Appendix C

SMUD Response to SMW NOP Comments and Westslope Consulting and Capitol Airspace Comment Letters

DOWNEYBRAND

Christian L. Marsh
cmarsh@downeybrand.com
415.848.4830 Direct
415.848.4831 Fax

Downey Brand LLP
455 Market Street, Suite 1500
San Francisco, CA 94105
415.848.4800 Main
downeybrand.com

April 26, 2019

VIA E-MAIL AND U.S. MAIL

Mr. Robert "Perl" Perlmutter
Shute Mihaly & Weinberger LLP
396 Hayes Street
San Francisco, California 94102

Re: Solano County ALUC Comments on SMUD Notice of Preparation for Solano 4 Wind Project

Dear Mr. Perlmutter:

We represent the Sacramento Municipal Utility District ("SMUD") and I am writing in response to your letter dated February 8, 2019, submitted on behalf of the Solano County Airport Land Use Commission ("ALUC") with comments regarding the January 9, 2019 Notice of Preparation ("NOP") for the Solano Wind Phase 4 Project ("Project"). While not required to do so under the California Environmental Quality Act ("CEQA"), SMUD is providing this response to the ALUC out of professional courtesy and in the interests of working cooperatively with the County on this important Project. As described in more detail below, the NOP's statement that the Solano Wind Project does not require ALUC approval is accurate. First, electrical generation/production facilities are exempt from a county's building and zoning ordinances under Government Code Section 53091, subdivisions (d) and (e). Second, the Federal Aviation Administration ("FAA") finding of no significant hazard for the Project preempts the ALUC regulations under the Travis Air Force Base ("AFB") Land Use Compatibility Plan ("LUCP") regarding air safety, including radar interference. Third, even if the ALUC regulations applied to the Project, SMUD, as a local agency, has the authority to overrule the ALUC determination under the State Aeronautics Act ("SAA")[1] provisions. Notwithstanding the lack of formal approval process, SMUD looks forward to reviewing and responding to comments from the Solano County ALUC on the Project's Environmental Impact Report to help ensure that concerns surrounding air safety are appropriately addressed.

[1] Pub. Util. Code, §§ 21001, et seq.

I. The Project is Exempt from the ALUC Review Because an Energy Generating/Production Facility is Exempt from a County's Zoning and Building Ordinances under the Government Code Section 53091.

SMUD's wind turbine facilities are exempted from the ALUC provisions because under subdivisions (d) and (e) of Section 53091 of the Government Code, the zoning and building ordinances of a county or city *shall not* apply to the location or construction of facilities for the generation of electrical energy. SMUD, as a municipal utility district, is a local agency for purposes of Section 53091. (See *City of Lafayette v. East Bay Municipal Utilities District* (1993) 16 Cal.App.4th 1005, 1012; 78 Cal.Atty.Gen.Ops. 31 (1995); see also *Center for Biological Diversity v. County of San Bernardino* (2016) 247 Cal.App.4th 326, 344 fn.4 [county did not have authority to apply building and zoning regulations to water project proposed by local water agency pursuant to Sections 53091 and 53096].) As a wind turbine facility is an electrical generation facility, the Project qualifies for the exemptions under subdivisions (d) and (e) of Section 53091.

In your February 8, 2019 Letter, the ALUC insists that Section 53091 exemptions do not apply because the ALUC is an independent governmental entity and not a "city or a county," and therefore the LUCP is not a "city or county" ordinance. (2/8/2019 Letter, at pp. 2-3.) As discussed below, the ALUC's powers exercised pursuant to the LUCP are tantamount to those powers exercised by a "county or city" in enacting a zoning ordinance. Indeed, the ALUC and its LUCP were formed pursuant to the County's police powers for the enactment of zoning and land use regulations. Consequently, to divorce the LUCP from the County's zoning powers would ignore the ALUC's and LUCP's foundational underpinnings. Further, the Section 53091 energy facility exemptions are more specific than the SAA provisions, and thus control.

A. The ALUC's Powers in Approving an LUCP is Tantamount to that Exercised by Solano County in Enacting a Zoning Ordinance, since it is an Exercise of the Same Zoning Power.

The ALUC's exercise of authority in drafting the LUCP is an exercise of the same zoning authority conferred by the Legislature upon cities and counties. Cities and counties draw their zoning authority from the state's general police powers. (See Cal. Const. art. XI, § 7 ["A county or city may make and enforce within its limits all local, police, sanitary, and other ordinances and regulations not in conflict with general laws"].) The Attorney General has made clear that the ALUC exercises its authority specifically by using zoning power, which derives from the general police powers possessed by cities and counties. (See 63 Cal.Atty.Gen.Ops. 641, at pp. 3-4 (1980) ["Attorney General Opinion No. 80-416"].) "Even though generally thought of in terms of city or county regulation, zoning is one exercise of the state's police power, and there is no impediment to the legislature granting that power to other agencies in the statewide interests." (*Id.* at p. 4.) This is precisely what the legislature has done in this case in creating the ALUC under the SAA.

The ALUC was established by Solano County on December 7, 1971 by Ordinance 781 to provide for orderly development of public airports in Solano County, as well as area surrounding airports to prevent new noise and safety problems.[2] The act creating the ALUC—a sub-agency of the County—and the powers delegated to the ALUC are derived from Solano County's inherent police powers.[3] Thus, the ALUC's powers in drafting and approving the LUCP are an extension of Solano County's police powers, and not separate powers of an independent agency.

Nevertheless, your February 8, 2019 Letter asserts that the ALUC's authority is something more than or separate from that of a city or county, as the ALUC is an independent government body. But the Attorney General Opinion No. 80-416 demonstrates that the authority exercised by the ALUC is a type of "zoning authority" shared by counties and cities. In fact, the question in that case was whether an ALUC is able to zone land in the vicinity of an airport. The Attorney General found that an ALUC is, in fact, able to zone a land parcel, and that "ALUC's [sic] have been granted zoning authority." (Attorney General Opinion No. 80-416, at p. 5.) Contrary to the assertion in your February 8, 2019 Letter, the Attorney General in no way implied that the zoning authority possessed by an ALUC derives from a different or independent source than that possessed by a city or county.

Furthermore, under the SAA provisions, cities and counties have the authority to overrule the action of the ALUC. For example, a county may expressly overrule an ALUC's disapproval of an action, regulation or permit by a two-thirds vote of its governing body, along with making certain findings. (Pub. Util. Code, § 21675.1(d).) A county also has the power to decide whether to submit all subsequent actions to the ALUC pursuant to Public Utilities Code Section 21676.5(a). Solano County's ALUC Review Procedures recognize this overruling authority possessed by a county over the ALUC. (Solano County ALUC Review Procedures, § 1.5.2(b).) This authority demonstrates that the ALUC's powers are shared with, not separate from or in addition to, those of Solano County.

While Attorney General Opinion No. 80-416 acknowledges the lack of clarity in state law regarding the precise interplay between city and county zoning and the authority held by an ALUC, the Attorney General clearly lays out the mechanism for reconciling the land use planning and zoning regulations of an ALUC with those of the county or city in which the ALUC is located:

> The first level is that of measuring the local regulation against those of the ALUC, and if the ALUC determines that the local regulation is inconsistent with the ALUC plan, and after a hearing, that the implementation of the local regulation

---

2 https://www.solanocounty.com/depts/rm/boardscommissions/solano_county_airport_land_use_commission/default.asp.

3 Even the SAA recognizes the police powers of a county and require counties to establish an ALUC for orderly development of the public airports in a county and the areas around the airports. (Pub. Util. Code, § 21670(b).)

> would be harmful and not in the best interests of the airport and the adjacent area, then, at that point, the ALUC plan would prevail . . . . On the second level, however, the local agency, after a hearing, may overrule the determination of the ALUC if the city council or board of supervisors so votes with the requisite majority. The existence of such an override, however, does not detract from our conclusion that airport land use commissions have been granted zoning authority.

(Attorney General Opinion No. 80-416, at pp. 4-5.) These procedures clearly demonstrate that the ALUC's authority is not superior to, or unconnected with, that of a city or county, but rather derives from the same source and is carefully balanced with the zoning authority of a county or city under the SAA.

Thus, the ALUC's zoning authority in drafting the LUCP is indeed an exercise of the same zoning authority conferred by the Legislature upon cities and counties, and the Section 53091 exemptions apply with equal force to the ALUC's zoning provisions.

B. Principles of Statutory Construction Indicate Government Code Section 53091 Exempts SMUD from the LUCP as Section 53091 is a more Specific Provision than the SAA.

Even if one considers that there is a potential conflict between Public Utilities Code Section 21670(f) and Government Code Section 53091, the Section 53091 exemptions prevail because they expressly exempt facilities "for the production or generation of electrical energy." For example, while Section 21670(f) of the Public Utilities Code provides generally that "special districts, school districts, and community college districts are included among the local agencies that are subject to airport land use laws," Section 53091(d) of the Government Code provides specifically that:

> Building ordinances of a county or city *shall not apply* to the location or construction of facilities for the production, generation, storage, treatment, or transmission of . . . electrical energy by a local agency.

Section 53091(e) further provides that:

> Zoning ordinances of a county or city *shall not apply* to the location or construction of facilities . . . for the production or generation of electrical energy.

The ALUC's February 8, 2019 Letter argues that Section 21670(f) expressly subjects special districts such as SMUD to the ALUC's land use requirements. But the plain reading of the statutes above supports SMUD's interpretation that zoning actions by the ALUC *are not binding* on SMUD (a local agency) with regard to the location and construction of wind turbines for electric generation under Section 53091 of the Government Code.

As a well-settled principal of statutory interpretation, a specific statute relating to a particular subject controls over a more general statute covering the same subject. (See, e.g., *Rea Enterprises v. California Coastal Zone Conservation Commission* (1975) 52 Cal.App.3d 596.)

Here, the provisions relating to Section 21670(f) of the Public Utilities Code are more general, as they essentially state that many different types of "local agencies" are subject to "airport land use laws." Subdivisions (d) and (e) of Section 53091 of the Government Code, however, provide a specific exemption from local zoning ordinances for facilities "for the production or generation of electrical energy." Given that subdivisions (d) and (e) grant narrow and specific exemptions for certain facilities, while Section 21670(f) makes airport land use laws broadly applicable to all local agencies, the exemptions available under the subdivisions (d) and (e) of Section 53091 are the narrower and more specific of the two sets of provisions. To interpret otherwise would allow the energy facilities exemption to be swallowed by the more general airport land use laws. The specific exemption for electrical generating facilities makes sense; otherwise agencies and public utilities developing energy facilities would be completely beholden to local politics within cities and counties, and thus unable to provide necessary services to customers throughout a region or to adjacent cities or counties.

Overall, the ALUC's authority in drafting the LUCP provisions are derived from Solano County's police powers and zoning authorities. And because the exemptions within Section 53091 are narrower and more specific than those announced in the SAA provisions, the Section 53091 exemptions control. Thus, SMUD's wind turbine facilities are exempt from the LUCP provisions.

II. The ALUC Review of the Project is Preempted by Federal Law.

The ALUC in its LUCP has attempted to impose broad land use controls based on general safety and noise concerns, but in limiting the height of wind turbines has relied solely on the narrow and technical issue of alleged radar interference. As to the narrow and technical issue of radar interference, FAA and its regulations concerning air safety and aviation navigation occupy the field and preempt the ALUC's land use regulations regarding radar system interference.

The federal government has "exclusive sovereignty of airspace of the United States." (49 U.S.C. § 40103.) Congress has also given the Administrator of the FAA authority to regulate "the use of airspace necessary to ensure the safety of aircraft" and to "prescribe air traffic regulations" for, among other things, "navigating, protecting, and identifying aircraft." (49 U.S.C. § 40103[b].) In addition, the California legislature "recognizes the authority of the federal government to regulate the operation of aircraft and to control the use of the airways . . . ." (Pub. Util. Code, § 21240.) California further acknowledges the preemptive nature of federal regulation in this area: "nothing in [the State Aeronautics Act] shall be construed to give the department [of transportation] the power to so regulate and control safety factors in the operation of aircraft or to control use of the airways." (*Id.*)

A Ninth Circuit Court of Appeals decision affirms that Congress intended the Federal Aviation Act of 1958 to preempt state regulation of air safety. (*Montalvo v. Spirit Airlines* (9th Cir. 2007) 508 F.3d 464, 470-72.) The *Montalvo* court summarized,

> the regulations enacted by the Federal Aviation Administration, read in conjunction with the [Federal Aviation Act] itself, *sufficiently demonstrate an intent to occupy exclusively the entire field of aviation safety* and carry out Congress' intent to preempt all state law in this field.

(*Id.* at 471, emphasis added.) California Courts of Appeal have further concluded that the FAA has authority over navigation aids such as air control towers, radio navigation systems, runway markers, and directional beams. (*Bethman v. City of Ukiah* (1989) 216 Cal.App.3d 1395, 1403, 1408; *City of Burbank v. Burbank-Glendale-Pasadena Airport Authority* (1999) 72 Cal.App.4th 366, 379.) Likewise, a federal district court in South Dakota has opined that a state agency may not veto a FAA No Hazard Determination, particularly where the basis for the agency's veto, in that case, potential harm to visual flight rules ("VFR") routes, had been specifically considered by the FAA. (*Big Stone Broadcasting, Inc. v. Lindbloom* (D.S.D. 2001) 161 F.Supp.2d 1009, 1019.) The court in that case enjoined the state agency from prohibiting construction of radio towers where the FAA had determined that the towers would result in no hazard to air traffic and safety. (*Id.* at 1021.)

In this case, the FAA has already evaluated the Project's "impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures." (FAA Determination of No Hazard to Air Navigation, dated February 1, 2019 ("FAA Determination"), at p. 4.) The FAA Determination states that the Project's "aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities." (*Id.* at p. 1)

We also note the process for obtaining the Determination of No Hazard included review by the Department of Defense Clearinghouse, which engaged Travis Airforce Base (Travis). If Travis had filed objections related to radar, we understand the FAA would have suspended processing of SMUD's application and directed formation of a Mitigation Monitoring Team to resolve concerns. These processes did not happen.

The ALUC submitted comments to the FAA, stating the ALUC belief that the wind turbines would "have electromagnetic effects on radar [of Travis AFB]." (*Id.* at p. 5.) But the ALUC never submitted any information in support of these statements and instead requested that FAA confirm that the Project did not exceed obstruction standards. (*Ibid.*) FAA did analyze the Project's impacts, including exceedances of various obstructions standards, and concluded that just because a wind turbine is within the line of sight of a radar sensor *does not imply* that the

turbine will result in unacceptable adverse impacts on Air Traffic Control ("ATC") operations. (*Id.* at pp. 5-6.) While the Project turbines would be within the line of sight of the Travis AFB radar facilities, "[s]tudy for possible VFR effect disclosed that the proposals would have no effect on existing or proposed VFR arrival or departure operations." (*Id.* at p. 6.) The FAA thus concluded that while the Project turbines "would extend upwards into altitudes commonly used for en route VFR flight," there is no information that the turbines would be "located along a regularly used VFR route or that they would pose a problem for pilots operating en route" or otherwise result in unacceptable adverse impact on ATC operations. (*Id.* at p. 6.) The FAA's determination is conclusive.

Further, the ALUC neglected to file a petition for review of the FAA Determination by the review deadline, and the FAA Determination became final on March 13, 2019. The ALUC has thus waived any challenge to the FAA's No Hazard Determination, and the LUCP provisions that rely on unsupported and inaccurate radar interference issues are preempted under the federal law. Therefore, there is no basis for the ALUC review of the Project for radar interference or under the visual flight rules.

III. Even if the LUCP Applied to the Project, SMUD can Overrule the ALUC's Determination.

Even if the updated Travis AFB LUCP provisions regarding radar interference apply, SMUD, as a local agency, can overrule the ALUC by holding a hearing, making findings that the action is consistent with the purposes of the SAA, and obtaining a two-thirds vote of its governing body. (*See* Pub. Util. Code, § 21674.7(b) ["This subdivision does not limit the authority of local agencies to overrule [the ALUC] actions or recommendations pursuant to Sections 21676, 21676.5, or 21677."].)

While your February 8, 2019 Letter argues that only cities and counties can utilize the overruling authorities under the SAA, the language and legislative intent of the SAA does not support this interpretation. As stated above, and without expressly limiting the provisions to cities or counties, the SAA does not limit "the authority of *local agencies*"" to overrule an ALUC's actions or recommendations, and certainly does not limit that discretion to only local agencies with land use authority. (*See* Pub. Util. Code, § 21674.7(b).) Further, by using the term "local agency" in Sections 21676 and 21676.5 of the Public Utilities Code, and conversely and expressly using the term "city or county" in Section 21675.1(d) with respect to parallel provisions regarding overruling an ALUC's determination, the legislature clearly intended that "local agencies" such as SMUD similarly have discretion to overrule the ALUC under Sections 21676 and 21676.5. (See Pub. Utilities Code, §§ 21674.7(b), 21675.1(d), 21676, 21676.5, and 21677 [allowing local agencies in Marin County to overrule an ALUC determination by a simple majority].) In fact, Solano County staff already conceded that "SMUD is a regulated entity by the ALUC and is similarly situated as any city or the County." (Solano County ALUC Agenda Submittal for ALUC-17-10: SMUD Plan Amendment Request [File No. AC 17-035], October

12, 2017; see also *Suisun Alliance v. Suisun City* (2010) Solano Co. Sup. Ct. Case No. A125042, 2010 WL 3280273, at 4-5).) The Legislature clarified its intent that a local agency such as a special district has the ability to overrule the ALUC determination, as long as the local agency follows the proper procedure set forth in the SAA. (See Assembly Bill Analysis for AB 332 [May 2003], at p. 3.)

Broadly stated, the intent of the SAA is to minimize the risk to public health, safety, and welfare from exposure to excessive noise and safety hazards (i.e., aircraft accidents) and to ensure the orderly development and expansion of airports and surrounding areas. (Pub. Util. Code, § 21670(a); see also *Suisun Alliance, 2010 WL 3280273* at 4-5.) Therefore, even if the ALUC provisions apply to the Project, SMUD has the authority under Sections 21676 and 21676.5 to overrule the ALUC's consistency determination upon making the requisite findings, similar to any city or county.

Here, as discussed above, SMUD prepared an individual line-of-sight study for the Project and has obtained the FAA Determination of no significant hazard (including a confirmation from the FAA that its determination addresses the VFR routes and radar issues). As stated above, the ALUC did not file a petition challenging the FAA's determination. Thus, even if the ALUC provisions applied to the Project, SMUD can overrule the ALUC inconsistency determination based on its own findings and the substantial evidence—including the FAA Determination—supporting its findings to overrule the ALUC. (*California Aviation Council v. City of Ceres* (1992) 9 Cal.App.4th 1384, 1393 [a court's review of a local agency's findings in support of its decision to overrule the ALUC is for substantial evidence].)

Pursuant to the exemption provisions under Section 53091 of the Government Code, the FAA's no significant hazard determination, and SMUD's ability to overrule any inconsistency determination the ALUC might render, SMUD's NOP is accurate. Nevertheless, SMUD will be evaluating air-related hazards in its CEQA process, and is happy to work with Solano County and its ALUC to ensure that any safety considerations are addressed in the EIR.

Please do not hesitate to contact me if you have any questions or concerns regarding this letter.

Very truly yours,

DOWNEY BRAND LLP

Christian L. Marsh

cc: Ammon Rice, Environmental Management, Sacramento Municipal Utility District
Thomas Randall, Chair, Solano County Airport Land Use Commission
Lee Axelrad, Deputy County Counsel, Solano County

WESTSLOPE CONSULTING

March 30, 2021

Ammon Rice
Sacramento Municipal Utility District
P.O. Box 15830, Sacramento, CA 95852-0830

Re: Response to Dr. Jerry Johnson, Director of Engineering Regulus Group, LLC letter dated August 6, 2019

Mr. Rice,

This letter is in response to Dr. Jerry Johnson, Director of Engineering Regulus Group, LLC dated August 6, 2019. In this letter, we address each of the points raised by Dr. Johnson.

1. *Dr. Johnson commented on air safety impacts as discussed in the draft environmental impact report (DEIR) and stated that it is well known that utility scale wind turbines impact primary surveillance radar systems when the turbines are located within the line of sight of the radar. Dr. Johnson stated that the existing turbines in the proposed project area have created turbine radar interference at Travis Air Force Base (AFB). To adjust, Dr. Johnson stated the AFB had to move/lose a circling approach and the AFB would like to reclaim the lost airspace.*

Utility scale wind turbines within line-of-sight of a primary surveillance radar, such as the Travis AFB digital airport surveillance radar (DASR), can have an adverse effect on radar performance. In fact, Travis AFB has served and continues to serve as an excellent source of information for the United States government and the wind industry in understanding the effects that multiple wind projects can have on a DASR and the display system used by the air traffic controllers, the Standard Terminal Automation System (STARS), at the Travis AFB Radar Approach Control (RAPCON) facility. Travis AFB and the wind projects in the Collinsville-Montezuma Hills Wind Resource Area (WRA) area also served as an excellent source of information in determining how to manage or lessen the effects of wind turbines for a DASR and STARS air traffic control systems configuration. Part of this work was conducted under Cooperative Research and Development Agreement (CRADA) No. 10-002 in collaboration with Travis AFB, Westslope Consulting, LLC (Westslope), and three wind project developers including the Sacramento Municipal Utility District (SMUD).[1,2] It should also be noted that while there can be adverse effects on the DASR, the Monopulse Secondary Surveillance Radar (MSSR), which is the secondary surveillance radar co-located with the DASR and is the main radar used for air traffic control by the base, was shown to not be effected by wind turbines. The MSSR interrogates transponder equipment on board the vast majority of aircraft operating in and around the Travis AFB RAPCON's airspace.

[1] Air Mobility Command article at Cooperative agreement forges solution for wind turbine projects at Travis AFB > Air Mobility Command > Article Display.

[2] United States Transportation Command Cooperative Research and Development Agreement, "Assessment of Wind Farm Construction on Radar Performance" Operations Working Group Research Conclusions and Recommendations Interim Report to Joint Technical Working Group dated January 20, 2010. Available at blobdload.aspx (solanocounty.com).

Secondary surveillance radar, such as the MSSR, are less susceptible to interference from wind turbines than primary surveillance radar. Unlike primary surveillance radar that depends on reflected energy to discern aircraft, secondary surveillance radar relies on, in general terms, two-way communication with aircraft via operating transponders. This process is cooperative whereby the secondary surveillance radar transmits a set of pulses at one frequency to interrogate transponders, then receives and processes replies from operating transponders at another frequency. Because of the use of different transmit and receive frequencies, secondary surveillance radar is not as susceptible to the effects of clutter that interfere with the performance of primary surveillance radar. Clutter is unwanted radar returns from the ground, rain or other precipitation, buildings, antenna towers, transmission lines, wind turbines, vehicular traffic, and birds. Some publicly available United States government research has considered the effects of wind turbines on secondary surveillance radar. A Department of Homeland Security (DHS) funded study conducted by JASON found that "[s]econdary (i.e., transponder, or "beacon") tracks were rarely affected" by wind farms.[3] JASON is a group of the nation's top scientists that advise the United States government. In addition, the Department of Energy, Department of Defense (DoD), DHS, and the Federal Aviation Administration (FAA) sponsored flight trials conducted by Massachusetts Institute of Technology/Lincoln Laboratory (MIT/LL) and Sandia National Laboratories as part of an Interagency Field Test and Evaluation (IFT&E) program noted that "primary surveillance radars are severely impacted by wind turbines while the beacon transponder-based secondary surveillance radars was not affected by wind turbines."[4]

The below excerpts are from the Solano 4 Wind Project (Solano 4) Determinations of No Hazard (DNHs) issued by the FAA originally on February 1, 2019, and after further DoD and FAA review, were recently extended on January 28, 2021.

> "Simply being "seen" by the radar is not the real issue though. How that target (in this case, the wind turbine) is processed and displayed for ATC is the key. The users of the system (ATC) is the sole decider on whether the system is acceptable to be able to perform their duties. Although there may be others entities using these radar systems, the responsibility and authority of the FAA is the safe and efficient use of the navigable airspace, including the impact of the radar effects on air navigation."
>
> "The turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. The proposals will affect the quality and/or availability of radar signals. The effects would be unwanted primary returns (clutter) and primary target drops, all in the area of the turbines. Tracked primary targets could diverge from the aircraft path and follow wind turbines, when the aircraft is over or near the turbines."
>
> "However, this would not cause an unacceptable adverse impact on ATC operations at this time."

[3] JASON, MITRE Corporation, "Wind Farms and Radar," January 2008, pp. 7. Available at Wind Farms and Radar (fas.org).

[4] Sandia National Laboratories, MIT Lincoln Laboratory, "IFT&E Industry Report, Wind Turbine-Radar Interference Test Summary," September 2014, pp. 32. Available at SANDIA REPORT;SF 1075-SUR (energy.gov).

> "The cumulative impact of the proposed structures, when combined with other proposed and existing structures, is not considered to be significant. Study did not disclose any significant adverse effect on existing or proposed public-use or military airports or navigational facilities, nor would the proposals affect the capacity of any known existing or planned public-use or military airport."
>
> "Therefore, it is determined that the proposed construction would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation providing the conditions set forth in this determination are met."

The extension process resulted in the formation of a Mitigation Response Team (MRT) with Travis AFB as required by the DoD Military Aviation and Installation Assurance Siting Clearinghouse (the "DoD Siting Clearinghouse") mission compatibility evaluation process as documented in Part 211 of Title 32 of the Code of Federal Regulations.[5] The DoD Siting Clearinghouse was established under direction of the United States Congress per the National Defense Authorization Act for Fiscal Year 2011.[6] The result of the MRT review was a conclusion by the 60th Air Mobility Wing of "[a]s proposed, Solano 4 should have minimal negative impact on Travis Operations" and a conclusion by the DoD Siting Clearinghouse that Solano 4 "will not present an adverse impact to military operations."[7,8]

When evaluating the effects of wind turbines on radar, it is important to distinguish between effects and operational impacts. Effects do not always translate into operational impacts (i.e., a substantial adverse effect). As a result of early consultation with Travis AFB and Solano County's Windfarm Re-Power Group dating back to April 21, 2016, SMUD and Westslope undertook a substantial effort to identify a wind project configuration—considering different wind turbine layouts, numbers of wind turbines, and wind turbine models—for Solano 4 to ensure there would be no additional effects as a result of the project on the DASR and on the air traffic controllers' displays in STARS. In the spirit of collaboration, the results of multiple radar cumulative impact studies were presented to Travis AFB prior to filing the Solano 4 wind turbines with the FAA.[9]

Westslope's studies indicate that removing and replacing 23 existing wind turbines with up to 22 136-meter rotor diameter or up to 19 150-meter rotor diameter modern wind turbines will have no material difference to the DASR or on the air traffic controllers' displays in STARS.

The Solano 4 wind turbines are located outside of Travis AFB circling approach areas and will have no effect on the base's published visual flight rules (VFR) operations or on instrument flight rules (IFR) operations.[10] Solano 4 will replace 23 existing Vestas V47 wind turbines, which currently interfere with the Travis AFB DASR, with up to 22 136-meter rotor diameter or up to 19 150-meter rotor diameter wind turbines. Because construction of Solano 4 will result in fewer overall wind

---

[5] Welcome to the Military Aviation and Installation Assurance Siting Clearinghouse (osd.mil).
[6] H.R.6523 - 111th Congress (2009-2010): Ike Skelton National Defense Authorization Act for Fiscal Year 2011 | Congress.gov | Library of Congress.
[7] Letter from the 60th Air Mobility Wing Commander dated January 11, 2021. On file.
[8] Letter from the DoD Military Aviation and Installation Assurance Siting Clearinghouse dated February 9, 2021.
[9] See SMUD Solano 4, Cumulative Impact Study and Mitigation Solution Results for Vestas V136 and V150 Wind Turbine Layouts dated September 6, 2018.
[10] In accordance with FAA Order 8260.3D and FAA Order 8260.58A.

turbines and the proposed wind turbines will have no effect on the base's published VFR or IFR operations, Solano 4 will have no material difference on the performance of the DASR and STARS configuration compared to current conditions and will not impact current RAPCON air traffic operations. Further, the secondary surveillance radar co-located with the DASR, which is the main radar used for air traffic control, will not be affected. These conclusions regarding impacts are supported by the MRT process and FAA's DNHs that state that the Solano 4 wind turbines "would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation."

2. *Dr. Johnson stated that the DEIR does not include information needed to inform decision makers and the public about the scope of the project's impacts. Dr. Johnson notes that the DEIR refers to an FAA aeronautical study conclusion that navigable airspace is not affected by turbine operation, but the DEIR does not mention that the study also reports that quality and availability of radar signals would be affected. Dr. Johnson further commented that when wind turbine radar interference (i.e., clutter) is high, air traffic controller workloads can increase due to the creation of track duals (false tracks), which increase the need for more coordination between controllers and pilots and greater distances among aircraft, and may impact aircraft maneuvers.*

The DEIR focused on the conclusion of the aeronautical study process rather than FAA's initial findings. As pointed out by Dr. Johnson, the FAA's initial findings state that the "[t]he proposals will affect the quality and/or availability of radar signals. The effects would be unwanted primary returns (clutter) and primary target drops, all in the area of the turbines. Tracked primary targets could diverge from the aircraft path and follow wind turbines, when the aircraft is over or near the turbines." This language is standard language used by the FAA for any wind turbine that is within line-of-sight of a primary surveillance radar and is used to inform the proponent of a wind project that further study is required to determine whether these effects could result in operational impacts.

After in-depth study, at the request of SMUD, the FAA determined that Solano 4 "would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation". Further, the DNHs state that the aeronautical studies "considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact" resulting from Solano 4 when combined with the impact of other existing structures.

Regarding "track duals", Dr. Johnson may be confusing this term with "false targets." Track duals and false targets are two different effects. It is also possible that Dr. Johnson may be confusing track duals with a phenomenon identified during testing of in-fill radar ongoing at Travis AFB at this time.

While false primary targets are possible, replacing the 23 existing wind turbines with up to 22 136-meter rotor diameter or up to 19 150-meter rotor diameter modern wind turbines will have no material difference in the number of false primary targets reported by the DASR or in the number of the false primary tracks on the air traffic controllers' displays in STARS. After construction, system optimization, including updating the range-azimuth gate map in the DASR, will address the

difference in the location and number of wind turbines. In other words, the conditions under the Solano 4 Wind Project would not be any different than the current condition.

3. *Dr. Johnson's comment that while the DEIR indicates that the wind turbines would not be a hazard to air navigation if the turbines are properly painted and lighted, these are measures for obstruction avoidance and would not mitigate the turbines' interference with radar or air traffic control.*

Per the FAA issued DNHs, Solano 4 "would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft" and "would not be a hazard to air navigation" provided the wind turbines are marked/lighted in accordance with FAA Advisory Circular 70/7460-1 L Change 2, Obstruction Marking and Lighting. This advisory circular provides the FAA's standard for marking and lighting to ensure the appropriate daytime and nighttime conspicuity so that pilots can visibly see and avoid wind turbines.

The FAA and SMUD, in Mitigation Measure 3.7-3, are not suggesting that marking and lighting is a radar mitigation.

4. *Dr. Johnson stated that the DEIR does not mention that Air Traffic Control (ATC) Minimum Vectoring Altitudes (MVAs) for the turbine area would need to be increased and that the FAA has identified this as an adverse effect.*

During the aeronautical study process, the FAA's prime objective is to ensure the safety of air navigation and the efficient utilization of navigable airspace.[11] As many as ten different government offices take part in each study, including: the FAA's Office of Airports, Instrument Flight Procedures Impact Team, Flight Standards, Technical Operations, and Frequency Management, and the United States Air Force, United States Navy, United States Army, DHS, and the DoD. The FAA utilizes the information provided by each office, as well as defined metrics, to determine whether or not the proposed wind turbines would be hazardous. [12]

During the review of Solano 4, the FAA identified that the proposed wind turbines would have an adverse effect on a minimum vectoring altitude (MVA) sector. A MVA defines the lowest altitude that air traffic controllers can normally issue radar vectors to aircraft and is based on obstacle clearance. Specifically, the FAA identified an effect on Sector MCC_B which is utilized by the air traffic controllers at Northern California Terminal (NCT) Radar Approach Control (TRACON). To address this effect, the FAA requires Form 7460-2, Part 1, Notice of Actual Construction or Alteration to be submitted at least 60 days before the start of construction so that appropriate action can be taken to amend the affected procedure(s) and/or altitude(s), if necessary. By SMUD e-filing FAA Form 7460-2, Part 1, Notice of Actual Construction or Alteration at least 60 days before the start of construction, the FAA would take appropriate action to amend the affected procedure(s) and/or altitude(s), if necessary." The FAA will modify Sector MCC_B by increasing the MVA from 1,700 to 1,800 feet above mean sea level (MSL). This increase ensures the appropriate obstacle clearance and, as a result, maintains safety.[13] This amendment to modify the sector by increasing the MVA to 1,800 feet MSL removes the adverse effect on the MVA sector. Lastly, Northern

[11] FAA Order 7400.2M Paragraph 6-3-1(a) "Policy."
[12] FAA Order 7400.2M Paragraph 6-3-3(a) "Determining Adverse Effect" with reference to aeronautical study number 2018-WTW-13388-OE.
[13] FAA Order 8260.3D Paragraph 11-3-3 "Obstacle Clearance."

California TRACON confirmed that this would not have an operational impact on providing radar vectoring services. For these reasons, the effect on a MVA sector will not result in the degradation of safety or efficiency.

5. *Dr. Johnson commented that while the DEIR acknowledges that the project could have potentially significant adverse impacts, it does not provide enough information about the impacts for readers to comprehend them. Dr. Johnson states that the DEIR should 1) discuss objective metrics regarding the effects on radar performance, 2) compare clutter tracks over the wind turbine area with the additional clutter that would be generated by the new turbines, 3) compare expected dual tracks with real targets and provide metrics such as length measured over a span of time, and 4) discuss increased operator workload (controllers and pilots) due to clutter and provide metrics regarding this.*

As stated above, SMUD undertook extensive efforts to identify a wind project configuration for Solano 4 to ensure there would be no additional effects as a result of the project on the DASR and on the air traffic controllers' displays in STARS. Results of an initial cumulative impact study conducted by Westslope, employing the same method verified under CRADA No. 10-002 and using primary probability of detection (Pd) as a metric, showed that the 22 136-meter rotor diameter wind turbines will result in a 0.1 percent overall decrease in the primary Pd over the Collinsville-Montezuma Hills WRA. A subsequent cumulative impact study for 19 150-meter rotor diameter wind turbines at the proposed locations showed no drop in the primary Pd. In other words, the conditions under Solano 4 will result in no material difference on the performance of the DASR and STARS configuration compared to existing conditions. These findings were presented to Travis AFB on September 6, 2018 and were used to support the current layouts proposed for the Solano 4 wind turbines.

As determined by the FAA and stated in the Solano 4 DNHs "the turbines would be within the line of sight of the Stockton, CA. (SCK) ASR-11, the Travis (SUU) DASR, the Mill Valley (QMV) ARSR-4, and the McClellan (MCC) ASR-9 facilities. The proposals will affect the quality and/or availability of radar signals. The effects would be unwanted primary returns (clutter) and primary target drops, all in the area of the turbines. Tracked primary targets could diverge from the aircraft path and follow wind turbines, when the aircraft is over or near the turbines." The DNHs conclude, "[h]owever, this would not cause an unacceptable adverse impact on ATC operations at this time."

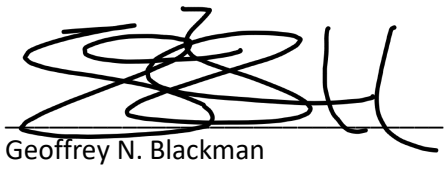
The number of false primary targets reported by the DASR and the number of false primary tracks presented on the STARS' displays were also considered as a metric during these studies; however, based on Westslope's experience with the Travis AFB DASR and STARS, as well as other similar facilities, and the fact that Solano 4 will replace 23 existing wind turbines with 22 or 19 new wind turbines, Westslope expects no material difference in the number of false primary targets out of the DASR or the number of false primary tracks on the STARS' displays. As stated above, the result of the MRT review was a conclusion by 60th Air Mobility Wing Commander of "[a]s proposed, Solano 4 should have minimal negative impact on Travis Operations" and a conclusion by the DoD Siting Clearinghouse that Solano 4 "will not present an adverse impact to military operations." The FAA determined that the proposed Solano 4 wind turbines "would not cause an unacceptable adverse impact on ATC operations at this time" and "would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation providing the conditions set forth in this determination are met." Further, SMUD received extensions for the 19 DNHs for Solano 4 on January 28, 2021, as requested.

6. *Lastly, Dr. Johnson stated that the DEIR does not discuss other potentially feasible means to mitigate the project's adverse impacts, such as a Pilot Mitigation Program at Travis AFB that is studying how in-fill radar systems could mitigate turbine radar interference, or an effort that is underway to develop radar processing algorithms that could reduce clutter on air traffic control screens. Dr. Johnson notes that these are not yet proven or certified for use, and so the only way to limit turbine impacts on radar systems is to locate the turbines beyond the line-of-sight of the radar.*

As discussed above and in the cumulative impact studies conducted by Westslope, the Solano 4 wind turbines will result in no material difference on the performance of the DASR and STARS configuration compared to existing conditions, and will not impact current RAPCON air traffic operations. Further, the secondary surveillance radar co-located with the DASR, which is the main radar used for air traffic control, will not be affected. These conclusions are supported by the FAA's DNHs that states that the Solano 4 wind turbines "would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation".

Please direct any questions to Geoff Blackman of Westslope Consulting at gnblackman@westslopeconsulting.com or Joe Anderson of Capitol Airspace Group at joe.anderson@capitolairspace.com.

Respectfully,



Geoffrey N. Blackman
Owner/Principal
Westslope Consulting, LLC

_____

Joe Anderson
Director of Airspace Consulting
Capitol Airspace Group, LLC

GEOFFREY N. BLACKMAN
3960 West Tecumseh Road, Suite 100
Norman, OK 73072
M: (405) 816-2604
O: (405) 310-6058
E: gnblackman@westslopeconsulting.com

SUMMARY

Founded Westslope Consulting, LLC in 2008. Provides radar consulting and technical services to developers of wind energy projects, commercial real estate projects including high-rises, event venue and stadium projects, transmission line projects, and solar energy projects in the United States, Canada, and overseas.

Over 26 years of experience in the United States working with radar and associated tracking and display systems and is considered a subject matter expert on the potential effects of wind turbines on air traffic control radar, air defense radar, homeland security radar, weather radar, over-the-horizon drug interdiction radar, and test-range instrumentation radar.

Works with developers at all stages of project development. In the early stages of project planning to identify potential radar concerns as well as other potential aviation, military, and weather-related operational concerns. In the late stages of development as projects move through the approval process at local, state, and federal levels. This work includes conducting radar studies, identifying impacts, outlining mitigation techniques and strategies, modeling, simulation, data analysis, optimization, flight tests, and defining and testing software and/or hardware changes.

Engages with military bases, BOEM, DoD Siting Clearinghouse, DHS Long Range Program Office, FAA Obstruction Evaluation Group, NOAA, NORAD, NTIA, WSR-88D Radar Operations Center, and national laboratories on behalf of clients and the wind industry.

Supports hearings and meetings at various levels of government.

Technical expertise spans multiple navigation and surveillance systems including airport surveillance radar, long range radar, secondary surveillance radar, ADS-B and multilateration systems, in-fill wind farm mitigation radar, navigational aids, precision approach radar, coastal HF radar, Aircraft Detection Light Systems, bird and bat radar, over-the-horizon radar, weather radar, and associated tracking and display systems.

EDUCATION

University of Leeds – Leeds, England September 1991 to July 1994

Bachelor of Engineering with Honors in Electronic Engineering with a concentration in Microwave Engineering.

PROFESSIONAL EXPERIENCE

Westslope Consulting, LLC – Norman, OK

Founder, Owner, and Principal May 2008 to present

- Provides mitigation studies and negotiates mitigation agreements with various federal agencies and third parties.
- Develops data analysis and modeling tools to assess for radar effects and identify possible mitigation solutions.
- Serves as the wind industry technical representative to the DOE Wind Turbine Radar Interference Mitigation Working Group.
- Consults with American Clean Power Association regarding wind-radar policy, process, and technical issues.
- Served as a subject matter expert in over 20 FAA safety risk management panels involving radar-related hazards as a result of wind development.
- Worked hand-in hand with the DHS to identify and site in-fill radar mitigation and draft agreements to resolve border security concerns.
- On behalf of wind developer, supported first exercise modeling the impacts of wind turbines on Relocatable Over-the-Horizon Radar working with the United States Navy and MIT/LL.
- Provided expert witness testimony relating to impacts to United States and Canadian weather radar.
- Supported the DoD, DOE, DHS, and FAA Interagency Field Test and Evaluation.
- Served as Radar Working Group lead under the first Cooperative Research and Development Agreement with United States Transportation Command and three wind developers successfully improving DASR radar performance over approximately 600 wind turbines near Travis AFB. This work included implementing and validating a proprietary Westslope Consulting modeling method for predicting the impacts of wind energy projects, integrating two adjacent radar sites into STARS, several iterative optimization changes, third party evaluation of wind farm mitigation, and flight testing.
- Served as the wind industry representative for the DHS radar and wind turbines interaction modeling tool.
- Served as a technical advisor for wind developer in negotiations of first Memorandum of Agreement with the DoD and United States Navy.

Regulus Group, LLC – Woodstock, VA

Partner, Senior Engineer, and Consultant September 2003 to May 2008

- On behalf of the FAA, supported DoD testing at King Mountain, Texas during the ARSR-4 long range radar wind turbine interference and mitigation study.

- At the request of Idaho National Laboratory, served as a technical advisor for the 2008 JASON Report JSR-08-125 Wind Farms and Radar.
- Supported Idaho National Laboratory at wind-radar intra-agency meetings to further understanding of radar impacts and existing and potential mitigation techniques.
- Led FAA working group to study potential impacts on the ASR-11 and co-located MSSR (referred to as the DASR by the United States Air Force) and VOR from a proposed wind energy project near Ted Stevens International Airport. Identified potential impacts, outlined mitigation strategies, simulated and modeled potential impacts and mitigation techniques, analyzed data, and defined and tested software changes.
- Managed field engineering activities including maintenance and troubleshooting, system optimization and commissioning flight inspection for the FAA ASR-11 Program Office.
- Developed ASR-11 Optimization Procedures and ASR-11 Optimization Training Course. Conducted training courses and on-the-job training for various government agencies and radar manufacturer.
- Led and participated in numerous detailed investigations into ASR-11 performance issues. Instrumental in defining, modeling, testing, analyzing, and implementing new algorithms and algorithm enhancements to the ASR-11 software to improve performance.
- Co-developed Radar Toolbox, a FAA software radar analysis tool.
- Supported the assessment of radar concerns for the FAA regarding real estate development projects and wind projects.

Fesler Technical Services – Oklahoma City, OK

Principal Engineer July 2002 to September 2003

Senior Engineer May 2000 to July 2002

- Managed engineering activities including maintenance and troubleshooting, system optimization, commissioning flight inspection, and test and evaluation support to FAA ASR-11 Program Office.
- Assigned to National Airways System Engineering Division to provide systems engineering support. Provided coordination between FAA ASR-11 Program Office and DoD DASR Program Office.
- FAA point of contact for test and evaluation of ASR-11 weather channel. Worked with MIT/LL to complete Developmental Test and Evaluation.
- Participated in FAA's Pre-Operational Test and Evaluation and Operational Test and Evaluation at Stockton, California. Assessed radar performance to ensure operational suitability. Modeled algorithms to investigate potential software changes. Developed enhancements to improve system performance. Coauthored several data processing algorithm enhancements required by the FAA.

PUBLISHED WORKS/PRESENTATIONS

- *Radar Mitigation in the U.S.*, presented at the Canadian Wind Energy Association 2012 Conference and Exhibition, October 15, 2012.

- *Wind and Radar Introduction and Mitigation Overview*, presented at the International Wind and Radar Forum, Canadian Wind Energy Association, June 29, 2011.
- *Military, Radar, and Aviation Issues: Growing Concerns and Ways to Navigate Potential Problems*, presented at WINDPOWER 2010 Conference and Exhibition, American Wind Energy Association, May 24, 2010
- *Introduction to the Issues*, presented at the State of the Art in Wind Siting Seminar, National Wind Coordinating Collaborative, October 21, 2009.
- *Candidate Solutions*, presented at the State of the Art in Wind Siting Seminar, National Wind Coordinating Collaborative, October 21, 2009.
- *Overview of Mitigation Efforts at Wind Projects in the UK and US*, presented at the WINDPOWER 2009 Conference and Exhibition, American Wind Energy Association, May 7, 2009.
- *Long Range Radar Technical Discussion*, Competition for the Sky, FAA, September 29-October 2, 2008.
- *Issues, Wind Turbine Clutter, I/Q Data, Detection and Track Eligibility, and Modeling Tools*, Competition for the Sky, FAA, September 29-October 2, 2008.
- *Radar Issues: A Developer's Perspective*, presented at the WINDPOWER 2008 Conference and Exhibition, America Wind Energy Association, June 1-4, 2008.
- *Technology Update and Mitigation Options*, presented at the Wind Energy Project Siting Workshop, America Wind Energy Association, February 14-15, 2008.
- *Fire Island Wind/Radar*, presented at the WINDPOWER 2007 Conference and Exhibition, America Wind Energy Association, June 3-6, 2007.
- *Fire Island Wind Turbine Project*, 51st Annual Conference Proceedings, Air Traffic Control Association, October 2006.

HONORS/AWARDS

- *Thank you letter*, Brigadier General Steven J. Lepper, February 2010.
- *Thank you letter*, Congressman John Garamendi, CA-10, February 2010.
- *Award for Exemplary Performance*, FAA ASR-11 Program Office, August 2009.
- *Letter of Appreciation*, FAA ASR-11 Program Office, May 2008.
- *Letter of Appreciation*, FAA ASR-11 Program Office, June 2007.
- *ASR-11 Team Award*, FAA ASR-11 Program Office, November 2005.

PROFESSIONAL AFFILIATIONS

- IEEE, Member
- IET, Member

CITIZENSHIP

- United States

Joe (Alton) Anderson

Phone: (571) 297-6507 **E-mail Address:** *joe.anderson@capitolairspace.com*

Experience

Capitol Airspace Group — *Alexandria, Virginia*

Director of Airspace Consulting, January 2020 to present

- Supporting 250+ projects throughout the United States, including consulting on the development of event stadiums, high-rise buildings, utility-scale wind projects, and moored aerostats.
- Developing unique strategies that strike a balance between the needs of economic development and the need to protect the National Airspace System.
- Providing expertise in instrument procedure design, optimization, and impact mitigation.
- Mitigating interference with military training routes and special use airspace.
- Assisting in development of Project Manager training program.

Senior Project Manager, July 2016 to December 2019

- Cultivated and grew portfolio to include 100+ development projects.
- Coordinated project details, including development constraints, to determine technical support that would lead to resolving identified airspace impacts.
- Assisted in business development, including redesigning company website, updating relevant social media platforms, and creation of educational "aeronautical study" video.

Senior Airspace & GIS Specialist, September 2015 to July 2016

- Developed analytical processes and Python-based automation to assess historical air traffic operations and climatological data in order to evaluate risks to proposed development.
- Developed Python-based GIS automation to:
  - improve efficiency of obstruction evaluation and airspace analyses, and
  - analyze frequency of nighttime flight operations in proximity to proposed wind turbines; findings utilized by wind developers to determine cost efficacy for lighting control systems.
- Designed new instrument approach procedures, in a challenging obstacle environment, that allowed for an airport operator to maintain procedure minimums while allowing for proposed development.
- Participated in FAA's Aeronautical Charting Meeting Instrument Procedures Group (IPG)
- Assisted in recruitment and training of Airspace Specialists

Airspace Specialist, June 2014 to September 2015

- Prepared written reports, with supporting methodology and easy-to-interpret graphics, that described the potential impact of development on the National Airspace System, including the evaluation of instrument flight rules (IFR) and visual flight rules (VFR) air traffic operations; conducted in accordance with FAA Orders 8260.3 and 8260.58.
- Provided verbal briefings regarding findings of analytical studies, including descriptions of airspace, usage, and impacts.
- Analyzed "notice requirements" for proposed development in accordance with 14 CFR 77.9.
- Implemented procedures for consistent graphics and report writing

Embry-Riddle Aeronautical University — *Daytona Beach, Florida*

Graduate Teaching Assistant, January 2013 to June 2014

- Mentored Air Traffic Control (ATC) students and created teaching scenarios for three high-fidelity simulation classes
- Assisted with learning analytics, Aviation Accreditation Board International (AABI) processes, and managing of department's web presence.

Education

Embry-Riddle Aeronautical University — *Daytona Beach, Florida*

Master of Science in Aeronautics, 2014

- Treasurer, Student Government Association

Bachelor of Science in Air Traffic Management, 2012

- Founder of Air Traffic Honor Society

CALIFORNIA ENVIRONMENTAL QUALITY ACT FINDINGS AND STATEMENT OF OVERRIDING CONSIDERATIONS IN CONNECTION WITH

SOLANO 4 WIND PROJECT

SACRAMENTO MUNICIPAL UTILITY DISTRICT

I. Introduction

The Sacramento Municipal Utility District (SMUD) is lead agency under the California Environmental Quality Act (CEQA) for purposes of the Solano 4 Wind Project, hereafter Solano 4 Wind or the project. CEQA prohibits an agency from approving or carrying out a project for which significant effects have been identified, unless the agency can make one or more of a set of three findings set forth in Public Resources Code (PRC) section 21081, subdivision (a):

> (1) Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant effects on the environment.
>
> (2) Those changes or alterations are within the responsibility and jurisdiction of another public agency and have been, or can and should be, adopted by that other agency.
>
> (3) Specific economic, legal, social, technological, or other considerations, including considerations for the provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or alternatives identified in the environmental impact report. (See also California Code of Regulations [CCR] Title 14, section 15091.)

When significant effects are subject to a finding under paragraph (3) of subdivision (a), it means that a significant and unavoidable environmental impact would result from project implementation. If this occurs, the public agency must find that specific overriding economic, legal, social, technological, or other benefits of the project outweigh the significant effects on the environment, if the agency approves the project. (PRC section 21081, subd. (b).)

CEQA requires public agencies to prepare a program for monitoring or reporting on the revisions which it requires in the project and the measures it has imposed to mitigate or avoid significant environmental effects. (CCR Title 14, section 15097, subd. (a).)

Under PRC section 21002.1, subdivision (d), when issuing an approval for an aspect of a project for which a lead agency has performed CEQA review, a responsible agency

considers only the aspects of the project that the agency is required by law to carry out or approve. SMUD therefore provides the following CEQA findings and mitigation monitoring and reporting program (MMRP) (Attachment 1) that concern potentially significant impacts to resources identified by the lead agency as part of the CEQA review and in fulfillment of CCR Title 14, section 15097, subd. (a).

II. CEQA Compliance

SMUD, as the lead agency pursuant to CEQA, has prepared a Draft and Final Environmental Impact Report (EIR) for the proposed Solano 4 Wind Project (project). The project involves the decommissioning of existing wind turbine generators (WTGs); construction of new, more technologically advanced WTGs, an associated electrical collection system, and access roads, along with minor upgrades to the existing Russell Substation; and operation and maintenance of the new WTGs. The SMUD Board of Directors (Board) hereby issues these Findings and concurrently certifies the Solano 4 Wind Project EIR.

The EIR has been assigned State Clearinghouse Number 2019012016. The Final EIR consists of amendments to the Draft EIR through responses to comments, and formal responses to comments received on the Draft EIR; minor corrections, clarifications, and revisions; and a MMRP. The Draft EIR assesses the potential environmental effects of implementation of the Solano 4 Wind Project, identifies the means to eliminate or reduce potentially significant adverse environmental impacts, and evaluates a reasonable range of alternatives to the project.

Pursuant to PRC section 21081 and CCR Title 14, section 15090, the Board hereby certifies that it completed the following activities prior to taking action related to activities evaluated under the Solano 4 Wind Project EIR: the Board has received the Final EIR; the Board has reviewed and considered the information contained in the Final EIR and received through public comments; and the Board has considered all additional written and oral statements received prior to or at its public hearing on the Final EIR. The Board additionally certifies that the Final EIR was completed in compliance with CEQA (PRC section 21000 et seq.), the CEQA Guidelines (CCR Title 14, section 15000 et seq.), and SMUD's policies and procedures for the implementation of CEQA and that the Final EIR reflects SMUD's independent judgment and analysis. The conclusions presented in these Findings are based on the Final EIR and other evidence in the administrative record. The findings set forth below pertain to the certification of the EIR for the Solano 4 Wind Project.

III. Findings

Having received, reviewed, and considered the Final EIR and all other information in the administrative record, the Board hereby adopts the following Findings for the Solano 4 Wind Project EIR in compliance with CEQA, the CEQA Guidelines, and SMUD's procedures for implementing CEQA. The Board adopts these Findings and Statement of

Overriding Considerations in conjunction with its approval of the Solano 4 Wind Project EIR, as set forth below.

a. Project Description and Background

Sacramento Municipal Utility District (SMUD) is proposing the Solano 4 Wind Project (project). The project would involve:

- decommissioning of existing wind turbine generators (WTGs);
- construction of new, more technologically advanced WTGs, an associated electrical collection system, and access roads, along with minor upgrades to the existing Russel Substation; and
- operation and maintenance of the new WTGs.

Project Objectives

SMUD's objectives for the project include the following:

- Contribute to a diversified energy portfolio that will aid in the continued improvement of air quality in the Sacramento Valley Air Basin by decreasing reliance on fossil fuel combustion for the generation of electricity, and reduce SMUD's exposure to price volatility associated with electricity and natural gas.
- Assist SMUD in achieving the Board of Directors' directive of using dependable renewable resources to meet SMUD's renewable portfolio standards (RPS) obligations. This goal is consistent with Senate Bill 100, which was enacted in 2018.
- Develop an economically feasible wind project that will deliver a reliable supply of up to 91 MW of electrical capacity at the point of interconnection with the grid managed by the California Independent System Operator (CAISO).
- Accommodate the long-term viability of agricultural use within the Montezuma Hills.

Project Location

The project site is located within the Solano County Wind Resource Area (WRA) in southern Solano County. The WRA lies north of the confluence of the Sacramento and San Joaquin rivers and southwest of the city of Rio Vista.

The project site comprises two geographically distinct areas owned by SMUD, Solano 4 East and Solano 4 West, and the collection and home run lines, which total 2,549 acres. State Route (SR) 12 provides regional access to the project area. Montezuma Hills Road and Birds Landing Road provide local access to Solano 4 East, while Collinsville Road and Shiloh Road provide local access to Solano 4 West.

Topography and Natural Habitat

The WRA consists of a series of gently rolling hills of similar texture and size. The hills crest at a relatively constant elevation, generally 150–250 feet above mean sea level. Valleys in the project area transition to sloped hillsides with relatively flat ridgelines.

The vegetation in the WRA and the project area is generally monotypic (annual grassland or dryland farming) and is mostly treeless. The few trees in the Montezuma Hills are mostly nonnative and are associated with rural farmsteads. Permanent and seasonal wetlands occur on the project lands and adjacent to Suisun Marsh; some of the land has been reclaimed with levees. Vegetation is primarily pasture and grain crops, with intermittent wetland swales and sporadic eucalyptus windbreaks. Varied shrub vegetation is present only in the drainage swales and around existing and abandoned settlements. Native vegetation is limited; most of the area is nonnative annual grassland. Some of the lowland vegetation includes native willows, blackberry, rushes, and tules. Marsh vegetation is present in some of the shallow sloughs, which drain portions of the project area into the Sacramento River to the south.

Existing Land Uses

The project area is designated for agricultural use and leased for dryland farming and grazing. The water-dependent industrial zoning of the WRA and the properties' covenants, conditions, and restrictions preclude new residential development in the WRA. Visible developments include electric transmission towers, and WTGs on the surrounding hilltops.

Except for the home run lines (cable or conductor taking power from the site to the substation) running between the two main WTG project subareas (Solano 4 East and Solano 4 West) and the Russell Substation, all project facilities would be constructed on land owned by SMUD. Solano 4 East is dominated by nonnative grasslands and used for seasonal livestock grazing and rotational dry cropland farming. Solano 4 East also currently supports Solano Phase 1, which includes 23 Vestas V-47 WTGs, gravel pads and roads, underground collection lines, and pad-mounted transformers. Solano Phase 1 would be decommissioned and removed as part of this project.

Solano 4 West is dominated by nonnative grasslands and used for seasonal livestock grazing and rotational dry crop farming. A portion of Solano 4 West previously supported 59 Kenetech KCS-56-100 WTGs and contains gravel access roads, and underground collection lines and other infrastructure associated with this earlier wind development project. However, the WTGs and their associated infrastructure reached their end of life. Accordingly, the WTGs were removed in 2019 as part of a separate and independent project. The project owner plans to abandon the underground infrastructure in place. Existing access roads that would not be repurposed for use at the Solano 4 Wind Project would be reclaimed and restored to land suitable for agriculture or grazing. Exhibit 2-3

and Exhibit 2-4 show existing and past land uses on the properties, including WTGs and soil disking in preparation for spring planting.

Project Characteristics

With the Solano 4 Wind Project, SMUD would construct up to 22 new WTGs: up to 10 in Solano 4 East and up to 12 in Solano 4 West. The project would have a net energy production capacity of up to 91 MW, resulting in a net increase in capacity at the Solano Wind Project from the existing 230 MW to 306 MW. Individual WTGs would have a maximum height of 492 to 590 feet (150 to 180 meters) and a maximum rotor diameter of 446 to 492 feet (136 to 150 meters). Associated access roads and collection lines would be installed to support the new WTGs. Power generated by the new WTGs would be transmitted from Solano 4 East and West to the point of interconnection with the CASISO grid at the existing Russell Substation on Montezuma Hills Road via new, underground direct-buried electrical cable. The power would be distributed from the substation via the adjacent Birds Landing Switching Station through the existing 230-kilovolt Vaca–Dixon–Contra Costa transmission line (two circuits), which runs through the WRA.

b. Absence of Significant New Information

CEQA Guidelines Section 15088.5 requires a lead agency to recirculate an EIR for further review and comment when significant new information is added to the EIR after public notice is given of the availability of the draft EIR but before certification. New information includes: (i) changes to the project; (ii) changes in the environmental setting; or (iii) additional data or other information. CEQA Guidelines Section 15088.5 further provides that "[n]ew information added to an EIR is not 'significant' unless the EIR is changed in a way that deprives the public of a meaningful opportunity to comment upon a substantial adverse environmental effect of the project or a feasible way to mitigate or avoid such an effect (including a feasible project alternative) that the project's proponents have declined to implement."

Comments received on the Draft EIR expressed a range of CEQA and non-CEQA issues, as discussed in Chapter 2, "Comments and Responses to Comments," of the Final EIR. Each comment has been responded to in the Final EIR and none of the comments triggered the need to recirculate the Draft EIR.

Having reviewed the information contained in the Draft and Final EIR, and in the administrative record, including all comments received, as well as the requirements under CEQA Guidelines Section 15088.5 and interpretive judicial authority regarding recirculation of draft EIRs, the Board hereby finds that no significant new information was added to the Draft EIR after the public review period. The Board specifically finds that: no new significant environmental impact would result from the Solano 4 Wind Project or from the implementation of a mitigation measure; no substantial increase in the severity of an environmental impact would result, or if such an increase would result, SMUD has

adopted mitigation measures to reduce the impact to a level of insignificance; SMUD has not declined to adopt any feasible project alternative or mitigation measures considerably different from others previously analyzed that would clearly lessen the environmental impacts of the Solano 4 Wind Project; and the Draft EIR is not so fundamentally and basically inadequate in nature that it precluded meaningful public review.

Having reviewed the information in the Draft EIR, Final EIR, and administrative record, the Board finds that no new significant information was added to the EIR following public review, and recirculation of the EIR is therefore unnecessary and not required by CEQA.

c. Environmental Impacts Summary

As required by CEQA and the CEQA Guidelines, the following section summarizes the direct, indirect, and cumulative environmental impacts of the project identified in the Final EIR and includes the Board's Findings regarding those impacts and any mitigation measures set forth in the Final EIR, adopted by the Board, and incorporated as requirements of the project. These Findings summarize the determinations of the Final EIR with respect to the project's impacts before and after mitigation and do not attempt to describe the full analysis of each environmental impact considered in the Final EIR. Instead, the Findings provide a summary of each impact, describe the applicable mitigation measures identified in the Final EIR and adopted by the Board, and state the Board's Findings regarding the significance of each impact with the adopted mitigation measures. The Final EIR contains a full explanation of each impact, mitigation measure, and the analysis that led SMUD to its conclusions on that impact. These Findings hereby incorporate by reference the discussion and analysis in the Final EIR, which support the Final EIR's determinations regarding the project's environmental impacts and mitigation measures. In making these Findings, the Board ratifies, adopts, and incorporates by reference the Final EIR's analysis, determinations, and conclusions relating to environmental impacts and mitigation measures. The substantial evidence supporting these findings and conclusions are set forth in the Final EIR and the record of proceedings.

The Board hereby adopts, and incorporates as conditions of approval, the mitigation measures set forth in the findings below to reduce or avoid the potentially significant impacts of the project. In adopting the mitigation measures described below, the Board intends to adopt each of the mitigation measures recommended in the Final EIR. Accordingly, in the event that a mitigation measure recommended in the Final EIR has been inadvertently omitted from these Findings, that mitigation measure is hereby adopted and incorporated by reference in the Findings. Additionally, in the event that the description of mitigation measures set forth below fails to accurately capture the substance of a given mitigation measure due to a clerical error (as distinct from specific and express modification by the Board through these Findings), the language of the mitigation measure as set forth in the Final EIR shall govern.

1. Significant and Unavoidable Adverse Impacts and Related Mitigation Measures

Pursuant to PRC section 21081(b) and CEQA Guidelines section 15093, where the lead agency identifies significant adverse environmental impacts that cannot feasibly be mitigated to a less-than-significant level, the lead agency may nonetheless approve the project if it finds that specific economic, legal, social, technological, or other benefits of the project outweigh the unavoidable significant environmental impacts.

After implementation of the recommended mitigation measures, implementation of the Solano 4 Wind Project would result in the following significant and unavoidable impacts:

Air Quality

Impact 3.2-1: Construction-related exceedance of thresholds of significance established by the air districts for criteria air pollutants. Project construction activities would emit NOx and PM_{10} at levels that could exceed YSAQMD and BAAQMD daily emissions thresholds for these pollutants.

> *Mitigation Measure 3.2-1: Reduce construction-related exhaust and dust emissions.* The construction contractor shall prepare a fugitive dust control plan for the project's construction phases. Before the start of construction, the plan shall be submitted to YSAQMD and BAAQMD for review and approval. The fugitive dust control plan shall include but not be limited to the following measures for all construction phases to reduce fugitive dust emissions and emissions of PM and NOX exhaust:
>
> Fugitive Dust Control Plan
>
> - All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered at a frequency adequate to maintain minimum soil moisture of 12 percent (at least two times per day). Moisture content can be verified by lab samples or moisture probe.
>
> - All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
>
> - All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
>
> - All vehicle speeds on unpaved roads shall be limited to 15 miles per hour.
>
> - All roadways, driveways, and wind turbine generator foundations and work areas to be paved or graveled shall be completed as soon as possible. These areas shall be paved or graveled as soon as possible after grading

unless seeding or soil binders are used. No recycled concrete will be utilized on the roadways.

- Idling times shall be minimized either by shutting equipment off when not in use or by reducing the maximum idling time to 2 minutes. Clear signage shall be provided for construction workers at all access points.

- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition before operation.

- A publicly visible sign shall be posted identifying the name and telephone number of the person to contact at SMUD regarding dust complaints. This person shall respond and take corrective action within 48 hours. The air districts' phone numbers shall also be visible to ensure compliance with applicable regulations.

- All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 miles per hour.

- Vegetative ground cover (e.g., fast-germinating native grass seed) shall be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established.

- The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time shall be limited. Activities shall be phased to reduce the surface area disturbed at any one time.

- All trucks and equipment, including their tires, shall be washed off before leaving the site.

- Site access areas shall be covered with a 6- to 12-inch compacted layer of wood chips, mulch, or gravel to a distance of 100 feet from the paved road.

- Sandbags or other erosion control measures shall be installed to prevent silt runoff to public roadways from sites with a slope greater than 1 percent.

- The project shall develop a plan demonstrating that off-road equipment exceeding 50 horsepower) to be used in the construction project (owned, leased, and subcontractor vehicles) would achieve project-wide, fleet-average emissions reductions of 20 percent for NOX and 45 percent for PM, compared to the most recent ARB fleet average. Acceptable options for reducing emissions include the use of late-model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment

products, add-on devices such as particulate filters, and/or other options as they become available.

- Low-VOC (i.e., ROG) coatings shall be used beyond local requirements (Regulation 8, Rule 3, “Architectural Coatings”).

- All construction equipment, diesel trucks, and generators shall be equipped with best available control technology for reduction of NOX and PM emissions.

- All contractors shall use equipment that meets ARB’s most recent certification standard for off-road heavy-duty diesel engines (BAAQMD 2017:Tables 8-2 and 8-3).

Finding: The Board finds that changes or alterations have been required in, or incorporated into, the project that substantially lessen these potentially significant impacts as identified in the EIR, however implementation of the Solano 4 Wind Project would still create significant and unavoidable construction emissions of criteria air pollutants and ozone precursors. Specific economic, legal, social, technological, or other considerations make infeasible additional mitigation measures or project alternatives identified in the EIR.

2. Issues for which the project would have a Less-than-Significant Impact with Project-specific Mitigation Measures Incorporated

Pursuant to PRC section 21081(a)(1) and CEQA Guidelines section 15091(a)(1), SMUD finds that changes or alterations have been required or incorporated into the project to avoid or substantially lessen the following potentially significant impacts identified in the Final EIR to a less-than-significant level.

Aesthetics

Impact 3.1-2: Creation of new sources of substantial light or glare that would adversely affect day or nighttime views in the area. Project construction and operation would introduce permanent sources of light and glare, mainly to comply with FAA safety lighting requirements.

Mitigation Measure 3.1-2: Use Technology to Reduce Night Sky Impacts. To reduce the potential for visual impacts associated with lighting, lighting for the turbine doorways shall be limited to the illumination required for safety of personnel and security of project infrastructure. To minimize the effect of light pollution in the surrounding area, all lighting shall be motion-activated and downcast.

To minimize night sky impacts from hazard navigation lighting associated with wind facilities, ADLS technology will be employed as described in the FAA

Determination of No Hazard. ADLS is a radar-based obstacle avoidance system that activates obstruction lighting and audio signals only when an aircraft is close to an obstruction on which an ADLS unit is mounted, such as a wind turbine.

Finding: The Board finds that implementation of the Solano 4 Wind Project would introduce new sources of light associated with new WGTs. Adoption and incorporation of Mitigation Measure 3.1-2 into the project will reduce the impact to a less-than-significant level. Thus, pursuant to PRC section 21081(a)(1) and CEQA Guidelines section 15091(a)(1), changes or alterations have been required or incorporated into the project to avoid or substantially lessen the potentially significant impact to less-than-significant level.

Biological Resources

Impact 3.3-1: Temporary and permanent construction impacts on special-status amphibians and reptiles. Special-status amphibians or reptiles could be killed or injured by construction equipment or personnel, should they be present on the project site during construction.

Mitigation Measure 3.3-1a: Avoid and minimize impacts on California tiger salamander. SMUD will implement the following measures to avoid and minimize potential construction impacts on California tiger salamander:

- A qualified California tiger salamander biologist (defined as an individual with 3 years of experience conducting surveys for California tiger salamander and habitat in the project region) will be present on-site to conduct monitoring during project construction and decommissioning activities that disturb surface soils within 250 feet of drainages or any other aquatic features identified as suitable for California tiger salamander (AECOM 2018b).
- SMUD will confine all project-related parking, storage areas, laydown sites, equipment storage, and any other surface-disturbing activities to previously disturbed areas or areas that are not suitable habitat for California tiger salamander (AECOM 2018b). To the extent it is not possible to limit such activities to previously disturbed areas or areas that are not suitable habitat for California tiger salamander, the qualified biologist will perform a preconstruction survey within 48 hours before constructing project-related parking, storage areas, laydown sites, and equipment storage sites to ensure California tiger salamander are not present. If a California tiger salamander is found within the project area, SMUD will implement any actions necessary to avoid take of California tiger salamander, including establishing appropriate buffer area and

exclusion fencing in consultation with USFWS and/or CDFW. If after avoidance measure cannot avoid take, SMUD shall seek an Incidental Take Permit from USFWS and/or CDFW, as appropriate, and implement any measures specified therein to reduce chances of take and minimize and fully mitigate any incidental take (including the measures in this MM 3.3-1a).

- All steep-walled holes or trenches that are 1 foot deep or greater and located within 250 feet of aquatic habitat that is suitable for CTS will have at least one escape ramp constructed of earthen fill or wooden planks. All such holes or trenches will be completely covered before sunset of each workday using boards or metal plates that are placed flush to the ground, and will be inspected before the start of daily construction activities.
- To prevent inadvertent entrapment of California tiger salamanders during project construction, maintenance, and decommissioning, all construction pipes, culverts, conduits, and other similar structures stored on-site overnight will be inspected before the structure is buried. Plastic monofilament netting will not be used for sediment control because it could pose an entrapment hazard to California tiger salamanders and other wildlife.

Mitigation Measure 3.3-1b: Develop and implement a worker environmental awareness program. Before the start of any construction activity, SMUD will develop a worker environmental awareness program that will be provided to all personnel working on the project site during construction and operation. Training materials and briefings will include but not be limited to the following elements:

- A discussion of applicable requirements established by the following laws and regulations, consequences of noncompliance, and the specific conditions of permits obtained for the project from regulatory agencies (USACE, the RWQCB, USFWS, and CDFW) under these laws and regulations:
- the federal ESA and CESA;
- the Bald and Golden Eagle Protection Act;
- the Migratory Bird Treaty Act;
- the Clean Water Act;
- Sections 3503, 3503.5, 3511, 3513, 3800(a), 4150, 4700, 5050, 5515, and 1602 of the California Fish and Game Code;
- California Code of Regulations Title 14, Sections 30.10 and 251.1;
- the Porter-Cologne Water Quality Control Act;

- Sections 5004 and 7201 of the CDFA Code; and
- California Coastal Act
- Information about workers' responsibilities with regard to California tiger salamander, an overview of the species' appearance and habitat, and a description of the measures being taken to reduce potential effects on the species during project construction.
- Identification and values of the special-status plant and wildlife species to be protected by the project; identification of important wildlife habitat and sensitive natural communities to be protected; and identification of special-status species, life history descriptions, habitat requirements during various life stages, and the species' protected status.
- Fire protection measures, measures to avoid introduction and minimize the spread of invasive weeds during construction and operation; procedures for managing trash and food waste to prevent attracting corvids or nuisance wildlife to the site; and procedures for preventing and containing spills of hazardous substances.

SMUD will conduct the worker-training program for new employees coming on the project site before the start of any construction, maintenance, or decommissioning activity that would disturb surface soils. SMUD will ensure that all personnel working on-site receive the training, including construction contractors and personnel who will operate and maintain project facilities. The training program will be recorded and subsequently shown to any project personnel who are unable to attend the initial training program.

If a California tiger salamander, alive or dead, is encountered (i.e., observed, killed, or otherwise taken) at any location on the project site during the project's lifetime, SMUD will notify USFWS and CDFW on the same day as the detection. Project personnel will not move the salamander encountered unless instructed to do so by USFWS and CDFW.

If instructed to move the California tiger salamander by USFWS, a USFWS-approved and permitted biologist will carefully relocate the salamander by hand to a suitable, nearby active burrow system (e.g., for Botta pocket gopher or California ground squirrel) outside the area where project activities could injure or kill the animal. (The USFWS-approved and permitted biologist will be an individual with a Section 10[a][1][A] handler's permit for California tiger salamander.) The qualified biologist will monitor the rescued California tiger salamander until it enters the burrow.

In addition to the measures described above, SMUD will implement the following measures, listed after Impact 3.3-13 below, to protect water quality and drainages during construction:

- Mitigation Measure 3.3-13a, “Avoid and Minimize Impacts on Wetlands and Other Waters of the United States”
- Mitigation Measure 3.3-13b, “Avoid and Minimize Potential Effects on Waters of the United States Associated with Installation of Access Road Culvert Crossings”
- Mitigation Measure 3.3-13c, “Comply with Section 1602 Streambed Alteration Agreement”
- Mitigation Measure 3.3-13d, “Avoid and Minimize Potential Effects on Waters of the United States from Horizontal Directional Drilling”

Finding: The Board finds that implementation of the Solano 4 Wind Project could result in temporary and permanent construction impacts on special-status amphibians and reptiles. Adoption and incorporation of Mitigation Measures 3.3-1a and 3.3-1b into the project will reduce the impact to a less-than-significant level. Therefore, pursuant to PRC section 21081(a)(1) and CEQA Guidelines section 15091(a)(1), changes or alterations have been required or incorporated into the project to avoid or substantially lessen the potentially significant temporary and permanent construction impacts on special-status amphibians and reptiles to less- than-significant levels.

Impact 3.3-2: Construction impacts on nesting birds (nonraptors). Project construction could affect avian nesting success if active nests would be directly affected or if construction activity would disturb nest sites, thereby reducing adults’ nest attentiveness and productivity.

Mitigation Measure 3.3-2: Avoid impacts on nesting birds. In addition to Mitigation Measure 3.3-1b, “Develop and Implement a Worker Environmental Awareness Program,” and measures for biological monitors, SMUD will implement the following measures to avoid directly or indirectly affecting nesting birds during project construction:

- SMUD will conduct preconstruction nesting bird surveys to locate all active nests of special-status birds and birds protected under the MBTA and California Fish and Game Code Sections 3503 and 3503.5. No more than one week before any construction activities occur during the nesting season (February 1–August 31), including vegetation removal if necessary, a qualified biologist shall conduct nesting bird surveys to identify any nests within 100 feet of proposed work areas. The qualified

biologist is defined as an individual knowledgeable about the distribution, habitat, life history, and identification of Northern California birds, and with 3 years of experience in nest searching for birds that may be present in the project area.

- If nests are detected during the preconstruction surveys, a 100-foot exclusion zone will be established around the nest in which no work will be allowed until the young have successfully fledged or nesting activity has ceased. The qualified biologist will make the determination of fledging or cessation of nesting. In consultation with a qualified avian biologist, USFWS, and CDFW, the size of the exclusion zone may be modified depending on the species and the type of construction activity and associated disturbance anticipated near the nest.

Finding: The Board finds that implementation of Solano 4 Wind Project construction could affect avian nesting success if active nests would be directly affected or if construction activity would disturb nest sites. Adoption and incorporation of Mitigation Measure 3.3-2 into the project will reduce the impact to a less-than-significant level. Thus, pursuant to PRC section 21081(a)(1) and CEQA Guidelines section 15091(a)(1), changes or alterations have been required or incorporated into the project to avoid or substantially lessen the potentially significant construction impacts on nesting birds to less-than-significant level.

Impact 3.3-4: Construction impacts on raptor nesting activity. Project construction could affect raptor nesting success if active nests would be directly affected or if construction activity would disturb nest sites, thereby reducing adults' nest attentiveness and nest productivity.

Mitigation Measure 3.3-4a: Avoid and minimize impacts on nesting raptors. SMUD will implement the following measures to avoid and minimize impacts on nesting raptors:

- If construction activities are scheduled to occur during the breeding season (February 1–August 31), SMUD will conduct preconstruction surveys in all potential suitable raptor nesting habitat within 0.25 mile of proposed construction areas, including trees, shrubs, grasslands, and wetland vegetation. A qualified wildlife biologist shall determine the timing of preconstruction surveys based on the time of year and habitats that are present, and shall conduct the surveys no more than 30 days before construction. The 30-day survey period allows flexibility in order for

surveys to be conducted when the likelihood of nest detection is maximized (e.g., during courtship, nest building, or when feeding young).

- SMUD will conduct nesting surveys for Swainson's hawks in accordance with the Swainson's Hawk Technical Advisory Committee (TAC) guidance published in 2000 (Recommended Timing and Methodology for Swainsons' Hawk Nesting Surveys in California's Central Valley). These methods will require surveys to start early in the nesting season (late March to early April). Surveys will be conducted within a minimum 0.25-mile radius of the project area or a larger area if necessary to identify potentially active nests potentially affected by project construction. As required by the TAC guidance, surveys will be conducted for at least two survey periods in the nesting season, immediately before the start of project construction activities. The qualified biologist conducting the surveys will have a minimum of 2 years of experience in implementing the TAC survey methodology.
- SMUD will maintain no-disturbance buffers around active raptor nests during the breeding season, or until it is determined the young have fledged. The no-disturbance zone shall include a 500-foot buffer around all raptor nests (including owls) and a 0.25-mile buffer for any active Swainson's hawk nests.
    - No-disturbance buffer sizes for non-special-status species raptors may be increased or decreased by a qualified biologist based on the sensitivity of the species of raptor, or based on site conditions that affect disturbance, such as the type of work, vegetation structure or density, and the line of sight between construction work and the nest to nesting raptors.
    - No-disturbance buffer sizes for special-status raptor species may be increased or decreased by the qualified biologist in consultation with USFWS and CDFW as appropriate.
    - Buffers will not apply to construction-related traffic using existing roads that are not limited to project-specific use (e.g., county roads, highways, farm roads).
    - If no nests are observed during the preconstruction survey but nesting occurs after the start of construction, it will be assumed that the individuals are acclimated to the level of ongoing disturbance.
- SMUD will clearly identify the locations of no-disturbance buffers (e.g., 250 feet, 500 feet, or 0.25 mile) on maps that will be made available to construction crews.

- Before and during construction, a qualified biologist shall identify all active nest setback areas on construction drawings, and if appropriate, shall flag or fence the setback areas.
- If construction is scheduled to occur during the non-nesting season, then no nesting bird surveys are required before construction activity begins, except provisions for surveys for burrowing owls outside the nesting season (September 1–January 31), as specified below in Mitigation Measure 3.3-4b.

Mitigation Measure 3.3-4b: Avoid and minimize impacts on burrowing owls. To avoid and minimize impacts on burrowing owls, SMUD will implement the following guidelines adapted from the *CDFW Staff Report on Burrowing Owl Mitigation* (CDFG 2012):

- SMUD will have preconstruction burrowing owl surveys conducted in all areas that may provide suitable nesting habitat according to CDFW (CDFG 2012) guidelines. A qualified wildlife biologist shall conduct take avoidance surveys, including documentation of burrows and burrowing owls, in all suitable burrowing owl habitat within 500 feet of proposed construction. The take avoidance surveys, consisting of up to four visits, shall be initiated within 30 days of and completed at least 14 days before construction is initiated at a given location. In areas with burrows or refuge that could potentially support burrowing owls, a clearance visit shall be conducted within 24 hours of construction, including when construction work is reinitiated after a lapse of two or more weeks.
- SMUD will avoid disturbing active western burrowing owl nests and occupied nesting burrows.
    - In accordance with standard CDFW mitigation guidelines, SMUD and its construction contractor will avoid disturbance at occupied burrows in accordance with the following seasonal distance buffers for low, medium, and high levels of disturbance (CDFG 2012):
        - April 1 – August 15: 200 m (low), 500 m (medium), and 500 m (high)
        - August 16 – October 15: 200 m (low), 200 m (medium), and 500 m (high)
        - October 16 – March 31: 50 m (low), 100 m (medium), and 500 m (high)
    - These distances may be increased or decreased if, as determined by a qualified biologist, a different distance is required to ensure

construction activities will not adversely affect occupied burrows or disrupt breeding behavior.

- If a qualified biologist, in consultation with CDFW, determines that construction could adversely affect occupied burrows during the September 1–January 31 nonbreeding season, SMUD shall consult with CDFW to determine if passive relocation using one-way doors, in accordance with guidelines prepared by the California Burrowing Owl Consortium (CDFG 2012), should be implemented, and if off-site compensatory mitigation is required to offset habitat loss. Compensatory mitigation for loss of burrowing owl habitat would require protection of suitable mitigation lands in perpetuity at a minimum 3:1 mitigation ratio.

Finding: The Board finds that implementation of the Solano 4 Wind Project could result in significant construction impacts on raptor nesting activity. Adoption and incorporation of Mitigation Measures 3.3-4a and 3.3-4b into the project will reduce the impact to a less-than-significant level. Thus, pursuant to PRC section 21081(a)(1) and CEQA Guidelines section 15091(a)(1), changes or alterations have been required or incorporated into the project to avoid or substantially lessen the potentially significant impact on raptor nesting activity to less-than-significant level.

Impact 3.3-5: Removal and modification of raptor nesting, foraging, and roosting habitat during construction. Project construction would result in permanent and temporary impacts on raptor nesting and foraging habitat.

Mitigation Measure 3.3-5: Acquire off-site mitigation to replace lost raptor foraging habitat. SMUD will implement the following compensatory mitigation to offset net impacts on foraging habitat for breeding Swainson's hawks and other raptor species. Based on Swainson's hawk nest locations documented in recent years, no permanent project impacts on foraging habitat will occur within 1 mile of an active Swainson's hawk. Depending on whether the 150m WTG option or the 136m WTG option is selected, 25.38 acres or 30.49 acres of suitable Swainson's hawk foraging habitat will be required to mitigate this loss.

SMUD will mitigate the loss of Swainson's hawk foraging habitat in accordance with CDFW recommendations (DFG 1994) by providing mitigation lands as follows:

- Foraging habitat permanently lost within 5 miles of an active Swainson's hawk nest tree but more than 1 mile from the nest tree (either 25.38 acres or 30.49 acres, depending on the WTG option selected) will be replaced with 0.75 acre of mitigation land for each acre of foraging habitat

permanently lost because of project construction (0.75:1 ratio). This ratio is consistent with recommendations in DFG 1994: “Projects within 5 miles of an active nest tree but greater than 1 mile from the nest tree shall provide 0.75 acres of habitat mitigation land for each acre of urban development authorized [0.75:1]).” All mitigation lands protected under this requirement shall be protected in perpetuity in a form acceptable to CDFW (e.g., through fee title acquisition or conservation easement) on agricultural lands or other suitable habitats that provide foraging habitat for Swainson’s hawk. The easement will be held by a governmental entity, special district, non-profit organization, for-profit entity, person, or another entity, to hold title to and manage the property provided that the district, organization, entity, or person meets the requirements of Sections 65965–65968 of the Government Code, as amended. As the State’s trustee for fish and wildlife resources, CDFW is to be named as a third-party beneficiary under the conservation easement. SMUD will consult with CDFW in determining the suitability of the proposed mitigation lands to offset impacts of the project on Swainson’s hawk foraging habitat.

- Management authorization holders/project sponsors will provide for management of the mitigation lands in perpetuity by funding a management endowment.

Finding: The Board finds that implementation of the Solano 4 Wind Project could result in significant removal and modification of raptor foraging habitat during construction. Adoption and incorporation of Mitigation Measure 3.3-5 into the project will reduce the impact to a less-than-significant level. Therefore, the project with mitigation will not cause significant construction impacts on raptor foraging habitat.

Impact 3.3-6: Construction impacts on bald and golden eagle nesting activity. Project construction activities could affect eagle nesting success if they would disturb nest sites, thereby reducing adults’ nest attentiveness and nest productivity.

Mitigation Measure 3.3-6: Avoid and minimize impacts on nesting eagles. SMUD will implement the following measures to avoid and minimize impacts on nesting eagles:

- Ground-based surveys will be conducted to assess the status of all previously documented eagle nest locations (CNDDB or other reliable sources) within the 2-mile buffer of the project area, and will follow guidance set forth in USFWS (2013) for ground-based surveys to

determine occupancy, including the following site-specific recommendations:

- Two 4-hour observations shall be conducted at each nest (multiple nests may be observed simultaneously), one in late January and the other in late February, to determine whether territories are occupied by adult eagles and identify nesting activity where possible.
- If an active nest is located, no further ground monitoring is required. However, if nesting behavior is observed within 2 miles of the project buffer and a nest site is not located, an aerial inspection of the area shall be conducted.
- The results of the surveys shall be documented in a report and submitted to USFWS and CDFW no later than August of the breeding season in which the survey was conducted (e.g., August 2020 for winter/spring 2020 surveys).

SMUD will implement the following avoidance buffer distances for bald eagle and golden eagle (respectively) for the indicated construction activity, assuming a direct line of sight between the construction activity and the active nest:

- Human foot traffic: 400 meters/800 meters
- Pass-through vehicular traffic: 200 meters/400 meters
- Any other construction work except the types described below: 800 meters/1,600 meters
- Blasting: 1,600 meters for both species
- Helicopter flight: 1,600 meters (horizontal and vertical) for both species

Active eagle nests and associated buffers will be indicated in construction drawings for the project and will be discussed in the worker environmental awareness program training for construction workers (Mitigation Measure 3.3-1b).

Finding: The Board finds that implementation of the Solano 4 Wind Project could result in significant construction impacts on bald and golden eagle nesting activity. Adoption and incorporation of Mitigation Measure 3.3-6 into the project will reduce the impact to a less-than-significant level. Therefore, the project with mitigation will not cause significant construction impacts on bald and golden eagle nesting activity.

Impact 3.3-7: Removal and modification of golden eagle foraging habitat during construction. Project construction would result in temporary and permanent impacts on golden eagle foraging habitat, resulting in decreased prey availability.

Mitigation Measure 3.3-7: Implement Mitigation Measure 3.3-5. SMUD will implement Mitigation Measure 3.3-5, "Acquire Off-site Mitigation to Replace Disturbed Raptor Foraging Habitat," listed above.

Finding: The Board finds that implementation of the Solano 4 Wind Project could result in significant temporary and permanent impacts on golden eagle foraging habitat during construction. Adoption and incorporation of Mitigation Measure 3.3-7 into the project will reduce the impact to a less-than-significant level. Thus, pursuant to PRC section 21081(a)(1) and CEQA Guidelines section 15091(a)(1), changes or alterations have been required or incorporated into the project to avoid or substantially lessen the potentially significant impact on golden eagle foraging habitat during construction to less-than-significant level. .

Impact 3.3-9: Injury to and mortality of raptors, other birds, and bats from project operation. Project operation could result in injury to and mortality of bats and birds, including eagles and other special-status birds, as a result of collisions with wind turbine generators.

Mitigation Measure 3.3-9a: Avoid and minimize operational impacts on birds and bats. SMUD will design and operate the project to minimize potential operational impacts on birds and bats by adhering to impact avoidance and minimization measures, including those described the *SMUD Solano Wind Bird and Bat Conservation Strategies* (SMUD 2013), and SMUD's Eagle Conservation Plan (SMUD 2014). These measures include the following:

- Maintain a landscape that does not encourage bird or bat occurrence by conducting regular rotational agricultural activities to keep rodent prey populations to relatively low levels. In addition, implement a prey management program to reduce the availability of rabbits, ground squirrels, and other prey that could attract eagles and other raptors.
- Adhere to the general guidelines for turbine and WTG tower design and operation to minimize bird and bat mortality:
    - Use turbines and WTG tower designs lacking potential raptor perches that may encourage bird activity near the moving rotors.
    - Use turbines with rotor tips at least 25 meters, preferably 30 meters, above the ground.
- Avoid guy wires on meteorological towers.
- Select WTG sites using the following guidelines designed to minimize the extent of potential avian and bat mortality:

- Minimize the density of WTGs on the landscape and avoid placing WTGs close together in long strings, which creates barriers to movement by restricting the available space for birds and bats to negotiate through a WTG field.
- Establish setbacks from roads, residences, and wetlands and other unique habitats where birds and bats are more likely to congregate.
- Where possible, avoid steep slopes, canyons, saddles, and other high-risk topographic features.

Mitigation Measure 3.3-9b: Conduct bird and bat mortality monitoring. To assess operational impacts on birds and bats and inform potential adaptive management and mitigation approaches, SMUD will conduct 1 year of postconstruction mortality monitoring in the project area, as follows:

- Qualified biologists shall monitor bird and bat mortality annually throughout the project area in accordance with the requirements set forth below, which incorporate guidelines described in SMUD's Solano BBCS (SMUD 2013), SMUD's *Final Eagle Conservation Plan* (SMUD 2014), and the *California Guidelines for Reducing Impacts to Birds and Bats from Wind Energy Development* (CEC and DFG 2007). The monitoring shall be conducted so that sufficient information is available to allow evaluation of WTG design characteristics and location effects that contribute to mortality, including information about the species, number, location, and distance of dead birds relative to WTG locations; availability of raptor prey species; and cause of bird and bat mortalities.
- Monitoring will be conducted monthly for 1 year at all turbines in the Solano 4 Wind Project area after the first delivery of power, and will include but not be limited to the following methods unless otherwise determined appropriate by SMUD:
    - The standard search radius will be 100 meters to account for terrain and WTG height.
    - A sufficient number of "road and pad" searches will be conducted to 150 meters to determine the proportion of carcasses falling outside of the standard (100-meter) search radius.
    - Searcher efficiency trials will be conducted for four seasons and will be sufficient to analyze differences in carcass size (small/medium/large) and vegetative cover.
    - Data will be analyzed using procedures described by the California Energy Commission and CDFW (CEC and CDFG 2007), or newer

approaches (e.g., General Estimator [Dalthorp et al. 2018], the Evidence of Absence model [Dalthorp et al. 2017]). The data analysis will address adjusted fatality rates annually, seasonally, and by species. An annual report will be prepared each year and a final report will be prepared after the 1-year monitoring period.

  - If a carcass with a band is found in the project area, SMUD will promptly report the banding information to USFWS's Bird Banding Laboratory. SMUD will consult with the laboratory to include any information provided by USFWS that is pertinent to avian mortality at the project site, if any, in the annual monitoring reports.

- After postconstruction monitoring data have been obtained, SMUD will review the data. In consultation with USFWS and CDFW, SMUD will determine which specific WTGs, if any, generate disproportionately high levels of avian mortalities (based on evidence of statistically significant higher levels of mortality relative to other WTGs), and whether adaptive management measures are needed to reduce or avoid mortalities at those specific WTGs.
- If unauthorized take of a federally listed or state-listed endangered or threatened avian or bat species occurs during project operation, SMUD will notify the appropriate agency (USFWS and/or CDFW) within 48 hours of the discovery, and will submit written documentation of the take to the appropriate agency within 2 calendar days. The documentation will describe the date, time, location, species, and if possible, cause of unauthorized take. Although not expected to occur, SMUD will implement any measures to avoid, minimize, or compensate for possible take in consultation with the USFWS and/or CDFW, including obtaining an Incidental Take Permit, as appropriate. Also, see Mitigation Measure 3.3-9g Implement Adaptive Management.

SMUD will design and conduct postconstruction mortality monitoring in a way that ensures at least a 50 percent chance of detecting mortality of large raptors (including golden eagle and Swainson's hawk) caused by a collision with a project WTG. Modeling tools such as the Evidence of Absence model (Dalthorp et al. 2017) can be used to design studies with such an objective in mind. This may require adjusting the radius of the search area around the WTGs, the proportion of WTGs searched, or other standard parameters set forth above.

After postconstruction monitoring activities, SMUD will conduct an annual "clean sweep" around all Solano 4 turbines each subsequent calendar year for the life of the project. In addition, SMUD will continue its current practice of incidental

monitoring of the project area through reporting of incidental fatalities or injured birds by on-site staff to the Avian Reporting System (see Mitigation Measure 3.3-9h, “Implement Adaptive Management to Address Disproportionate Mortality of Special-Status Birds or Bats,” below). SMUD will also continue to report incidental fatalities or injured birds in compliance with its USFWS Special Purpose Utility Permit (Permit #MB189818-0). As required in Mitigation Measure 3.3-9b SMUD will notify the appropriate agency (USFWS and/or CDFW) within 48 hours of the discovery any unauthorized take of a federally listed or state-listed endangered or threatened species.

Mitigation Measure 3.3-9c: Implement a training program for construction and project personnel. SMUD will implement a training program so that on-site staff will have a thorough understanding of eagle mortality issues and corresponding protocols. The training program focuses on staff members with direct and indirect implementation responsibilities, including managers, supervisors, engineers, and on-site field crews. The training program will include the following elements:

- introduction and description of eagle mortality issues;
- description of SMUD’s environmental stewardship policy (SMUD Board Policy SD 7);
- description of avian resources in the project area and the species most susceptible to collision mortality or injury;
- discussion of federal and state regulations that protect birds, legal implications, and the need for compliance;
- protocols for recording/reporting avian incident data and procedures for carcass collection and injured wildlife; and
- responsibilities of staff members to implement the BBCS.

Mitigation Measure 3.3-9d: Provide funding for raptor recovery and rehabilitation. SMUD will contribute $5,000 each year for the duration of project operation to the University of California, Davis, California Raptor Center (UC Davis Raptor Center) or its successors for rehabilitation of injured avian species, including eagles and other raptors. The UC Davis Raptor Center is authorized by USFWS and CDFW to rehabilitate injured and orphaned raptors. The UC Davis Raptor Center successfully returns approximately 60 percent of the sick, injured, and orphaned birds it receives to the wild each year (UC Davis California Raptor Center 2019).

Mitigation Measure 3.3-9e: Reduce vehicle collision risks to wildlife. SMUD's operators will enforce a speed limit of 15 miles per hour on all roads on the project site to minimize the risk of collisions with small mammals and other wildlife, thereby reducing the number of roadkills, a potential food source that could attract eagles and increase their risk of vehicle collisions.

Mitigation Measure 3.3-9f: Secure an eagle incidental take permit for Solano 4 Wind from USFWS and implement permit conditions. SMUD will compensate for the loss of any golden or bald eagles injured or killed as a result of project operation by complying with the conditions described in SMUD's Eagle Take Permit. Compensatory mitigation for eagle fatalities may include paying for the retrofitting of electrical utility poles that present a high risk of electrocution to eagles, as prescribed in the *Eagle Conservation Plan Guidance*, Appendix G (USFWS 2013). The performance standard for this compensatory mitigation would be to implement sufficient measures (e.g., electric utility retrofits) to offset all eagle fatalities directly attributable to project operation and resulting in permanent removal of an eagle from the wild, whether detected during structured postconstruction mortality monitoring surveys or detected incidentally.

For each instance of project-related injury or mortality that removes a bird from the population, 32 utility poles shall be retrofitted. This is based on a resource equivalency analysis performed in accordance with USFWS guidelines (USFWS 2013:Appendix G) and assumes that each retrofitted pole would result in 10 years of avoided loss because of electrocution. The resource equivalency analysis also assumes that the take of one eagle and the associated compensatory mitigation will occur during the same year. Certain utility poles may be eligible for "reframing" (as opposed to retrofitting) to avoid electrocution, which USFWS assumes will result in 30 years of avoided loss rather than 10 years. The reframing of 14 eligible utility poles is sufficient to offset take of a single eagle, according to the resource equivalency analysis.

Compensatory mitigation for the loss of each eagle shall be completed within 1 year of each instance of documented take. Retrofitted poles must be considered "high-risk" for electrocution (per USFWS 2013:Appendix G). For instances of bald eagle take, retrofitted poles must be located in areas where both species occur and within the Pacific Flyway north of 40 degrees North latitude. For instances of golden eagle take, retrofitted poles must be located within the Pacific Flyway. These areas represent the USFWS-designated "Eagle Management Units" at the project site for bald eagles and golden eagles, respectively (USFWS 2016).

SMUD will comply with the federal eagle incidental take permit that will be secured for the project. Any mitigation completed toward fulfillment of the eagle take permit requirements will be counted toward the mitigation requirements described above. If mitigation requirements specified in the USFWS eagle take permit differ from those described above, the USFWS permit requirements shall prevail.

Mitigation Measure 3.3-9g: Implement adaptive management to address disproportionate mortality of special-status birds or bats. SMUD will implement adaptive management strategies if postconstruction mortality monitoring studies determine that project operation is resulting in disproportionate mortality of one or more avian or bat species. The goal of the adaptive management strategies is to avoid a local population of avian or bat species dropping below self-sustaining levels. In accordance with the Solano BBCS (SMUD 2014), a determination to implement adaptive management based on “disproportionate mortality” will consider the factors listed below.

- Number of annual fatalities per turbine
- Disproportionate representation of a particular species
- Comparison to other wind energy facilities

As part of the annual survey and monitoring program described in Mitigation Measure 3.3-3b above, SMUD will analyze information related to these factors. Through this process of data collection, analysis, and consideration of these factors, disproportionate mortality at individual WTGs will be analyzed.

A project-related fatality of one or more federal- or California-listed species or one or more California Fully Protected Species would trigger consultation with USFWS and/or CDFW, and implementation of the adaptive management and compensatory mitigation measures described below. If avian or bat mortality resulting from operation of the Solano 4 Wind Project exceeds the maximum estimated fatality rates described in Tables 3.3-11 and 3.3-12 for special-status birds or bats as well as common species, SMUD will develop and implement a comprehensive set of biologically based, reasonable, and feasible management and/or mitigation measures for responding to the fatality threshold exceedance, along with a timeline for implementation. SMUD will consult the USFWS and CDFW in development of the adaptive management and compensatory mitigation strategies for special-status birds and bats. Potential adaptive management actions to be considered include but are not limited to the following:

- *Implement avian or bat detection/deterrent systems.* This involves testing and implementing systems that detect birds and bats and taking actions designed to reduce the probability of a collision (e.g., informed WTG curtailment, utter deterrents designed to warn or frighten birds and bats from operating WTGs), including:
    - DT Bird/DT Bat Systems
    - IdentiFlight Eagle Detection System
- *Implement passive avian or bat deterrents.* This involves testing and implementing deterrents designed to warn or frighten birds and bats from operating WTGs, including:
    - improved blade marking (compatible with Solano County visual guidelines) such as variations in paint color and color patterns;
    - blade designs that produce bird warning “whistles” (without upsetting blade integrity or exceeding ambient noise limits); and
    - ultrasonic devices that infuse the blade-swept area with high-frequency sounds that alert or frighten bats.
- *Reduce on-site hazards.* Additional techniques for reducing on-site hazards, including possible operational adjustments, should be discussed if mortality rates substantially exceed study estimates. This could include making adjustments to cut-in speed or changes during migratory periods, if such actions are demonstrated to be effective as avoidance and minimization techniques.
- *Reduce off-site hazards.* This can include installing safety features, such as anti-perching devices on poles or anti-electrocution retrofits and diverters on power lines, outside the project area (with concurrence from landowners and Pacific Gas and Electric Company or their successors) to discourage bird use. This should take advantage of Avian Power Line Interaction Committee guidelines and use hazard reduction techniques identified in SMUD’s avian protection plan.
- *Implement operational minimization protocols (curtailment) during high-risk periods for bats.* High-risk periods include nighttime when wind speeds are low, spring and autumn migration periods, and certain weather conditions such as before and after storms (Arnett et al. 2011), Standard curtailment protocols can reduce bat fatalities by up to 93 percent, and feathering turbine blades can reduce bat fatalities by an average of 35 percent. Refined curtailment approaches such as the predictive algorithm-based curtailment approach developed by Korner-Nievergelt et al. (2013 in Sutter 2018) and Behr et al. (2017 in Sutter 2018), and activity-based curtailment strategies based on bat detection

(Sutter 2018) have also been shown to substantially reduce bat mortality.

- *Contribute to ongoing conservation efforts.* Examples include acquisition of additional conservation property (or easements) that provide habitat for species affected by project operations, and additional direct contributions to habitat restoration organizations or facilities such as the UC Davis Raptor Center.

Finding: The Board finds that implementation of the Solano 4 Wind Project could result in significant injury to and mortality of birds and bats from project operation. Adoption and incorporation of Mitigation Measure 3.3-5 into the project will reduce the impact to a less-than-significant level. Thus, pursuant to PRC section 21081(a)(1) and CEQA Guidelines section 15091(a)(1), changes or alterations have been required or incorporated into the project to avoid or substantially lessen the potentially significant operation impact on birds and bats to less-than-significant level.

Impact 3.3-12: Indirect impacts on riparian habitat. Project construction and operation could indirectly affect riparian habitat by altering existing topography and hydrology, causing fugitive dust to accumulate on vegetation, and potentially contributing to the introduction and spread of nonnative invasive plant species.

Mitigation Measure 3.3-12a: Avoid indirect impacts on riparian habitat. SMUD will avoid and minimize indirect impacts on riparian habitat by implementing the following mitigation measures:

- Mitigation Measure 3.5-1, “Prepare and Implement a SWPPP and Associated BMPs,” listed in Section 3.5, “Geology, Soils, Paleontological Resources, and Mineral Resources”
- Mitigation Measure 3.7-1b, “Establish and Implement an Environmental Training Program,” listed in Section 3.7, “Hazards and Hazardous Materials”
- Mitigation Measure 3.7-1c, “Prepare and Implement a Hazardous Substance Control and Emergency Response Plan,” listed in Section 3.7, “Hazards and Hazardous Materials”
- Mitigation Measure 3.7-1d, “Prepare and Implement a Spill Prevention, Control, and Countermeasures Plan,” listed in Section 3.7, “Hazards and Hazardous Materials”

In addition, SMUD will implement the following measures:

- Before any construction activity, SMUD will assign a qualified biologist to identify the locations of riparian habitat and corresponding setbacks required by project permits, for avoidance. Identification of riparian habitat for avoidance will be in addition to and distinguished from any required construction boundary fencing or flagging. Setback requirements will be identified as appropriate (e.g., 100-foot setback) on project maps to comply with requirements specified in 404, 401, or 1602 permit conditions.

Mitigation Measure 3.3-12b: Comply with Section 1600 streambed alteration agreement and CWA Sections 401 and 404 or the state's Porter-Cologne Act. SMUD will obtain all necessary permits under Section 1602 of the California Fish and Game Code (Lake and Streambed Alteration Agreement) and Sections 401 and 404 of the CWA or the state's Porter-Cologne Act and will implement all conditions and requirements of these state and federal permits obtained for the project.

Mitigation Measure 3.3-12c: Develop a reclamation and revegetation plan. Before project construction, SMUD will develop and implement a reclamation and revegetation plan to restore sites disturbed by construction, and to reclaim abandoned access roads that will be restored to agricultural uses. The plan will describe reclamation and revegetation efforts to be conducted during project construction, both to stabilize the site and to return temporarily affected areas to pre-project conditions or restore abandoned roads to agricultural uses.

The goals of the reclamation and restoration plan will be to:

- avoid the introduction and spread of invasive weeds,
- develop vegetative cover in disturbed areas to prevent erosion, and
- restore abandoned roads to agricultural uses (livestock grazing and dryland farming).

The reclamation and restoration plan will be consistent with the goals and objectives described in SMUD's Land Management Plan for the Solano Wind Farm (Althouse and Meade 2018) or subsequent updates to that plan. The targets for percent vegetative cover and percent non-native species composition will be based on pre-project baseline surveys in areas that will be subject to disturbance. Monitoring to assess success (i.e., achieving the target pre-project vegetative cover and species composition) will occur for a period of 2 years. If the success criteria are not met at the end of 2 years, adaptive management measures for weed and erosion control, as described

in SMUD's Land Management Plan (Althouse and Meade 2018), will be implemented.

The reclamation and revegetation plan will be developed and implemented to reclaim existing vegetation communities and agricultural land uses in the project area to the maximum extent feasible.

Reclamation and revegetation of temporarily disturbed sites immediately after the completion of construction activities will help protect against indirect effects on riparian habitat by stabilizing soil and reducing the potential for invasion by nonnative invasive and noxious weeds.

The plan will include, at a minimum, the following provisions:

- Reclamation of all areas disturbed by project construction, including temporary disturbance areas around construction sites, laydown/staging areas, temporary access roads, and the home run collection lines. Pest species listed by CDFA as List A or B, listed by the California Invasive Plant Council as Moderate or High, and/or targeted by the Solano Weed Management Area for eradication in Solano County shall not be used. A qualified biologist with demonstrated experience with the land cover types to be revegetated will have oversight for the selection of reclamation species.
- Revegetation of areas of temporary disturbance as soon as construction is complete to reduce erosion and inhibit the establishment of invasive weeds.
- A description of proven available revegetation techniques and procedures (such as hydroseeding, drill seeding, and broadcast seeding, adapted to local conditions) on all disturbed areas.
- Salvage of topsoil in all areas subject to grading or excavation. Topsoil will be removed, stockpiled on-site, and returned to the original site (reclaimed) or used in habitat reclamation activities elsewhere on the site.
- Monitoring of revegetated and reclaimed habitat for a minimum of 2 years or until herbaceous cover meets or exceeds preproject conditions. Success criteria are defined as minimum thresholds for herbaceous vegetative cover, and maximum thresholds for noxious weeds, based on preproject (baseline) conditions for each habitat type to be revegetated (e.g., grazed annual grassland, farmland).

- Weed control measures, which may include cultural, mechanical, and/or chemical methods. Any application of herbicides shall be in compliance with all federal and state laws and regulations and implemented by a licensed qualified applicator. Herbicides shall not be applied during or within 72 hours of a scheduled rain event. In riparian areas and near streams and wetlands, only water-safe herbicides shall be used. Herbicides shall not be applied when wind velocities exceed 6 miles per hour.
- Adaptive management measures and a remedial planting plan. Remedial measures (e.g., additional planting, weeding, or erosion control) will be taken during the monitoring period if necessary to ensure success of the revegetation or reclamation effort.
- Maintenance, monitoring, and reporting procedures.

If the revegetation/reclamation fails to meet the established performance criteria for vegetative cover within the maintenance and monitoring period, monitoring of remedial planting shall extend beyond the initial period until the criteria are met, unless otherwise approved by the permitting agencies.

If elements of the revegetated/reclaimed area(s) meet their success criteria before the end of 2 years of monitoring, they may be eliminated from future monitoring with approval from the permitting agencies.

Mitigation Measure 3.3-12d: Conduct worker awareness training. SMUD will implement Mitigation Measure 3.3-1b, “Develop and Implement a Worker Environmental Awareness Program,” to include specific information regarding riparian habitat that occurs on the project site and that would be identified for avoidance. Training will be conducted before the start of construction. The training will include information about the locations and extent of riparian habitat, methods of resource avoidance, permit conditions, and possible fines for violating permit conditions and federal and/or state environmental laws. The training will also include guidance on methods to avoid the introduction and spread of invasive plant species.

Finding: The Board finds that implementation of the Solano 4 Wind Project could result in significant indirect impacts on riparian habitat. Adoption and incorporation of Mitigation Measures 3.3-12a through 3.3-12d into the project will reduce the impact to a less-than-significant level. Thus, pursuant to PRC section 21081(a)(1) and CEQA Guidelines section 15091(a)(1), changes or alterations have been required or

incorporated into the project to avoid or substantially lessen the potentially significant impact on riparian habitat to less-than-significant level.

Impact 3.3-13: Loss and degradation of federally protected waters of the United States. Project construction for installation of wind turbine generators and associated infrastructure would result in the loss and degradation of federally protected wetlands and other waters of the United States. Federally protected waters could also be disturbed indirectly by activities associated with staging areas and laydown of project components.

Mitigation Measure 3.3-13a: Avoid and minimize impacts on wetlands and other waters of the United States. SMUD will avoid and minimize impacts on wetlands and other waters of the United States by implementing the following mitigation measures:

- Mitigation Measure 3.3-12c, “Develop a Reclamation and Revegetation Plan”
- Mitigation Measure 3.5-1a, “Prepare and Implement a SWPPP and Associated BMPs,” listed in Section 3.5, “ Geology, Soils, Paleontological Resources, and Mineral Resources”
- Mitigation Measure 3.7-1b, “Establish and Implement an Environmental Training Program,” listed in Section 3.7, “Hazards and Hazardous Materials”
- Mitigation Measure 3.7-1c, “Prepare and Implement a Hazardous Substance Control and Emergency Response Plan,” listed in Section 3.7, “Hazards and Hazardous Materials”
- Mitigation Measure 3.7-1d, “Prepare and Implement a Spill Prevention, Control, and Countermeasures Plan,” listed in Section 3.7, “Hazards and Hazardous Materials”

SMUD will obtain and implement the terms of all necessary permits under Section 1602 of the California Fish and Game Code (Lake and Streambed Alteration Agreement) and CWA Sections 401 and 404, and will comply with the conditions and requirements of all other federal and state permits obtained for the project. In addition, SMUD will implement the following measures:

- SMUD will identify corresponding setback requirements as appropriate (e.g., 100-foot setback) on project maps to comply with setback requirements described in permit conditions. Any required setback will be shown on project construction drawings and plans (e.g., grading and

improvement plans). Construction activities and project components will be located at least 100 feet from aquatic resources wherever feasible.

- Before the start of any construction activity, SMUD will assign a qualified biologist to identify the locations of wetlands and other waters and their corresponding setbacks (if applicable) as required by project permits, for avoidance. Identification of wetlands and other waters for avoidance will be in addition to and distinguished from any required construction boundary fencing or flagging

Mitigation Measure 3.3-13b: Avoid and minimize potential effects on waters of the United States from installation of access road culvert crossings. SMUD will comply with the following mitigation measures to minimize potential effects on waters of the United States caused by installation of culvert crossings to allow vehicular access across waters:

- Before project construction, SMUD will design culvert crossings to maintain hydrological connectivity while allowing vehicular access across aquatic features. A hydrology study of the proposed culvert location(s) will be conducted to analyze existing drainage conditions and calculate appropriate culvert size(s).
- Before project construction, the contractor will obtain a grading permit from Solano County. During construction, the contractor will comply with all terms and conditions of the permit, including any supplemental conditions if applicable, and with the provisions of Chapter 31 of the Solano County Code, “Grading, Drainage, Land Leveling, and Erosion Control Ordinance.” All grading work will be performed in accordance with good design and construction practice. SMUD will supply a bond if requested by Solano County.
- The contractor for culvert installation shall adhere to the following general design principles and standards, which shall serve as minimum guidelines for grading and erosion control work performed pursuant to the project’s grading permit:
    - All work shall be done in a manner that will minimize soil erosion.
    - Existing natural vegetation shall be retained and preserved wherever possible and practical.
    - Increased potential for erosion by removal of vegetation shall be limited by minimizing the area and time of vegetation removal to the extent practical. Exposure of barren soils shall be limited by completing work before the onset of the rainy season, to ensure

that the soil is stabilized and vegetation is established in advance of the rainy season (October 15–April 15).

- Facilities shall be constructed to retain sediment produced on-site. Sediment basins, sediment traps, and similar required measures shall be installed before any clearing or grading activities, and shall be maintained throughout any such operations until removal is authorized.
- Seeding, mulching, and other suitable stabilization measures shall be used to protect exposed erodible areas in advance of the rainy season.
- Provisions shall be made to mitigate any increased runoff caused by altered soil conditions during and after construction.
- Neither cut nor fill slopes shall be steeper than two parts horizontal to one part vertical (2:1) unless a geological or engineering analysis indicates that steeper slopes are safe and appropriate erosion control measures are specified.
- Cleared vegetation and excavated materials shall be disposed of in a manner that reduces the risk of erosion, and in conformance with the provisions of the approved grading permit. Topsoil shall be conserved for use in revegetation of disturbed areas whenever possible or practical.
- Every effort shall be made to preserve existing channels and watercourses. No work shall be performed within a channel or watercourse unless no reasonable alternative is available. If such work is performed, it shall be limited to the minimum amount necessary.
- All fill material shall not include organic, frozen, or other deleterious materials. No rock or similar irreducible material greater than 12 inches in any dimension shall be included in fills.
- All fill supporting a structure shall be compacted to 90 percent of maximum density as determined by ASTM D 1557, modified proctor, in lifts not exceeding 12 inches in depth

Mitigation Measure 3.3-13c: Comply with Section 1602 streambed alteration agreement for construction activities in jurisdictional areas. Before construction, SMUD will submit a notification of streambed alteration to CDFW under Section 1602 of the Fish and Game Code. If CDFW concludes that the project will result in adverse impacts to fish and wildlife resources, it will provide a proposed

Streambed Alteration Agreement, which must obtain reasonable conditions. SMUD will implement all reasonable permit conditions, including requirements for compensatory mitigation (if any). Where feasible, the compensatory mitigation requirement may be combined with those for other mitigation measures or mitigation required for the CWA Section 404 and 401 permits. These conditions may include the following measures:

- Pre-construction Measures: Before any construction activities begin, a qualified wetland biologist will identify and flag the boundaries of all wetlands in the project area. Appropriate barriers (straw bales, silt, fences, etc.) will be installed near sensitive resources to prevent sedimentation outside the work areas. During construction, wetlands will be treated as exclusion areas and activities within them will be strictly limited to those pertaining to this permit application.
- SWPPP: The construction contractor shall prepare and implement a SWPPP and associated BMPs.
- Hazardous Substance Control Plan. SMUD shall prepare and implement a construction-specific hazardous substance control and emergency response plan for quick, safe cleanup of accidental spills.
- Buffer from Drainages. All staging and stockpile areas will be adjacent to the proposed road crossings, but away from sensitive areas. A minimum buffer of 100 feet from drainages would be used for refueling and storage.
- Worker Education: Prior to construction, Environmental Awareness Training will be provided to all construction workers. This will consist of tailgate environmental training sessions conducted by a qualified biologist for the purpose of informing all personnel about the wetlands and intermittent streams in the project area and the importance of spill prevention, emergency response measures, and proper implementation of BMPs. Any sensitive species in the project region will also be discussed. Personnel will be trained on the locations of sensitive areas and species as well as rules and methods for avoiding these resources. They will also be briefed on all permit conditions as well as the potential disciplinary actions that could result from violations of state or federal laws.
- Construction Monitoring. A qualified biologist will be on site during grading and construction activities to ensure protection of biological and other resources.

- Erosion Control: Erosion control and slope stabilization best management practices will be implemented. These practices may include installation of orange construction fencing, silt fencing, hay wattles, hay bales and other protective measures to avoid impacts to unvegetated areas

Mitigation Measure 3.3-13d: Avoid and minimize potential effects on waters of the United States from horizontal directional drilling. SMUD will implement the following mitigation measures to avoid and minimize potential effects on aquatic resources from horizontal directional drilling underneath drainage and swale features during installation of the underground home run collection lines:

- SMUD will provide notification regarding the HDD to CDFW as part of the streambed alteration agreement application. SMUD will assign a qualified biological monitor with previous HDD monitoring experience and knowledge of the environmental sensitivities of the project area to monitor all HDD activities. The monitor shall be on-site for the duration of HDD activities and shall provide brief reports of daily activities to CDFW.
- SMUD's biologist shall conduct on-site briefings for all HDD workers to ensure that all field personnel understand the locations of aquatic resources and their responsibility for timely reporting of frac-outs.
- Barriers (e.g., straw bales, sedimentation fences) shall be erected between the bore site and all nearby aquatic resources before drilling to prevent any material from reaching aquatic resource areas. The distance between the bore site and aquatic resource areas shall be compliant with requirements for protective setback boundaries as specified the CDFW permit.
- If the biological monitor suspects a potential frac-out that is not yet visible at the surface (e.g., loss of bentonite slurry in the drill pit but no frac-out at the surface), the HDD contractor shall immediately cease HDD activities and implement measures to reduce the potential for a frac-out (e.g., increase the density of the drilling mud or reduce the pressure of the drill). The contractor shall then be allowed to continue HDD activities.
- The HDD contractor shall keep necessary response equipment and supplies (e.g., vacuum truck, straw bales, sediment fencing, sand bags) on-site during HDD operations so that they are readily available in the event of a frac-out.
- SMUD shall prepare a frac-out contingency plan. In the event a frac-out is detected, the HDD contractor shall implement the following measures to reduce or minimize effects on the affected aquatic resource:

- All work shall stop until the frac-out has been contained and cleaned up.
- The frac-out area shall be isolated with straw bales, sandbags, or silt fencing to surround and contain the drilling mud; cleanup shall be performed using a vacuum truck supported by construction workers on foot using hand tools, as necessary. (To avoid affecting the stream bed and banks, mechanized equipment shall not be used to scoop or scrape up frac-out materials.)
- If a frac-out occurs, SMUD shall notify the appropriate jurisdictional agency (USACE, the Central Valley RWQCB, and/or CDFW) by telephone and in writing (email is acceptable) within 24 hours. The required notification shall describe the frac-out and cleanup measures implemented.

If a frac-out occurs and, based on consultation with appropriate agencies, is considered to have negatively affected waters of the United States, SMUD will implement appropriate measures to restore the area to pre-HDD conditions in consultation with the permitting agencies.

Mitigation Measure 3.3-13e: Conduct worker awareness training. SMUD will implement Mitigation Measure 3.3-1b, “Develop and Implement a Worker Environmental Awareness Program,” to include specific information regarding wetlands and other waters that occur on the project site and that either will be affected or have been identified for avoidance. Training will be conducted before the start of construction and will include information about the locations and extent of wetlands and other waters, methods of resource avoidance, permit conditions, and possible fines for violating permit conditions and federal and/or state environmental laws.

Mitigation Measure 3.3-13f: Restore temporarily affected waters of the United States. SMUD will require the construction contractor to restore temporarily disturbed wetlands and other waters of the United States by returning them to preconstruction conditions after construction in accordance with the project’s reclamation and restoration plan (Mitigation Measure 3.3-12c). SMUD will comply with all conditions and requirements of federal and state permits obtained for the project.

Mitigation Measure 3.3-13g: Compensate for loss of waters of the United States. The acreage and function of all wetlands and other waters lost as a result of project implementation will be replaced and restored on a “no-net-loss” basis.

SMUD will compensate for the loss of aquatic resources by purchasing credits from a USACE-approved mitigation bank; purchasing in-lieu fee credits; or restoring, preserving, creating, or enhancing similar habitats at another USACE-approved mitigation area as determined during CWA Section 404 and Section 401 permitting.

The minimum wetland compensation ratio to achieve no net loss of the functions and services of wetlands and other waters will be at least 1:1. Final ratios will be determined during the permitting process.

Finding: The Board finds that implementation of the Solano 4 Wind Project could result in significant loss, degradation and indirect disturbance of federally protected wetlands and other waters of the United States. Adoption and incorporation of Mitigation Measures 3.3-13a through 3.3-13g into the project will reduce the impact to a less-than-significant level. Therefore, pursuant to PRC section 21081(a)(1) and CEQA Guidelines section 15091(a)(1), Board finds that changes or alterations have been required or incorporated into the to reduce the significant impacts on federally protected wetlands and other waters of the United States to less-than-significant level.

Archaeological, Historical, and Tribal Cultural Resources

Impact 3.4-1: Impacts on unique archaeological resources. Previous investigations resulted in the documentation of four archaeological resources, a ranch complex, and the potential Montezuma Hills Rural Historic Landscape. These resources have been evaluated for the NRHP and CRHR but do not appear to be eligible; therefore, they are not considered unique archaeological resources. However, project-related ground-disturbing activities could result in the discovery of or damage to as-yet undiscovered archaeological resources as defined in Section 15064.5 of the State CEQA Guidelines.

Mitigation Measure 3.4-1a: Avoid or conduct subsurface testing and/or monitoring during construction in areas with high potential for the presence of buried archaeological sites. The construction contractor shall avoid conducting ground-disturbing activities in the few locations within the direct APE that have high or the highest potential for buried archaeological sites. If these areas cannot be avoided and project-related ground disturbance in those areas would be sufficiently deep that they could encounter buried archaeological resources, then additional actions may be necessary to mitigate any impacts on as-yet unidentified buried resources. These minimization efforts could include conducting subsurface testing before project construction and/or monitoring during the construction period. In the event that a historic-period archaeological site (such as concentrated deposits of bottles or bricks with makers marks, amethyst glass, or other historic refuse) is uncovered during grading or other construction activities, all ground-disturbing activity within

100 feet of the discovery shall be halted until a qualified archaeologist can assess the significance of the find. SMUD will be notified of the potential find and a qualified archeologist shall be retained to investigate its significance. Any previously undiscovered resources found during construction will be recorded on appropriate California Department of Parks and Recreation 523 forms and evaluated for significance under all applicable regulatory criteria. If the archaeologist determines that the find does not meet the CRHR standards of significance for cultural resources, construction may proceed. If the find is determined to be significant by the qualified archaeologist (i.e., because the find is determined to constitute either a historical resource or a unique archaeological resource), the archaeologist shall work with SMUD to follow accepted professional standards such as further testing for evaluation or data recovery, as necessary. If artifacts are recovered from significant historic-period archaeological resources, they shall be housed at a qualified curation facility. The results of the identification, evaluation, and/or data recovery program for any unanticipated discoveries shall be presented in a professional-quality report that details all methods and findings, evaluates the nature and significance of the resources, analyzes and interprets the results

Mitigation Measure 3.4-1b: Prior to the start of construction, SMUD shall provide worker awareness training to the construction contractor and SMUD's project superintendent regarding the potential for cultural and tribal cultural resources that could be encountered during ground disturbance, the regulatory protections afforded to such finds, and the procedures to follow in the event of discovery of a previously unknown resource, including notifying SMUD representatives. SMUD shall invite representatives of UAIC to periodically inspect the active areas of the project, including any soil piles, trenches, or other disturbed areas. UAIC shall be notified at least 48 hours prior to start of construction. In the event that tribal representatives or construction workers find evidence of potential tribal cultural resources, the procedures identified in Mitigation Measure 3.4-1c and 3.4-2 shall be implemented.

Mitigation Measure 3.4-1c: Halt ground-disturbing activity upon discovery of subsurface archaeological features. If any prehistoric or historic-era subsurface archaeological features or deposits, including locally darkened soil ("midden"), that could conceal cultural deposits are discovered during construction, all ground-disturbing activity shall cease within 100 feet of the resource(s) discovered. A qualified cultural resources specialist and Native American representatives and monitors from culturally affiliated Native American Tribes shall assess the significance of the find and make recommendations for further evaluation and treatment as necessary. These recommendations shall be documented in the project record. For any recommendations made by interested Native American Tribes that are not implemented, the project record shall provide a justification explaining why the recommendation was not followed.

If the qualified archaeologist determines the find to be significant (because the find constitutes either a historical resource, a unique archaeological resource, or a tribal cultural resource), and if an adverse impact on a TCR, unique archaeology, or other cultural resource occurs, then SMUD shall consult with interested Native American groups and individuals regarding mitigation contained in PRC Sections 21084.3(a) and 21084.3(b) and State CEQA Guidelines Section 15370. Potential mitigation measures developed in coordination with interested Native American groups may include:

- preservation in place (the preferred manner of mitigating impacts on archaeological sites),
- archival research,
- replacement of cultural items for educational or cultural purposes,
- preservation of substitute TCRs or environments and/or subsurface testing, or contiguous block unit excavation and data recovery (when it is the only feasible mitigation, and pursuant to a data recovery plan).

Finding: The Board finds that implementation of the Solano 4 Wind Project could result in significant impacts on unique undiscovered archaeological resources. Adoption and incorporation of Mitigation Measures 3.4-1a, 3.4-1b, and 3.4-1c into the project will reduce the impact to a less-than-significant level. Thus, pursuant to PRC section 21081(a)(1) and CEQA Guidelines section 15091(a)(1), changes or alterations have been required or incorporated into the project to avoid or substantially lessen the potentially significant impact on unique undiscovered archaeological resources to less-than-significant level.

Impact 3.4-2: Impacts on tribal cultural resources. Consultation with the Wilton Rancheria is ongoing and could result in the identification of TCRs as described under AB 52 and PRC Section 21074.

Mitigation Measure 3.4-2: Complete AB 52 consultation. SMUD concluded consultation with the UAIC and Wilton Rancheria under AB 52. If TCRs are identified that have the potential to be adversely affected by the project, SMUD shall notify Tribal Historic Preservation Officer Matthew Moore (THPO@auburnrancheria.com) and Lou Griffin (hgriffin@wiltonrancheria-nsn.gov) should an inadvertent discovery of TCRs occur, and will develop mitigation measures in consultation with interested Native American groups and individuals to minimize those impacts. These mitigation measures could include the following or equally effective mitigation measures (as identified in PRC Section 21084.3):

(1) Avoidance and preservation of the resources in place, including but not limited to planning and construction to avoid the resources and protect the cultural and natural context, or planning greenspace, parks, or other open

space, to incorporate the resources with culturally appropriate protection and management criteria.

(2) Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including but not limited to the following:

(A) protecting the cultural character and integrity of the resource;

(B) protecting the traditional use of the resource; or

(C) protecting the confidentiality of the resource.

(3) Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.

(4) Protecting the resource.

(5) Preserving substitute TCRs, resources, or environments

Finding: The Board finds that implementation of the Solano 4 Wind Project could result in significant impacts on tribal cultural resources. Adoption and incorporation of Mitigation Measure 3.4-2 into the project will reduce the impact to a less-than-significant level. Thus, pursuant to PRC section 21081(a)(1) and CEQA Guidelines section 15091(a)(1), changes or alterations have been required or incorporated into the project to avoid or substantially lessen the potentially significant impact on tribal cultural resources to less-than-significant level.

Impact 3.4-3: Impacts on previously unidentified human remains. Excavation during project construction could disturb previously undiscovered human remains.

Mitigation Measure 3.4-3: Halt ground-disturbing activity upon discovery of human remains. If human remains are discovered during any demolition/construction activities, potentially damaging ground-disturbing activities within 100 feet of the remains shall be halted immediately, and SMUD will notify the Solano County coroner and the NAHC immediately, according to PRC Section 5097.98 and Section 7050.5 of the California Health and Safety Code. If the remains are determined by the NAHC to be Native American, the guidelines of the NAHC shall be followed during the treatment and disposition of the remains. SMUD will also retain a professional archaeologist with Native American burial experience to conduct a field investigation of the specific site and consult with the Most Likely Descendant, if any, identified by the NAHC. Following the coroner's and NAHC's findings, the archaeologist and the NAHC-designated Most Likely Descendant shall determine the ultimate treatment and disposition of the remains and take appropriate steps to ensure that additional human interments are not disturbed.

PRC Section 5097.94 identifies the responsibilities for acting upon notification of a discovery of Native American human remains.

Finding: The Board finds that implementation of the Solano 4 Wind Project could result in significant impacts on previously unidentified human remains. Adoption and incorporation of Mitigation Measure 3.4-3 into the project will reduce the impact to a less-than-significant level. Thus, pursuant to PRC section 21081(a)(1) and CEQA Guidelines section 15091(a)(1), changes or alterations have been required or incorporated into the project to avoid or substantially lessen the potentially significant impact on previously unidentified human remains to less-than-significant level.

Geology and Soils

Impact 3.5-1: Substantial soil erosion or loss of topsoil. The proposed project has the potential to disturb approximately 91 acres during decommissioning, rehabilitation, and construction. Although these activities would be temporary, grading, excavation, and other ground-disturbing activities would expose soil and could result in accelerated erosion.

Mitigation Measure 3.5-1: Prepare and implement a SWPPP and associated BMPs. Before any ground-disturbing activities begin, the construction contractor shall apply for and maintain coverage under the Construction General Permit. The contractor shall prepare and implement a SWPPP, including an erosion control plan, that includes erosion control measures and construction waste containment measures to ensure that waters of the United States and the state are protected during and after project construction. The SWPPP shall include site design measures to minimize off-site stormwater runoff that might otherwise affect surrounding habitats. The SWPPP shall be provided to SMUD for review and approval before it is provided to the SWRCB. The Central Valley Regional Water Quality Control Board and/or San Francisco Bay Regional Water Quality Control Board will review and monitor the effectiveness of the SWPPP through mandatory reporting by SMUD and the construction contractor as required.

The SWPPP shall be prepared with the following objectives:

- Identify all pollutant sources, including sources of sediment, that may affect the quality of stormwater discharges from construction of the project.

- Identify BMPs that effectively reduce or eliminate pollutants in stormwater discharges and authorized nonstormwater discharges from the site during construction to the Best Available Technology/Best Control Technology standard.

- Provide calculations and design details as well as BMP controls for site run-on that are complete and correct.

- Identify project discharge points and receiving waters.
- Provide stabilization BMPs to reduce or eliminate pollutants following construction.

The construction contractor shall implement the SWPPP, including all BMPs, and shall inspect all BMPs during construction. Potential SWPPP BMPs could include but would not be limited to the following:

- Preserve existing vegetation where possible.
- Roughen the surfaces of final grades to prevent erosion, decrease runoff, increase infiltration, and aid in vegetation establishment.
- Place riparian buffers or filter strips along the perimeter of the disturbed area to intercept pollutants before off-site discharge.
- Place fiber rolls around on-site drain inlets to prevent sediment and construction-related debris from entering inlets.
- Place fiber rolls along down-gradient disturbed areas of the site to reduce runoff flow velocities and prevent sediment from leaving the site.
- Place silt fences down-gradient of disturbed areas to slow down runoff and retain sediment.
- Stabilize the construction entrance to reduce the tracking of mud and dirt onto public roads by construction vehicles.
- Stage excavated and stored construction materials and soil stockpiles in stable areas and cover or stabilize materials to prevent erosion.
- Stabilize temporary construction entrances to limit transport/introduction of invasive species and control fugitive dust emissions.

Finding: The Board finds that implementation of the Solano 4 Wind Project, during decommissioning, rehabilitation, and construction, could increase erosion and potentially result in loss of topsoil. Adoption and incorporation of Mitigation Measure 3.5-1 into the project will reduce the impact to a less-than-significant level. Thus, pursuant to PRC section 21081(a)(1) and CEQA Guidelines section 15091(a)(1), changes or alterations have been required or incorporated into the project to avoid or substantially lessen the potentially significant impact related to erosion and loss of topsoil to less-than-significant level.

Impact 3.5-2: Location of the project on a geologic unit or soil that is unstable, or that would become unstable as a result of the project. Historically the project area

has experienced a low level of seismic activity; however, the potential exists for unstable soils to be present in the project area.

> *Mitigation Measure 3.5-2: Conduct a site-specific geotechnical investigation.* Before final design of the project, the construction contractor shall complete a design level geotechnical investigation and report for the project, to be prepared by a California Registered Civil Engineer or Geotechnical Engineer. The report will set forth design and construction measures intended to ensure site stability in compliance with applicable seismic and building codes. The report shall address and make recommendations on the following:
>
> - road, pavement, and parking area design;
> - structural foundations;
> - grading practices;
> - erosion/winterization;
> - special problems discovered on-site (e.g., groundwater, expansive/unstable soils); and
> - slope stability.
>
> All recommendations of the geotechnical report shall be incorporated into the construction plans and specifications that are reviewed and stamped by a licensed engineer of the appropriate discipline. SMUD must include the measures in the contract for implementation by the construction contractor for the duration of construction related activities

Finding: The Board finds that implementation of the Solano 4 Wind Project, during construction, could encounter unstable soils. Adoption and incorporation of Mitigation Measure 3.5-2 into the project will reduce the impact to a less-than-significant level. Thus, pursuant to PRC section 21081(a)(1) and CEQA Guidelines section 15091(a)(1), changes or alterations have been required or incorporated into the project to avoid or substantially lessen the potentially significant impact related to unstable soils to less-than-significant level.

Impact 3.5-3: Creation of a substantial risk as a result of expansive soils. Expansive soils are composed largely of clays, and extensive areas of clay soils are present on the project site. Although these soils are not expected to adversely affect WGTWTG foundations, clay soils are subject to shrinkage and swelling that can affect ancillary site improvements, such as roadways that are supported by shallow foundations.

> *Mitigation Measure 3.5-3: Implement Mitigation Measure 3.5-2, "Implement all recommendations from the geotechnical investigation."* The construction

contractor shall implement Mitigation Measure 3.5-2, above, which requires the completion of a design level geotechnical investigation and report for the project and the implementation of all design and construction measures contained therein

Finding: The Board finds that implementation of the Solano 4 Wind Project could encounter expansive soils. Adoption and incorporation of Mitigation Measure 3.5-3 into the project will reduce the impact to a less-than-significant level. Thus, pursuant to PRC section 21081(a)(1) and CEQA Guidelines section 15091(a)(1), changes or alterations have been required or incorporated into the project to avoid or substantially lessen the potentially significant impact related to expansive soils to less-than-significant level.

Impact 3.5-4: Degradation or destruction of a unique paleontological resource. The proposed project has the potential to disturb approximately 91 acres during decommissioning, rehabilitation, and construction. The Montezuma Hills, including the project site, have been determined by Solano County to be a sensitive resource area with respect to paleontological resources. A site-specific paleontological investigation has not been prepared for the site to confirm the presence or absence of paleontological resources.

Mitigation Measure 3.5-4: Conduct a site-specific paleontological resource investigation and implement identified protective measures. Before the start of any ground-disturbing activities, SMUD shall have prepared a site-specific analysis of paleontological resources. At a minimum, the site-specific analysis shall include a review of the types of the geologic formation(s) present at the project site and a determination of the likelihood that those formation(s) would contain a "unique paleontological resource" as stated in Title 14, California Code of Regulations, Appendix G (the CEQA checklist). If a site-specific analysis determines that a project may have an adverse effect on a "unique paleontological resource," project-specific mitigation measures shall be identified and implemented to address the following requirements:

- Cessation of work in the vicinity of the find and notification to SMUD.
- Retention of a qualified paleontologist to evaluate the resource and prepare a proposed mitigation plan, which may include some or all of the following elements: a field survey, construction monitoring, sampling and data recovery procedures, museum storage coordination for any specimen recovered, and a report of findings.
- Implementation of recommendations made by the paleontologist, where SMUD determines that such recommendations are necessary and feasible.
- All recommendations of the report shall be incorporated into the construction plans and specifications that are reviewed and stamped by a

licensed engineer of the appropriate discipline. SMUD must include the measures in the contract for implementation by the construction contractor for the duration of construction related activities.

Finding: The Board finds that implementation of the Solano 4 Wind Project, during construction, could encounter unique paleontological resources. Adoption and incorporation of Mitigation Measure 3.5-4 into the project will reduce the impact to a less-than-significant level. Thus, pursuant to PRC section 21081(a)(1) and CEQA Guidelines section 15091(a)(1), changes or alterations have been required or incorporated into the project to avoid or substantially lessen the potentially significant impact related to unique paleontological resources to less-than-significant level.

Hazards and Hazardous Materials

Impact 3.7-1: Exposure of people and the environment to hazardous materials. Construction, operation, and eventual decommissioning activities would involve the storage, transport, and/or handling of hazardous materials. Transport or use of these materials on-site could expose workers or the environment to hazards.

Mitigation Measure 3.7-1a: Implement Mitigation Measure 3.5-1, "Prepare and implement a SWPPP and associated BMPs." The contractor shall implement Mitigation Measure 3.5-1 listed in Section 3.5, "Geology, Soils, and Mineral Resources." This measure requires the preparation of a project-specific SWPPP and implementation of the SWPPP by the construction contractors, including all necessary BMPs.

Mitigation Measure 3.7-1b: Establish and implement an environmental training program. Before the start of construction, SMUD or its contractor shall establish an environmental training program to communicate environmental concerns and appropriate work practices to all field personnel. The training program shall cover the use of hazardous materials, waste management, spill prevention, emergency response measures, and proper implementation of BMPs. The program shall emphasize site-specific physical conditions to improve hazard prevention (e.g., identification of potentially hazardous substances) and shall include a review of all site-specific plans, including but not limited to the project's SWPPP, health and safety plan (as required by OSHA), fugitive dust control plan, and hazardous substances control and emergency response plan.

Mitigation Measure 3.7-1c: Prepare and implement a hazardous substance control and emergency response plan. Before the start of construction, SMUD or its contractor shall prepare a construction-specific hazardous substance control and emergency response plan. The plan shall include preparations for quick and safe cleanup of accidental spills; prescribe procedures for handling hazardous materials to reduce the potential for a spill during construction; and include an emergency response program to ensure quick and safe cleanup of accidental

spills. The hazardous substance control and emergency response plan shall also identify BMPs in the event a spill occurs. BMPs may include but are not limited to the following: use of oil-absorbent materials, tarps, and storage drums to contain and control any minor releases; and storage and use of emergency-spill supplies and equipment in locations adjacent to work and staging areas.

The hazardous substance control and emergency response plan shall identify areas where refueling and vehicle maintenance activities and storage of hazardous materials, if any, will be permitted.

Mitigation Measure 3.7-1d: Prepare and implement a spill prevention, control, and countermeasures (SPCC) plan. If more than 1,320 gallons of petroleum products will be stored on-site (excluding vehicles), SMUD's construction contractor shall prepare and implement a SPCC plan in accordance with state and federal requirements, including 40 CFR 112. The SPCC plan shall identify engineering and containment measures for preventing releases of oil into waterways. The SPCC plan shall be submitted to SMUD for review and approval before the start of operations, or during construction.

If less than 1,320 gallons of petroleum products will be stored on-site (excluding vehicles), this mitigation measure is not required.

Mitigation Measure 3.7-1e: Prepare and implement a hazardous materials business plan. If the project will use or store hazardous materials equal to or greater than 55 gallons of liquids, 500 pounds of solids, and/or 200 cubic feet (at standard temperature and pressure) of compressed gases, SMUD's construction contractor shall prepare a hazardous materials business plan that will conform with Solano County Environmental Health requirements. The contractor shall file the plan with SMUD annually. The hazardous materials business plan shall identify site activities; list the contact information for the business owner/operator; provide an inventory of hazardous materials used on-site; provide a facilities map; and identify an emergency response plan/contingency plan.

During the construction phase, if threshold quantities of any hazardous materials are stored on-site for more than 90 consecutive days, then the hazardous materials business plan shall be filed and maintained for as long as any of those thresholds are met or exceeded. During the operations phase, if the threshold for any hazardous materials is met or exceeded for more than 30 consecutive days, then the hazardous materials business plan shall be to SMUD and shall be maintained as long as the thresholds are met or exceeded. The regulations require annual submittal of the hazardous materials business plan as long as the project meets the conditions for the continued applicability of the regulations.

If less than 55 gallons of liquids, 500 pounds of solids, and/or 200 cubic feet (at standard temperature and pressure) of compressed gases will be used or stored on-site, this mitigation measure is not required.

Finding: The Board finds that implementation of the Solano 4 Wind Project could expose people and the environment to hazardous materials. Adoption and incorporation of Mitigation Measures 3.7-1a through 3.7-1e into the project will reduce the impact to a less-than-significant level. Thus, pursuant to PRC section 21081(a)(1) and CEQA Guidelines section 15091(a)(1), changes or alterations have been required or incorporated into the project to avoid or substantially lessen the potentially significant impact due to potential upset conditions to less-than-significant level.

Impact 3.7-2: Exposure of people and the environment to subsurface hazardous materials disturbed during construction. Construction could result in a short-term hazard to the public and/or the environment if subsurface hazardous materials were to be disturbed during construction activities.

Mitigation Measure 3.7-2a: Implement Mitigation Measures 3.7-1a through 3.7-1e. SMUD or its construction contractor shall implement Mitigation Measures 3.7-1a through 3.7-1e, listed above. These measures establish and require implementation of various plans to minimize the risk of accidental release of hazardous materials.

Mitigation Measure 3.7-2b: Delineate any construction areas where the presence of hazardous materials is known or suspected. Before the start of construction, SMUD or its contractor shall delineate construction areas where the presence of hazardous materials is known or suspected. Such areas shall be avoided during construction to the extent feasible. These areas include but are not limited to abandoned gas wells and underground gas pipelines. Underground utilities, such as gas pipelines and high-voltage lines, shall be identified and marked clearly. If necessary, appropriate encroachment permits shall be obtained before work begins.

A Spill Discovery Response Plan shall be developed before construction begins. The plan shall be implemented in the event that hazardous materials are unexpectedly encountered during construction. The plan shall include instructions for work crews to stop work immediately, notify the appropriate emergency response agency, and in the case of natural gas pipelines, notify the pipeline operator.

Mitigation Measure 3.7-2c: Maintain access to gas wells. Should a gas well location be verified, SMUD and its construction contractor shall implement the following measures:

- Maintain physical access to any gas well encountered.
- Ensure that the abandonment of gas wells is to current standards.
- If one or more unknown wells is discovered during project development, immediately notify the California Department of Conservation, Division of

Oil, Gas, and Geothermal Resources so that the newly discovered well(s) can be incorporated into the records and investigated. Any wells found during implementation of the project, and any pertinent information obtained, shall be communicated to the Solano County Recorder for inclusion in the title information of the subject real property. This is to ensure that present and future property owners are aware of (1) the wells located on the property, and (2) potentially significant issues associated with any improvements near oil or gas wells.

- Avoid performing work on any oil or gas well without written approval from the California Department of Conservation, Division of Oil, Gas, and Geothermal Resources in the form of an appropriate permit. This includes but is not limited to mitigating leaking fluids or gas from abandoned wells, modifications to well casings, and/or any other re-abandonment work.

Finding: The Board finds that implementation of the Solano 4 Wind Project, during construction, could expose people and the environment to subsurface hazardous materials. Adoption and incorporation of Mitigation Measures 3.7-2a, 3.7-2b, and 3.7-2c into the project will reduce the impact to a less-than-significant level. Thus, pursuant to PRC section 21081(a)(1) and CEQA Guidelines section 15091(a)(1), changes or alterations have been required or incorporated into the project to avoid or substantially lessen the potentially significant impact due to potential upset conditions to less-than-significant level.

Impact 3.7-3: Safety hazard to air traffic. The project site lies within the planning boundary of the Travis AFB LUCP, which contains policies designed to promote land use compatibility with airport operations. Placement of WTGs have the potential to intrude into navigable airspace, thereby increasing the risk of aircraft collision, or causing interference with radar signals used by air traffic control.

Mitigation Measure 3.7-3: Mark and light wind turbine generators during construction. SMUD will e-file FAA Form 7460-2, Part 1, Notice of Actual Construction or Alteration, at least 60 days before the start of construction, so that appropriate action can be taken to amend the affected procedure(s) and/or altitude(s), if necessary.

To ensure proper conspicuity of turbines at night during construction, all WTGs shall be lit with temporary lighting once they reach a height of 200 feet or greater until the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting shall be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights shall be installed and operated at each level as construction progresses.

An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, WTGs shall be lit with self-contained, solar-powered light-emitting diode (LED) steady red light fixtures that meet the photometric requirements of an FAA Type L-810 lighting system. The lights shall be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a Notice to Airmen (NOTAM) (D) to avoid lighting WTGs within the project site until completion of the entire project is prohibited.

This measure includes temporary construction equipment such as cranes and derricks, which may be used during actual construction of the structures. However, this equipment shall not exceed a height of 200 feet. Separate notice shall be provided to the FAA for any equipment taller than 200 feet.

Finding: The Board finds that implementation of the Solano 4 Wind Project could intrude into navigable airspace or cause interference with radar signals used by air traffic control. Adoption and incorporation of Mitigation Measure 3.7-3 into the project will reduce the impact to a less-than-significant level. Thus, pursuant to PRC section 21081(a)(1) and CEQA Guidelines section 15091(a)(1), changes or alterations have been required or incorporated into the project to avoid or substantially lessen the potentially significant impact to air traffic to less-than-significant level.

Impact 3.7-4: Exposure of employees and the public to hazards from accidental rotor failure. If a blade on a project WTG were to fail, the blade could become a projectile, exposing employees and the public to a hazard. As part of final design and siting, SMUD requires that the contractor prepare a blade throw analysis to inform the final site layout, and ensure sufficient setback is provided to minimize the risk of exposure to such a hazard.

Mitigation Measure 3.7-4: Conduct Safety Evaluation of WTGs. The Contractor shall provide a safety evaluation of the proposed siting plan, and ensure that the design and layout of the project considers the safety evaluation. The Contractor's safety evaluation shall include an analysis of the following types of failure that could occur:

a. Blade Throw Risk Analysis: Probability of Loss of an entire blade by failure at the hub attachment.

b. Tower Failure. Complete failure of the tower, particularly at the base.

c. Rotor Delamination. Failure of the fiberglass rotor skin, resulting in flying fragments.

d. Blade-Throw Strike. Impact of a failed rotor blade on the tubular tower

Finding: The Board finds that implementation of the Solano 4 Wind Project could expose employees and the public to hazards from accidental rotor failure. Adoption and

incorporation of Mitigation Measure 3.7-4 into the project will reduce the impact to a less-than-significant level. Therefore, the project with mitigation will not cause significant safety hazard impacts due to accidental rotor failure.

Impact 3.7-5: Exposure of people or structures to a significant risk of loss, injury, or death involving wildfires. The project site is not located in an area classified as a High Fire Hazard Severity Zone. Although the project would adhere to applicable fire regulations, the use of construction equipment in grass-covered areas could expose people or structures to a significant fire risk.

> *Mitigation Measure 3.7-5a: Prepare and implement a grass fire control plan.* SMUD or its construction contractor will develop a grass fire control plan. The plan shall be implemented for use during construction and operation of the project to reduce potential impacts on public services relative to fire protection services in the project area. The plan shall include notification procedures and emergency fire precautions, as discussed in Section 4.8, "Hazards and Hazardous Materials." This shall include the training of construction workers in the use of firefighting equipment available on-site (e.g., fire extinguishers) and communicating with the Montezuma Fire Protection District. Additionally, the nearby Montezuma Fire Protection District stations are equipped for grass fires, and the proposed access roads for WTG maintenance shall be used to improve access by fire trucks during emergency situations and serve as a fire break. The operations and maintenance building shall be designed to SMUD's safety standards and shall include a fire alarm. In addition, construction and maintenance crews shall be trained in fire prevention, carry fire extinguishers in all vehicles, and have access to one or more water trucks.
>
> *Mitigation Measure 3.7-5b: Implement Mitigation Measure 3.11-1b, "Create and implement an emergency access plan and notify emergency services providers of anticipated roadway obstructions."* SMUD will implement Mitigation Measure 3.11-2 listed in Section 3.11, "Transportation and Traffic." This measure requires the development and implementation of a plan to maintain emergency access during WTG transport and throughout the construction period.

Finding: The Board finds that implementation of the Solano 4 Wind Project could expose people and structures to a significant fire risk. Adoption and incorporation of Mitigation Measures 3.7-5a and 3.7-5b into the project will reduce the impact to a less-than-significant level. Thus, pursuant to PRC section 21081(a)(1) and CEQA Guidelines section 15091(a)(1), changes or alterations have been required or incorporated into the project to avoid or substantially lessen the potentially significant impact fire risk to people and structures to less-than-significant level.

Hydrology and Water Quality

Impact 3.8-1: Short-term degradation of water quality. Decommissioning of existing wind power facilities, project construction, and future project decommissioning or

repowering activities would require the grading and movement of soil. Such activities could result in erosion, sedimentation, and discharge of other nonpoint-source pollutants to stormwater, which could then drain off-site and degrade local water quality.

Mitigation Measure 3.8-1a: Implement Mitigation Measure 3.5-1, "Prepare and implement a SWPPP and associated BMPs." SMUD shall prepare and the construction contractor to implement Mitigation Measure 3.5-1 listed in Section 3.5, "Geology, Soils, and Mineral Resources." This measure requires the construction contractor to implement a SWPPP, including all necessary BMPs.

Mitigation Measure 3.8-1b: Implement Mitigation Measure 3.7-1b, "Establish and implement an environmental training program." The construction contractor shall implement Mitigation Measure 3.7-1b listed in Section 3.7, "Hazards and Hazardous Materials." This measure requires SMUD to establish and require implementation of an environmental training program for all field personnel that communicates spill prevention, emergency response measures, and proper implementation of BMPs.

Mitigation Measure 3.8-1c: Implement Mitigation Measure 3.7-1c, "Prepare and implement a hazardous substance control and emergency response plan." The construction contractor shall implement Mitigation Measure 3.7-1c listed in Section 3.7, "Hazards and Hazardous Materials." This measure requires SMUD to prepare and implement a construction-specific hazardous substance control and emergency response plan for quick, safe cleanup of accidental spills.

Mitigation Measure 3.8-1d: Implement Mitigation Measure 3.7-1d, "Prepare and implement a spill prevention, control, and countermeasures plan." The construction contractor shall implement Mitigation Measure 3.7-1d listed in Section 3.7, "Hazards and Hazardous Materials." This measure requires SMUD to prepare and the construction contractor to implement a spill prevention control and closures plan to prevent the discharge of petroleum products into waterways.

Finding: The Board finds that implementation of the Solano 4 Wind Project could result in short-term degradation of water quality. Adoption and incorporation of Mitigation Measures 3.8-1a through 3.8-1d into the project will reduce the impact to a less-than-significant level. Thus, pursuant to PRC section 21081(a)(1) and CEQA Guidelines section 15091(a)(1), changes or alterations have been required or incorporated into the project to avoid or substantially lessen the potentially significant short-term degradation of water quality impact to less-than-significant level.

Transportation and Circulation

Impact 3.11-1: Short-term construction transport-related traffic hazards and incompatible uses. Construction-related transport of WTG components could result in hazardous conditions on state routes and local roadways because of the transport vehicle's weight, length, width, height, and speed.

Mitigation Measure 3.11-1a: Create and implement a traffic control plan and notify the public of anticipated roadway obstructions. SMUD or its construction contractor will work with Caltrans, Solano County, and the City of Napa to determine the lowest hourly traffic flows on affected facilities and develop a traffic control plan. The traffic control plan shall specify travel times and days and provide for public notification of anticipated roadway obstructions before transporter travel days. Traffic control plan measures shall include the use of pilot cars for oversize loads; traffic safety measures, such as warning signs; coordination with local jurisdictions; and safety personnel to direct traffic as needed. To minimize impacts on roadway traffic flows, transporters shall travel under loaded conditions during off-peak hours and possibly during evenings or at night. The final plan shall be submitted to all affected agencies for review and approval. After agency approvals have been received, the traffic control plan shall be implemented during transport of the WTG components.

Mitigation Measure 3.11-1b: Create and implement an emergency access plan and notify emergency services providers of anticipated roadway obstructions. SMUD or its construction contractor will work with affected emergency services providers to develop and implement a plan to maintain emergency access during transport of WTG components and throughout the construction period. The plan shall identify alternative emergency access routes; the need to station emergency equipment in areas where access will be reduced; and notification protocols between SMUD, its contractors, and affected providers. The final plan shall be submitted to all affected agencies for review and approval. After agency approvals have been received, the emergency access plan shall be implemented during transport of WTG components and throughout the construction period as necessary.

Mitigation Measure 3.11-1c: Obtain an agency transportation permit for each load exceeding weight, length, width, and height standards. SMUD or its construction contractor will submit an application to Caltrans, Solano County, and the City of Napa for a transportation permit for each load that exceeds weight, length, width, or height standards. The applications shall identify the specific transporter to be used and provide details about the turbine components' load specifications, the requested route, and the time and date of transport. All permit conditions shall be implemented during transport of WTG components.

Mitigation Measure 3.11-1d: Improve roadways to enable safe use or use shorter transporters, and obtain agency transportation permits for transport of extra-legal length vehicles. SMUD or its construction contractor will make improvements to public roads to enable delivery of WTG components and provide access for construction equipment. These improvements shall accommodate all turning movements of the maximum-size transporter. A detailed topographic survey shall be conducted to determine the exact limits, and to identify additional areas that

may be affected. All roadway improvements shall be designed and implemented in close cooperation with Solano County (and other jurisdictions, if applicable).

An alternative mitigation measure is to use shorter transporters to reduce the impact, although this measure is also expected to require a reduction in the size of the WTG components, which likely will increase the number of trips if the overall turbine dimensions remain the same.

Finding: The Board finds that implementation of the Solano 4 Wind Project could result in hazardous conditions on state routes and local roadways because of the transport vehicle's weight, length, width, height, and speed. Adoption and incorporation of Mitigation Measures 3.11-1a through 3.11-1d into the project will reduce the impact to a less-than-significant level. Thus, pursuant to PRC section 21081(a)(1) and CEQA Guidelines section 15091(a)(1), changes or alterations have been required or incorporated into the project to avoid or substantially lessen the potentially significant transportation impact due to construction-related transport to less-than-significant level.

Impact 3.11-2: Short-term increase in construction traffic on physically deficient roadway segments. Construction activities would result in a short-term increase in heavy vehicle traffic on state routes and local roads. The project could result in the degradation of pavement conditions along these roadways.

Mitigation Measure 3.11-2: Monitor the physical condition of roadway segments along primary access routes to the project site and restore the physical condition of affected roadways to the extent damaged by the project. SMUD or its construction contractor will conduct a preconstruction survey and assessment of existing pavement conditions along SR 12 east, Shiloh Road, Collinsville Road, Talbert Lane, Stratton Road, Birds Landing Road, and Montezuma Hills Road. If the preconstruction pavement conditions are deficient, the preconstruction pavement analysis shall establish the baseline for required improvements. If the preconstruction pavement conditions are acceptable, improvements shall be required only if the postconstruction pavement condition is deficient, and only to the extent that the project demonstrably contributed to such deficiencies. If deficient following construction, any segments of SR 12 east and Shiloh Road, Collinsville Road, Talbert Lane, Stratton Road, Birds Landing Road, and Montezuma Hills Road that are affected by the project shall be returned to preconstruction conditions after construction. Implementing this measure will ensure that construction activities will not worsen pavement conditions, relative to existing conditions.

Before construction, SMUD will enter into mitigation agreements with Caltrans (for SR 12 east) and Solano County (for Shiloh Road, Collinsville Road, Talbert Lane, Stratton Road, Birds Landing Road, and Montezuma Hills Road) to verify the location, extent, timing, and fair-share cost to be paid by SMUD for any necessary pre- and postconstruction physical improvements. The fair-share amount will be

either the cost to return the affected roadway segment to its preconstruction condition or a contribution to programmed planned improvements. Repairs may include overlays or other surface treatments.

Finding: The Board finds that implementation of the Solano 4 Wind Project, during construction, could result in the degradation of pavement conditions along state routes and local roads due to a short-term increase in heavy vehicle traffic. Adoption and incorporation of Mitigation Measure 3.11-2 into the project will reduce the impact to a less-than-significant level. Thus, pursuant to PRC section 21081(a)(1) and CEQA Guidelines section 15091(a)(1), changes or alterations have been required or incorporated into the project to avoid or substantially lessen the potentially significant impact degradation of pavement conditions along construction transportation routes to less-than-significant level.

3. Issues for which the project would have a Less-than-Significant Impact

Aesthetics

Impact 3.1-1: Project impacts on scenic vistas and potential for substantial degradation of existing visual character or quality of public views of the site and surroundings, including those within the viewshed of a state or locally designated scenic highway. Project decommissioning, construction, and eventual decommissioning activities would be visible to motorists, recreationists, and residents near the project site; however, these changes in views would be temporary. Placement and operation of WTGs under the Solano 4 Project reduces the number of WTGs operating onsite but places taller WTGs in replacement. Views would remain of a utility scale wind energy facility and any permanent change in views would be incremental. Under either condition WTGs are the dominant visual feature. The greatest visual change would be seen from Collinsville and West Sherman Island. Therefore, the project would not result in a substantial degradation of visual character. This impact would be less than significant. Therefore, no impact will occur. Pursuant to the State CEQA Guidelines, Section 15091, no further finding is required.

Impact 3.1-3: Shadow flicker effects**.** The project would not result in substantial shadow flicker. This impact would be less than significant. Pursuant to the State CEQA Guidelines, Section 15091, no further finding is required.

Biological Resources

Impact 3.3-3: Loss of foraging and nesting habitat for resident and migratory birds (nonraptors). Project construction would result in permanent and temporary impacts on foraging and nesting habitat for resident and migratory birds. Because the permanent loss of foraging and nesting habitat caused by the project would be small, and because the habitat types that would be permanently lost are abundant in the project area, this impact would be less than significant. Pursuant to the State CEQA Guidelines, Section 15091, no further finding is required.

Impact 3.3-5: Removal and modification of raptor nesting, foraging, and roosting habitat during construction. Project construction would result in permanent and temporary impacts on raptor nesting and foraging habitat. This impact on nesting habitat would be less than significant. Pursuant to the State CEQA Guidelines, Section 15091, no further finding is required.

Impact 3.3-8: Construction impacts on bats and bat habitat. Project construction would result in temporary disturbance of foraging bats and loss of foraging habitat. This impact would be less than significant. Pursuant to the State CEQA Guidelines, Section 15091, no further finding is required.

Impact 3.3-10: Loss of special-status plants and their habitat. Project construction activities could degrade or destroy special-status plants and their habitat. However, because no special-status plants are present on the project site, this impact would be less than significant. Pursuant to the State CEQA Guidelines, Section 15091, no further finding is required.

Impact 3.3-11: Loss of or direct impacts on riparian habitat. Project construction activities could degrade or destroy special-status plants and their habitat. However, because no special-status plants are present on the project site, this impact would be less than significant. Pursuant to the State CEQA Guidelines, Section 15091, no further finding is required.

Impact 3.3-14. Adverse effects on migratory corridors or nursery sites. Project construction and operation could adversely affect migratory corridors or nursery sites. Because no migratory corridors or nursery sites are present on the project site, this impact would be less than significant. Pursuant to the State CEQA Guidelines, Section 15091, no further finding is required.

Archaeological, Historical, and Tribal Cultural Resources

Impact 3.4-4: Indirect impacts on a historical resource. The Hastings Adobe (a historical resource listed in the NRHP and CRHR) is located outside of the project's direct APE. Project-related construction vibration and visual effects would not result in an indirect substantial adverse change. This impact would be less than significant. Pursuant to the State CEQA Guidelines, Section 15091, no further finding is required.

Greenhouse Gas Emissions and Energy

Impact 3.6-1: Direct or indirect generation of GHG emissions that may have a significant impact on the environment or conflict with an applicable plan, policy, or regulation of an agency adopted for the purpose of reducing emissions of GHGs. The fundamental purpose of the project is to reduce GHG emissions produced in the SMUD service area and in California, or to support beneficial uses there. The project is expected to reduce GHG emissions by approximately 2,446,322 MTCO2e over the project's 35-year life. Although project construction activities would make a relatively

small contribution of 4,603 MTCO2e to overall GHG emissions, implementing the project would not result in a substantial cumulative contribution to GHG emissions or conflict with any applicable plan, policy, or regulation regarding GHGs. This impact would be less than significant. Pursuant to the State CEQA Guidelines, Section 15091, no further finding is required.

Impact 3.6-2: Impacts of climate change on the project. Climate change is anticipated to result in various changes to local weather patterns in the future. The project does not propose any new residences and would not expose people to increased risks from climate change. This impact would be less than significant. Pursuant to the State CEQA Guidelines, Section 15091, no further finding is required.

Impact 3.6-3: Wasteful, inefficient, and unnecessary consumption of energy. Project construction activities would consume energy. However, because the project, once operational, would serve as a power generation facility and increase SMUD's capacity to generate power, the project would not result in the wasteful, inefficient, and unnecessary consumption of energy. Therefore, this impact would be less than significant. Pursuant to the State CEQA Guidelines, Section 15091, no further finding is required.

Hazards and Hazardous Materials

Impact 3.7-4: Exposure of employees and the public to hazards from accidental rotor failure. If a blade on a project WTG were to fail, the blade could become a projectile, exposing employees and the public to a hazard. As part of final design and siting, SMUD requires that the contractor prepare a blade throw analysis to inform the final site layout, and ensure sufficient setback is provided to minimize the risk of exposure to such a hazard. This impact would be less than significant. Pursuant to the State CEQA Guidelines, Section 15091, no further finding is required.

Hydrology and Water Quality

Impact 3.8-2: Alteration of the site's existing drainage pattern. The project would include limited grading of the project site, with only a small portion of the site to be developed with compacted materials and concrete pads. Therefore, installation of project facilities would not alter existing on-site drainage patterns and flow paths sufficiently to alter the way in which stormwater flows onto and off the site during major events. This impact would be less than significant. Pursuant to the State CEQA Guidelines, Section 15091, no further finding is required.

Impact 3.8-3: Long-term degradation of water quality. The project would alter the types, quantities, and timing of contaminant discharges in stormwater runoff. Overall, if the system is not designed properly, the project could cause or contribute to a long-term increase in discharges of urban contaminants (e.g., oil and grease, trace metals and organics, trash) into the stormwater drainage system compared with existing conditions. SMUD would comply with federal and state stormwater management regulations and would incorporate appropriate BMPs into project design to prevent long-term degradation

of water quality. Therefore, this impact would be less than significant. that it would have excess water capacity during project construction, this impact would be less than significant. Pursuant to the State CEQA Guidelines, Section 15091, no further finding is required.

Impact 3.8-4: Substantial decrease in groundwater supplies. The project is expected to use up to several million gallons of water during construction for dust control and other activities. Water use would vary over time depending on the construction phasing. SMUD or its contractor plans to obtain construction water from the City of Rio Vista. Because Rio Vista has forecast. Pursuant to the State CEQA Guidelines, Section 15091, no further finding is required.

Land Use

Impact 3.9-1: Division of an established community. The proposed project is not located within an existing community and does not have any features that would divide a community. This impact would be less than significant. Pursuant to the State CEQA Guidelines, Section 15091, no further finding is required.

Impact 3.9-2: Conflict with a plan, policy, or regulation adopted to avoid or mitigate an environmental effect. The proposed project could be found consistent with local plans, policies, and regulations. This impact would be less than significant. Pursuant to the State CEQA Guidelines, Section 15091, no further finding is required.

Noise

Impact 3.10-1: Generation of a Substantial Temporary Increase in Ambient Noise Levels in the Vicinity of the Project in Excess of Standards Established in the Local General Plan or Noise Ordinance, or Applicable Standards of Other Agencies due to Short-term construction noise impacts. Proposed construction areas are located mostly far from existing noise-sensitive receptors, the only closest receptor (LT-2) being approximately 275 feet from where construction activities (underground cabling) would occur. Most noise-generating construction activity would be performed during daytime hours, when people are less sensitive to noise. This impact would be less than significant. Pursuant to the State CEQA Guidelines, Section 15091, no further finding is required.

Impact 3.10-2: Temporary and Short-Term Exposure of Sensitive Receptors to, or Temporary and Short-Term Generation of, Excessive Groundborne Vibration. Construction activities, including but not limited to the use of large dozers, would not expose existing nearby sensitive residential or historical receptors and structures to levels of ground vibration that could result in structural damage and/or disturbance to people occupying nearby buildings because of the project's distance from the closest sensitive receptor (275 feet). This impact would be less than significant. Pursuant to the State CEQA Guidelines, Section 15091, no further finding is required.

d. Alternatives

In compliance with CEQA and the CEQA Guidelines, Chapter 6, “Alternatives” of the Draft EIR evaluated a reasonable range of alternatives to the project, including the No Project Alternative, followed by identification of an environmentally superior alternative. The EIR examined each alternative’s feasibility and ability to meet the following Project Objectives:

- Contribute to a diversified energy portfolio that will aid in the continued improvement of air quality in the Sacramento Valley Air Basin by decreasing reliance on fossil fuel combustion for the generation of electricity, and reduce SMUD’s exposure to price volatility associated with electricity and natural gas.

- Assist SMUD in achieving the Board of Directors’ directive of using dependable renewable resources to meet SMUD’s RPS obligations. This goal is consistent with Senate Bill 100, which was signed into law in 2018.

- Develop an economically feasible wind project that will deliver a reliable supply of up to 91 MW of electrical capacity at the point of interconnection.

- Accommodate the long-term viability of agricultural use within the Montezuma Hills.

Potential alternatives found to be clearly infeasible, including offsite alternatives and alternative technologies, were rejected because they would not achieve most of the basic project objectives without further environmental review in Section 6.2.3 of the Draft EIR.

The No Project Alternative and Reduced Turbine Height Alternative that might have been feasible and that would attain some of the project Objectives, were carried forward and analyzed with regard to whether they would reduce or avoid significant impacts of the project.

In connection with certification of the Final EIR for the project, the Board certifies that it has independently reviewed and considered the information on alternatives provided in the Final EIR and the record of proceedings. The Board finds that no new alternatives have been identified and that the feasibility of the analyzed alternatives has not changed since the Draft EIR was circulated for public review. The Board certifies that it has independently reviewed and considered the information on alternatives provided in the Final EIR and the administrative record, and find, for the reasons set forth below, that each of the following alternatives cannot feasibly attain, either at all or to the same extent as the proposed Project, one or more of the project Objectives, is otherwise infeasible or fails to avoid or substantially lessen the significant effects of the Solano 4 Wind Project.

1. No Project Alternative

Under this alternative, the project would not be constructed on the project site, and as a result, none of the permits or approvals that would be required by SMUD and various

permitting agencies for the project would occur. The existing WTGs on Solano Phase 1 would continue to generate approximately 15MW although increased maintenance needs would result in higher costs to operate over time. This alternative would not go as far toward meeting the objectives identified in Section 6.2.1, “Attainment of Project Objectives.” No impacts would occur under this alternative.

The No Project Alternative would not meet any of the project objectives because a wind energy facility would not be constructed on the project site. Because this alternative would not attain any project objectives and for the reasons set forth above, the No Project Alternative is rejected by the Board from further consideration.

Findings: Based on the entire record, the SMUD Board of Directors finds that while the No Project Alternative will substantially avoid effects to the public and environment (air quality) associated with the Solano 4 Wind Project, the No Project alternative is infeasible because it will not achieve any of the identified Project Objectives.

2. Reduced Turbine Height Alternative

Under this alternative, SMUD would replace existing WTGs with reduced turbine height WTGs (turbine height of 138 meters) compared to the proposed project (up to 22 new WTGs with turbine height of 150-180 meters) for a total of 27 WTGs that would be placed on the property (13 at Solano 4 east and 14 at Solano 4 west) in a configuration similar to that of the proposed project. Total capacity for the Reduced Turbine Height Alternative would be 62 MW compared to the 91 MW for the proposed project.

Environmental Analysis

Aesthetics

Under this alternative, the visible elements of the WTG facility would be reduced in height (138 meters tall with hub height of 80 meters) compared to the proposed project which could install 150 meter WTGs with a hub height of 105 meters. Smaller structures are less visible at distance and are compatible with the surrounding wind energy projects that utilize older, smaller WTGs. Under either development scenario, impacts to nighttime views would be minimized through incorporation of ADLS technology that activates aircraft warning lights only when an aircraft is detected. Therefore, overall visual impacts under this alternative would be less than those of the project.

Air Quality

Selection of the Reduced Turbine Height Alternative would introduce 27 WTG compared to the 22 WTG for the project. As such, all construction activities and resulting criteria air pollutants would be similar to, but slightly greater than, those of the project.

Under either development scenario, construction activity would emit NOX and PM10 at levels that could exceed YSAQMD and BAAQMD daily emissions thresholds for these

pollutants. Similar to the project, implementation of Mitigation Measure 3.2-1 would reduce construction-related exhaust and dust emissions but not below the threshold and this impact would remain at significant levels. On an operational basis, neither the Proposed Project nor Reduced Turbine Height Alternative would conflict with an adopted plan or policy adopted for the purpose of environmental protection. Thus, assuming the implementation of Mitigation Measure 3.2-1, short-term construction air quality impacts would be similar to, but slightly greater than, the project.

Biological Resources

The Reduced Height Alternative would result in construction of 27 smaller, WTGs than the 22 WTGs proposed by the project. Therefore, the Reduced Turbine Height Alternative would result in more ground disturbance than would the project. Placement of a greater number of tall structures in the area may increase the chances for protected birds to hit obstacles while flying. Direct and indirect effects to waters and jurisdictional resources could result from grading, trenching, pile driving, and creation of impervious surface adjacent to wetlands and non-wetland waters under either development scenario. Potential indirect effects include potential changes in hydrology through modification of surface flows or perched groundwater flows, penetration of the hardpan, shading of wetlands, and reduced water quality caused by erosion and siltation or herbicide use (chemical runoff or drift). Implementation of the mitigation measures identified in Section 3.3, “Biological Resources,” would apply to this alternative, but like the project, would not reduce impacts on biological resources to less-than-significant levels. Overall, impacts to biological resources would be greater compared to the project.

Archaeological, Historical, and Tribal Cultural Resources

Under this alternative, a greater number of WTGs would be constructed on the project site. This alternative may result in greater disturbance to unknown archaeological sites because additional roadways would be required to access the additional WTGs and more foundations would be created compared to the project. Because earthwork and ground-disturbing activities would occur under this alternative, implementation of Mitigation Measures 3.4-1, 3.4-2, and 3.4-3 would apply, and would reduce impacts to less-than-significant levels. Overall, impacts under this alternative would be greater than those of the project since more land disturbance would likely occur.

Geology and Soils

Implementation of this alternative would involve grading and other ground-disturbing activities similar to the project, but over a slightly larger footprint. Therefore, this alternative would have similar impacts associated with geological hazards and soil erosion compared to the project. Implementation of Mitigation Measures 3.5-1 through 3.5-3 would apply to this alternative, and would reduce these impacts to less-than-significant levels. Overall, this alternative would result in more geology and soils impacts compared to the project.

Greenhouse Gas Emissions and Energy

Under this alternative, a greater number of WTGs would be constructed on the project site compared to the project. As such, all construction activities and resulting GHG emissions would be similar to, but slightly greater than, the project. A reduction in the annual generation capacity of the facility would also result in a reduction in avoided GHG emissions. Thus, while this alternative would result in a slight reduction of construction-related GHG emissions, the reduction would be smaller than the amount of GHG avoided emissions lost through the reduction of wind energy capacity compared to the proposed project. Potential impacts of climate change on this alternative would be the same as the project because the site would be unchanged in location and the same County policies are in place to respond to the effects of climate change. Thus, GHG impacts under this alternative would be less than significant.

Hazards and Hazardous Materials

Implementation of this alternative would involve the storage, transport, and handling of hazardous materials; exposure of or disturbance to contaminated soils or asbestos containing materials; and exposure of people or structures to a significant fire risk, similar to the project. Implementation of Mitigation Measures 3.7-1a through -1d, -2a through -2d, and -3a through -3c would apply to this alternative, and would reduce these impacts to less-than-significant levels.

The Reduced Turbine Height Alternative would introduce structures that exceed the 200 foot threshold. Both development scenarios would be subject to review by the FAA under Part 77 and must implement lighting and other physical measures applied during this process to avoid posing an obstacle to aviation by intruding into flight patterns or interfering with operation of radar equipment. The FAA found the proposed project was not a hazard to aviation, and while WTGs may be detected by radar sensors, this would not cause an unacceptable adverse impact on ATC operations. The placement of more WTGs on the project site may increase radar interference compared to the proposed project as the density of WTGs is greater than for the project. Overall, the Reduced Turbine Height Alternative may result in greater hazards or hazardous materials impacts compared to the project.

Hydrology and Water Quality

Implementation of this alternative would involve grading and movement of soil, which could result in erosion and sedimentation, and discharge of other nonpoint source pollutants in stormwater runoff that could degrade local water quality. Installation of the WTGs under either development scenario would not alter existing onsite drainage patterns. Implementation of Mitigation identified for the proposed project would reduce these impacts to less-than-significant levels. Overall, this alternative would result in similar hydrology and water quality impacts compared to the project.

Land Use

The Reduced Turbine Height Alternative would be sited on land designated for agricultural use. WTGs are permitted in the agricultural designation and would be compatible with the existing grazing and farming occurring on neighboring parcels and no conflicts with regulatory plans or policies adopted for the protection of environmental resources would occur. Impacts under this alternative would be similar to those of the project.

Noise

The Reduced Turbine Height Alternative would require slightly more heavy truck trips to deliver components to the site as more turbines would be placed on the site compared to the project. As such, all construction activities would be slightly greater to the proposed project and, therefore, construction noise impacts would be slightly greater. Under either development scenario, noise impacts are less than significant, so the slight increase in construction noise impacts is not substantially greater than those for the project. Therefore, overall impacts under this alternative would be similar to those of the project.

Transportation and Traffic

The Reduced Turbine Height Alternative would require slightly more heavy truck trips needed to haul more WTGs than those for the project. Operational trips would be similar since the O&M activity would not change. As such, all construction activities would be similar but slightly greater to the proposed project and, therefore, construction-related increases to vehicle traffic on the surrounding roadway network and resulting degradation of pavement conditions would be similar. Implementation of Mitigation Measures 3.10-2a and -2b would apply to this alternative, and would reduce these impacts to less-than-significant levels. Overall, this alternative would result in similar transportation and traffic impacts compared to the project.

This alternative would meet most of the project objectives. However, reducing the height of the WTGs would result in a project that produces a smaller amount of energy (62 MW compared to the 92 MW for the proposed project) at a higher price. This would result in reduced ability to comply with California's renewable energy and greenhouse gas emission reduction laws and goals and SMUD Board Strategic Directive 9. Because this alternative would not attain project objectives and for the reasons set forth above, the Reduced Turbine Height Alternative is rejected by the Board from further consideration.

Findings: Based on the entire record, the SMUD Board of Directors finds that because the Reduced Height Alternative does not reduce unavoidable significant impacts to air quality and will not achieve any of the identified Project Objectives to the same degree as the project, the Reduced Height Alternative is deemed to be infeasible.

3. Environmentally Superior Alternative

CEQA requires the identification of an environmentally superior alternative. Section 15126.6(e)(2) of the CEQA Guidelines states that if the No Project Alternative is the environmentally superior alternative, then the EIR shall also identify an environmentally superior alternative among the other alternatives. The impact of the respective alternatives is identified in Table 6-1 of the Draft EIR, followed parenthetically by the comparison to the impact of the proposed Project.

As shown in the Executive Summary Chapter of the Draft EIR, there would be significant impacts associated with the project. These impacts are related to aesthetics; air quality; biological resources; historic, archaeological, and tribal cultural resources; geology and soils; hazards and hazardous materials; hydrology and water quality; and transportation. Each of these impacts would be reduced to a less-than-significant level through the adoption and implementation of the mitigation measures adopted in the findings on the project, with the exception of significant and unavoidable impacts to air quality from construction activities as noted above. The No Project Alternative would have no impacts. The Reduced Turbine Height Alternative would have similar environmental impacts as the proposed project.

When considering objectives, the Solano 4 Wind Project would meet all of the project objectives, as stated in Chapter 2, “Project Description.” In contrast, because there would be no project under the No Project Alternative, it would fail to meet any of the project objectives. The Reduced Turbine Height Alternative achieves some but not all of the project objectives and does not reduce unavoidable significant impacts to air quality. The Reduced Turbine Height Alternative was responsive to one of the primary issues raised by the ALUC, turbine height. Ultimately, while Reduced Turbine Height Alternative would lessen one impact and have similar impacts to the project, the DEIR concluded that the proposed Project would be the environmentally superior alternative. Such a limited range of alternatives is appropriate where, as here, there are so few variations or significant impacts of the project. (See, e.g. Marin Municipal Water Dist. v. KG Land Cal. Corp. (1991) 235 Cal.App.3d 1652, 1666 [upheld EIR that evaluated two alternatives—a no project alternative and conservation alternative].) The SMUD Board of Directors has the authority to make to adopt a qualified exemption under Government Code Section 53096 based on compliance with notice and hearing proceedings and finding there is no feasible alternative to the proposal.

e. Additional Findings

1. These Findings incorporate by reference in their entirety the text of the EIR prepared for the Solano 4 Wind Project. Without limitation, this incorporation is intended to elaborate on the scope and nature of the project, related mitigation measures, and the basis for determining the significance of such impacts.

2. All of the environmental effects of the Solano 4 Wind Project have been adequately addressed in the EIR and have been mitigated or avoided.

3. Section 15093(b) of the State CEQA Guidelines provides that when the decision of the public agency results in the occurrence of significant impacts that are not avoided or substantially lessened, the agency must state in writing the reasons to support its actions. The Findings adopted by the Board in connection with its approval of the Solano 4 Wind Project EIR and certification that the associated EIR addressed all of the potentially significant impacts associated with implementation of the Solano 4 Wind Project. The EIR concluded that the air quality impacts (project-specific and cumulative) associated with the construction of the project would be significant and unavoidable even with the adoption of identified mitigation measures. As a result, the adoption of a Statement of Overriding Considerations for the Solano 4 Wind is required.

4. CEQA Guidelines section 15074 requires the Lead Agency approving a Project to adopt a mitigation monitoring and reporting program for changes to the project that it adopts or makes a condition of Project approval in order to ensure compliance during Project implementation. The Board adopts the mitigation monitoring and reporting program for Solano 4 Wind Project and the specific mitigation measures will be monitored in conjunction with SMUD's Final EIR Mitigation Monitoring Program and Reporting process.

f. Record of Proceedings

For purposes of CEQA and these Findings, the record of proceedings for the Solano 4 Wind Project (Record of Proceedings) consists of the following documents and other evidence, at a minimum:

- The Notice of Preparation (NOP) distributed on January 9, 2019 and comments received during its 30-day public review;

- The EIR for the project, including, without limitation, the Draft EIR, Final EIR, and all of its appendices;

- All studies, EIRs, maps, rules, regulations, guidelines, permits and other documents and materials incorporated by reference in any portion of the EIR;

- All presentation materials from every noticed public meeting and public hearing for the project;

- The Mitigation Monitoring and Reporting Program for the proposed Project (MMRP);

- Matters of common knowledge, including but not limited to federal, state and local laws and regulations, including, without limitation, SMUD's adopted CEQA Procedures and other adopted plans, policies and programs;

- Any documents expressly cited in these Findings and/or in the Statement of Overriding Considerations; and

- All materials not otherwise identified which are expressly required to be in the Record of Proceedings by PRC section 21167.6(e).

g. Custodian and Location of Records

The documents and other materials which constitute the Record of Proceedings are located at the Headquarters Campus. Copies of those documents are, and at all relevant times, have been and will be available upon request at the Customer Service Center (6300 S Street, Sacramento, CA 95817). The custodian of the Record of Proceedings may be contacted as follows:

Ammon Rice
Sacramento Municipal Utility District
6201 S Street, MS B203
Sacramento, CA 95817-1899
(916) 732-7466
Ammon.rice@smud.org

This information is provided in compliance with PRC Section 21081.6(a)(2) and CEQA Guidelines Section 15091(e).

IV. Project Benefits

SMUD needs new renewable and carbon-free resources to meet California's mandate for renewable procurement (60% by 2030)[1] and to meet its Board directed goals. SMUD's Integrated Resource Plan (IRP), adopted by its Board in 2018, guides decisions on future resource developments, and lays out a pathway to achieve a Net Zero greenhouse gas (GHG) emissions goal by 2040 through investment in electrification while significantly expanding renewable and carbon-free resources in its portfolio.[2] In July 2020, SMUD's Board declared a climate emergency and adopted a resolution calling for SMUD to take significant and consequential actions to eliminate its greenhouse gas emissions by 2030, and directed staff to develop a plan to achieve this goal. SMUD's 2030 Zero Carbon Plan (2030 Plan[3]) has been approved by the Board and calls for the addition of up to 2,300 MW of new renewables and 1,100 MW of batteries by 2030 – more than double the

[1] Sen. Bill No. 100, approved by Governor, Sept. 10, 2018.
[2] https://www.smud.org/-/media/Documents/Corporate/Environmental-Leadership/Integrated-Resource-Plan.ashx.
[3] https://www.smud.org/-/media/Documents/Corporate/Environmental-Leadership/ZeroCarbon/2030-Zero-Carbon-Plan-Technical-Report.ashx

amount SMUD was planning for in its 2018 IRP. The 2030 Plan calls for maximizing new cost-effective utility-scale renewables within our service territory (up to 1,500 MW utility solar), but also requires SMUD to add additional resources that it does not have locally, such as wind and geothermal.

Thus, the fundamental purpose of the Solano 4 Wind Project is to contribute to a diversified energy portfolio that will aid in the continued improvement of air quality in the Sacramento Valley Air Basin by decreasing reliance on fossil fuel combustion for the generation of electricity, and reduce SMUD's exposure to price volatility associated with electricity and natural gas. The Solano 4 Wind Project would assist SMUD in achieving the Board of Directors' directive of using dependable renewable resources to meet SMUD's renewable portfolio standards (RPS) obligations. This goal is consistent with Senate Bill 100, which was enacted in 2018. The Solano 4 Wind Project would deliver a reliable supply of up to 91 MW of electrical capacity at the point of interconnection with the grid managed by the California Independent System Operator (CAISO) and would accommodate the long-term viability of agricultural use within the Montezuma Hills. SMUD has long-anticipated the continued use of the project site for wind projects, which has been a key component of SMUD's efforts for planning to meet a carbon-free energy portfolio.

a. Need for Sustainable and Carbon-free Power Supply

The Project furthers SMUD's objective to provide a sustainable power supply as part of SMUD's IRP and a diversified energy portfolio that will aid in the continued improvement of air quality in the Sacramento Valley Air Basin by decreasing reliance on fossil fuel combustion for the generation of electricity and reduce SMUD's exposure to price volatility associated with electricity and natural gas.

b. Generation of Electrical Energy

The Project would add an additional 91 MW of power, culminating in 306 MW of clean renewable wind energy. In 2018, SMUD set one of the most aggressive carbon reduction targets in the country with the goal of achieving net zero emissions by 2040, five years ahead of California's 2045 net zero goal. In July 2020, SMUD Board of Directors declared a climate emergency and adopted a resolution calling for SMUD to take significant and consequential actions to become carbon neutral (net zero carbon) by 2030. The Board also directed SMUD staff to report by March 31, 2021 on clear, actionable and measurable strategies and plans to reach SMUD's climate emergency goals. Rapidly

advancing clean energy technology and a collaborative and inclusive approach to carbon reduction has allowed SMUD to set the even more ambitious goal of zero carbon by 2030, with the 2030 Zero Carbon Plan being the strategy to achieve that goal. To achieve the net zero carbon by 2030 SMUD anticipates needing 300 to 500 MW of wind energy generation from various locations between 2021 and 2030. The power generated from Solano 4 Wind is critical to SMUD's goals of achieving a carbon-free energy portfolio by 2030.

c. Environmental Benefits

The project provides significant air quality benefits through the avoidance of emissions which would occur if electricity generated by the project were instead generated by a fossil fuel and will offset approximately 132,000 metric tons of carbon emissions annually that would otherwise be produced from fossil fuel facilities.

The project will produce enough electricity to power almost 40,000 homes. As discussed in the EIR, construction activities would emit NOx and PM10 at levels that could exceed YSAQMD and BAAQMD daily emissions thresholds for these pollutants. As part of its mitigation commitment, SMUD will develop a fugitive dust control plan for the project that will reduce construction-related exhaust and dust emissions as required by Mitigation Measure 3.2-1. While no further measures are available to reduce Project impacts to a less-than-significant level, these measures will protect resources to the maximum extent feasible.

d. Economic Benefits

Wind energy projects can benefit the economy through job creation, increases in personal income, and fiscal contributions. Short-term construction jobs account for the majority of direct wind-related job creation, though each project creates ongoing operations and maintenance jobs, as well as supporting jobs in the professional services such as environmental, finance, and legal services. Solano 4 construction spending is expected to contribute $14.5 million in earnings, $39.4 million in output, and $22.5 million in value added to the local economy while supporting 211 jobs in the County. The operations of Solano 4 is expected to result in $230 thousand in earnings, $590 thousand in output, and $440 thousand in value added to the local economy. Local annual jobs supporting operations is estimated to be 4. Additional statewide benefits include 87 construction jobs, $7.6 million in earnings, $21.4 million in output, and $15 million in value added, and

annual operating and maintenance benefits of 2 jobs, $340 thousand in earnings, $690 thousand in output, and $510 thousand in value added.

Finding: The SMUD Board finds the approval of the proposed Solano 4 Wind Project will result in continuing and enhanced benefits to SMUD customers in the form of carbon-free renewable wind energy.

V. Statement of Overriding Considerations

This section of the findings document addresses the requirement in CEQA Guidelines section 15093. It requires the approving agency to balance the benefits of a proposed project against its unavoidable significant impacts and to determine whether the impacts are acceptably overridden by the project benefits. As described below, unavoidable significant impact would occur in the area of Air Quality.

a. Air Quality

Under the proposed Solano 4 Wind Project, Project construction activities would emit NOx and PM10 at levels that could exceed YSAQMD and BAAQMD daily emissions thresholds for these pollutants. SMUD will implement mitigation measures designed to minimize impacts on air quality, but acknowledges that potential impacts could be significant and unavoidable. Implementation of these measures, including preparing and implementing a fugitive dust control plan to reduce construction-related exhaust and dust emissions as required by Mitigation Measure 3.2-1, seeks to reduce impacts. Nevertheless, the potential remains for implementation of the Solano 4 Wind Project to create significant and unavoidable construction emissions of criteria air pollutants and ozone precursors. Because all feasible mitigation has been included and no additional measures are available to SMUD to reduce construction activity emissions of NOx and PM10 at levels that could exceed YSAQMD and BAAQMD daily emissions thresholds for these pollutants, impacts on air quality are significant and unavoidable.

Finding: The SMUD Board finds that the project benefits identified in Section IV outweigh the unavoidable significant adverse environmental effect on air quality. The project benefits described in Section IV are hereby determined to be, independent of other

potential project benefits, a basis for overriding all significant and unavoidable environmental impacts identified in the Final EIR and in these findings.

VI. Summary

Based on the foregoing findings and the information contained in the record, it is hereby determined that:

1. Most significant impacts on the environment due to the project have been eliminated, or substantially lessened, where feasible.

2. The Project will result in a significant and unavoidable environmental effect to air quality as discussed above, and adoption of a Statement of Overriding Considerations in connection with the approval of the project is required.

3. The environmentally superior alternative would lessen the significant and unavoidable impacts of the proposed project. However, the environmentally superior alternative, as well as the other alternatives evaluated in the EIR, are rejected as infeasible because they fail to achieve project objectives.

This determination reflects the Board's independent judgment and analysis.

This page intentionally left blank.

2

SSS No.
COTC 21-001

BOARD AGENDA ITEM

STAFFING SUMMARY SHEET

Committee Meeting & Date
Policy Meeting August 11, 2021
Board Meeting Date
August 19, 2021

TO		TO	
1.	Claire Rogers	6.	
2.	Brandy Bolden	7.	
3.	Jennifer Davidson	8.	
4.	Stephen Clemons	9.	**Legal**
5.		10.	**CEO & General Manager**

Consent Calendar		**Yes**		**No** *If no, schedule a dry run presentation.*	**Budgeted**		**Yes**		**No** *(If no, explain in Cost/Budgeted section.)*

FROM (IPR)	DEPARTMENT	MAIL STOP	EXT.	DATE SENT
Tracy Carlson	Customer Care	A151	7248	07/22/2021

NARRATIVE:

Requested Action: Accept the monitoring report for Strategic Direction SD-5, Customer Relations.

Summary: Communicate status of key metrics as they relate to customer satisfaction and the hearing/appeal process.

Board Policy: *(Number & Title)* SD-5, Customer Relations. This report provides the measurement of customer service as specified in SD-5.

Benefits: Provide Board Members with an update on the compliance of the Strategic Direction and allow an opportunity to make corrections, additions, or changes if necessary.

Cost/Budgeted: N/A

Alternatives: No action would impact ability to meet Strategic Direction.

Affected Parties: Customer Operations, Communications, Marketing, & Community Relations, Legal, and SMUD customers

Coordination: Customer Operations

Presenter: Tracy Carlson, Director, Customer Operations

Additional Links:

SUBJECT	ITEM NO. ***(FOR LEGAL USE ONLY)***
Annual Monitoring Report for SD-5, Customer Relations	

ITEMS SUBMITTED AFTER DEADLINE WILL BE POSTPONED UNTIL NEXT MEETING.

SACRAMENTO MUNICIPAL UTILITY DISTRICT

OFFICE MEMORANDUM

TO: Board of Directors **DATE:** August 3, 2021

FROM: Claire Rogers CR 8/3/21

SUBJECT: **Audit Report No. 28007407**
Board Monitoring Report; SD-5: Customer Relations

Audit and Quality Services (AQS) received the SD-5 *Customer Relations* 2020 Annual Board Monitoring Report and performed the following:

- A review of the information presented in the report to determine the possible existence of material misstatements;
- Interviews with report contributors and verification of the methodology used to prepare the monitoring report; and
- Validation of the reasonableness of a selection of the report's statements and assertions.

During the review, nothing came to AQS' attention that would suggest the SD Board Monitoring report did not fairly represent the source data available at the time of the review.

CC:

Paul Lau

Board Monitoring Report 2020
SD-5, Customer Relations

1) Background

Strategic Direction 5 states that:

Maintaining a high level of customer relations is a core value of SMUD. Additionally, the Board recognizes that the customer satisfaction target of 95 percent with no individual component measured falling below 85 percent.

In addition, the Board establishes an overall customer experience "value for what you pay" target of 70 percent by the end of 2025 and 80 percent by the end of 2030, with neither the average commercial customer score falling below 69 percent nor the average residential customer score falling below 65 percent in any year.

As part of this policy:

a) SMUD customers shall be treated in a respectful, dignified and civil manner.

b) SMUD shall communicate a procedure for customers who believe they have not received fair treatment from SMUD to be heard.

2) Executive summary

To ensure customers are receiving the highest quality of service, SMUD measures the satisfaction of key interactions with SMUD: Outages, Tree Trimming, Bill Inquiries, New Connections, IVR Payments, and IVR Payment Arrangements.

In addition, we measure Value for What You Pay as value drives customer loyalty. Value is defined as the trade-off between the perceived benefits a customer gets to the cost they have to pay for the benefits. Knowing what customers value allows SMUD to tailor services, products, and offerings to sustain customer relationships as the utility market evolves. SMUD is measuring customer perceived value because SMUD believes it is an effective early indicator of customer loyalty. When customers have options to choose alternatives, whether alternatives in energy, energy advisement, and other related services, we want our customers to continue choosing SMUD.

High satisfaction in these key interactions below and a high Value for What You Pay score support SMUD's purpose and vision to act in the best interests of our customers and community.

SMUD is in compliance with the policy and has exceeded the targets set forth by the Board in all instances for SD-5.

SMUD has exceeded the target of 95% with an overall Customer Satisfaction of 97%. All four components exceeded the expectation set.

SMUD achieved a 77% overall Value for What You Pay score, with neither Residential nor Commercial falling below their prescribed floors. Deferring shut-offs and late fees during the COVID-19 pandemic, no public power safety shut-offs, and robust communication and responsiveness to customer needs all contributed to the 2020 annual VFP score surpassing target. In the near future, VFP scores are anticipated to decline due to the restart of collections and shut-offs and multiple pricing changes. Looking beyond, a continued focus on customer experience initiatives will boost customer trust in SMUD and their adoption of 2030 Decarbonization recommendations.

Metric	Status		Compliance
Customer Service Level	**Overall Satisfaction**	**97%**	**Yes**
	Tree Trimming	**95%**	
	New Connects	**99%**	
	Bill Inquiries	**96%**	
	Outage Communication	**95%**	
	IVR Payment	**97%**	
	IVR Payment Arrangement	**93%**	
Value for What You Pay Addendum	**Overall VFP**	**77%**	**Yes**
	Commercial	**79%**	
	Residential	**75%**	

Respectful Customer Treatment: Compliant

SMUD customers are treated in a respectful, dignified and civil manner. SMUD employees are trained to deliver quality customer experience through extensive, multi-channel employee competency development.

Hearing Appeal Process: Compliant

Customers are made aware of SMUD's Hearing and Appeal process through multiple channels. The back page of every paper bill describes the process. In addition, the process is described in detail on the SMUD website and is linked from the digital bill in My Account.

Link: https://www.smud.org/assets/documents/pdf/Board-Meeting-Procedures.pdf

Zero hearings were conducted in 2020, as staff successfully resolved all escalations within standard customer communication channels.

3) **Additional supporting information**

See Appendix A for supporting information.

2020 Accomplishments
1) Friendly Reminder Campaign – Over 240,000 customer touchpoints made to residential and commercial customers with unpaid SMUD bills. These touchpoints included information on billing and payment resources delivered via CSR/SAA calls, robocalls, emails, and direct mail.
2) Food Drive – In partnership with Elk Grove Food Bank, SMUD collected over a ton of food through a drive-through, touchless canned food drive which brought critical awareness and support to our community members.
3) Increased EAPR Assistance – 20k-30k customers retained their discount without reapplying, allowing ~12k customers to stay on EAPR who may have otherwise been dropped. Eligibility requirements were loosened to increase eligibility. CSR personalized outreach to over 2,900 customers around holidays.
4) EnergyHELP Donations – SMUD collected multiple generous donations totaling $10,000 which was applied to additional assistance and income eligible arrearages.
5) 'We're Here to Help' campaign – SMUD launched a 3-phase campaign advertising our resources and efforts to support our community.
6) SAA awareness campaign – SAA's sent individualized, targeted messages to commercial customers highlighting help available from SAAs and SMUD.
7) Business reinvented - Social media campaign sharing local businesses' ingenuity coming to the aid of others.
8) Newsletter support for local business - Called upon our community to continue to support small business through both residential and commercial newsletters.
9) Virtual Meet the Buyers Expo - This annual event was offered virtually for the first time in 2020.

10) COVID-19 business resources - SMUD created an online platform of community, state and federal resources available to business customers.
11) Virtual assessments - SAAs, Energy Specialists and Energy Advisors conducted energy audits virtually giving customers a safe and convenient way to engage and thrive with SMUD during and after COVID-19. Resulting in operational efficiency and cost reduction for truck/car rolls.
Ongoing Accomplishments
12) Solar + weatherization - SMUD funded installations for 30 single family homes in partnership with Grid Alternatives.
13) Shade Trees - In partnership with Sac Tree Foundation, SMUD delivered over 9,800 trees.
14) Wattson chatbot launched - Helps customers navigate smud.org, used by 9,200 customers and counting.
15) SMUD Energy Store - SES had a record setting year with 23,000+ items sold, 53% customer awareness, $72.5k+ donated to EnergyHELP, and free holiday lights to over 2,300 EAPR customers.
16) Launched EV Concierge Service - Offers live support, answering questions on all things EV.
17) Educational Outreach - Ten residential and two K-12 educational videos produced with 150,000+ views across all channels. Solar@Home summer camp was attended by over 280 local students.
18) Enhanced SMUD App – Improvements made to App including robust charting features, real-time payment posting, mobile alerts and increased performance and speed.
19) Digital self-service enhancements - Online automation of HomePower Repair request form, EnergyHelp Program and VIN Decoder for EV rate identification.
20) Sustainable communities resource priorities map – Drives community support to under-resourced neighborhoods.
21) Commercial rate impact tool - This tool estimates bill impacts of 8-year rate restructure for commercial customers.
22) Launched Neighborhood SolarShares - Developers and builders to secure utility-scale solar from SMUD to meet the solar mandate.
23) Solar support for our community - Provided solar installations for 4 local nonprofits.
24) Commercial MyAccount - Expanded eligibility for commercial customers to make payment arrangements in self-service channels.
25) EE Incentives - 820+ commercial customers received energy efficiency incentives.
26) Electric transportation - Incentivized the installation of 125 commercial vehicle chargers and vehicles through the commercial charging, fleet and CALeVIP programs.

27) Business guide to beneficial electrification - Overview of benefits to go electric as a business, including reducing carbon, electrification costs, incentives, steps to electrify and equipment technology descriptions.
28) SMUD business bill tips - Self-help video on smud.org/MyAdvisor addressing the most commonly asked billing questions.

Respectful Customer Treatment Supporting Information:

Virtual Classroom Training Attendees: 604
Web/ E-Learning: 406
Real Time Training – 2020 Bulletins: 134
Customer Journey Mapping and Design thinking sessions: 15

4) Challenges

Upcoming price increases, new rate structures, and resuming shut-offs and collections are likely to put downward pressure on future VFP scores and customers' positive perception of SMUD. In addition, customer needs and expectations will continue to evolve. Investing in customer experience enhancements are critical to ensure ongoing customer engagement such as EAPR and Sustainable Communities, efficient operations, and success of SMUD's 2030 Decarbonization strategy.

5) Recommendation

It is recommended that the Board accept the Monitoring Report for SD-5.

6) **Appendices**

Appendix A

Customer Satisfaction

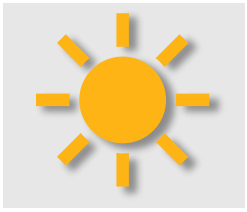
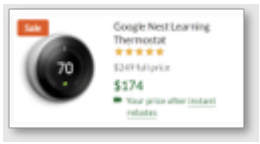
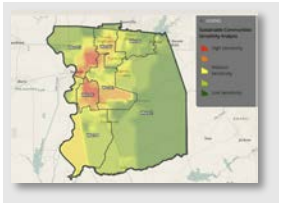
Overall Satisfaction	2020 **97%**	2019 **97%**	2018 **97%**
Tree Trimming	95%	95%	95%
New Connects	99%	98%	98%
Bill Inquires	96%	96%	95%
Outage	95%	96%	96%
IVR Payment	97%	96%	96%
IVR Payment Arrangement	93%	98%	98%

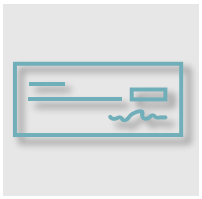
Value for What You Pay

VFP Segment Thresholds	2020 **77%**	2019 **67%**	2018 **71%**	2017 **70%**	2016 **70%**	2015* **65%**
Commercial 69% Minimum	79%	69%	73%	72%	74%	67%
Residential 65% Minimum	75%	66%	69%	68%	66%	63%

Accomplishments

1. Friendly reminder campaign 	2. Food drive collected 1 ton+ of food 
3. Increased EAPR assistance to loosen guidelines and allow more customers to stay on or join the discounted rate	4. EnergyHelp Donations totaling $14k
5. 3-phase “We’re here” to help marketing campaign 	6. SAA Awareness Campaign 
7. Business reinvented social media campaign 	8. Newsletter support for local business 
9. Virtual meet the buyers 	10. Covid 19 business resources 

11. Virtual assessments 	12. Solar + weatherization 
13. 9.8k shade trees delivered 	14. Wattson – live chat 
15. SMUD Energy Store record setting year 	16. Launched EV Concierge service 
17. Education outreach, with increased virtual options 	18. Enhanced SMUD app 
19. Digital self-service enhancements 	20. Sustainable Communities resource priorities map 

21. Commercial rate impact tool 	22. Launched Neighborhood SolarShares 
23. Solar support for community 	24. Commercial MyAccount 
25. EE incentives 	26. Electric transportation – 130 EVs + chargers 
27. Business guide to electric transportation 	28. SMUD business bill tips 

3

SSS No.
CMCR 21-001

BOARD AGENDA ITEM

STAFFING SUMMARY SHEET

Committee Meeting & Date
Policy, August 11, 2021
Board Meeting Date
August 19, 2021

TO		TO	
1.	Claire Rogers	6.	
2.	Jennifer Davidson	7.	
3.	Stephen Clemons	8.	
4.		9.	**Legal**
5.		10.	**CEO & General Manager**

Consent Calendar		**Yes**		**No** *If no, schedule a dry run presentation.*	**Budgeted**		**Yes**		**No** *(If no, explain in Cost/Budgeted section.)*

FROM (IPR)	DEPARTMENT	MAIL STOP	EXT.	DATE SENT
Farres Everly	CMCR	A352	6478	7/23/21

NARRATIVE:

Requested Action: Accept the monitoring report for Strategic Direction SD-15, Outreach and Communication.

Summary: The Board of Directors will be presented with overall customer communications activities for 2020.

Board Policy: *(Number & Title)* SD-15, Outreach and Communication Policy.

Benefits: As a customer-owned utility, SMUD has a responsibility to communicate with all of our customers. Consistent, integrated purpose-driven communications enhance our relationship with our customers and create an environment of partnership and engagement.

Cost/Budgeted: N/A

Alternatives: Provide the Board with written reports and communication through the Chief Executive Officer and General Manager.

Affected Parties: Communications, Marketing, & Community Relations, Customer Operations and SMUD customers.

Coordination: Communications, Marketing & Community Relations

Presenter: Tom Jas, Manager, Marketing & Market Research, SMUD

Additional Links:

SUBJECT	ITEM NO. ***(FOR LEGAL USE ONLY)***
Annual Monitoring Report for SD-15, Outreach and Communication	

ITEMS SUBMITTED AFTER DEADLINE WILL BE POSTPONED UNTIL NEXT MEETING.

SACRAMENTO MUNICIPAL UTILITY DISTRICT

OFFICE MEMORANDUM

TO: Board of Directors **DATE:** August 3, 2021

FROM: Claire Rogers CR 8/3/21

SUBJECT: **Audit Report No. 28007341**
Board Monitoring Report; SD-15: Outreach and Communication

Audit and Quality Services (AQS) received the SD-15 *Outreach and Communication* 2020 Annual Board Monitoring Report and performed the following:

- A review of the information presented in the report to determine the possible existence of material misstatements;
- Interviews with report contributors and verification of the methodology used to prepare the monitoring report; and
- Validation of the reasonableness of a selection of the report's statements and assertions.

During the review, nothing came to AQS' attention that would suggest the SD Board Monitoring report did not fairly represent the source data available at the time of the review.

CC:

Paul Lau

Board Monitoring Report 2020
SD-15 Board Strategic Direction on Outreach and Communication

1) Background

Strategic Direction 15 states:

Providing broad outreach and communication to SMUD's customers and the community is a key value of SMUD.

Specifically:

a. SMUD shall provide its customers the information, education and tools they need to best manage their energy use according to their needs.

b. SMUD will use an integrated and consistent communication strategy that recognizes the unique customer segments that SMUD serves.

c. SMUD's communication and community outreach activities shall reflect the diversity of the communities we serve. SMUD shall use a broad mix of communication channels to reach all customer segments. This communication shall be designed to ensure that all groups are aware of SMUD's major decisions and programs.

2) Executive summary

Strategic Direction 15 requires SMUD's communication and community outreach activities to reflect the diversity of SMUD and the community we serve, using a broad mix of communication channels. In accordance, we look at the level of our marketing and outreach activities by communication channel, as well as the customer awareness of various programs and services by ethnicity.

SMUD is in compliance with SD-15 Outreach and Communication.

2020 was a year like no other. And that was reflected in our outreach and communication campaigns throughout the year. As the COVID-19 pandemic unfolded and the shelter-in-place order came in mid-March, we immediately refocused our communications and outreach strategies and implementation plans. We understood immediately this was going to have a significant impact on our customers and our community. It was important that we communicate that we were here to help, offering resources and assistance. We developed a new campaign and outreach strategy and began rolling it out within a week. Messaging evolved over time but focused on programs and resources to help customers through difficult times such as flexible

payment options, the suspension of late fees and disconnects and the expanded guidelines for the EAPR discount so more customers could qualify. Additionally, we were actively promoting our programs and services, targeted to customers most likely to benefit.

As the pandemic was impacting every aspect of everyday life for our customers, we also looked for new ways to give back in 2020. Some examples include hand sanitizer drop-off to food distribution sites, clothing drive, virtual events guide, school supply drive and food supply drive.

We could be seen or heard in 15 customer-facing communication channels, including information in as many as 10 languages. We implemented over 20 marketing campaigns and participated in 772 community events, workshops, and partnerships. Over 80% of the 772 events and partnerships were cultural, ethnic and/or special populations, including LGBTQ, low income, military, seniors, disabilities, education, environmental, health & safety and STEM. See Appendices A and B.

Our activities accounted for more than 559,798,928 customer impressions in 2020. Of these, 282,138,660 were ethnic customer impressions. Just looking at TV and radio, the average SMUD customer had the opportunity to see or hear a SMUD commercial 34 times in 2020.

We look at trends related to the overall awareness of a cross-section of SMUD's programs and services, segmented by ethnicity. The segments include Asian Pacific Islander, Latinx or Hispanic, Black and White. The programs measured are Rebates, Energy Assistance Program Rate (EAPR), Greenergy, Electric Vehicle (EV) discount rate, My Energy Tools, SMUD Energy Store, SMUD Mobile App and the TOD Rate. See charts in Appendix B.

SD Requirement	Program/initiative/ policy	Purpose	Outcome	Notes
Education and tools to manage energy use	In 2020, we implemented a robust multi-channel and multi-phased communication and outreach campaign about how SMUD is here to help, which offered resources and tips for customers to manage energy use and their bills during the COVID-19 pandemic. This campaign, along with more than 20 others, promoted customer programs and services. Some of	To provide customers with the education and tools for managing their energy use and their bills, in particular in relation to the pandemic and stay-at-home orders for many customers, as well as many who may have lost jobs or were considered essential and still had to report to a	Successfully implemented campaigns that informed our customers of resources and tools available to them. Also successfully participated in over 700 community events with employees volunteering more than 16,000 hours. Awareness of most programs and tools was mostly steady from 2019 to 2020, with some increases	Three phases of the "We're here to help" campaign were implemented in 2020 to continue to keep customers informed of resources and tools available to them to help manage energy use and their bill, as well as other community resources, in particular during the pandemic.

	those included EAPR, MED Rate, My Energy Tools, EVs/Drive Electric, Go Electric rebates, SMUD Energy Store, Billing/Payment options including flexible payment arrangements, and Shade Trees.	work location.	in awareness of EAPR and self-service options. Over 80% of the 772 events and partnerships were cultural, ethnic and/or special populations, including LGBTQ, low income, military, seniors, disabilities, education, environmental, health & safety and STEM. (Appendices A, B)	
Integrated and consistent communication that recognizes unique customer segments	Implemented communications, including collateral and advertisements in as many as 10 languages and in over a dozen communication channels to ensure we reach our customers in the channel they prefer, at the time they need it and with information specifically targeted to them. We also participated in hundreds of community events to reach our customer segments.	To have consistent, integrated messages available for various customer segments, including those based on ethnicity or those who may not see our messages in mainstream communication channels.	More than 282 million ethnic customer impressions, and more than 80% of the 772 community events we participated in were cultural, ethnic and/or special populations. Special populations include arts, LGBTQ, low income, military, seniors, disabilities, education, environmental, health & safety and STEM. (see Appendices A, B).	As the pandemic was impacting every aspect of everyday life for our customers, we looked for new ways to give back in 2020, including hand sanitizer drop-off to food distribution sites, clothing drive, school supply drive, food supply drive.
Broad mix of communication channels	In 2020, we used 15 customer-facing communication channels to reach our customers, including community events, partnerships, digital, social media, broadcast and streaming media, billboards, surveys, direct mail and email. By leveraging customer data and using this broad mix of channels, we are able to reach customers in the communication channel they prefer with information that is pertinent to them. (See Appendix B)	To reach customers with our messages in the communication channels they prefer.	More than 559 million customer impressions across multiple communication channels and support of 772 community outreach events and partnerships in 2020 (see Appendices A, B).	

3) **Additional supporting information for SD-15, Outreach and Communication**

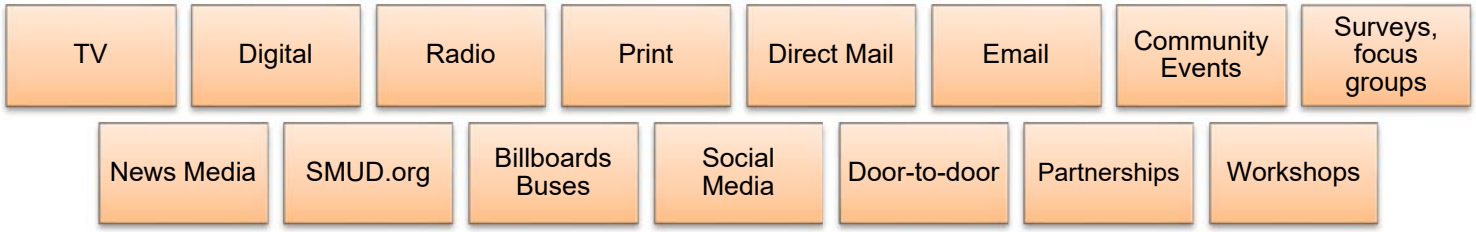
a) SMUD shall provide its customers the information, education and tools they need to best manage their energy use according to their needs.

In 2020, we developed and implemented over 20 campaigns, including:

- We're here to help/Stay well
- Bill Alerts/My Energy Tools
- Budget Billing
- Community-Owned, Not-For-Profit
- EAPR
- Economic Development
- Electric Vehicles
- EnergyHELP
- Environmental Leadership
- Go Electric rebates
- Greenergy
- HomePower
- My Business Tools
- Paperless Billing/My Account
- Powering Futures
- Refrigerator Recycling
- Safety (Car Pole, Wildfire)
- SMUD Energy Store
- Shade Trees
- Shine Neighborhood Awards
- Time-of-Day Summer reminder

b) SMUD will use an integrated and consistent communication strategy that recognizes the unique customer segments that SMUD serves.

In 2020, our marketing and communications could be seen and heard in as many as 10 languages in 15 customer-facing channels, including:



c) SMUD's communication and community outreach activities shall reflect the diversity of SMUD. SMUD shall use a broad mix of communication channels to reach all customer segments. This communication shall be designed to ensure that all groups are aware of SMUD's major decisions and programs.

With hundreds of events and sponsorships, millions of bill inserts and emails, tens of thousands of websites and multiple social media channels where customers could see our ads, and our schedule of TV, radio, and print advertisements, it's clear that we used a broad mix of channels to reach all of our customers in the channels they prefer. This includes in-language media such as TV, radio, print, digital and customer collateral in up to 10 languages or more.

These tactics account for 559,798,928 customer impressions in 2020. Of these, 282,138,660 were ethnic impressions. Just measuring TV and radio, the average SMUD customer had the opportunity to see or hear a SMUD commercial 34 times in 2020.

- 11,553,302 bill package inserts
- 772 sponsorships & events
- 12,465,445 emails
- 416 billboards, transit boards
- 36 print publications
- 6 Social Media Channels
- 1,093,418 direct mail pieces
- 27 radio stations
- 136,903 websites & app's
- 24 broadcast & cable TV stations
- 16,784 volunteer hours
- 29 Shine awards

4) **Challenges**

As mentioned throughout this report, the COVID-19 pandemic presented some unique challenges related to how we communicate and reach our customers as well as the type of information and resources we are communicating.

One clear example is the cancellation of in-person events, meetings and any forums where people gather, and information can usually be shared. We were able to meet this challenge by transitioning community meetings and events to virtual formats, while also relying on targeted communication channels such as email, direct mail and social media to communicate important information.

This is in addition to our ongoing use of a broad mix of channels and tactics to ensure SMUD messages reach our customers in the communication channels they prefer. With customer communication channel preferences always evolving, we continue to look for new opportunities and channels to reach our customers. However, channels can be limited based on our service territory and especially when trying to reach customers that prefer communications in certain languages, we have limited opportunities.

Additionally, not all programs and services are intended for all customers, which is why target marketing and segmentation is necessary to reach customers most likely to qualify and benefit from a particular program or service.

5) **Recommendation**

It is recommended that the Board accept the Monitoring Report for SD-15 Outreach and Communication.

6) **Appendices**

APPENDIX A

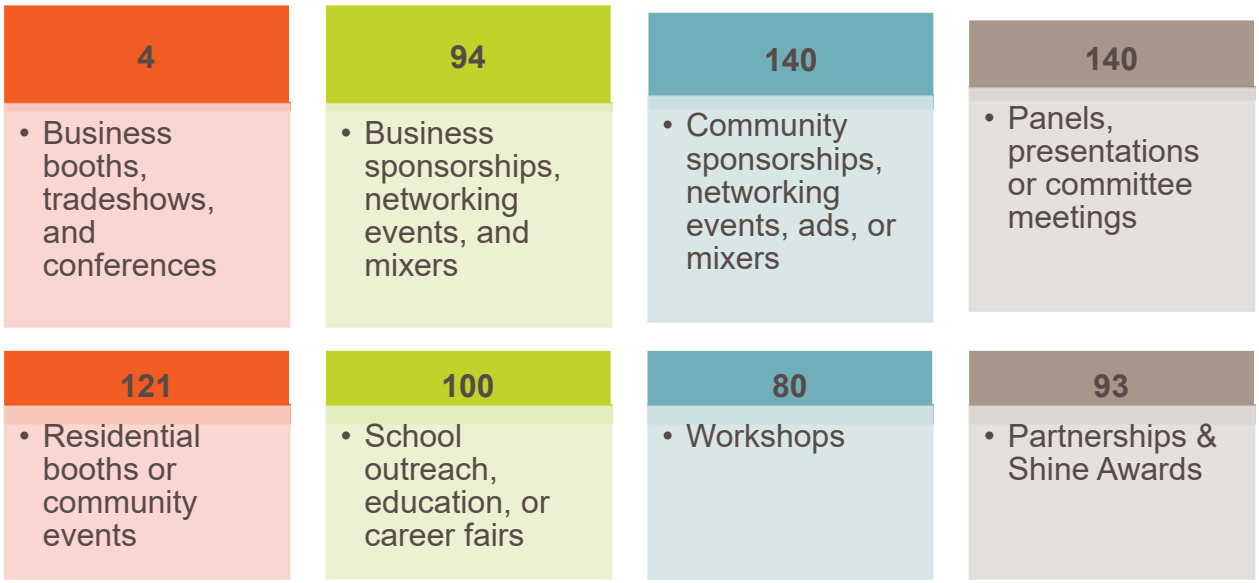
Community Outreach and Engagement

In 2020, we continued to be very active in the community through our support of efforts that improve the quality of life in our region. SMUD participated in 772 events and sponsorships, and SMUD employees volunteered 16,784 hours.

772
Total events & partnerships

16,784
Total volunteer hours

Following is the overview of total events, sponsorships, partnerships, workshops and other outreach that are included in total events and partnerships in 2020.

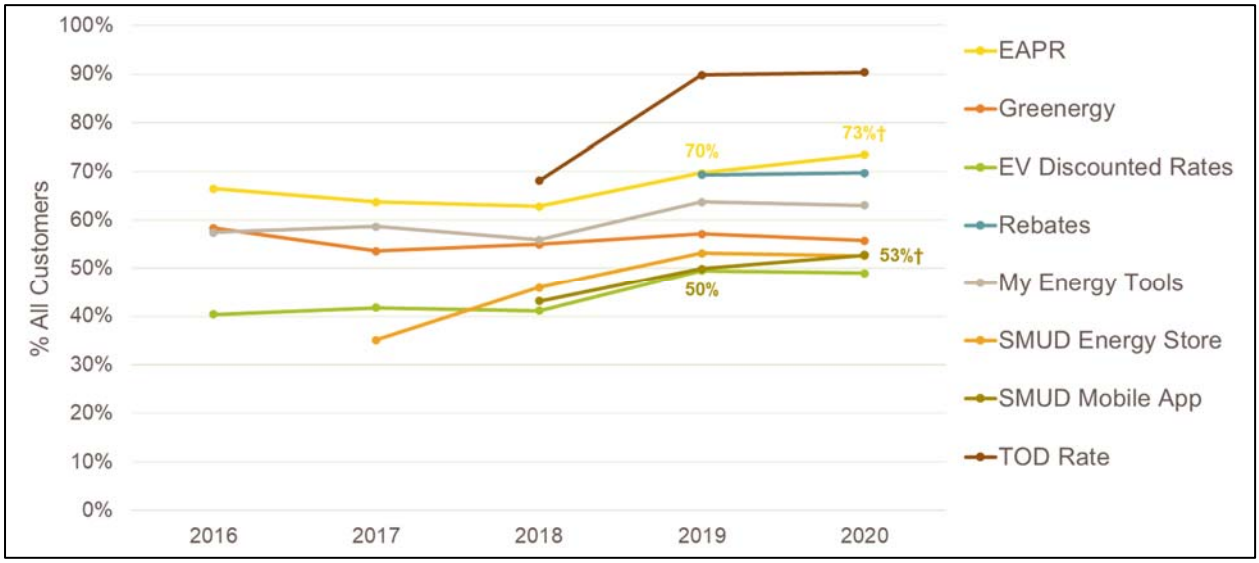


81.6% of events are cultural, ethnic and/or special populations. Special populations include arts, LGBTQ, low income, military, seniors, disabilities, education, environmental, health & safety and STEM.

APPENDIX B
Awareness of Programs by Ethnicity

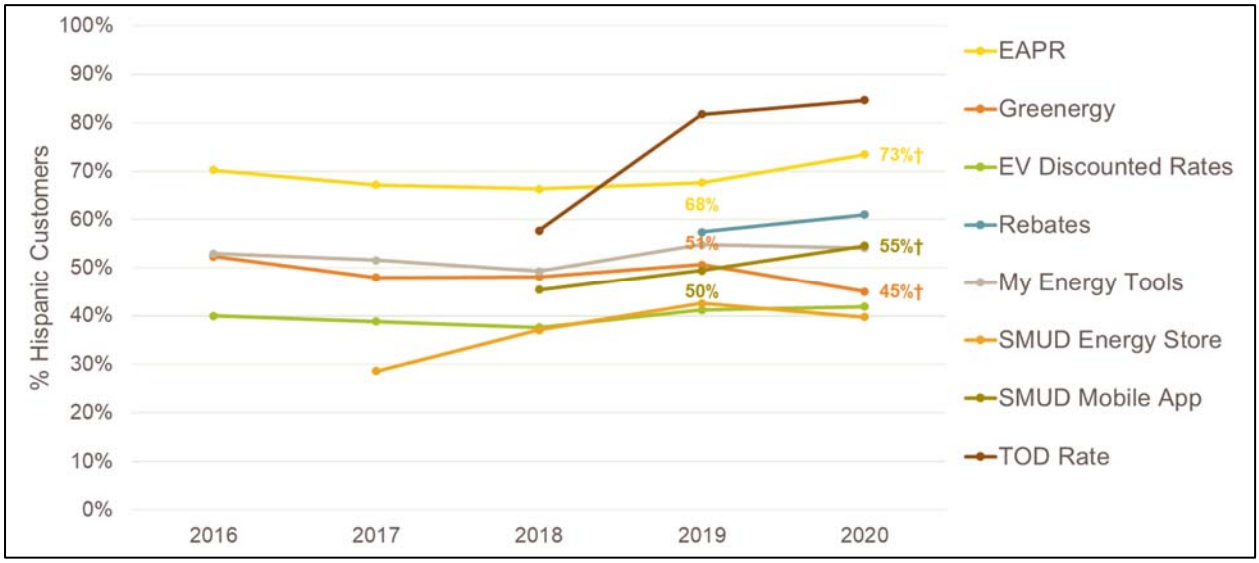
All Customers – Overall Awareness 2021

Awareness trends over past five years. Most programs were flat year over year, but we did see increases in awareness of EAPR and the SMUD App.



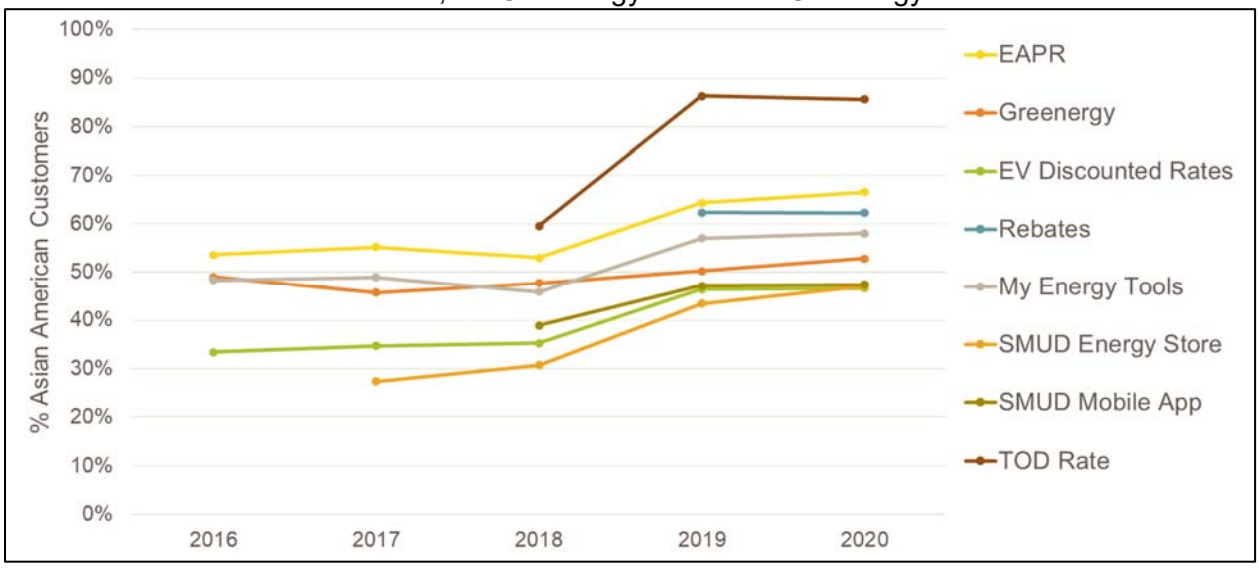
Hispanic or Latinx – Overall Awareness 2021

Awareness trends over last five years among Latinx or Hispanic customers. Increases in awareness for EAPR and the SMUD App, and a decrease for Greenergy.



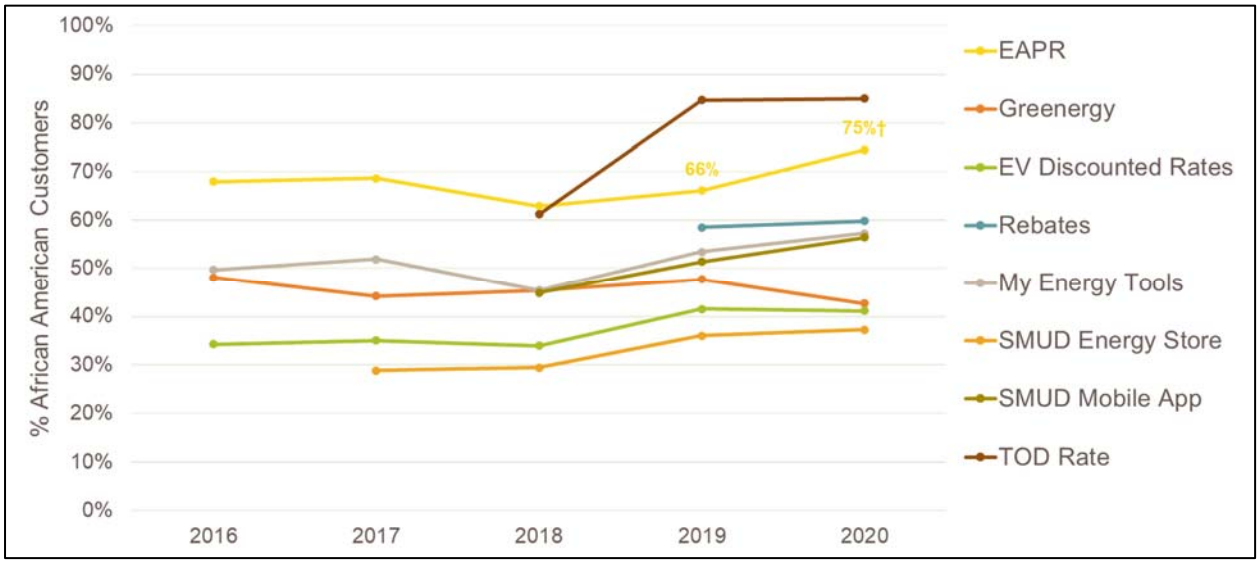
Asian Pacific Islander – Overall Awareness 2021

For Asian Pacific Islander customers, awareness of most programs was steady with slight increases in awareness for EAPR, SMUD Energy Store and Greenergy.



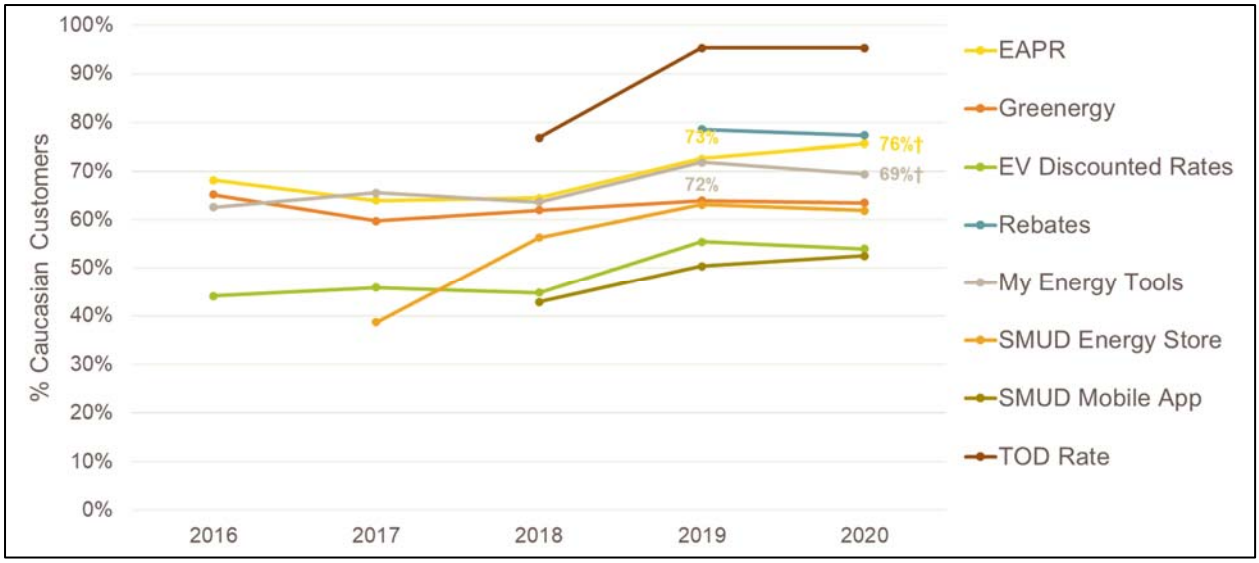
Black – Overall Awareness 2021

For Black customers, awareness was flat for most programs year-over-year. The exceptions are EAPR which had an increase and Greenergy which saw a decrease.



White – Overall Awareness 2021

Among White customers, we saw an increase in awareness of EAPR and a decrease for My Energy Tools. All other programs were steady.



SSS No.
BOD 2021-001

BOARD AGENDA ITEM
STAFFING SUMMARY SHEET

Committee Meeting & Date
Policy 2021
Board Meeting Date
2021

TO		TO	
1.	Jennifer Davidson	6.	
2.	Stephen Clemons	7.	
3.		8.	
4.		9.	**Legal**
5.		10.	**CEO & General Manager**

Consent Calendar		**Yes**	x	**No** *If no, schedule a dry run presentation.*	**Budgeted**		**Yes**		**No** *(If no, explain in Cost/Budgeted section.)*

FROM (IPR)	DEPARTMENT	MAIL STOP	EXT.	DATE SENT
Nancy Bui-Thompson / Donna Lofton	Board Office	B307	5079	12/22/2020

NARRATIVE:

Requested Action: Enable the Board of Directors and Executive Staff an opportunity to review the Board Work Plan.

Summary: The Board President reviews the Board Work Plan at the Policy Committee meeting to ensure agenda items support the work of the Board.

Board Policy: *(Number & Title)* This review of the work plan supports GP-6 Role of the Board President which states that the Board President shall give progress reports on the Board's work plan.

Benefits: Reviewing the Work Plan allows the Board members and Executive staff to make changes to the Work Plan and Parking Lot items as necessary.

Cost/Budgeted: N/A

Alternatives: Not review the Work Plan at this time

Affected Parties: Board and Executive staff

Coordination: Donna Lofton

Presenter: Nancy Bui-Thompson, Board President

Additional Links:

SUBJECT	ITEM NO. ***(FOR LEGAL USE ONLY)***
Board Work Plan	

ITEMS SUBMITTED AFTER DEADLINE WILL BE POSTPONED UNTIL NEXT MEETING.

SSS No.	Committee Meeting & Date
BOD 2021-004	Policy 2021
	Board Meeting Date: N/A

BOARD AGENDA ITEM
STAFFING SUMMARY SHEET

TO		TO	
1.	Stephen Clemons	6.	
2.	Jennifer Davidson	7.	
3.		8.	
4.		9.	**Legal**
5.		10.	**CEO & General Manager**

Consent Calendar		**Yes**	x	**No** *If no, schedule a dry run presentation.*	**Budgeted**		**Yes**		**No** *(If no, explain in Cost/Budgeted section.)*

FROM (IPR)	DEPARTMENT	MAIL STOP	EXT.	DATE SENT
Heidi Sanborn / Donna Lofton	Board Office	B307	5079	12/22/20

NARRATIVE:

Requested Action: Provide a summary of committee direction from the Board to Staff.

Summary: During a Board discussion at the January 2017 Policy Committee, the Board requested having an on-going opportunity to do a wrap up period at the end of each committee meeting to summarize various Boardmember suggestions and requests that were made at the meeting in an effort to make clear the will of the Board. The Committee Chair will summarize Board member requests that come out of the committee presentations for this meeting.

Board Policy: *(Number & Title)* GP-4 Agenda Planning states the Board will focus on the results the Board wants the organization to achieve.

Benefits: Having an agendized opportunity to summarize the Board's requests and suggestions that arise during the committee meeting will help clarify what the will of the Board.

Cost/Budgeted: N/A

Alternatives: Not summarize the Board's requests at this meeting.

Affected Parties: Board of Directors and Executive Staff

Coordination: Donna Lofton, Special Assistant to the Board

Presenter: Heidi Sanborn, Policy Committee Chair

Additional Links:

SUBJECT	ITEM NO. ***(FOR LEGAL USE ONLY)***
Summary of Committee Direction	

ITEMS SUBMITTED AFTER DEADLINE WILL BE POSTPONED UNTIL NEXT MEETING.