Special Meeting
Governing Board of Sweetwater Authority
AGENDA

Saturday, December 14, 2024
9:00 a.m.
Sweetwater Authority
505 Garrett Avenue
Chula Vista, CA 91910

Notice: This meeting will be held at the above date, time, and location, and Sweetwater Authority Board members and members of the public may attend in person. Some Sweetwater Authority Board members may attend and participate in the meeting virtually pursuant to the Brown Act (Gov. Code § 54953). As a convenience to the public, the Sweetwater Authority provides a call-in option and internet-based option for members of the public to virtually observe and provide public comments at its meetings. Additional details on in-person and virtual public participation are below. Please note that, in the event of a disruption in the call-in option or internet-based option, the meeting will continue unless otherwise required by law, such as when a Director is attending the meeting virtually pursuant to certain provisions of the Brown Act.

To join via Zoom Webinar from a computer, tablet, or smartphone, click on the link below:
https://zoom.us/j/91458023440

To join this meeting via telephone, please dial:
1-669-900-6833 or 1-253-215-8782
Meeting ID: 914 5802 3440
The Zoom Webinar link and telephone number will be active approximately 15 minutes prior to the meeting start time.

If you are unable to access the meeting using this call-in information, please contact the Assistant Board Secretary at (619) 409-6704 for assistance.

INSTRUCTIONS FOR PUBLIC COMMENT

Members of the public may address the Board regarding items listed on the agenda. Speakers are asked to state name, address, and topic, and to observe a time limit of three (3) minutes each. Public comment on a single topic is limited to twenty (20) minutes. (Note: Written comments will no longer be read aloud during the meeting.)

Making Public Comment for Those Attending In-Person:
Anyone desiring to address the Governing Board regarding an item listed on the agenda is asked to fill out a speaker's slip and present it to the Board Chair or the Secretary. Request to Speak forms are

available at the meeting location.

Making Public Comment for Those Not Attending In-Person:
The Chair will inquire if there are any comments from the public regarding any items listed on the agenda prior to Board discussion. Members of the public may request to speak and make comments as follows:

- Via Zoom Webinar, click on “Raise Hand” button. This will notify the moderator that you wish to speak during Oral Communication or during a specific item on the agenda.
- Via phone, you can raise your hand by pressing *9 to notify the moderator that you wish to speak during the current item.

Any person with a disability who requires a modification or accommodation in order to participate in a meeting should direct such request to the Board Secretary at (619) 409-6703 at least twenty-four (24) hours before the meeting, if possible.

UNDERSTANDING THE MEETING AGENDA

Action Calendar Agenda Items on the Action Agenda call for discussion and action by the Board. All items are placed on the Agenda so that the Board may discuss and take action on the item if the Board is so inclined, including items listed for information.

This agenda was posted at least twenty-four (24) hours before the meeting in a location freely accessible to the Public on the exterior bulletin board at the main entrance to the Authority’s office and it is also posted on the Authority’s website at www.sweetwater.org. No action may be taken on any item not appearing on the posted agenda, except as provided by California Government Code Section 54954.2. Any writings or documents provided to a majority of the members of

the Sweetwater Authority Governing Board regarding any item on this agenda will be made available for public inspection at the Authority Administration Office, located at 505 Garrett Avenue, Chula Vista, CA 91910, during normal business hours. Upon request, this agenda will be made available in appropriate alternative formats to persons with disabilities, as required by Section 202 of the Americans with Disabilities Act of 1990. Any person with a disability who requires a modification or accommodation in order to participate in a meeting should direct such request to the Board Secretary at (619) 409-6703 at least twenty-four (24) hours before the meeting, if possible.

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SWEETWATER AUTHORITY

Governing Board
December 14, 2024

Sweetwater Reservoir Floating Photovoltaic Project Environmental Review Next Steps

RECOMMENDATION
Staff recommends that the Governing Board authorize the General Manager to request proposals from the Authority's on-call environmental consulting firms to assist with the preparation of an Environmental Impact Report for the Sweetwater Reservoir Floating Photovoltaic Project.

OVERVIEW

In the last decade, Sweetwater Authority (Authority) has been developing policies and strategies to become more sustainable while keeping its water rates low for its customers. Projects such as the installation of a 4-acre photovoltaic system at the Richard A. Reynolds Desalination Plant and the installation of a hydroelectric turbine at the Robert A. Perdue Water Treatment Plant (WTP) were implemented to reduce energy costs and the agency's carbon footprint. Consistent with the Authority's Strategic Plan Goals and Objectives, the Board approved a term sheet between the Authority and Noria Energy on June 28, 2023. In summary, the term sheet established certain conditions for pursuing and studying the Sweetwater Reservoir Floating Photovoltaic (FPV), which would include the installation of an FPV array and supporting facilities at the reservoir and near the WTP, as shown and described in Attachments 1 and 2 (Proposed Project). Per the term sheet, Noria Energy was to assist with the application process for the San Diego Gas & Electric (SDG&E) Renewable Energy Self-Generation, Bill Credit Transfer (RES-BCT) Program, provide technical support, and perform preliminary design, while the Authority would begin preparation of documentation compliant with the California Environmental Quality Act (CEQA), including the preparation of an Initial Study and supporting technical documentation.

Initial Study / Environmental Assessments

On September 27, 2023, the Board approved a proposal from its on-call environmental consultant, WSP USA Environment and Infrastructure (WSP), to prepare CEQA documentation and supporting technical studies for the Proposed Project. The Authority received Noria's Design Alternatives in January 2024. At that time, WSP started its environmental analysis. WSP provided initial draft documents to Authority staff between April and June 2024 and revised draft documents on December 6, 2024; those draft documents are attached to this memorandum (Attachment 2). WSP's scope of work included preparing an Administrative Draft Initial Study for the Proposed Project and four technical assessments, including a Biological Resources Technical Report, a Cultural Resources Technical Report, a Visual Assessment, and a Water Quality Technical Memorandum. The Administrative Draft Initial Study includes a Draft Project Description for the Proposed Project and a Draft Environmental Checklist that discusses environmental topics of interest and the potential project impact level on those environmental topics. The technical assessments address the potential effects the Proposed Project may have on the environment and recommend mitigation measures, where applicable, to reduce any environmental effect to less than significant.

Project Description. The Proposed Project is located at Sweetwater Reservoir. It includes a 0.2-acre Pilot floating photovoltaic (FPV) system based on Noria's AquaPhi™ technology or similar rotating technology and a larger FPV system based on two potential design alternatives, a 9.4-acre rectangular FPV array ("Design Alternative 1"), or a 7.4-acre FPV made of multiple rotating islands ("Design Alternative 2"). The total reservoir surface area needed to accommodate the FPV system would be between 7.6 and 9.6 acres, and depending on water levels at the reservoir, the FPV system would

cover between 1.3 and 3.6 percent of the reservoir's surface area. Above-ground facilities would include an approximately 0.1-acre concrete equipment pad east of the WTP facilities. While discussions of a battery energy storage system (BESS) have occurred to complement the Proposed Project and increase overall net savings, the BESS has not yet been approved as a Project Component. For more information on the Proposed Project, please refer to *Section 9. Project Description of the Draft Initial Study* (Attachment 2).

Environmental Assessments

Draft Biological Resources Technical Report (BRTR). The Draft BRTR prepared for the Proposed Project evaluated biological resources in a Study Area of approximately 120 acres to ensure biological resources in the Project and surrounding areas are discussed and assessed properly. The assessment included discussions on the methods of analysis, data sources, applicable regulations, and detailed evaluations of vegetation communities, habitats, wetlands and waters, sensitive wildlife and plant species, wildlife corridors, and other sensitive biological resources that may occur within the Study Area. The Draft BRTR identified relatively small impacts to vegetation communities and open waters as the Proposed FPV would only cover approximately 1.3 to 3.6 percent of the reservoir surface area, depending on reservoir levels. The Draft BRTR also discussed impacts resulting from avian collisions, indicating that it is unlikely that bird strikes on the proposed FPV array would be significant. Other potential issues, including wildlife electrocution or solar flux, are not expected to occur, while entrapment of birds could be prevented or mitigated by following suggested mitigation measures and recommendations. Mitigation for habitat losses could be accomplished by conducting off-site restoration and enhancement. The Draft BRTR recommends multiple mitigation measures to ensure the Proposed Project impacts to biological resources are less than significant, after implementation of mitigation measures. The Draft BRTR is attached to the Administrative Draft Initial Study.

Draft Cultural Resource Assessment (CRA). WSP prepared a Draft CRA, which included a review of historic maps, a cultural resources records search from the South Coastal Information Center of the California Historical Resources Information System, and consultation with the Native American Heritage Commission (NAHC). Records indicated that multiple studies have been conducted within a 1-mile radius of the Project, with at least eight studies involving portions of the Proposed Project. The CRA identified 53 previously recorded cultural resources within one mile of the Project site, however, none of these resources were present within the Project site. Similarly, no known human remains have been documented or are expected to occur within the Proposed Project site. As part of the CRA and in coordination with archaeologists and Kumeyaay Native American Tribal representatives, mitigation measures have been developed in order to minimize and mitigate impacts to Cultural Resources or Tribal Resources. This includes archaeological sensitivity training of construction crews and monitoring by a qualified archaeologist and a Native American of Kumeyaay descent. Given the confidential nature of some of the data discussed in the Draft CRA, the Draft CRA is not attached to the Administrative Draft Initial Study. A non-confidential version of the CRA document will become available at a later time.

Draft Water Quality Technical Memorandum (WQ Memo). The WQ Memo was prepared by WSP to assess potential impacts on water quality at Sweetwater Reservoir and to provide recommendations to mitigate or avoid such impacts, as it relates to questions in the CEQA Environmental Checklist, such as "Would the Project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?". The WQ Memo is based on WSP's experience of monitoring lakes and peer-reviewed literature of studies conducted on existing FPV systems, where parameters such as temperature changes in the water column or metal leaching where studied. The WQ memo concluded that there would be minimal concerns with adverse water quality impacts to Sweetwater Reservoir with the size installation of the FPV system that is currently planned and that there would be no violations in water quality because the currently proposed FPV system coverage would not be enough to result in an impact to lake hydrodynamics, internal cycling, or contribute levels of leachate at concentrations of concern.

Nevertheless, in an abundance of caution, multiple recommendations/mitigation measures were developed to ensure that impacts to water quality standards do not occur as a result of the proposed FPV system, including the following:

1. Recommendation No. 1. Comply with NSF-61 Requirements when applicable
2. Recommendation No. 2. Consider the use of PFAS-Free Solar Panels
3. Recommendation No. 3. Develop a Water Quality Monitoring Plan
4. Recommendation No. 4. Conduct Bio-foul and Quagga Mussel Inspections
5. Recommendation No. 5. Develop and Implement an Avian Mitigation Plan
6. Recommendation No. 6. Develop and Implement a Maintenance and Monitoring Program

Draft Aesthetics and Visual Resources Study (AVRS). The goal of the Draft AVRS is to assess impacts on visual resources, per CEQA. The Draft AVRS and photo simulations were based on design data provided by Noria Energy and photographs taken of the Proposed Project site and surrounding vicinity. According to the Draft AVRS, there are no impacts to scenic vistas or scenic qualities protected under the Sweetwater Community Plan or the Spring Valley Community Plan. Per the assessment, the view of the FPV system would be most visible from certain locations on the north side of the reservoir, which is not publicly accessible. While views of the proposed FPV system are also provided along the south side of the reservoir, the proposed FPV system generally blends into the background views, particularly at elevations close to the water surface. At greater elevations, such as the Tiki Hut located at Cactus Hill/Southern Trail, more surface area of the solar panels is visible to the viewer and could potentially be distracting to the view. However, the color of the solar panels would minimize the contrast between the water surface and reduces potential impacts.

Additionally, given the presence of existing development along the north shoreline (e.g., Perdue WTP), the solar panels do not present incompatible uses/development. The proposed Project would not substantially obscure or distract from the character-defining features of the views along the south shoreline of the reservoir. While all potential impacts related to aesthetics and visual resources are considered less than significant, recommendations are also provided, including coating with anti-reflective material all panels, potentially “stippling” the panels, and “light trapping.”

Next Steps

FPV arrays on drinking water reservoirs are becoming more common in other countries, including Japan, Germany, Singapore, and China. A few examples exist in the United States (Utah, New Jersey, and Upstate New York). FPV arrays on drinking water reservoirs have not been built yet in California. The Proposed Project has the potential to mitigate up to 67 percent of the Authority’s carbon footprint and significantly help reduce the Authority’s energy costs by approximately $500,000 per year. Staff recommends continuing to pursue the environmental review of the Project. WSP’s preliminary conclusions indicate that many of the environmental effects that the Proposed Project could have on the reservoir and vicinity are less than significant, or can be mitigated to levels less than significant if the identified mitigation measures are implemented. In an abundance of caution, staff recommends the preparation of an Environmental Impact Report (EIR) to comply with CEQA. An EIR would satisfy any CEQA needs, including conducting scoping meetings with the community and preparing feasible alternatives. An EIR would also provide a solid foundation for the following permitting phase, assuming the Board certifies the EIR. Preparation of an EIR would take approximately 12 months. Staff requests that the Board authorize the General Manager to request proposals from the Authority’s on-call environmental consulting firms to assist with the preparation of an EIR for the Proposed Project. Staff will return to the Board for the award of a task order if the amount exceeds the General Manager’s signing authority.

Alternatively, the Board could approve the continuation of the ongoing assessment and, *assuming that nothing changes in terms of impact level on any of the environmental topics that would trigger the need for an EIR*, the Authority could

prepare and circulate a Notice of Intent (NOI) to Adopt a Mitigated Negative Declaration (MND). If the Board decides to proceed with the preparation of a NOI to adopt an MND, the Authority may receive negative feedback from the public and potentially from the permitting and CEQA Responsible Agencies, potentially delaying the permitting process and implementation of the Proposed Project. Given the public and regulatory agency feedback provided on the project up to today, this option is not recommended by Authority staff.

FISCAL IMPACT

The FY 2024-25 Budget Operating Expense line item 10-40-400-5650 Engineering General – Consulting includes a total of $125,000 for environmental tasks related to the Sweetwater Reservoir Floating Photovoltaic Project.

Sweetwater Reservoir Floating Photovoltaic Project – Environmental Tasks	
WSP FY 2023-24 actual costs [1)]	$ 48,721.69
WSP FY 2024-25 estimated costs [2)]	$25,000.00
EIR CEQA task FY 2024-25 estimated costs [2)]	$100,000.00
Total estimated cost	$173,721.69

1) Funded in the prior fiscal year's budget.
2) Current funding in the amount of $125,0000 should be sufficient for the prospective costs. However, if additional funding is needed, then those funds would be requested with the FY 2025-26 Budget.

Noria Energy's term sheet will expire in December 2024. Staff is not recommending a renewal/extension. Options to continue the development of this project will be explored as the environmental process continues.

OPTIONS

1. Authorize the General Manager to request proposals from the Authority's on-call environmental consulting firms to assist with the preparation of an Environmental Impact Report for the Sweetwater Reservoir Floating Photovoltaic Project.

2. Authorize WSP USA Environment and Infrastructure to continue with the completion of the Initial Study and, assuming that nothing changes in terms of impact level on any of the environmental topics that would trigger the need for an Environmental Impact Report, circulate a Notice of Intent to Adopt a Mitigated Negative Declaration.

3. Other direction, as provided by the Governing Board.

Staff Contact:
Carlos Quintero, General Manager
Roberto Yano, Assistant General Manager
Erick Del Bosque, Director of Engineering and Operations
Israel Marquez, Interim Engineering Manager – Water Resources and Environmental

SUPPORTING INFORMATION

Attachments

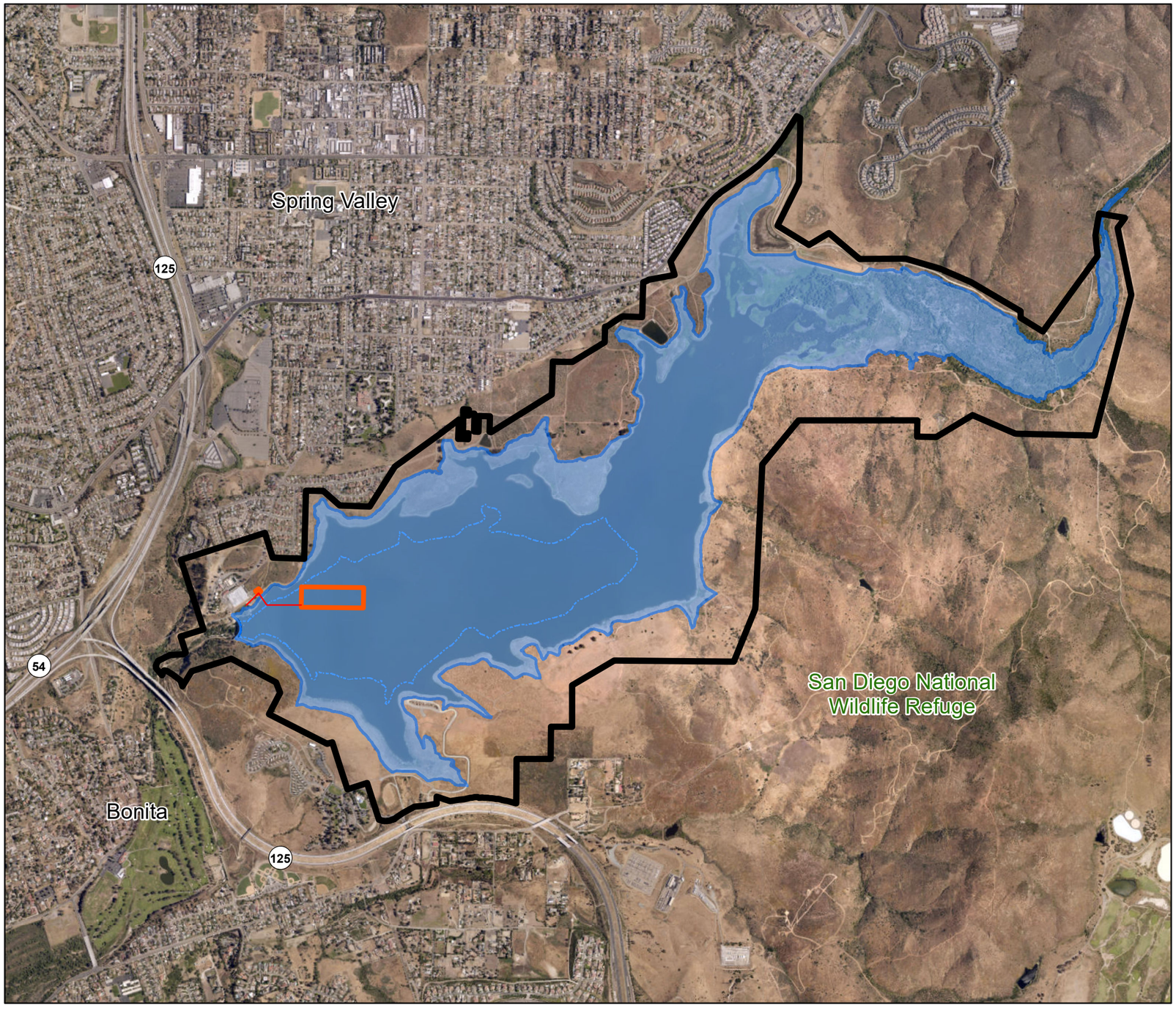
1. Project Location Maps
2. Draft CEQA Initial Study
3. Staff Presentation

Strategic Plan

- Strategic Plan Goal 3 Financial Viability - Ensure long term financial viability of the agency through best practices, operational efficiency, and maximizing assets.
    - Objective FV6: Explore innovative opportunities for leveraging Authority assets to reduce financial burden on Authority ratepayers
        - Task 2: Consider lease agreements (e.g. renewable energy projects) public/private partnerships to leverage Authority assets to generate revenue.
- Strategic Plan Goal 7 Environmental Stewardship - Provide core services while maintaining a balanced approach to human and environmental needs
    - Objective ES2: Develop strategies to achieve carbon neutrality
        - Task 1: Complete environmental Initial Study for the potential installation of an FPV array at Sweetwater Reservoir;
        - Task 2: Seek additional approvals from Governing Board if additional environmental documentation is needed for the potential FPV at Sweetwater Reservoir.

Past Board Actions

September 27, 2023	The Governing Board approved a proposal from its on-call environmental consultant, WSP USA Environment and Infrastructure, to prepare CEQA documentation and supporting technical studies.
June 28, 2023	The Governing Board approved a term sheet between the Authority and Noria Energy, establishing certain conditions to pursue the Sweetwater Reservoir Floating Photovoltaic Project.



Sweetwater Reservoir Floating Photovoltaic Project

Legend

- Project Area
- Property Boundary
- Lake Boundary (239')
- Minimum Pool (196')

DRAFT

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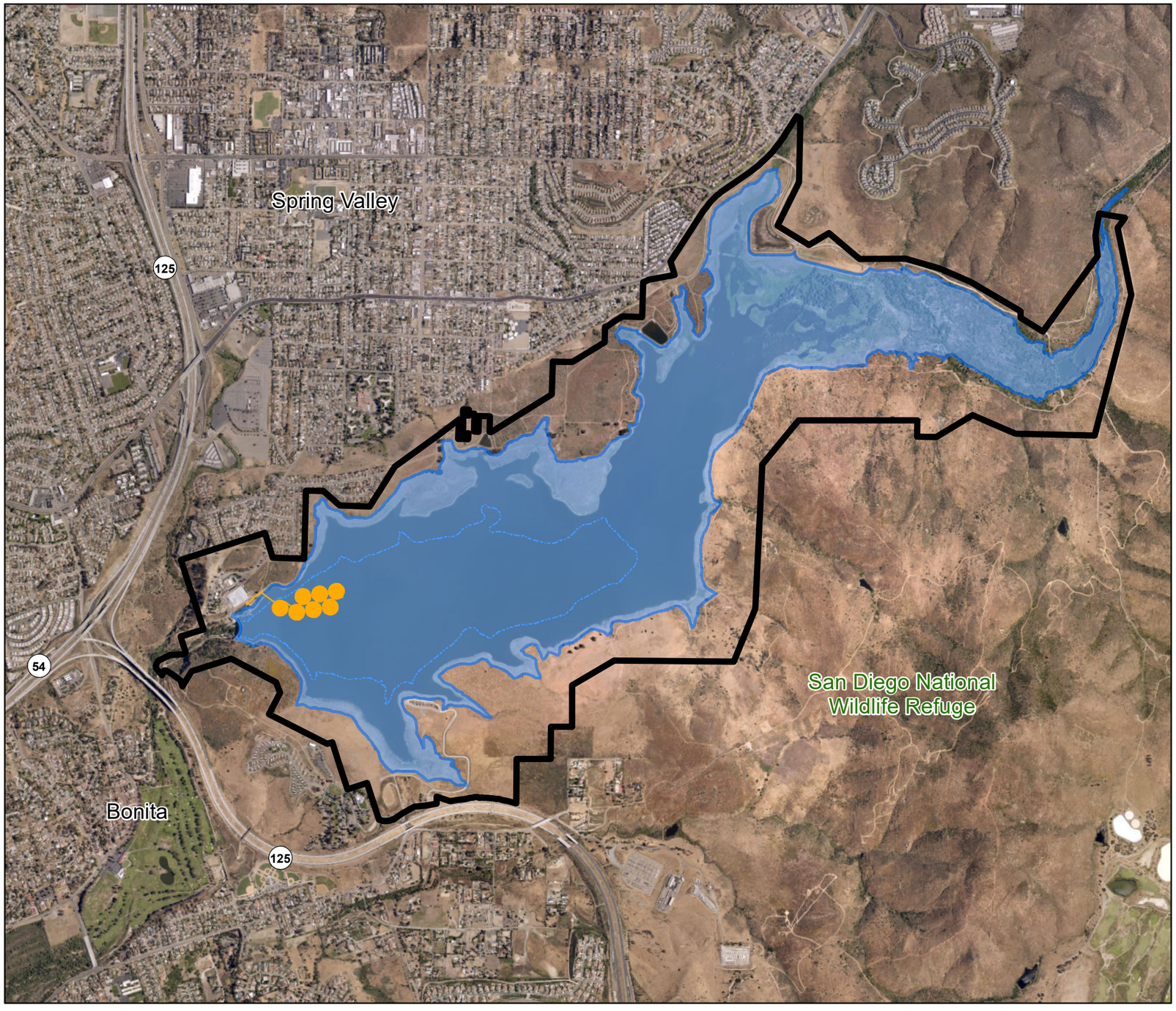
0 0.5 1

Miles

1 inch = 2,000 feet



Sweetwater Reservoir Floating
Photovoltaic Project

Legend

- Project Area (Alt 2)
- Property Boundary
- Lake Boundary (239')
- Minimum Pool (196')

DRAFT

N

0 0.5 1

Miles

1 inch = 2,000 feet

Draft Initial Study
Sweetwater Reservoir
Floating Photovoltaic System Project

State Clearinghouse Number
TBD

Sweetwater Authority
505 Garrett Avenue
Chula Vista, California 91910

December 2024

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ATTACHMENTS:

Attachment 1. Draft Aesthetics and Visual Resources Study for the Proposed Sweetwater Reservoir Floating Photovoltaic System Project (December 2024)

Attachment 2. Draft Biological Resources Technical Report for the Sweetwater Reservoir Floating Photovoltaic System Project (November 2024)

Attachment 3. Draft Cultural Resources Assessment of the Sweetwater Reservoir Floating Photovoltaic Project (July 2024)

Attachment 4. Draft Technical Memorandum Assessing the Influence of Floating Solar Photovoltaic Systems on Water Quality in the Sweetwater Reservoir (December 2024)

ACRONYMS AND ABBREVIATIONS

AB	Assembly Bill
AC	Alternate Current
AF	acre-foot
AMSL	above mean sea level
AQIA	Air Quality Impact Assessment
BMP	best management practice
CAAQS	California Ambient Air Quality Standards
Cal EPA	California Environmental Protection Agency
CAL FIRE	California Department of Forestry and Fire Protection
Caltrans	California Department of Transportation
CAP	Climate Action Plan
CARB	California Air Resources Board
CDC	California Department of Conservation
CDF	California Department of Forestry
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CFC	chlorofluorocarbon
CGS	California Geological Survey
CH_4	Methane
CHRIS	California Historical Resources Information System
CNEL	Community Noise Equivalent Level
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CPA	Community Planning Area
CUPA	Certified Unified Program Agency
CWA	Clean Water Act
dB	decibel
dBA	A-weighted decibel
DC	Direct Current
DPR	Department of Parks and Recreation
DSOD	Department of Safety of Dams
DTSC	Department of Toxic Substances Control
EIR	Environmental Impact Report
EO	Executive Order
FEMA	Federal Emergency Management Agency
FPD	Fire Protection District
FPV	floating photovoltaic
GHG	greenhouse gas
GWh	gigawatt hour
HA	hydrologic area
HCFC	hydro chlorofluorocarbon
HDPE	High-Density Polyethylene
HSA	hydrologic subarea
HU	hydrologic unit
I-	Interstate

in/sec	inches per second
IRP	Integrated Resource Plan
IS	Initial Study
kV	kilovolt
kW	kilowatt
LRA	Local Responsibility Area
MM	mitigation measure
MND	Mitigated Negative Declaration
MRZ	Mineral Resources Zone
MSCP	Multiple Species Conservation Plan
MT	metric ton
MW	megawatt
MWh	megawatt-hour
N_2O	nitrous oxide
NAHC	Native American Heritage Commission
NCCP	Natural Community Conservation Plan
NFPA	National Fire Protection Association
NO_2	nitrogen dioxide
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
O_3	ozone
PFAS	per- and polyfluoroalkyl substances
PM_{10}	particulate matter with a diameter of less than 10 microns
$PM_{2.5}$	particulate matter with a diameter of less than 2.5 microns
PPA	Power Purchase Agreement
PRC	Public Resources Code
RAQS	Regional Air Quality Strategy
RES-BCT	Renewable Energy Self-Generation, Bill Credit Transfer
RPS	Renewables Portfolio Standard
RWQCB	Regional Water Quality Control Board
SANDAG	San Diego Association of Governments
SB	Seante Bill
SCH	State Clearinghouse
SCIC	South Coastal Information Center
SDAB	San Diego Air Basin
SDAPCD	San Diego Air Pollution Control District
SDCWA	San Diego County Water Authority
SDG&E	San Diego Gas and Electric
SDP	Services Delivery Point
SEIR	Supplemental Environmental Impact Report
SLF	Sacred Lands File
SMARA	Surface Mining and Reclamation Act
SO_2	sulfur dioxide
SR-	State Route
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	toxic air contaminate

UL	Underwriters Laboratories
URDS	Urban Runoff Diversion System
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VMT	vehicle miles traveled
WTP	Water Treatment Plant

1. PROJECT TITLE:

Sweetwater Reservoir Floating Photovoltaic System Project

2. LEAD AGENCY NAME AND ADDRESS:

Sweetwater Authority (Authority), 505 Garrett Avenue, Chula Vista, California, 91910.

3. CONTACT PERSON & PHONE:

Israel Marquez, Land and Environmental Manager
imarquez@sweetwater.org, (619) 409-6759

4. PROJECT LOCATION:

The Project site is located on the Sweetwater Reservoir near the Robert A. Perdue Water Treatment Plant (Perdue WTP). The Sweetwater Reservoir is located in San Diego County, approximately 7 miles upstream from the San Diego Bay, and surrounded by the unincorporated communities of Spring Valley to the north, and Bonita and Sunnyside to the south and west. The U.S. Fish and Wildlife Service (USFWS) San Diego National Wildlife Refuge (Refuge) is located on the east side of the Reservoir.

5. PROJECT SPONSOR'S NAME AND ADDRESS:

Sweetwater Authority, 505 Garrett Avenue, Chula Vista, California, 91910.

6. GENERAL PLAN DESIGNATION:

The Project site is located within the boundaries of the Sweetwater Community Plan and Spring Valley Community Plan. The Land Use Map associated with the Sweetwater Community Plan and the Spring Valley Community Plan of the San Diego County General Plan designates the entire area surrounding the Sweetwater Reservoir as Public Agency Lands (County of San Diego 2020).

7. ZONING:

According to the County of San Diego Zoning and General Plan Map, the entire areas surrounding the Sweetwater Reservoir is zoned as Public Agency Land (County of San Diego 2021c).

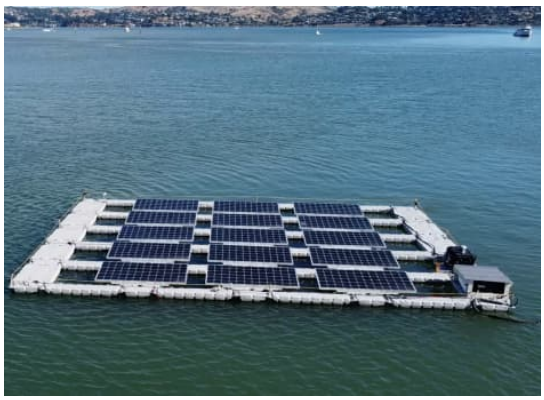
8. PREVIOUS ENVIRONMENTAL DOCUMENTS:

The Authority has not prepared any previous CEQA-compliant environmental documentation for the proposed Project. In the vicinity of the Project area, the Authority previously prepared the Final Environmental Impact Report (EIR) for the Robert A. Perdue Water Treatment Plant Master Plan for Future Plant Activities (State Clearinghouse [SCH] No. 2004011048), which was certified by the Sweetwater Authority Governing Board on July 26, 2006. This EIR did not assess the proposed Project but did address a long-term development plan for the area within the vicinity of

the water treatment facility. The Authority also prepared the Final EIR and subsequent CEQA addenda for the Sweetwater Reservoir Urban Runoff Diversion System Phase I for Future Plant Activities (SCH No. 1985042404), which was certified by the Sweetwater Authority Governing Board on October 29, 1987. This EIR did not assess the proposed Project but did address the construction of a diversion system designed to capture poor-quality, first-storm urban runoff and dry-season low-flow waters to divert to treatment ponds or around the reservoir. Additionally, the Authority previously prepared the Final Initial Study / Mitigated Negative Declaration (IS/MND) for the Sweetwater Dam and South Dike Improvement Project (SCH No. 2017111066), which was adopted by the Sweetwater Authority Governing Board on January 24, 2018. This IS/MND did not assess the proposed Project but did describe the existing setting surrounding the Sweetwater Reservoir and addressed improvements to the Sweetwater Dam and the South Dike. These documents have been used along with Project-specific technical reports to describe the existing conditions within the vicinity of the Project site.

9. PROJECT DESCRIPTION:

The Authority, as a Lead Agency pursuant to the California Environmental Quality Act (CEQA), is proposing the installation of a proposed floating photovoltaic (FPV) system on the Sweetwater Reservoir. As described in further detail below, the system would be installed in two phases:



FPV systems are solar arrays that float atop buoyant high density polyethylene (HDPE). These systems are scalable and can be anchored in place or remotely controlled with autonomous tracking.

- **AquaPhi™ Pilot:** A pilot solar array that provides autonomous tracking of the sun for increased energy production. This pilot array would cover less than 0.2 acre and provide 100 kilowatts (kW) of solar capacity. This pilot solar array would help inform decision making regarding the design of the Renewable Energy Self-Generation, Bill Credit Transfer (RES-BCT) system.

- **RES-BCT System:** A solar array covering up to 9.4 acres and providing up to a maximum of approximately 3.7 megawatts (MW) of solar energy production. This solar array would help the Authority meet its sustainability goals and would be used to offset existing Authority energy use at the Perdue WTP as well as other facilities owned and operated by the Authority.

Sweetwater Authority and the Sweetwater Reservoir

The Authority is a public agency and water purveyor in the South Bay area of San Diego County serving a total of approximately 200,000 customers in National City, Bonita, and the western and central portions Chula Vista (Authority 2023). The mission of the Authority is to provide its current and future customers with a safe, and reliable water supply through the use

of the best available technology, sound management practices, public participation, and a balanced approach to human and environmental needs (Authority 2024).

The Authority obtains its water supply from four sources: treated and untreated water from the San Diego County Water Authority (SDCWA); surface runoff from the Sweetwater River watershed impounded at Sweetwater Reservoir and Loveland Reservoir; the National City wells field; and the Richard A. Reynolds Desalination Facility (Desalination Facility), a brackish groundwater desalination facility.


The Sweetwater Reservoir Riding and Hiking Trail (left) is a 5-mile trail that runs along the south side of Sweetwater Reservoir and is popular for hikers, trail runners, equestrian users, and mountain bikers. Sweetwater Summit Regional Park (right) is a 500-acre regional park that is owned and managed by the County of San Diego Parks & Recreation. The park that provides 112 campsites, trails, a seasonal splash pad, play areas and exercise equipment, picnic areas, and a community room and amphitheater.

The Sweetwater Reservoir is a surface water reservoir located in southwestern San Diego County at the boundary of the urban and rural areas near the foot of San Miguel Mountain. The reservoir is formed by Sweetwater River and Sweetwater Dam, which was originally constructed between 1886 and 1888, and is located on approximately 1,775 acres of land owned and managed by the Authority. The 28,100-acre-foot (AF) reservoir has a surface area of approximately 1,023 acres when filled to capacity at an elevation of 239 feet above mean sea level (AMSL); this area includes both surface waters and wetlands and riparian habitat areas to the northeast of the reservoir. The reservoir can be drawn down to a minimum pool elevation of 196 feet AMSL with a resulting volume of 1,650 AF and a surface area of approximately 195 acres.

The reservoir and surrounding open space areas provide a variety of beneficial uses, including drinking water, recreation (e.g., shoreline fishing and hiking), and habitat for a variety of wildlife, including waterfowl. The undeveloped upland areas of the reservoir include hundreds of acres of valuable sensitive habitat for multiple threatened and endangered species, including the coastal California gnatcatcher (*Polioptila californica californica*), Otay tarplant (*Deinandra conjugens*), the San Diego fairy shrimp (*Branchinecta sandiegonensis*), among many others.

Public access to the Sweetwater Reservoir for public and recreation purposes is currently limited to the Sweetwater Reservoir Recreational Area, in the southern side of the lake, and the County Riding and Hiking Trail, a County of San Diego trail operated through a Revocable License Agreement granted by the Authority. However, the Authority is currently working with the County of San Diego and the recreational community to increase recreational

opportunities around the reservoir. This includes additional trails in the southside of the lake, and implementation of the Sweetwater Reservoir Loop Trail on the northside of the reservoir which would eventually connect the trails on the southside of the lake with the new trail system on the northside.

As described further in Section 10, *Surrounding Land Uses*, the reservoir property is bordered by the community of Spring Valley to the north, and the community of Bonita to the west and south. Single family residential homes intermixed with some general commercial and industrial land uses are located to the north of Sweetwater Reservoir, in the community of Spring Valley. To the southwest of the reservoir, the community of Bonita is characterized by more rural, low-density developments. Open space and recreation areas occur immediately to the southwest of the dam, including Sweetwater Summit Regional Park and the Bonita Golf Course. Further southwest of the State Route (SR-) 125 overpass, the community of Bonita includes primarily residential land uses.

The San Diego National Wildlife Refuge, which spans 11,152 acres from Jamul to Spring Valley and eastern Chula Vista, is located approximately 500 feet from the southern edge of Sweetwater Reservoir (see Figure 1). The Refuge is the USFWS contribution to the Multiple Species Conservation Program (MSCP), a landscape-wide habitat conservation plan to preserve habitat and species while allowing appropriate development (USFWS 2024).

Main access to the Perdue WTP and reservoir is provided through a gated checkpoint along Lakeview Avenue.

The Sweetwater Reservoir is formed by Sweetwater River and Sweetwater Dam located in southwestern San Diego County. The Project area would include a 9.6-acre area located northwest area of the Sweetwater Reservoir approximately 750 feet from the Sweetwater Dam.

Project Area

The Project area includes up to 9.6-acres of surface water on the northwestern portion of the Sweetwater Reservoir where the pilot array and RES-BCT system would be located. The FPV system would be located within the minimum pool boundary of the reservoir and would represent approximately 1 to 2 percent of the Sweetwater Reservoir's total surface area. The landside area that would be affected by the proposed Project would include 0.1 acre of a previously disturbed site located immediately east of the Perdue WTP.

Purpose and Need

The purpose of the proposed Project is to offset up to approximately 67 percent of the Authority's energy demands for the following 25 years, using FPV technology. The proposed FPV system is needed to help the Authority accomplish the goals of the Authority's Sustainability Action Plan, Drought Response Plan, and the state's broader renewable energy goals.


Project Location
LA MESA
LEMON GROVE
SPRING VALLEY
SAN DIEGO
BONITA
CHULA VISTA
UNIVERSITY AVENUE
SPRING STREET
CAMPO ROAD
KENWOOD DRIVE
TROY STREET
MASSACHUSETTS AVENUE
SKYLINE DRIVE
LEMON GROVE AVENUE
SWEETWATER SPRINGS BOULEVARD
JAMACHA ROAD
JAMACHA BOULEVARD
CARDIFF STREET
MEADOWBROOK DRIVE
PARADISE VALLEY ROAD
SWEETWATER ROAD
CONDUIT ROAD
SAN MIGUEL ROAD
CENTRAL AVENUE
OTAY LAKES ROAD
EAST H STREET
CORRAL CANYON ROAD
PROCTOR VALLEY ROAD
Sweetwater Reservoir
Sweetwater Summit Regional Park
Bonita Golf Club
Sweetwater Regional Park
Rohr Park
Sweetwater River
SAN DIEGO NATIONAL WILDLIFE REFUGE
San Miguel Mountain
San Clemente
Oceanside
Carlsbad
Vista
San Marcos
Escondido
Encinitas
Solana Beach
Del Mar
Poway
SAN DIEGO COUNTY
Santee
San Diego
El Cajon
La Mesa
National City
Coronado
Chula Vista
Imperial Beach
PROJECT SITE
MILES
0
12
UNITED STATES
MEXICO
SCALE IN MILES
0
1
LEGEND
Incorporated City
San Diego County
Park/Open Space
San Diego National Wildlife Refuge
Stream
Lake/Pond/Reservoir

Statewide Energy GHG Emissions Reduction Goals

Senate Bill (SB) 350 increases California's renewable electricity procurement goal from 33 percent by 2020 under Executive Order (EO) S-14-08 to 50 percent by 2030. This objective increases the use of Renewables Portfolio Standard (RPS) eligible resources, including solar, wind, biomass, geothermal, and others. SB 350 also requires the state to double statewide energy efficiency savings in electricity and natural gas end uses by 2030. To help meet these goals and reduce greenhouse gas (GHG) emissions, large utilities will be required to develop and submit Integrated Resource Plans (IRPs). These plans detail how utilities will meet their customers' resource needs, reduce GHG emissions, and increase the use of clean energy resources.

In 2018, SB 100 established that 100 percent of all electricity in California must be obtained from renewable and zero-carbon energy resources by the end of 2045. SB 100 also creates new standards for the RPS, increasing required energy from renewable sources for both investor-owned utilities and publicly owned utilities from 50 percent to 60 percent by the end of 2030.

The Clean Energy, Jobs, And Affordability Act Of 2022 (SB 1020) revises state policy to provide that eligible renewable energy resources and zero-carbon resources supply 90 percent of all retail sales of electricity to California end-use customers by December 31, 2035, 95 percent of all retail sales of electricity to California end-use customers by December 31, 2040, 100 percent of all retail sales of electricity to California end-use customers by December 31, 2045, and 100 percent of electricity procured to serve all state agencies by December 31, 2035, as specified.

Authority Sustainability Goals

The Authority currently has an annual energy consumption of approximately 14 gigawatt hours (GWh) across 69 separate San Diego Gas and Electric (SDG&E) meters/accounts. The Perdue WTP and the Desalination Facility comprise the Authority's largest energy load; however, the Authority also owns and operates the National City Wells site as well as a variety of small sites that support existing tanks, wells, and pump stations.

In order to further the Authority's sustainability goals and to offset the cost of electricity, the Authority has installed a solar array through a Power Purchase Agreement (PPA) at the Desalination Facility at its desalination facility in Chula Vista, California, which currently helps mitigate a maximum of 1 MW of the Authority's annual electric use (Authority 2015).

The Authority previously installed a hydroelectric turbine at the Perdue WTP; however, this turbine only operates when the Authority is taking raw water from the SDCWA and treating it at the Perdue WTP. During times when the Authority is treating water stored in the Sweetwater Reservoir, the hydroelectric facility is not in use and the entire electrical load is provided by SDG&E.

The RES-BCT, which was established by AB 2466 and codified in Section 2830 of the Public Utilities Code, allows Local Governments and other entities to generate renewable energy on their land and credit this generation across multiple sites in a utility's service area. The RES-BCT program allows energy credits for up to 5 MW of renewable electricity generation to be distributed among a Local Government's accounts. Under the RES-BCT program, the

accounts do not need a single Services Delivery Point (SDP), therefore renewable electricity produced by a photovoltaic system at the Sweetwater Reservoir could be "used" by other Authority-owned facilities in addition to the Perdue WTP. There is, however, a maximum total capacity of 20.25 MW within SDG&E's service territory allowed under the program. As of April 1, 2024, there was 12.753 MW remaining in the program. The RES-BCT program is offered on a first-come-first-served basis at the time that the system is built and receives Permission-to-Operate.

In an effort to offset the energy use of as many as 50 SDG&E accounts, including the Perdue WTP, and to accomplish the broader goals of the Authority's Sustainability Action Plan and Drought Response Plan, the Authority is exploring the potential installation and operation of a FPV system on the Sweetwater Reservoir.

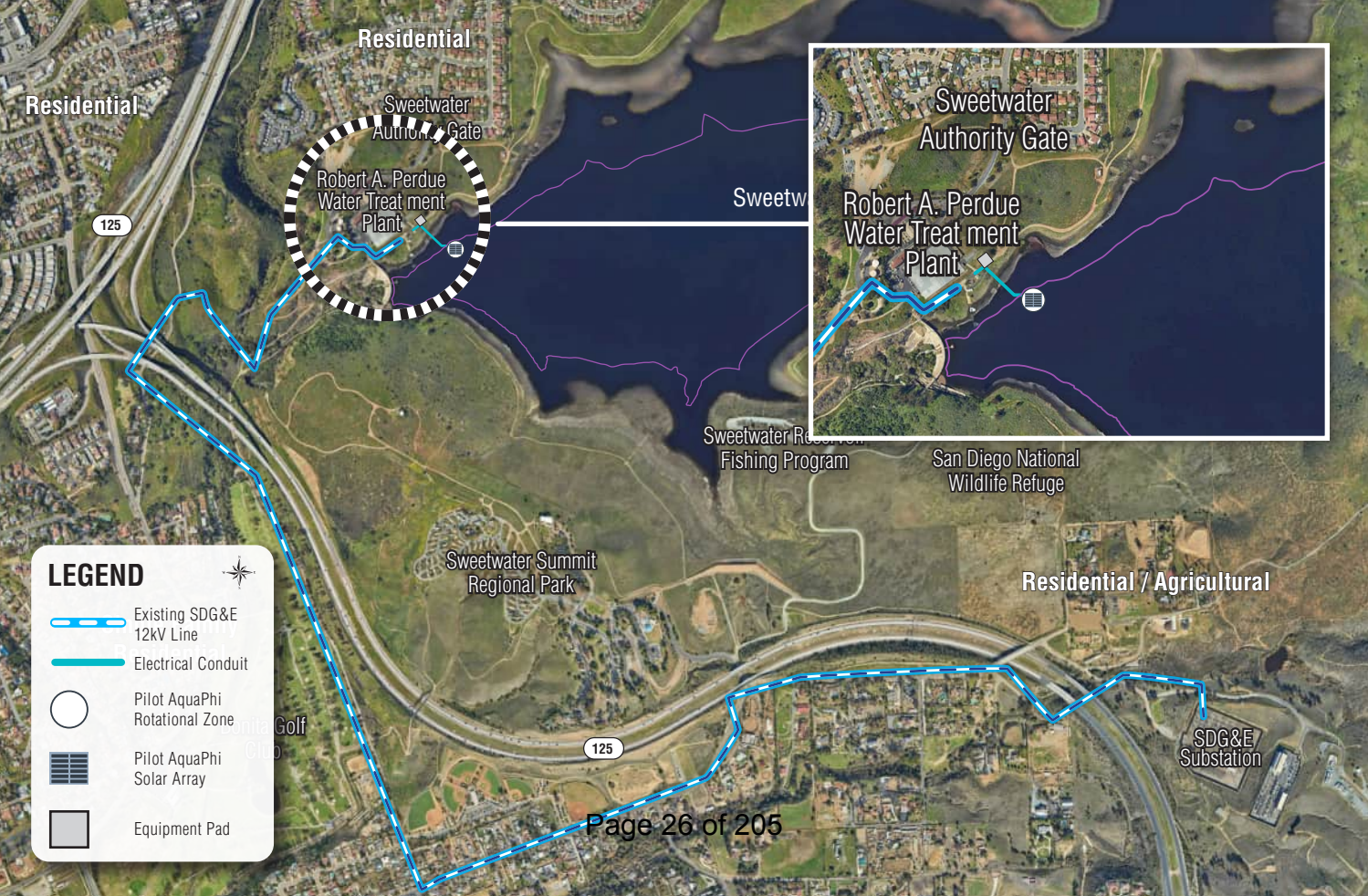
As currently envisioned, this FPV system would avoid potential impacts to environmentally sensitive open space areas surrounding the Perdue WTP. Additionally, the RES-BCT program would allow the Authority to "use" the power produced by the FPV system at other Authority-owned facilities, such as the pump stations and tank sites. In terms of sustainability and state goals, the proposed FPV array would help the State of California and the County of San Diego achieve current benchmarks for clean electricity, including 90 percent of the energy consumed in the state must come from a renewable energy by 2035 in California (SB 1020). A preliminary evaluation determined that a 10-acre, 3.75-MW system would offset a total of 9.2 GWh (approximately 67 percent of the Authority's annual energy consumption), resulting in an energy savings of approximately $500,000 in the first year of operation and a reduction in 52,324 metric tons (MT) of carbon dioxide (CO_2) over the life of the system.

Project Elements

The proposed Project would involve the installation of two separate solar arrays, including the AquaPhi™ (<0.2 acre and 100 kW) and the RES-BCT (up to 9.4 acres and providing up to a maximum of approximately 3.7 MW), which are described further below. A preliminary evaluation of the electrical distribution infrastructure at the Sweetwater Reservoir determined that the 12 kilovolt (kV) distribution switchgear at the Perdue WTP would be a feasible interconnection point for an FPV system. Installation of the FPV system would supply power to the SDG&E distribution grid and would operate parallel with SDG&E.

Pilot AquaPhi™

The Pilot AquaPhi™ system would involve the installation of a 0.2-acre 100 kW FPV system at the northwest area of the Sweetwater Reservoir approximately 750 feet from the Sweetwater Dam (see Figure 2). The Pilot AquaPhi™ system would utilize autonomous thruster technology that would replace the need for traditional anchoring and mooring. Thrusters attached to the bottom of the High-Density Polyethylene (HDPE) floats would be controlled by a DC-motor drive, and autopilot controller would enable automatic rotational tracking of the sun. The specific use of the electricity produced by the Pilot AquaPhi™ System is not yet determined; it may provide power to an existing meter at the Perdue WTP site or provide off-grid power to other equipment at the reservoir.


Residential
Residential
Sweetwater Authority Gate
Robert A. Perdue Water Treat ment Plant
125
Sweetw
Sweetwater Authority Gate
Robert A. Perdue Water Treat ment Plant
Sweetwater Reservoir Fishing Program
San Diego National Wildlife Refuge
Sweetwater Summit Regional Park
Residential / Agricultural
125
SDG&E Substation
LEGEND
Existing SDG&E 12kV Line
Electrical Conduit
Pilot AquaPhi Rotational Zone
Pilot AquaPhi Solar Array
Equipment Pad

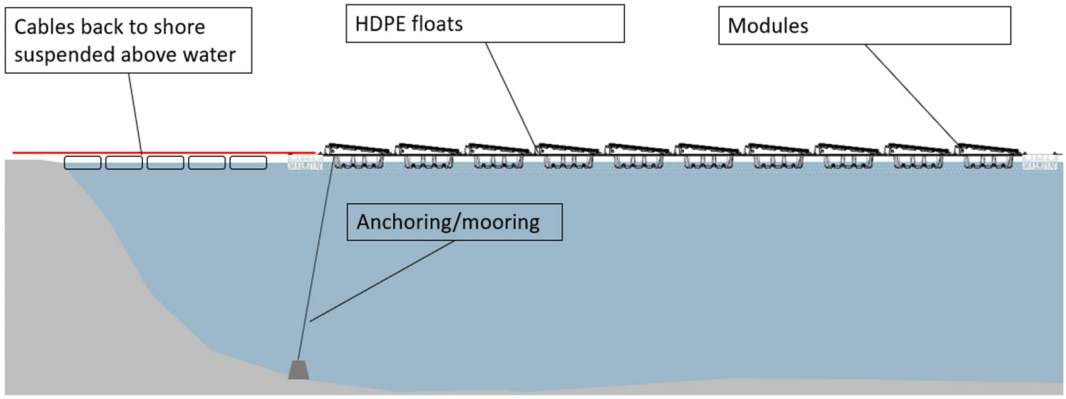
The autonomous tracking associated with the Pilot AquaPhi™ system would result in up to 17-percent more energy production as compared to a FPV system that is anchored in place. The performance of the Pilot AquaPhi™ system would factor into the decision making for the RES-BCT system. If this autonomous thruster technical is suitable for the RES-BCT system, it would avoid the need for anchoring and reduce the total system footprint due to increased energy production per acre.

Renewable Energy Self-Generation, Bill Credit Transfer (RES-BCT)

The proposed RES-BCT system would involve the installation of a second larger photovoltaic system on the northwestern surface of the reservoir, adjacent to the proposed Pilot AquaPhi™ system. The proposed RES-BCT system would include accompanying grid-interactive inverters and associated equipment.

The Authority is considering two separate alternative layouts for the RES-BCT system:

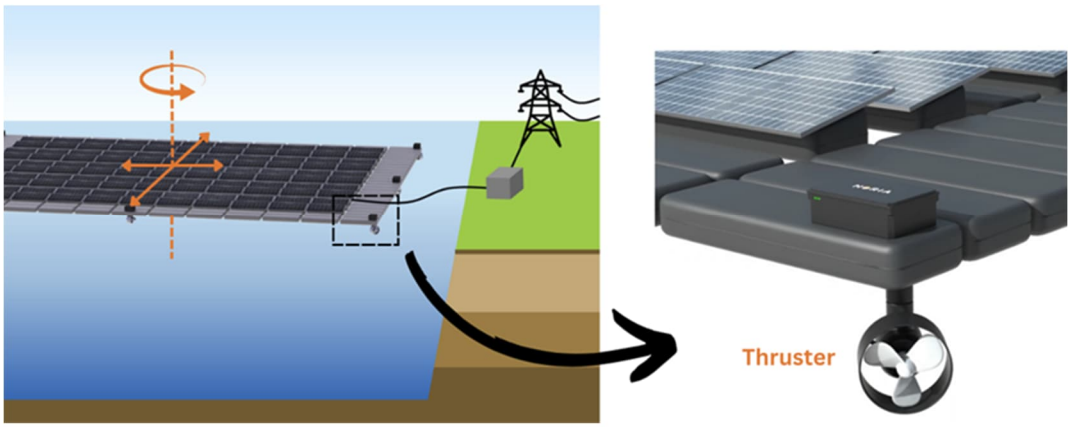
- **Design Alternative 1.** The Design Alternative 1 layout would involve the installation of an approximately 9.4-acre array of solar panels attached to a buoyant HDPE racking system that would float atop the surface of Sweetwater Reservoir. The solar array would be fixed in place using cables fastened along all four sides of the rectangular HDPE floats and attached to concrete block anchors. These anchors would be sunk and placed at the bottom of the reservoir. Beyond the placement of the anchors, no digging, drilling, or other disturbance of the reservoir would be required. The anchors would be designed for all anticipated water level fluctuations from maximum to minimum pool depths. Electrical conduits would be placed on floats to connect solar modules to the land-based equipment pad and the existing 12 kV line managed by SDG&E.



Under the Alternative 1 layout, the proposed RES-BCT system could be installed as a fixed FPV system anchored to the reservoir bottom using cables and concrete blocks.


Residential
Residential
Sweetwater Authority Gate
Robert A. Perdue Water Treat ment Plant
125
Sweetw
Sweetwater Authority Gate
Robert A. Perdue Water Treat ment Plant
Sweetwater Reservoir Fishing Program
San Diego National Wildlife Refuge
Sweetwater Summit Regional Park
Residential / Agricultural
125
SDG&E Substation
LEGEND
Existing SDG&E 12kV Line
Electrical Conduit
Anchoring
RES-BCT Solar Rotational Zone
RES-BCT Solar Array Layout
Equipment Pad

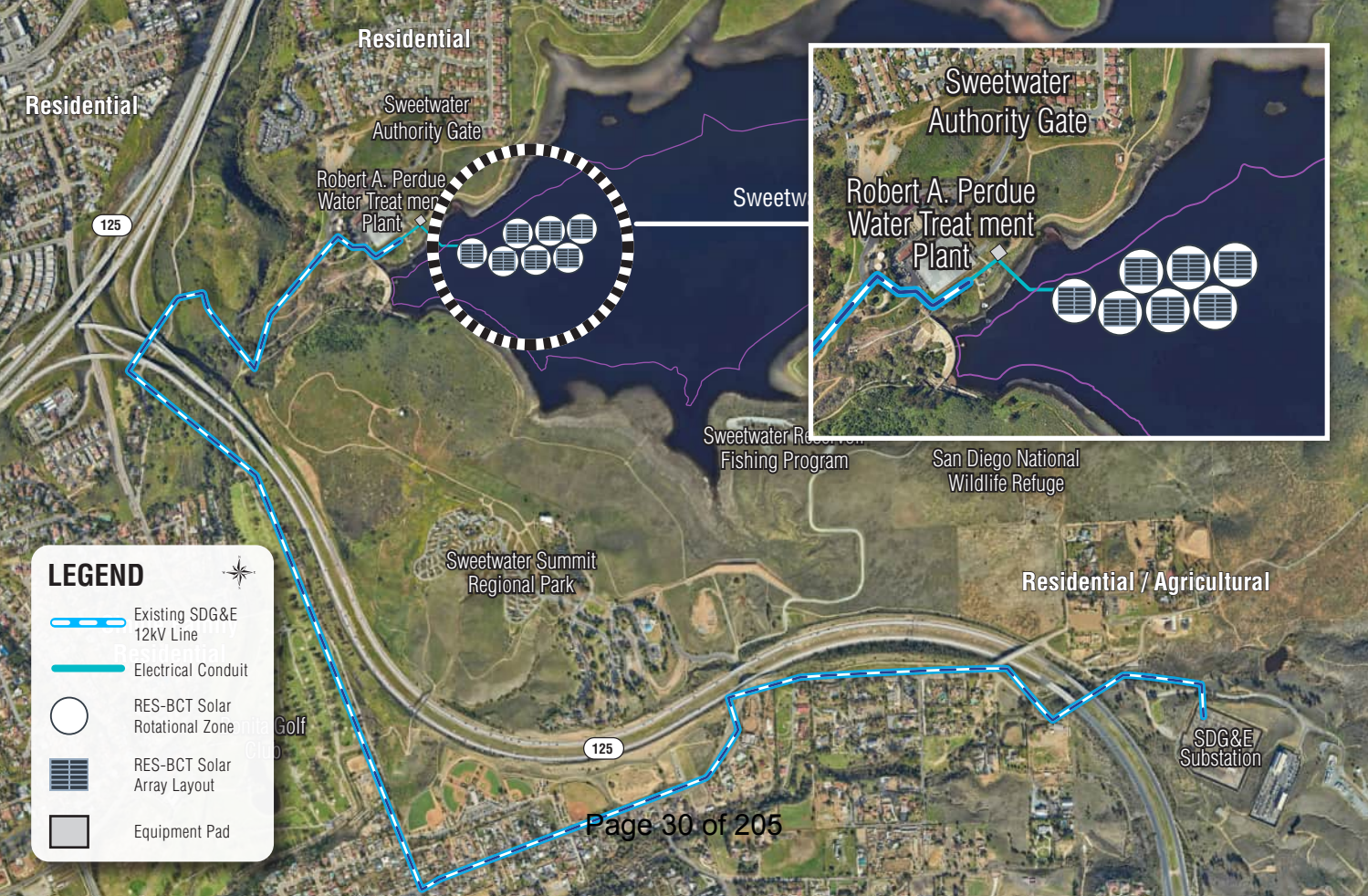
- **Design Alternative 2 Layout.** The Design Alternative 2 layout would involve the installation of approximately 7.4 acres of the reservoir's surface water area for seven floating solar islands. Similar to the Pilot AquaPhi™ system, the Design Alternative 2 layout would use autonomous thrusters technology to position floating solar islands, eliminating the need for traditional underwater anchoring and mooring. The autonomous underwater thrusters attached to the floating racking system would maintain the system's position while automatically rotating to track the sun and increase energy production. Autonomous solar tracking technology would allow for similar levels of energy production at a smaller project footprint compared to Design Alternative 1. Electrical conduits for the Design Alternative 2 layout would be placed on floats to connect solar modules to the land-based equipment pad and existing 12kV line managed by SDG&E.



Under the Alternative 2 layout, the proposed RES-BCT system could utilize autonomous thrusters. This method would be less invasive to the reservoir bottom than traditional anchoring and mooring methods.

Under both the Design Alternative 1 and Design Alternative 2 layouts, an approximately 0.1-acre concrete equipment pad would be constructed on the shoreline, immediately east of the Perdue WTP (refer to Figures 2 and 3). The equipment pad would contain a transformer, switchboards, and inverters to turn the Direct Current (DC) into an Alternate Current (AC) for electrical distribution purposes. Electrical conduits would run above ground from the equipment pad and connect to the 12 kV SDG&E transmission line and ultimately, an SDG&E substation. A connection to a 69 kV transmission line would be located near SR-125.

Minor alterations to SDG&E existing facilities may need to occur; however, construction of new buildings is not anticipated as a result of the proposed Project. Results of the Rule 21 interconnection study found that Ground fault Protection and Reclosing blocking and 3 Phase Interrupting SCADA Recloser are required upgrades.


Residential
Residential
Sweetwater Authority Gate
Robert A. Perdue Water Treat men Plant
125
Sweetw
Sweetwater Authority Gate
Robert A. Perdue Water Treat ment Plant
Sweetwater Fishing Program
San Diego National Wildlife Refuge
Sweetwater Summit Regional Park
Residential / Agricultural
125
SDG&E Substation
LEGEND
Existing SDG&E 12kV Line
Electrical Conduit
RES-BCT Solar Rotational Zone
RES-BCT Solar Array Layout
Equipment Pad

Construction

All construction dates are estimates pending project approvals (Authority's Governing Board and regulatory approvals) and the construction timeline will be influenced by utility upgrades, permitting, and procurement timelines. Construction of the Pilot AquaPhi™ system component is anticipated to begin in November 2025 and would occur over a period of 1 to 2 weeks. The RES-BCT system would be installed approximately a year later following the completion of design, permitting, and interconnection agreements. For the purposes of this analysis, construction of the proposed RES-BCT system is anticipated to begin in August 2026 and would occur over a period of 3 to 4 months.

For both the Pilot AquaPhi™ system as well as the RES-BCT system, the solar array, system floats, motors, and electronics would all be assembled on land and then deployed to the designated location on the reservoir. A temporary ramp would be placed along the shore of the lake (just south of the SDCWA aqueduct outfall) to deploy the system onto the reservoir using a boat for the final installation and commissioning of the FPV array and anchoring.

Permanent ground disturbance on the shoreline would be limited to the construction of the 0.1-acre concrete equipment pad and the placement of electrical conduits. The placement of electrical conduits would require approximately 65 feet of underground trenching from the reservoir's high-water mark to the proposed equipment pad.

Anticipated construction equipment would include a telehandler, delivery trucks, a crane, a concrete truck, a drilling rig, and a boat. Approximately 75-80 truck trips would deliver materials throughout the duration of the construction. It is anticipated that there would be 15-20 personnel for construction commuting from local housing accommodations. There would be 2 small, gas-powered pieces of equipment to receive the material pallets.

Existing paved surfaces or previously disturbed areas would be used for construction staging and material storage during construction. A paved surface lot outside of the Perdue WTP would be used for material storage as well as dirt and paved roadways running along the shoreline. A temporary launch ramp would also be placed along the shoreline of the reservoir.

Temporary construction and staging areas, totally approximately 4 acres for material storage, would be located in a paved area off of Lakeview Avenue outside of the Perdue WTP,

Sweetwater Reservoir Road, and a previously disturbed dirt road along the shoreline of the reservoir. Additionally, approximately 0.3 acres at the end of Sweetwater Reservoir Road would be used for the construction of temporary floating solar assembly and deployment ramp. During construction, there would be four to five containers on site occupying a total of approximately 1 acre of the paved area off of Lakeview Avenue. One container would be used as an office and the remaining would be used to store materials.

Maintenance

A full maintenance plan is being developed concurrently with the development of the FPV regulatory approvals, to ensure maintenance activities would fully be compliant with applicable environmental regulations, including those governing drinking water and water quality. It is expected that periodic maintenance activities would involve the annual inspection of solar panels, floats, mooring, anchors, electrical and onshore equipment. Some operations and maintenance activities (e.g., panel cleaning) would require workers to walk on the arrays using walkway sections specifically designed for maintenance. Panel cleaning would be performed manually with a dry soft cloth, using no water or solvents, a vacuuming system may be used to collect debris. The frequency of panel cleaning would be as needed, but it is expected to occur at least once a year. Maintenance activities would also include anti-fouling beneath floating panels to prevent or remove fouling organisms (e.g. algae, seaweed, mussels). Anti-fouling methods may include application of anti-stick coatings, biocides, or ultrasonic transducers, however specific methods for the proposed Project have not yet been determined. Frequency of anti-fouling is recommended once every 2 to 3 years.

System performance will remotely be monitored constantly. It is anticipated that a contractor would be hired to perform all required maintenance activities. The proposed Project would not result in the need for new full-time staff for day-to-day operations at the Perdue WTP.

Decommissioning

Once the FPV system has reached the end of its functional life (expected to be up to 25 years), it would be removed from the reservoir site, disassembled, and recyclable components would be taken to an appropriate universal waste handler. The solar panels would be recycled or disposed of accordingly.

10. SURROUNDING LAND USES AND SETTING:

Land use immediately surrounding the Sweetwater Reservoir site is limited to Open Space Parks. Land use extending further beyond the bounds of the reservoir is comprised of General Single Family or Single Family Detached to the north and west, and spaced rural residential to the south and east. General single family or single family detached land uses occur to the north of the Project site, as well open space areas. Recreation and hiking opportunities are provided along the south side of the reservoir via the County's Sweetwater Reservoir Riding and Hiking Trail that extends from Summit Meadows Road at the southwest portion of the reservoir to the National Wildlife Refuge. Additionally, shoreline fishing and hiking are permitted along a 2.5-mile stretch on the south side of reservoir, on the Sweetwater Reservoir Recreation Area.

11. REQUIRED AGENCY APPROVALS:

There are three primary agencies that regulate activities within jurisdictional waters in California: U.S. Army Corps of Engineers (USACE) regulates activities pursuant to Section 404 of the Clean Water Act (CWA); California Department of Fish and Wildlife (CDFW) regulates activities under Sections 1602 of the Fish and Game Code; and Regional Water Quality Control Board (RWQCB) regulates activities under Section 401 of the CWA and the Porter-Cologne Water Quality Control Act. Permits may be required under Section 404 of the CWA from the USACE, Section 401 Water Quality Certification from the RWQCB, and Section 1602 of the California Fish and Game Code from the CDFW for the installation and operation of the proposed systems.

San Diego County would be involved with the environmental review and permitting of the proposed Project. The County may need to perform a General Plan conformity check and may need to issue a building permit for the electrical work. While not specifically a permit, a Rule 21 Interconnection Agreement with SDG&E would likely need to be completed.

12. NATIVE AMERICAN CONSULTATION:

As described in Section 16.5, *Cultural Resources*, the proposed Project would not result in any ground disturbing activities that were not already previously evaluated and/or disturbed. Nevertheless, pursuant to AB 52, the Authority has offered tribal consultation to each of the Native American tribes identified by the Native American Heritage Commission.

13. ENVIRONMENTAL RESOURCES AREAS POTENTIALLY AFFECTED:

The proposed Project could potentially result in significant environmental impacts to the following environmental resource area(s) checked below. The following Initial Study (IS) provides a more though discussion and analyses of each of the environmental resource areas.

☐ Aesthetics	☐ Agriculture Resources	☐ Air Quality
☐ Biological Resources	☐ Cultural Resources	☐ Energy
☐ Geology and Soils	☐ Greenhouse Gas Emissions	☐ Hazards and Hazardous Materials
☐ Hydrology and Water Quality	☐ Land Use and Planning	☐ Mineral Resources
☐ Noise	☐ Population and Housing	☐ Public Services
☐ Recreation	☐ Transportation	☐ Tribal Cultural Resources
☐ Utilities and Service Systems	☐ Wildfire	☐ Mandatory Findings of Significance

14. DETERMINATION:

Based on this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, no further environmental documentation is required.

Signature	Date
Carlos Quintero, P.E. General Manager	Sweetwater Authority
Printed Name	For

15. ENVIRONMENTAL CHECKLIST

1) A brief explanation is required for all answers except “No Impact” answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A “No Impact” answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the Project falls outside a fault rupture zone). A “No Impact” answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. “Potentially Significant Impact” is appropriate if there is substantial evidence that an effect may be significant. If there are one or more “Potentially Significant Impact” entries when the determination is made, an EIR is required.

4) “Negative Declaration: Less Than Significant With Mitigation Incorporated” applies where the incorporation of mitigation measures has reduced an effect from “Potentially Significant Impact” to a “Less Than Significant Impact.” The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from “Earlier Analyses,” as described in (5) below, may be cross-referenced).

5) Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063I(3)(D). In this case, a brief discussion should identify the following:

    a. Earlier Analysis Used. Identify and state where they are available for review.

    b. Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.

    c. Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

7) Supporting Information Sources: A source list should be attached, and other sources used, or individuals contacted should be cited in the discussion.

8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.

9) The explanation of each issue should identify:

   a. The significance criteria or threshold, if any, used to evaluate each question; and

   b. The mitigation measure (MM) identified, if any, to reduce the impact to less than significance.

16.1 AESTHETICS

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the Project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) In non-urbanized areas, substantially degrade the existing visual character or quality of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage points.)	☐	☐	☒	☐
d) Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

16.1.1 Existing Setting:

The Sweetwater watershed area is characterized by scenic landform features, including rolling hillsides and expansive views of the San Miguel Mountain ridgeline, which are visually attractive and also provide opportunities for recreation (e.g. hiking, mountain biking, etc.). The San Miguel Mountain ridgeline includes Mother Miguel Mountain, which is designated by the County General Plan as a resource conservation area within the Sweetwater Community Planning Area (CPA) (County of San Diego 2014). Large areas of open space and expansive unobstructed scenic vistas, including Mother Miguel Mountain, are important County visual resources (County of San Diego 2011a, 2011b).

The Project area is located on the northwestern portion of Sweetwater Reservoir, approximately 750 feet from the dam. The Project site includes approximately 9.6 acres of surface water and 0.1 acres of previously disturbed site located immediately east of the Perdue WTP. The view from the Project area across the reservoir are characterized by open water, hilly terrain, and vegetated open space. There are no state scenic highways in the Project area. However, Bonita Road, San

Miguel Road, Guajolote Road, and Sweetwater River Road in the Project vicinity are designated by the County as first priority scenic routes (County of San Diego 2011b).

16.1.2 Discussion:

a) ***Have a substantial adverse effect on a scenic vista?***

A "scenic vista" is defined as a view of natural environmental, historic, and/or architectural features that possesses visual and aesthetic qualities of value to the community. The term "vista" generally implies an expansive view, usually from an elevated point or open area. As described above, the Sweetwater Community Plan and Spring Valley Community Plan do not identify any specific scenic vistas or scenic view corridors or related polices or recommendations. Therefore, the proposed Project would no impact on scenic vistas and no mitigation measures would be required.

b) ***Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?***

There are no state scenic highways in the vicinity of the Project site. The nearest designated scenic highway, SR-75, is located approximately 4 miles to the west (California Department of Transportation [Caltrans] 2022). The nearest eligible highway is another portion of SR-75 located approximately 4 miles northwest of the Project site. Due to the distance and development between the Project site and SR-75, the proposed Project would not affect any scenic resources within a State scenic highway. Bonita Road, San Miguel Road, Guajolote Road, and Sweetwater River Road in the Project vicinity are designated by the County as first priority scenic routes (County of San Diego 2011b); however, the Project site is not visible from these roads either.

The Scenic Highways Element of the Sweetwater Community Plan identified roads within Bonita that should be considered for design review including San Miguel Road and Quarry Road. However, the Project site is not visible from San Miguel Road (left) or Quarry Road (right).

The proposed Project would result in minor grading of a 0.1-acre equipment pad and 65-feet of utilities trenching. No trees would be removed as a part of these construction activities. Additionally, this area is located in close proximity to the Perdue WTP; the topography in this area is not considered a scenic rock outcropping and minor grading activities at the Project site would not substantially affect recognized scenic resources in this area. Further, no historic

buildings would be affected by the proposed Project. There would be no impact and no mitigation measures would be required.

c) ***In non-urbanized areas, substantially degrade the existing visual character or quality of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage points.)***

WSP prepared a Draft Aesthetics and Visual Resources Analysis (see Attachment 1), which includes a robust analysis of public views of the Project area using five representative Key View Points to discuss potential impacts during construction and operation of the proposed FPV system.

Views of the Project site are provided across the Sweetwater Reservoir from publicly accessible trails.

Construction activities associated with the proposed Project would be visible from close distances, but would be imperceptible from public view locations provided at farther distances. Heavy construction equipment (e.g., cranes) and haul trucks would be temporarily visible along the shoreline during grading and construction of the 0.1-acre equipment pad and during trenching of utilities. Additionally, the assembly of the floating solar arrays, including the use of boats(s) to launch the arrays, would also be temporarily visible on the waterfront. The 4-acre construction staging area, however, would be located behind the Perdue WTP and would not be visible from public viewing locations. Any minor construction-related impacts to visual character would be temporary. Overall construction-related impacts would be less than significant.

Following the completion of construction activities, approximately 9.6 acres of the water surface at the Sweetwater Reservoir would be covered with the proposed FPV system. Depending on the water level of the reservoir, this array could cover between 1 and 2 percent of the total surface area of the reservoir. The floating solar array would the most visually prominent from the north shoreline of the reservoir, which it distracts from the sweeping views of the lake in the foreground and mid-ground. However, the north shoreline of the reservoir is generally inaccessible to the public. Views of the reservoir from this location would be limited to Authority maintenance personnel at the Perdue WTP or driving along the maintenance roads.

The proposed FPV system would also be visible from more distant, publicly available views from the southern shoreline, including Cactus Hill and Sweetwater Summit Regional Park. These recreational resources are generally open to the public year round. Additionally, the proposed FPV system would be visible from the Authority's Recreational Area, which is open to the public on Friday through Monday. However, at these distances the proposed FPV system would appear much less prominent in the mid-ground and background of the views. The proposed FPV system would not interrupt the sweeping foreground views of the reservoir or the background views of the hilly terrain.

While the impacts to aesthetics are anticipated to be less than significant during construction and operation of the FPV system, the forthcoming EIR will discuss potential impacts on visual character using figures, photographs, and photo-simulations from the Draft Aesthetics and Visual Resources Analysis and any additional, relevant information. Further, the EIR will discuss consistency with policies and/or recommendations from the Sweetwater Community Plan or the Spring Valley Community Plan.

d) ***Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?***

The proposed Project would not require any nighttime lighting that would affect nighttime views in the area. Based on the Federal Aviation Administration's Technical Guidance for Evaluating Selected Solar Technologies on Airports, glare from solar panels is approximately equal to the glare from water surfaces. As such the potential impacts of glare as a result of the floating solar panels would be similar to the surface water in the Sweetwater Reservoir. Nevertheless, the daytime glare will be examined in further detail within the forthcoming EIR using the quantitative/geometric analysis provided in the Draft Aesthetics and Visual Resources Analysis.

16.2 AGRICULTURAL RESOURCES

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board (CARB).				
Would the Project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220[g]), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104[g])?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

16.2.1 Existing Setting:

The Project site is not located on Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. Additionally, the Project site does not contain forest land (as defined in Public Resources Code [PRC] Section 12220[g]), timberland (as defined by PRC Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104[g]).

The Williamson Act, also known as the California Land Conservation Act of 1965, enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use. In return, landowners receive property tax assessments which are much lower than normal because they are based upon farming and open space uses as opposed to full market value. There are no Williamson Act contracts associated with the Project site (California Department of Conservation [CDC] 2022).

16.2.1 Discussion:

a) ***Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?***

The Project area is designated as Other Land by the CDC in San Diego County (CDC 2018). There is no Prime Farmland, Unique Farmland, or Farmland of Statewide Importance within the Project site or the surrounding vicinity. Therefore, the proposed Project would result in no impact to such resources.

b) ***Conflict with existing zoning for agricultural use, or a Williamson Act Contract?***

There is no existing zoning for agricultural use or Williamson Act Contracts within the Project site or the surrounding vicinity. Therefore, the proposed Project would result in no impact to such resources.

c) ***Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220[g]), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104[g])?***

There is no Timberland within the Project site or the surrounding vicinity. Therefore, the proposed Project would result in no impact to such resources.

d) ***Result in the loss of forest land or conversion of forest land to non-forest use?***

There is no forest land within the Project site or the surrounding vicinity. Therefore, the proposed Project would not result in the loss of forest land or conversion of forest land to non-forest use. There would be no impact to such resources.

e) ***Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?***

There is no farmland or forest land within the Project site or the surrounding vicinity. Therefore, the proposed Project would not result in the conversion of farmland to non-agricultural use or forest land to non-forest use. The proposed Project would result in no impact to such resources.

16.3 AIR QUALITY

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations.				
Would the Project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under the applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☒	☐

16.3.1 Existing Setting

The Project site is located within the San Diego Air Basin (SDAB). SDAB is currently designated *nonattainment* for ozone (O_3), both 1-hour and 8-hour, and particulate matter (PM_{10} and $PM_{2.5}$) under the California Ambient Air Quality Standards (CAAQS). It is designated *attainment* for carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead, and sulfates. San Diego Air Pollution Control District (SDAPCD) and San Diego Association of Governments (SANDAG) are responsible for developing and implementing the clean air plan for attainment and maintenance of the ambient air quality standards in the SDAB. The Regional Air Quality Strategy (RAQS) outlines SDAPCD's plans and control measures designed to attain the state air quality standards for O_3. The RAQS was initially adopted in 1991, and is updated on a triennial basis

(most recently in 2022). The RAQS relies on information from the California Air Resources Board (CARB) and SANDAG, including mobile and area source emissions, as well as information regarding projected growth in San Diego County and the cities in the region, to project future emissions and then determine the strategies necessary for the reduction of emissions through regulatory controls. CARB mobile source projections and SANDAG growth projections are based on population, vehicle trends, and land use plans adopted by the County of San Diego and the cities in the region as part of the development of their general plans.

As part of its air quality permitting process, the SDAPCD has established thresholds in Rule 20.2 requiring the preparation of Air Quality Impact Assessments (AQIAs) for permitted sources. The SDAPCD sets forth quantitative screening level thresholds below which a project would not have a significant impact on ambient air quality. For $PM_{2.5}$, the U.S. Environmental Protection Agency's (USEPA's) "Proposed Rule to implement the Fine Particle National Ambient Air Quality Standards" (USEPA 2005) recommends a significance threshold of 10 tons per year, which equates to 55 pounds per day. Project-related air quality impacts estimated in this environmental analysis would be considered significant if any of the applicable significance thresholds presented in Table 1 are exceeded. For CEQA purposes, these screening criteria can be used as numeric methods to demonstrate that a proposed project's total emissions would not result in a significant impact to air quality.

Table 1.
Air Quality Significance Thresholds

Pollutant	Pounds per Hour	Pounds per Day	Tons per Year
Carbon Monoxide (CO)	100	550	100
Nitrogen Oxides (NO_x)	25	250	40
Respirable Particulate Matter (PM_{10})	-	100	15
Fine Particulate Matter ($PM_{2.5}$)	-	55	10
Sulfur Oxides (SO_x)	25	250	40
Lead (Pb)	-	3.2	0.6
Reactive Organic Gases (ROGs)	-	137	15
Sources: SDAPCD Rule 1501, 20.2 (d)(2); USEPA 2005.			

16.3.2 Discussion:

a) ***Conflict with or obstruct implementation of the applicable air quality plan?***

In general, a project would not interfere with an applicable air quality plan if: 1) it were consistent with growth assumptions used to develop the plan; and 2) if the project implements all reasonably available and feasible air quality control measures from the applicable air quality plan or planning document referenced or used in the plan. A project would conflict with or obstruct implementation an applicable air quality plan if the project is inconsistent with the underlying land use designation and zoning of the local applicable plan (e.g., General Plan).

The Project site located is within areas designated as Public Agency Lands and is zoned S80 – Special Purpose (County of San Diego 2014; County of San Diego Planning and Development Services 2012). The proposed Project would not change the existing use of the Project site. Therefore, the proposed Project would be consistent with the San Diego County General Plan Land Use designations. Operation of the proposed Project would involve minor operational emissions associated with annual maintenance activities and the transmission of energy generated by the proposed FPV system. However, over the long-term, the FPV system would substantially reduce operational emissions associated with the Authority's operations at the Sweetwater Reservoir and other locations across San Diego County (refer to Section 9, *Project Description*). Because the proposed Project would not contribute to local population growth, or long-term employment growth and associated vehicle miles traveled (VMT), the proposed Project is considered to be accounted for in the RAQS, and the proposed Project would not conflict with or obstruct the implementation of local air quality plans.

b) ***Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under the applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?***

The Sweetwater Reservoir – including the Project site – is located in the San Diego Air Basin (Basin). The SDAPCD and SANDAG are responsible for developing and implementing the clean air plan for attainment and maintenance of the ambient air quality standards in the Basin. The USEPA designates areas with criteria pollutant concentrations that do not meet the NAAQS as nonattainment areas. The USEPA has designated the San Diego County as nonattainment for the March 2015 8-hour O_3 standard emissions. The proposed Project may result in an increase in criteria pollutant emissions associated with temporary construction activities. As described in Section 9, *Project Description*, the Pilot AquaPhi™ system as well as the RES-BCT system, the solar array, system floats, motors, and electronics would all be assembled on land and then deployed to the designated location on the reservoir. For both the Pilot AquaPhi™ system as well as the RES-BCT system, the solar array, system floats, motors, and electronics would all be assembled on land and then deployed to the designated location on the reservoir. Permanent ground disturbance on the shoreline would be limited to the construction of the 0.1-acre concrete equipment pad and the placement of electrical conduits. The placement of electrical conduits would require approximately 65 feet of underground trenching from the reservoir's high-water mark to the proposed equipment pad. Emissions would originate from employee and haul truck vehicles as well as off-road equipment exhaust. However, these emissions would be minor and temporary occurring over a period of 3 to 4 months. Over the long-term, the FPV system would substantially reduce operational emissions associated with the Authority's operations at the Sweetwater Reservoir and other locations across San Diego County (refer to Section 9, *Project Description*). The proposed Project would not result in a significant increase in construction-related or operational emissions, and would not result in a considerable net increase of any criteria pollutant for which the SDAB is in nonattainment.

c) ***Expose sensitive receptors to substantial pollutant concentrations?***

Sensitive receptors in the immediate vicinity of the proposed Project include the single-family residences located approximately 800 feet to the northeast of the Project site. However, due to the short-term, temporary nature of the proposed construction activities, which would occur over an area of 3 to 4 months and the overall reduction in long-term operational emissions,

the proposed Project is not anticipated to expose sensitive receptors to substantial concentrations of criteria air pollutants or toxic air contaminates (TACs). Therefore, the implementation of the proposed Project would not impact sensitive receptors.

d) ***Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?***

Odors associated with the proposed Project may be generated from vehicle and construction equipment exhaust fumes during installation of the proposed FPV system. These fumes would result in odors that may be perceptible to those in the immediate vicinity of the Project site. However, diesel odors would occur periodically during the 1 to 2 week construction period for Pilot AquaPhi™ system and the 3 to 4 months for the RES-BCT system. Additionally, these odors would dissipate within a short distance from the Project site. The odors would not be objectionable because of the relatively small magnitude and short duration. Operation of the proposed FPV system would not generate objectionable odors. Therefore, impacts are expected to be less than significant, and no mitigation measures would be required.

16.4 BIOLOGICAL RESOURCES

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the Project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFW or the USFWS?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the CDFW or USFWS?	☐	☒	☐	☐
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☒	☐	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☒	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

16.4.1 Existing Setting:

Regionally, the topography in this area consists of rolling to steep hillsides traversed by the Sweetwater River, which is a predominant natural feature of the Sweetwater CPA. Most of the original vegetation of the area has been modified by surrounding development; however, coastal mixed chaparral and coastal sage scrub exist on undeveloped hilly terrain and steep slopes (County of San Diego 2011b). Further, isolated remnants of riparian woodland dominated by sycamores and willows lie within the Sweetwater River channel between Central and Bonita Roads. These vegetation communities provide habitat for a variety of indigenous wildlife species. The riparian areas within the Sweetwater CPA are incorporated into the MSCP for the least Bell's vireo (County of San Diego 2011b). Although some recently acquired smaller parcels are located within the MSCP area, most Authority-managed lands at Sweetwater Reservoir are not located in the MSCP area. Conduit Road passes through the MSCP area south of the dam.

WSP is prepared a Draft Biological Resources Technical Report for the proposed Project, which addressed an overall study area of 120.27 acres (Attachment 2). The study area encompasses the proposed solar areas, temporary construction and staging areas, a temporary launch ramp, and office and storage spaces. The study area includes developed lands containing Authority infrastructure, dirt and paved roads, and undeveloped open space areas.

Vegetation

Vegetation in the study area includes native and disturbed native communities, as well as developed areas/infrastructure associated with Sweetwater Reservoir. Vegetation communities include coastal sage scrub, coastal sage scrub – disturbed, and riparian woodland (see Table 2). Other mapped designations include open water and developed which includes existing facilities and managed areas. Each of the vegetation communities are discussed in further detail below.

Table 2. Vegetation Communities and Habitats in the Survey Area

Vegetation Community	Acres
Coastal Sage Scrub	10.10
Coastal Sage Scrub - Disturbed	2.33
Riparian Woodland	0.21
Open Water	88.06
Developed	19.58
Total	**120.28**

Coastal Sage Scrub – Coastal sage scrub habitat is located on both sides of the Sweetwater Reservoir, with a larger patch to the north and a smaller patch along the southern border of the study area. The northern patch is surrounded mostly by disturbed areas with the Reservoir to the east. Associated species include California buckwheat (*Eriogonum fasciculatum*), California sagebrush (*Artemisia californica*), and coast cholla (*Cylindropuntia prolifera*), with areas of San Diego sunflower (*Bahiopsis laciniata*), laurel sumac (*Malosma californica*), and other species. Understory components include native and non-native species. In the study area the community's growth pattern includes areas of dense shrubs, 3 to 5 feet tall to very open phases. The extent and distribution of coastal sage scrub has been greatly reduced from historical levels in coastal Southern California and is considered a sensitive habitat. It often supports a higher number of sensitive plant and wildlife species than the surrounding upland communities.

Coastal Sage Scrub – Disturbed – Three areas of coastal sage scrub – disturbed habitat are located on the north side of the Sweetwater Reservoir in the western part of the study area. These areas are bordered by developed lands. The species associated with this community are the same as those of coastal sage scrub; however, they have experienced disturbance from activities associated with the adjacent roads and/or infrastructure.

Riparian Woodland – One small band of riparian woodland occurs below the Sweetwater Reservoir Dam. This habitat includes areas of high-stature woodlands dominated by arroyo willow (*Salix lasiolepis*), black willow (*Salix gooddingii*), and western sycamore (*Platanus racemosa*). A band of riparian scrub habitat also occurs along much of the current shoreline of the Reservoir, dominated by arroyo willow and red willow (*Salix laevigata*), approximately 10 to 15 feet wide and generally consisting of a single row of 10- to 20-foot-tall trees.

Open Water – Open water describes portions of the Sweetwater Reservoir which currently hold water within in the study area boundary. The Sweetwater Reservoir is a surface water Reservoir that was created with construction of the Sweetwater Dam. It is managed primarily for drinking water but includes other added benefits such as plant and wildlife habitat for a variety of species.

Developed – Developed areas include bare ground, mostly bare disturbed areas, maintained dirt roads, paved roads, structures, and areas actively maintained to exclude naturally occurring vegetation. Developed areas of the study area include the dam, Reservoir facilities/infrastructure, associated landscaping, and paved access roads.

Wildlife

Since the mid 1990's, the Authority has collected and compiled data of both aquatic and terrestrial avifauna that regularly or seasonally use the Sweetwater Reservoir and/or its surrounding habitats. Six special-status wildlife species have been detected within the study area including Cooper's hawk (*Accipiter cooperii*), orange-throated whiptail (*Aspidoscelis hyperythra*), coastal cactus wren (*Campylorhynchus brunneicapillus sandiegensis*), Coronado skink (*Plestiodon skiltonianus interparietalis*), coastal California gnatcatcher, and least Bell's vireo (*Vireo bellii pusillus*). Additionally, one sensitive wildlife species was determined to have high potential to occur in the study area based on habitats on site and occurrence in the vicinity: rufous-crowned sparrow (*Aimophila ruficeps canescens*).

Additionally, avian data collected at Sweetwater Reservoir during the annual Christmas Bird Count reveals a total of 156 species of birds that have been detected between 1996 and 2023. Of the 156 species, 65 (approximately 42 percent) of those are aquatic birds and 91 (approximately 58 percent) are terrestrial birds.

Wetlands

The capacity of the Sweetwater Reservoir extends to elevation 239 feet AMSL, with the elevation of the dam spillway at the western edge of the Reservoir. The last time water spilled over the Sweetwater Dam was in 1998 (Authority 2023). Coordination between the Authority and USACE for previous projects in the vicinity has identified the 239 feet AMSL as the area regulated under

the Clean Water Act. The USACE, in combination with the USEPA, reserves the ultimate authority in making the final determination of presence and extent of waters of the U.S., including wetlands.

16.4.2 Discussion:

Terrestrial portions of the study area support some areas of native habitat, such as coastal sage scrub and open water, with a substantial portion of disturbed habitat and developed lands. The coastal sage scrub in the study area is considered to be of high biological value as, for the most part, it is contiguous with more expansive areas of coastal sage scrub that support special-status species, such as coastal California gnatcatcher, coastal cactus wren, rufous-crowned sparrow, and orange-throated whiptail. Further, these areas support moderate plant species diversity and provide vegetative cover for wildlife species that may be using the area as a wildlife corridor, such as mule deer (*Odocoileus hemionus*) and coyote (*Canis latrans*). Areas of coastal sage scrub that are not contiguous with more expansive areas of coastal sage scrub are considered to be of moderate value because even though they are isolated and small in size, they support special-status plant species, such as San Diego sunflower, and provide habitat for smaller wildlife species and nesting birds. Four special-status plant species have been detected in the study area during surveys conducted to date: California adolphia (*Adolphia californica*), San Diego sunflower, San Diego barrel cactus (*Ferocactus viridescens*), and ashy spike moss (*Selaginella cinerascens*). For these reasons, the terrestrial portions within and surrounding the study area are considered to be of moderate biological value.

Overall, the aquatic and terrestrial habitats within and surrounding the study area provide important aquatic and terrestrial resources for a variety of plant and wildlife species and also form part of a valuable wildlife corridor to adjacent open spaces. Therefore, they and are considered to be, for the most part, of moderate to high biological value.

a) ***Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFW or the USFWS?***

Special-Status Plants

As previously described, four special-status plant species have been previously detected in the study area: California adolphia, San Diego sunflower, San Diego barrel cactus, and ashy spike moss. These special-status plant species can likely be avoided by the proposed Project since the vast majority of permanent impacts would occur in open water on the Reservoir. The one exception to this is the land-based equipment pad which would result in a permanent impact of 0.10 acre of coastal sage scrub habitat that could potentially support these special-status plants. The forthcoming EIR will analyze potential impacts to sensitive plant species in more detail and will include recommendations and/or mitigation measures, as described in the Draft Biological Resources Technical Report, to address any special-status plant species that could be present within the Project site and affected during construction-related ground disturbance.

Special-Status Wildlife

As previously described, eight special-status wildlife species have been detected or have a high potential to occur within the study area: Coronado skink, orange-throated whiptail, Cooper's hawk, coastal cactus wren, bald eagle, coastal California gnatcatcher, least Bell's vireo, rufous-crowned sparrow. These special-status wildlife species can likely be avoided by the proposed Project since the vast majority of permanent impacts would be incurred on the Reservoir in open water. Again, the one exception to this is the land-based equipment pad which would result in a permanent impact of 0.10 acre of coastal sage scrub habitat that could potentially support these special-status species. The forthcoming EIR will analyze potential impacts to special-status wildlife species in more detail and will include recommendations and/or mitigation measures, as described in the Draft Biological Resources Technical Report, to address any special-status wildlife species that could be present within the project site and affected during construction-related ground disturbance.

b) ***Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the CDFW or USFWS?***

Potential impacts to sensitive natural communities were calculated in the Draft Biological Resources Technical Report based on engineering plans overlain with habitats mapped on site. With the exception of the land-based equipment pad (0.10 acre) permanent impacts associated with each system would occur entirely to open water of the Sweetwater Reservoir. The proposed Project would result in the following permanent impacts: a total of 0.43 acre for the AquaPhi™ Pilot system, 9.52 acres for Design Alternative 1, and 11.82 acres for Design Alternative 2.

The proposed Project has been designed to locate construction vehicle traffic, staging, and access areas on either paved or previously disturbed areas to the extent practicable in order to minimize temporary impacts to native habitats. Temporary impacts are defined as the crushing or removal of vegetation that would be restored in place to pre-Project conditions upon completion of the proposed Project. Temporary impacts would be the same for each of the three systems and encompass 2.34 acres and include areas mapped as coastal sage scrub, developed, and open water.

The proposed Project would result in the permanent loss of coastal sage scrub habitat and open waters of the Sweetwater Reservoir. The coastal sage scrub habitat supports several special-status species that are either known to occur or have a high potential to occur within the study area. Permanent impacts to coastal sage scrub habitat would be relatively minimal, totaling 0.10 acre. The permanent impact would be located at the edge of a large patch of coastal sage scrub habitat that is adjacent to lands developed with facility buildings and other infrastructure. The forthcoming EIR will examine impacts to coastal sage scrub habitat in more detail and will include recommendations and/or mitigation measures, as described in the Draft Biological Resources Technical Report, to address impacts to coastal sage scrub habitat.

The proposed Project would also result in the permanent loss of open water habitat for each system. The proposed AquaPhi™ Pilot would result in a permanent loss of 0.33 acre, the Design Alternative 1 layout would result in the loss of 9.42 acres, and the Design Alternative 2 layout

would result in the loss of 11.72 acres. Permanent impacts to open water habitat would result in the loss of foraging, and roosting habitat for water dependent bird species that are either known to occur of have a high potential to occur in the vicinity of the study area, some of which include osprey (*Pandion haliaetus*), American white pelican (*Pelecanus erythrorhynchos*), double-crested cormorant (*Phalacrocorax auritus*), and California gull (*Larus californicus*).

With full capacity of the Sweetwater Reservoir, the greatest permanent impact of the three systems (i.e., the Design Alternative 2 layout, which would impact 11.72 acres) would result in the permanent loss of approximately 1.3 percent of the Reservoir's surface area. Therefore, permanent impacts to open water habitat would result in a relatively small area of the Sweetwater Reservoir. Additionally, the solar arrays would be located in the western-most corner of the Reservoir where most of the Reservoir's anthropogenic disturbances exist, with residential neighborhoods located just north of the study area. Major components of the Reservoir's infrastructure (i.e., Sweetwater Dam, the South Spillway, Perdue WTP, and other developed infrastructure supporting the operation and maintenance of the Reservoir) is located in this part of the Reservoir. Therefore, loss of habitat is not expected to have a significant negative effect on local or migrating wildlife. Nevertheless, the forthcoming EIR will examine potential impacts to open water habitat in more detail and will include recommendations and/or mitigation measures, as described in the Draft Biological Resources Technical Report, to address impacts to coastal sage scrub habitat.

c) ***Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?***

The capacity of the Sweetwater Reservoir extends to elevation 239 feet AMSL, with the elevation of the dam spillway at the western edge of the Reservoir. The last time water spilled over the Sweetwater Dam (239 feet) was in 1998 (Authority 2023). Coordination between the Authority and USACE for previous projects in the vicinity has identified the 239 feet elevation as the area regulated under the Clean Water Act. The USACE, in combination with the USEPA, reserves the ultimate authority in making the final determination of presence and extent of waters of the U.S., including wetlands.

No wetlands are present within the study area, but open waters of the Sweetwater Reservoir are present and would be impacted by the proposed Project. It is likely that permits would be required under Section 404 of the Clean Water Act from the USACE, Section 401 Water Quality Certification from the RWQCB, and Section 1602 of the State Fish and Game Code from the CDFW. The three systems of the proposed Project (AquaPhi^{TM} Pilot, Design Alternative 1 and Design Alternative 2) would result in temporary and permanent impacts to jurisdictional waters. The forthcoming EIR will address potential impacts to wetlands in more detail and will include recommendations and/or mitigation measures, as described in the Draft Biological Resources Technical Report, to address impacts to coastal sage scrub habitat.

d) ***Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?***

Wildlife corridors include both local movement routes and regional corridors and linkages. Local movement routes often connect resources on a localized level, often on a daily or nightly basis, such as water sources, foraging areas, and den/cover sites. Regional movement corridors or linkages connect larger patches of open space and are important to wildlife for seasonal movements, and for the long-term genetic flow between subpopulations. For large mammals, regional corridors are often required to provide a network of large-scale foraging or hunting areas. Corridors can be continuous habitat features, or "stepping stones" such as rest areas along a bird migration route. Corridors often follow linear topographical, water, or vegetation features.

The study area includes developed and natural lands adjacent to the Sweetwater Reservoir as well as a portion of the Reservoir itself, adjacent to an area that forms an east-west connection between the coast and open space areas of southeastern San Diego County. The study area is situated just north of a segment of this corridor that is likely on the south side of Sweetwater Dam, as well as an area that connects open space areas to the north and south on a local level. The Reservoir is also likely a local water access route for species in the surrounding habitats.

The study area is situated within a wildlife corridor that is considered part of the Sweetwater River linkage area. However, permanent impacts resulting from the proposed Project would be limited to 0.10 acre of coastal sage scrub habitat. Additionally, permanent impacts to coastal sage scrub habitat would occur at the edge of a patch of habitat that is adjacent to and surrounded by developed lands associated with the Perdue WTP and Reservoir infrastructure. Therefore, the proposed Project is not expected to affect the function of this area as a wildlife corridor.

The Sweetwater Reservoir is a crucial resource for numerous bird species, particularly aquatic birds. The Reservoir provides important roosting and foraging habitat for resident and migrant birds, as well as stopover habitat for migrating birds due to its proximity to the Pacific Flyway. Potential impacts to the Pacific Flyway and aquatic birds would include loss of habitat and potential for collisions, electrocution, and entrapment. However, the proposed project would result in a maximum permanent loss of 1.3 percent of the Reservoir's surface. With 98.7 percent of the Reservoir's surface water remaining available for aquatic birds, loss of habitat is not expected to have a significant negative effect on resident or migrating wildlife. The forthcoming EIR will address examine potential impacts to the Pacific Flyway in more detail and will include recommendations and/or mitigation measures, as described in the Draft Biological Resources Technical Report, to address and minimize impacts related to migratory birds and collisions, electrocution, and entrapment.

e) ***Conflict with any local policies or ordinances protecting biological resources, such as tree preservation policy or ordinance?***

The County's policy framework contains several policies relating to the conservation and protection of biological resources, including the MSCP, Resource Protection Ordinance, Biological Mitigation Ordinance, and Habitat Loss Permit Ordinance. While the Sweetwater Reservoir and Project area are not within the County's MSCP boundaries, the Authority strives to

be consistent with local plans or ordinances when proposing and implementing projects. With the implementation of the recommendations and/or mitigation measures, as described in the Draft Biological Resources Technical Report, the proposed Project would not conflict with any local policies or ordinances protecting biological resources.

f) ***Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?***

Natural Community Conservation Plans (NCCPs) are state-sponsored programs endorsed by the federal government to balance the needs of urban development and economic growth with species and habitat protection. NCCPs employ a multi-habitat and multi-species conservation planning approach, focused on preserving the largest core habitat areas possible while protecting necessary habitat linkages and wildlife movement corridors necessary to maintain long-term biological and genetic diversity. As part of the programmatic permitting of the Authority's property operations and maintenance plan, the Authority is currently working again with CDFW and USFWS in the preparation of an NCCP / Habitat Conservation Plan (HCP), and has already identified multiple covered activities and drafted an initial conservation strategy, progressing towards the goal of having a complete draft NCCP/HCP by February 2026. The proposed Project Addition is not in conflict with the current NCCP/HCP effort as this aeration system is within operational areas, and identified as such in the current NCCP/HCP.

16.5 CULTURAL RESOURCES

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the Project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5 of CEQA Guidelines?	☐	☐	☒	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5 of CEQA Guidelines?	☐	☒	☐	☐
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	☐	☒	☐

16.5.1 Existing Setting:

Ethnographic Background

The Sweetwater Reservoir – including the Project site – is located within the territory of the Kumeyaay people, who reside within the regions of coastal and inland San Diego County and Northern Baja California, ranging from Mesa Grande in the north to approximately Ensenada to the south and from the Pacific Coast to the eastern foothills of the Cuyamaca Mountains. Kumeyaay settlements were mostly composed of seasonal camps, as the Kumeyaay followed a common

California Native settlement pattern of dwelling within the lower lying valleys during the cooler winter season and moving to the higher mountain elevations during the warmer summer months for comfort, security and access to seasonal resources. It is believed that the immediate vicinity of the Project area was utilized for material procurement and stone quarrying.

Historic Background

In 1542, Juan Rodriguez Cabrillo and his expedition first made landfall in Alta California when they arrived on the shore of present-day Santa Catalina Island. Spanish colonization of Alta California occurred during the overland expedition of Captain Gaspar de Portola when his band of soldiers and missionaries established the first Spanish settlement in Alta California, the Presidio of San Diego. The first Spanish mission in California, the Mission San Diego de Alcala, was founded shortly thereafter in July 1769. At the time of Spanish arrival, the Kumeyaay knew the area surrounding the Project site as Apusquel and habitation sites were located upon the mesas along the Sweetwater Under Spanish occupation, the area was renamed La Purisma and became part of the larger El Rancho del Rey, which was used for little more than cattle grazing to provide meat for those living at the Presidio. California was secured as a Mexican territory in 1822, before becoming a federal republic in 1824.

Following Mexico gaining its independence from Spanish rule in 1821, California was secured as a Mexican territory in 1822, before becoming a federal republic in 1824. Following Mexican independence, all former Mission lands were confiscated, and the secularization of the system began in 1834, under Governor Juan B. Alvarado. In 1836, Alvarado began subdividing the lands formerly controlled by the missions into large land grants called ranchos. The Sweetwater Reservoir spans the boundary of two historic ranchos known as Rancho de la Nación and Rancho Jamacha.

The State of California was annexed into the U.S. in 1850. The regional area of Southern California attracted settlers and citrus farmer due to its ideal climatic conditions for growing. Construction of the Sweetwater Dam began in 1886 to control the flow of the Sweetwater River and produce an accessible reservoir of usable water. The effort to construct the Dam was led by Frank Kimball, who founded National City in 1868 and wished to see National City become a major trading port in the American West During the Great Flood of 1916, the abutments of the Sweetwater Dam failed, resulting in a flood that killed eight people and caused approximately $3 million in damages. The failure led to the abandonment of the National City & Otay Railroad and the development efforts of Kimball's San Diego Land & Water Company in the area. In 1977, the Sweetwater Dam was purchased by the Sweetwater Authority, a public agency, who has owned and operated the facility since.

Cultural Resources Assessment

WSP prepared a Draft Cultural Resources Assessment (Attachment 3), which includes a review of historical maps, a cultural resources records search from the South Coastal Information Center (SCIC) of the California Historical Resources Information System (CHRIS), and consultation with the Native American Heritage Commission (NAHC). The Project site is located along the north shore of the Sweetwater Reservoir, immediately east of Sweetwater Dam. The Project site includes up to 9.6-acres of surface water on the northwestern portion of the Sweetwater Reservoir where the pilot array and RES-BCT system would be located. The landside area that would be affected by the proposed Project would include 0.1 acres of a previously disturbed site located immediately east of the Perdue WTP. The records search indicated that 109 previous studies were identified within a 1-mile radius of the Project site, of which eight involved at least a portion

of the Project site. A total of 53 cultural resources have been previously recorded within a 1-mile radius of the Project site. Some of these previously recorded sites include National Register and California Register eligibility recommendations, none had been formally evaluated for eligibility.

16.3.2 Discussion:

a) ***Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5 of the CEQA Guidelines?***

The Cultural Resources Assessment and the associated records search conducted by WSP (2024) did not identify any historical resources within the Project site. The adjacent Sweetwater Dam is considered eligible for the NRHP; however, neither the dam nor any of its character defining features would be affected by implementation of the proposed Project. Therefore, implementation of the proposed Project would be unlikely to have an impact on historical resources pursuant to CEQA Section Guidelines 15064.5. Nevertheless, this issue will be examined in more detail in the forthcoming EIR, with supporting analysis from the Cultural Resources Assessment that has been prepared by WSP and any additional applicable information.

b) ***Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5 of the CEQA Guidelines?***

The Cultural Resources Assessment identified 53 previously recorded cultural resources within 1-mile of the Project site; however, none of these resources were present within the Project site. Given the previous disturbance of the landside area of the Project site as well as the construction staging area it is highly unlikely that archaeological materials would be unearthed during grading and other construction activities associated within the proposed Project. Nevertheless, this issue will be examined in more detail within the forthcoming EIR, with supporting analysis from the Draft Cultural Resources Assessment that has been prepared by WSP and any additional applicable information. The EIR will include recommendations and/or mitigation measures, as described in the Draft Cultural Resources Assessment, to address inadvertent discoveries of previously unknown buried archaeological resources in the unlikely scenario that they are encountered during construction-related ground disturbance.

c) ***Disturb any human remains, including those interred outside of dedicated cemeteries?***

No known human remains have been documented or are expected to occur within the Project site. As previously described, given the previous disturbance of the landside area of the Project site as well as the construction staging area, it is highly unlikely that the proposed Project would disturb human remains, therefore no impact is anticipated. Nevertheless, consistent with CEQA Guidelines Section 15064.5(e), if human remains are accidentally discovered or recognized during grading activities, State Health and Safety Code Section 7050.5 requires that no further disturbance shall occur until the County Coroner has made the necessary findings as to origin and disposition pursuant to PRC Section 5097.98. If the remains are determined to be of Native American descent, the coroner has 24 hours to notify the NAHC. The NAHC would then identify the person(s) thought to be the Most Likely Descendent of the deceased Native American, who would then help determine what course of action should be taken in dealing with the remains. Per PRC Section 5097.98, the landowner shall ensure that the immediate vicinity, according to generally accepted cultural

or archaeological standards or practices, where the Native American human remains are located, is not damaged or disturbed by further development activity until the landowner has discussed and conferred, as prescribed in this section (PRC Section 5097.98), with the most likely descendants regarding their recommendations, if applicable, taking into account the possibility of multiple human remains.

16.6 ENERGY

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the Project:				
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☐	☒
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☐	☒

16.6.1 Existing Setting:

As discussed in Section *9*, *Project Description*, state policy encourages the development of renewable energy resources to reduce reliance on fossil fuels. For example, SB 350 increases California's renewable electricity procurement goal from 33 percent by 2020 under EO S-14-08 to 50 percent by 2030. SB 100 establishes a goal of 100 percent electricity in California must be obtained from renewable and zero-carbon energy resources by the end of 2045. SB 100 also creates new standards for the RPS, increasing required energy from renewable sources for both investor-owned utilities and publicly owned utilities from 50 percent to 60 percent by the end of 2030.

Additionally, SB 1020 revises state policy to provide that eligible renewable energy resources and zero-carbon resources supply 90 percent of all retail sales of electricity to California end-use customers by December 31, 2035, 95 percent of all retail sales of electricity to California end-use customers by December 31, 2040, 100 percent of all retail sales of electricity to California end-use customers by December 31, 2045, and 100 percent of electricity procured to serve all state agencies by December 31, 2035, as specified.

The proposed Project would provide a renewable energy resource and would assist the electric service provider in meeting its these energy goals.

16.6.2 Discussion:

a) ***Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?***

During construction-related activities, temporary consumption of energy resources (e.g., diesel and gasoline fuels) would be required for the construction worker commutes, delivery of materials, the use of power tools, and the use of generators). However, compliance with

federal, state, and local regulations (e.g., CARB's requirement to limit engine idling times, etc.) would reduce short-term energy demand during the implementation of the proposed Project to the maximum extent feasible. Typical temporary construction activities associated with the proposed Project, which would last for a period 1 to 2 weeks for the construction Pilot AquaPhi™ system and 3 to 4 months for the RES-BCT system, would not be anticipated to result in wasteful or inefficient use of energy and impacts would be less than significant and no mitigation measures would be required.

Operation of the proposed Project would produce a new source of renewable energy able to offset an estimated total of 9.2 GWh a year (approximately 67 percent of the Authority's annual energy consumption). Therefore, implementation of the proposed Project is anticipated to have beneficial impact related to the Authority's energy consumption.

b) ***Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?***

The proposed Project would generate renewable energy which would help support the state's renewable energy resources and zero-carbon resources supply goals as well as the Authority's Sustainability Action Plan and Drought Response Plan. Therefore, implementation of the proposed Project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency and would result in a beneficial impact related to improvements to existing efficiency, reliability, and sustainability of energy sources and facilities.

16.7 GEOLOGY AND SOILS

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the Project:				
a) Directly or indirectly cause substantial adverse effects, including the risk of loss, injury, or death involving:				
(i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area, or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☒	☐
(ii) Strong seismic ground shaking?	☐	☐	☒	☐
(iii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
(iv) Landslides?	☐	☐	☒	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on-site or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☐	☒
d) Be located on expansive soil, as defined in Table 18-1-B of the 1994 California Building Code 1997, creating substantial risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒

16.7.1 Existing Setting:

The geologic setting of the Project site is based on existing reports and maps, including the Sweetwater Community Plan (County of San Diego 2014), U.S. Geological Survey (USGS), California Geological Survey (CGS) maps, and previous geotechnical investigations conducted in the surrounding vicinity (e.g., Ninyo and Moore 2005; GEI 2016). The Project site is located in Southern California, which is a seismically active region at the junction of the North American and Pacific tectonic plates. In comparison to other Southern California areas, San Diego County has sparse seismicity. However, since 1984, earthquake activity in San Diego County has doubled over that of the preceding 50 years (County of San Diego 2017). There are no known active faults (i.e., faults that exhibit evidence of ground displacement in the last 11,000 years) or potentially active faults (i.e., faults that exhibit evidence of ground displacement in the last 2,000,000 years) in the immediate Project site. The Elsinore Fault has been mapped approximately 38 miles east of the Project site and the Rose Canyon Fault has been mapped approximately 8 miles west of the Project site. Ongoing field and laboratory studies suggest the largest credible earthquake predicted for the coastal and metropolitan areas is M7.2 on the Rose Canyon Fault (County of San Diego 2014).

According to the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) database, the soil within the Project site is San Miguel rocky silt loam, 9 to 30 percent slopes. This soil is not known to have stability issues, and characteristics are further described in Table 3. Soil liquefaction occurs within relatively loose, cohesion-less sands that are saturated from a relatively high groundwater table (less than 50 feet below ground surface). Seismically induced soil liquefaction is a phenomenon in which loose to medium dense, saturated granular materials undergo matrix rearrangement, develop high pore water pressure, and lose shear strength due to cyclic ground vibrations induced by earthquakes or other means. Because the soils present in the Project area are not sandy, no stability issues would be expected.

Table 3. Soils within the Project Area

Map Unit Name	Soil Characteristics
San Miguel rocky silt loam, 9 to 30 percent slopes	Well-drained, shallow to moderately deep silt loams that have clay subsoil. This soil type has a low potential for erosion.
Source: USDA 2024.	

16.7.2 Discussion:

a) ***Directly or indirectly cause substantial adverse effects, including the risk of loss, injury, or death involving:***

i) ***Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?***

Sweetwater Reservoir is located in Southern California, which is a seismically active region at the junction of the North American and Pacific tectonic plates. However, according to California Department of Conservation (2015), there are no known active faults (i.e., faults that exhibit evidence of ground displacement in the last 11,000 years) in the immediate vicinity of the Project site. The nearest active fault with the potential for surface rupture is the Elsinore Fault has been mapped approximately 38 miles east of the Sweetwater Reservoir and the Rose Canyon Fault has been mapped approximately 8 miles west of the Sweetwater Reservoir. Additionally, the FPV system would not involve the construction of any habitable structures that would increase risk of loss, injury or death resulting from an earthquake and associated ground shaking. Landside construction would be limited to the development of a 0.1-acre concrete equipment pad and the placement of electrical conduits, which would require approximately 65 feet of underground trenching from the reservoir's high-water mark to the proposed equipment pad. Therefore, impacts associated with the proposed Project would be less than significant and no mitigation measures would be required.

ii) ***Strong seismic ground shaking?***

Ground shaking as a result of earthquakes is a potential hazard throughout Southern California. The relative potential for damage from this hazard is dependent upon the type, magnitude, and location of an earthquake event. As described in Response 16.7(a)(i), there are no known underlying active faults are located in the area. The Rose Canyon Fault has been mapped approximately 8 miles west of the Sweetwater Reservoir. Additionally, none of the proposed Project components (i.e. floating solar panels, concrete equipment pad, electrical conduits, etc.), are habitable structures and therefore there would be a very low risk of loss, injury, or death. Implementation of the proposed Project would result in a less than significant impact and no mitigation measures would be required.

iii) ***Seismic-related ground failure, including liquefaction?***

Soil liquefaction occurs within relatively loose, cohesion-less sands that are saturated from a relatively high groundwater table (less than 50 feet below ground surface). The

proposed FPV system would largely occur over the surface of the reservoir and would not be at risk impacts associated with liquefaction. The 0.1-acre concrete equipment pad, and electrical conduits would be located within San Miguel rocky silt loam, 9 to 30 percent slopes. As previously described, this soil is not known to have stability issues (refer to Table 2). Therefore, there would be no impacts associated with seismic-related ground failure, including liquefaction, and no mitigation measures would be required.

iv) ***Landslides?***

According to the CGS Seismic Hazard Zone Map, the Project site is not currently included in a zone with seismic hazards, such as seismically induced landslides. As such, implementation of the proposed Project would result in a less than significant impact and no mitigation would be required.

b) ***Result in substantial soil erosion or the loss of topsoil?***

The proposed Project could result in soil erosion during minor excavation and grading of the 0.1-acre concrete equipment pad as well as a trenching for utilities. However, earthwork associated with the proposed Project would be minor. Construction activities would implement temporary best management practices (BMPs) to control wind and water erosion during and shortly after construction activities such as limitations on construction during high winds, covering soil stockpiles, or watering exposed soils. Following construction, operation of the proposed FPV system would not increase the potential for soil erosion rates as compared to existing conditions. The operation of the facility would generally be passive with limited maintenance visits and associated activities. Therefore, the impact on soil erosion and the loss of topsoil associated with the proposed Project would be less than significant and no mitigation measures would be required.

c) ***Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?***

As described in the Response 16.7(a)(iii) and Response 16.7(a)(iv), the proposed Project would not result in impacts related to unstable soils.

d) ***Be located on expansive soil, as defined in Table 18-1-B of the 1994 California Building Code 1997, creating substantial risks to life or property?***

The proposed Project would not involve construction on expansive soil, as defined in Table 18-1-B. As described in Response 16.7(a)(iii), the soil within the Project site is San Miguel rocky silt loam, 9 to 30 percent slopes. This soil is not known to have stability issues. Therefore, there would be no impacts and no mitigation measures would be required.

e) ***Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?***

The proposed Project would not involve the construction of new habitable facilities that would require the use of septic tanks or alternative wastewater disposal systems. Therefore, there would be no impacts and no mitigation measures would be required.

f) ***Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?***

Based on previous geotechnical investigations that covered the Project site, geologic formations underlying the area are classified as Santiago Peak Volcanics, weathered volcanics, and fill. This geologic formation is rated with a marginal sensitivity level for paleontological resources and have a limited probability for producing fossil remains from certain sedimentary lithologies at localized outcrops. Given the previously disturbance within the landside project area and construction staging area as well as the minor earthwork associated with the proposed Project, the incidental discovery and/or loss of paleontological resources would not be expected and no mitigation measures would be required.

16.8 GREENHOUSE GAS EMISSIONS

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the Project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☐	☒
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☐	☒

16.8.1 Existing Setting:

Global climate change can be measured by changes in wind patterns, storms, precipitation, and temperature. Scientific consensus has identified human-related GHG emissions above natural levels is a significant contributor to global climate change. GHGs are emissions that trap heat in the atmosphere and regulate the Earth's temperature, and include water vapor, CO_2, methane (CH_4), nitrous oxide (N_2O), ground level O_3, and fluorinated gases, such as chlorofluorocarbons (CFCs), hydro chlorofluorocarbons (HCFCs), and halons. The potential impacts of climate change include severe weather patterns, flooding, reduced quality and availability of water, sea level rise, and beach erosion. Primary activities associated with GHG emissions include transportation, operation of utilities (e.g., power generation and transport), industrial activities, manufacturing, agriculture, and residential uses. End-use sector sources of GHG emissions in California are as follows: transportation (39 percent), industry (23 percent), electricity generation (16 percent), agriculture and forestry (8 percent), residential (7 percent), and commercial (8 percent) (CARB 2024).

AB 32 and SB 32 establish statewide goals to reduce GHG emissions to 1990 levels by 2020 and 40 percent below 1990 levels by 2030, respectively. CARB adopted the AB 32 Scoping Plan for Achieving Carbon Neutrality as a framework for achieving AB 32 goals. The latest 2022 Scoping Plan for Achieving Carbon Neutrality, which outlines a path to achieve the SB 32 target goal, outlines a series of technologically feasible and cost-effective measures to reduce statewide GHG emissions. The actions and outcomes in the plan will achieve significant reductions in fossil fuel combustion by deploying clean technologies and fuels, further reductions in short-lived climate pollutants, support for sustainable development,

increased action on natural and working lands to reduce emissions and sequester carbon, and the capture and storage of carbon. The proposed Project would add renewable solar-generated energy to the electricity supply and result in an emissions benefit. As such, the proposed Project facilitates the statewide goal of reducing GHG emissions.

The County's Climate Action Plan (CAP) is a long-term programmatic plan that identifies strategies and measures to meet the County's targets to reduce GHG emissions within the unincorporated county, consistent with the state's legislative GHG reduction targets, and demonstrates progress towards the State's 2050 GHG reduction goal. However, on September 30, 2020, the County of San Diego Board of Supervisors voted to set aside its approval of the County's 2018 CAP and related actions because the Final Supplemental EIR (SEIR) was found to be out of compliance with the CEQA. In response to this Board action, the County is preparing a Climate Action Plan Update to revise the 2018 CAP and correct the items identified by the Court within the Final 2018 CAP SEIR that were not compliant. The Draft CAP Update and Draft SEIR were available for public review from October 26, 2023 – January 5, 2024 and have been revised to reflect feedback received during public review. There Draft Final CAP Update project documents were considered by the Planning Commission on June 14, 2024 for their recommendation for adoption by the Board of Supervisors by Fall 2024 (County of San Diego 2024).

16.8.2 Discussion:

a) ***Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?***

Construction activities, including construction of the 0.1-acre concrete pad, trenching for utilities, and assembly of the FPV system, would result in a temporary increase in GHG emissions. Construction emissions would be generated from worker vehicle trips to the site, heavy-haul trucks and materials delivery, and operation of heavy construction equipment and power tools during assembly of the arrays. County guidance for determining GHG emission impacts recommends construction emissions be amortized over the 20-year operational life of a project and added to annual operational emissions unless evidence is provided demonstrating a longer or shorter project life. Operational life of the proposed FPV system is expected to be up to 25 years. Therefore, in order to assess construction-related emissions, emissions from construction are amortized over a 25-year period and added to operational emissions in order to make a single significance determination.

Operational GHG emissions from the proposed Project would result from annual vehicle trips for maintenance and panel washing. However, these emissions would amount to less than 1 metric ton of CO_2 equivalent (CO_2e) per year. Additionally, the renewable energy generated by the proposed Project would displace GHG emissions that would be otherwise generated in the electrical grid by non-renewable resources. This displacement, estimated at up to a maximum of 249.12 pounds of CO_2e per megawatt-hour (MWh) using USEPA eGrid future-year emission factors (USEPA 2018) would far outweigh the amortized construction emissions and operational emissions over the estimated 25-year life of the proposed Project. Therefore, operation of the proposed Project would have a beneficial impact by resulting in a net reduction in GHG emission.

b) ***Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?***

As described in Response 16.8(a), the proposed Project would result in a net reduction in GHG emissions. As such, the proposed Project would be consistent with the pending CAP and would not conflict with any applicable state or local plans, policies, or regulations adopted for the purpose of reducing the emissions of GHGs.

16.9 HAZARDS AND HAZARDOUS MATERIALS

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the Project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project result in safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☒	☐

16.9.1 Existing Setting:

The San Diego County Department of Environmental Health – Hazardous Materials Division is the Certified Unified Program Agency (CUPA) for San Diego County. Government Code Section 65962.5 requires the California Environmental Protection Agency (Cal EPA) to develop and annually update the Hazardous Waste and Substances List – Site Cleanup (Cortese) List. Information on the location of hazardous material sites contained in the Cortese List is provided

by the Department of Toxic Substances Control (DTSC). A review of the Cortese List indicates that there are no identified hazardous materials release sites located within the Project site (DTSC 2024b). In addition, a review of the DTSC EnviroStor Database did not indicate any cleanup sites or hazardous waste facilities within the vicinity of the Project site (DTSC 2024a).

The closest school is Sunnyside Elementary School, which is located approximately 1.5 miles away from the Sweetwater Reservoir. The nearest public airport, Brown Field Municipal Airport, is located approximately 8 miles from the Project site. The proposed Project is not located within an airport land use plan area or within the vicinity of a private airstrip. Public access is restricted to the Sweetwater Dam and Reservoir area, and there are no through roadways.

16.9.1 Discussion:

a) ***Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?***

Construction activities associated with the proposed Project would involve the use of hazardous materials for construction, such as solvents, acids, curing compounds, grease, diesel fuels, oils, and other chemicals, which could pose risks to construction workers, if not properly stored, used, and disposed of. However, compliance with existing federal and state regulations related to the transport, handling, use, and disposal of hazardous materials during construction activities would ensure that impacts would be less than significant, and no mitigation measures would be required. Following the completion of construction, no hazardous materials would be stored on the Project site.

Operation and maintenance of the proposed FPV system would involve manually cleaning the panels with a dry soft cloth, using no water or solvents, a vacuuming system may be used to collect debris. The frequency of panel cleaning would be as needed, but it is expected to occur at least once a year. Maintenance activities would also include anti-fouling beneath floating panels to prevent or remove fouling organisms (e.g. algae, seaweed, mussels). Anti-fouling methods may include application of anti-stick coatings, biocides, or ultrasonic transducers, each of which have been demonstrated to be effective with minimal to no environmental impacts (Delgado et al. 2021). As previously described, a full maintenance plan is being developed concurrently with the development of the FPV regulatory approvals, to ensure maintenance activities would fully be compliant with applicable environmental regulations, including those governing drinking water and water quality.

Maintenance trucks would be used to perform routine maintenance, including but not limited to equipment testing, monitoring, repair, routine procedures to ensure service continuity, and standard preventative maintenance. Long-term maintenance and equipment replacement would be scheduled in accordance with manufacturer recommendations to ensure equipment integrity is maintained. Typically, one major maintenance inspection would take place annually.

Limited amounts of hazardous materials would be stored or used on-site during operation and appropriate spill containment and cleanup kits would be maintained by Authority staff. Transformers would contain dielectric insulating fluid and would be not routinely be handled by Authority staff. These materials would be stored in appropriate containers to prevent accidental release. Equipment storage would be in accordance with OSHA

requirements, such as inclusion of heating, ventilation, air conditioning, fire protection systems, and spill response supplies.

The implementation of the proposed Project would be unlikely to create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials, nevertheless, this issue will be examined in more detail in the forthcoming EIR.

b) ***Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?***

As described in the Response 16.9(a), compliance with existing Federal and State regulations related to the transport, handling, use, and disposal of hazardous materials during construction activities would ensure that the potential for release of hazardous materials into the environment would be minimal. Nevertheless, this issue will be examined in more detail in the forthcoming EIR.

c) ***Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?***

The proposed Project would not result in the emissions or handling of hazardous materials, substances, or wastes within 0.25-mile of an existing or proposed school. The nearest school is Sunnyside Elementary School, located approximately 1.5 miles away from the Sweetwater Reservoir. Neither the construction nor operation of the proposed FPV system would create hazardous emissions or involve the handling of hazardous or acutely hazardous materials, substances, or waste that could affect receptors at the school. Therefore, no impacts are anticipated to occur as a result of the proposed Project and no mitigation measures would be required.

d) ***Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?***

The Project site is not included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. Therefore, implementation of the proposed Project would not occur on a hazardous materials site that could create a risk to the public or the environment.

e) ***For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?***

The nearest public airport to the Project site is the Brown Field Municipal Airport, located approximately 8.5 miles to the south of the Sweetwater Reservoir. The proposed Project would not create a safety hazard associated with airport operations for people residing or working in the vicinity because no airports or private airstrips are located within 2 miles of the Project site.

f) ***Impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan?***

The San Diego County Operational Area Emergency Plan describes a comprehensive emergency management system which provides for a planned response to disaster situations associated with natural disasters, technological incidents, terrorism and nuclear-related incidents. The San Diego County Operational Area Emergency Plan divides the county into planning grids and provides evacuation plans for each grid. Construction activities and staging would be contained within the Project site and would not obstruct evacuation procedures or evacuation routes identified by the Operational Area Emergency Plan. There would be no impacts and no mitigation measures would be required.

g) ***Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?***

As described in Section 16.20, *Wildfire*, the proposed Project would not add habitable structures that could be exposed to fire risk and would not impact response times of local fire departments.

The implementation of the proposed Project would be unlikely to expose people or structures to a significant risk of loss, injury or death involving wildland fires. The proposed Project would comply with any requirements of the Fire Authority that has jurisdiction in the area, including removal of vegetation to create a fire break between Project structures and other existing structures and residential areas. Nevertheless, this issue will be examined in more detail in the forthcoming EIR and if needed, mitigation measures will be developed.

16.10 HYDROLOGY AND WATER QUALITY

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the Project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	☒	☐	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:	☐	☐	☒	☐
(i) Result in substantial erosion or siltation on- or off-site;	☐	☐	☒	☐

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
(ii) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off site;	☐	☐	☐	☒
(iii) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	☐	☒
(iv) Impede or redirect flood flows?	☐	☐	☐	☒
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☒	☐
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☒	☐
f) Place housing within a I00-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
g) Place within a I00-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☒
h) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒
i) Be subject to inundation by seiche, tsunami, or mudflow?	☐	☐	☒	☐

16.10.1 Existing Setting:

San Diego Region is defined as Region 9 by the RWQCB, and includes approximately 3,900 square miles of surface area. The San Diego Region has 13 principal stream systems originating in the western highlands which flow to the Pacific Ocean. The region is divided into 11 major hydrologic units (HUs), 54 hydrologic areas (HAs), and 147 hydrologic subareas (HSAs). HUs are the entire watershed of one or more streams; HAs are major tributaries and/or major groundwater basins within the HU; and HSAs are major subdivisions of HAs including both water-bearing and non-water-bearing formations. The RWQCB has designated Sweetwater Reservoir and its surrounding areas as being in the Sweetwater HU (Basin 9.00). This HU is a 230-square mile elongated strip that is traversed along its length by the Sweetwater River stretching from the eastern boundary of RWQCB Region 9 in the Laguna Mountains to San Diego Bay. The watershed has four major water bodies, the Sweetwater River, Sweetwater Reservoir, Loveland Reservoir, and San Diego Bay. The Sweetwater HU includes separate and fully functional HAs: Lower Sweetwater (9.10), Middle Sweetwater (9.20), and Upper Sweetwater (9.30) (RWQCB 2021). The Sweetwater Reservoir listed on the 303(d) List of Impaired Waters for mercury and dissolved oxygen (State Water Resources Control Board [SWRCB] 2022). Additionally, the

Lower, Middle, and Upper Sweetwater River are also included on the 303(d) List of Impaired Waters for various pollutants (SWRCB 2022).

Sweetwater Reservoir is a drinking water reservoir that receives water from the Sweetwater River watershed, as well as imported water from the San Diego County Water Authority, with the quality affected by upstream watershed development and activities. Surface and ground waters flowing into Sweetwater Reservoir are treated at the Perdue WTP prior to delivery to its customers. The Authority also supplements its local water supply with treated water purchased from the San Diego County Water Authority.

As previously described, the Urban Runoff Diversion System (URDS) is located along the north side of the Sweetwater Reservoir. The main purpose of the URDS is to minimize stormwater pollution in the reservoir resulting from upstream residential developments and industrial areas. Minimization of stormwater pollution is achieved mainly by capturing polluted runoff from the "first flush" and dry–season low flows. The system can also capture hazardous spills, preventing water pollution in the reservoir.

16.10.2 Discussion:

a) ***Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?***

The Sweetwater Reservoir is a drinking water reservoir that receives water from the Sweetwater River watershed, as well as imported water from the San Diego County Water Authority, with the quality affected by upstream watershed development and activities. Surface and ground waters flowing into Sweetwater Reservoir are treated at the Perdue WTP prior to delivery to Authority customers. The Authority also supplements its local water supply with treated water purchased from the San Diego County Water Authority. The Project site is located within the Sweetwater Reservoir hydrologic unit (180703040902). The Sweetwater Reservoir is included on the 303(d) List of Impaired Waters for mercury and low oxygen (USEPA 2024). The Sweetwater River, Middle (between Sweetwater and Loveland Reservoirs) is also included on the 303(d) List of Impaired Waters for degraded aquatic life (USEPA 2024).

Construction-Related Impacts

Potential impacts to hydrology and water quality could result from inadequate containment of sediment from grading and other construction activities and from fuels associated with construction equipment, such as from leaks or during maintenance and fueling. In addition, equipment storage areas and trash receptacles could pose potential significant impacts to water quality if they are not properly managed and maintained.

Direct ground disturbing activities (e.g., grading and trenching) would occur over an area of less than 1 acre. Given this small area of ground disturbance a National Pollutant Discharge Elimination System (NPDES) Construction General Permit would not be required. Nevertheless, a Water Pollution Control Plan (WPCP) would be prepared for the proposed Project. The WPCP shall include a description of BMPs that the applicant will employ during construction, a monitoring program to ensure implementation of the BMPs, a list of responsible parties and contacts, and other details of construction activities. The WPCP is a working document that is updated and modified throughout construction to detail any changes in

implementation of BMPs, any noncompliance, and resolution thereof. Compliance with the WPCP would ensure that there would be no impacts to hydrology and water quality from construction activities.

A short list of possible BMPs that may be used during construction of the proposed Project includes the following:

- Temporary Soil Stabilization: silt fencing, gravel bag berms, sandbag barriers, straw bale barriers, sediment traps, soil binders, and straw mulch, and fiber rolls
- Wind Erosion Control: portable water, dust and erosion control
- Tracking Control: street sweeping and entrance/outlet tire washing
- Waste Management and Material Pollution Control: vehicle and equipment cleaning, stockpile management, proper material delivery and storage, solid waste management, concrete waste management, and contaminated soil management

Check berms and desilting basins may be developed during construction to prevent off-site sediment transport. A typical BMP stormwater pollution interception system may include a temporary detention/sedimentation basin and a filter or clarifier device to remove pollutants from runoff before release from the property.

The small-scale construction activities associated with the proposed Project and the required implementation of a WPCP would reduce all potential construction impacts to a less than significant level.

Operational Impacts

WSP prepared a draft technical memorandum, including a thorough literature review, to address potential water quality impacts associated with the operation of the proposed FPV system (Attachment 4). These potential impacts will be discussed in the forthcoming EIR analysis, which will address the relative cover of the solar panels on the reservoir, physical water quality parameters such as water temperature, and metals and per- and polyfluoroalkyl substances (PFAS) leaching. The EIR will include recommendations and/or mitigation measures to address potential impacts, as necessary.

b) ***Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?***

Grading activities for the proposed 0.1-acre concrete equipment pad would be minor, a limited to what is needed to level the area. Additionally, trenching associated with installation of underground cables typically occurs at a depth of 3 to 4 feet. According to the NRCS, the water table where construction and trenching would occur is located at a greater depth than 6.5 feet (NRCS 2024). Therefore, there would be no impact related to groundwater. The proposed Project would not decrease groundwater supplies. The operation of the proposed Project would not result in any increase in water demand and would not measurably affect groundwater infiltration within the vicinity of the Sweetwater Reservoir. Therefore, no impacts would occur as a result of the proposed Project and no mitigation measures would be required.

c) ***Substantially alter the existing drainage pattern of the site or area including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:***

i) ***Result in substantial erosion or siltation on- or off-site?***

Construction-Related Impacts

As described in Section 16.7, *Geology and Soils*, the proposed Project could result in minor soil erosion during excavation, grading, and construction of the proposed Project. However, the proposed Project would be subject to the Statewide General Construction Permit (Order WQ 2022-0057-DWQ; NPDES No. CAS000002), which would require the development and implementation of a SWPPP. As described in the Response 16.10(a) BMPs would include:

- Temporary Soil Stabilization: silt fencing, gravel bag berms, sandbag barriers, straw bale barriers, sediment traps, soil binders, and straw mulch, and fiber rolls
- Wind Erosion Control: portable water, dust and erosion control
- Tracking Control: street sweeping and entrance/outlet tire washing
- Waste Management and Material Pollution Control: vehicle and equipment cleaning, stockpile management, proper material delivery and storage, solid waste management, concrete waste management, and contaminated soil management

Check berms and desilting basins may also be developed during construction to prevent off-site sediment transport.

The small-scale construction activities associated with the proposed Project and the required implementation of a SWPPP would reduce all potential construction impacts to a less than significant level.

Operational Impacts

Given that the proposed FPV system would be located on the surface of the reservoir, as compared to a landside area, operational activities would not increase soil erosion rates as compared to existing conditions. The impact on soil erosion and the loss of topsoil associated with the proposed Project would be less than significant and no mitigation measures would be required.

ii) ***Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off site?***

The proposed Project would not alter surface runoff or velocity compared to existing conditions. The proposed Project would neither alter existing drainage patterns nor the course of any stream or river that would result in flooding on- or off-site. The proposed Project would not involve any physical changes to the environment that would contribute or create runoff water that would exceed the capacity of existing drainage systems or

provide a substantial source of polluted runoff. No impacts would occur and no mitigation measures would be required.

iii) ***Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?***

As described in Response 16.10(c)(ii), the proposed Project would not involve any physical changes to the environment that would contribute to or create runoff water that would exceed the capacity of existing drainage systems or provide a substantial source of polluted runoff. No impacts would occur and no mitigation measures would be required.

iv) ***Impede or redirect flood flows?***

As described in Response 16.10(c)(ii), the proposed Project would not involve any physical changes to the environment that would impede or redirect flood flows. No impacts would occur and no mitigation measures would be required.

d) ***In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?***

The Project site is located 7 miles inland and is not considered within a tsunami hazard zone. Given its location at the Sweetwater Reservoir, the Project site may be at risk in the event of seiche. According to the Federal Emergency Management Agency (FEMA), the Project site is located in Flood Zone X an "Area of Minimal Flood Hazard" (FEMA 2024). The proposed Project would not increase risk associated with flood hazards or seiche beyond existing conditions and would not risk release of pollutants due to inundation of the Project site. Therefore, impacts would be less than significant and no mitigation measures would be required.

e) ***Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?***

The Authority is subject to the objectives and limits of the Water Quality Control Plan for the San Diego Basin (RWQCB 2021). Construction water use would occur during dust suppression activities during grading and trenching activities. Operational water use would be limited to maintenance activities and would be minimal. The proposed Project would not conflict with or obstruct implementation of a water quality control plan. The proposed Project would not result in increased demand for water supply (refer to Response 16.10[b]) and therefore would not impact or otherwise affect compliance with a sustainable groundwater management plan. Therefore, impacts would be less than significant and no mitigation measures would be required.

f) ***Place housing within a I00-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?***

As described in Response 16.10(d), the Project site is located in Flood Zone X an "Area of Minimal Flood Hazard" (FEMA 2024). Additionally, the proposed Project does not involve the construction of housing or any habitable structures. Therefore, the proposed Project would result in no impacts and no mitigation measures would be required.

g) ***Place within a I00-year flood hazard area structures which would impede or redirect flood flows?***

As described in Response 16.10(d) and Response 16.10(f), the Project site is located in Flood Zone X an "Area of Minimal Flood Hazard" (FEMA 2024). The proposed Project would neither alter existing drainage patterns nor the course of any stream or river that would result in flooding on- or off-site. The proposed Project would result in no impacts would occur and no mitigation measures would be required

h) ***Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?***

As described in Response 16.10(d) and Response 16.10(f), the Project site is located in Flood Zone X an "Area of Minimal Flood Hazard" (FEMA 2024). The proposed Project would neither alter existing drainage patterns nor the course of any stream or river that would result in flooding on- or off-site. Additionally, the Project site is not located immediately downstream of the Sweetwater Dam or the South Dike and would not be subject to flooding and associated loss in the unlikely event of dam failure. Therefore, the proposed Project would result in no impacts and no mitigation measures would be required.

i) ***Be subject to inundation by seiche, tsunami, or mudflow?***

As described in Response 16.10(d) the Project site is not located within a tsunami hazard area. Given the location of the Project site at the Sweetwater Reservoir, the Project site may be affected in the event of a seiche. However, as described in Response 16.10(d), potential damage to the proposed Project elements (i.e., floating solar panels, equipment pad, electrical connections) presents a low risk. As described in Response 16.7(iv), no landslides or indications of deep-seated landslide activity have been identified in the vicinity of the Sweetwater Reservoir. Therefore, the proposed Project would not be at risk of inundation by mudflow. Overall, impacts would be less than significant and no mitigation measures would be required.

16.11 LAND USE AND PLANNING

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the Project:				
a) Physically divide an established community?	☐	☐	☐	☒
b) Cause a significant environmental impact due to conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒

16.11.1 Existing Setting:

As previously described, the Sweetwater Reservoir – including the Project site – is located in unincorporated San Diego County. The Project area is designated Public Agency Lands and is zoned S80 – Special Purpose (County of San Diego 2014; County of San Diego Planning and

Development Services 2012). The Authority is the principal agency that has jurisdiction over the Project area and provides water service to customers in the Project vicinity. The Department of Safety of Dams (DSOD) also has jurisdiction over Sweetwater Dam. As described in Section 16.4, *Biological Resources*, the proposed Project is not located within an approved habitat conservation plan area or a natural community conservation plan area.

16.11.2 Discussion:

a) ***Physically divide an established community?***

The County of San Diego land use designation and zoning for the Project site Public Agency Land (County of San Diego 2021c). Land uses surrounding the Project site include Open Space Parks and General Single Family or Single Family Detached. The proposed FPV system would be contained within the Sweetwater Reservoir and would not conflict with existing land uses or divide an established community. Therefore, no impacts would occur and no mitigation measures would be required.

b) ***Cause a significant environmental impact due to conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?***

The County of San Diego land use designation and zoning for the Project site is Public Agency Lands (County of San Diego 2021c). Public Agency Lands designation include State Parks, National Forests, and other public agency non-conservation lands. The proposed FPV system would serve Authority's needs by providing electrical energy to SDG&E distribution grid and help the County meet its renewable energy conservation goals. The proposed Project would not conflict with the existing land use designations and zoning. No impacts would occur and no mitigation measures would be required.

16.12 MINERAL RESOURCES

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the Project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

16.12.1 Existing Setting:

The CDC classifies the regional significance of mineral resources in accordance with the California Surface Mining and Reclamation Act of 1975 (SMARA). The CDC designates Mineral Resources Zones (MRZs) that have regionally significant mineral deposits. The Sweetwater River deposited Quaternary-age alluvium and slopewash (Kennedy and Tan 1977). The proposed

Project would not cause a loss of availability of a locally-important mineral resource recovery site delineated on a local general plan. These alluvial deposits are interbedded with slopewash, which are poorly consolidated materials deposited along the flanks of the lower valley slopes by the interaction of gravity and water (ESA 2013). There are several mineral resource areas associated with the Sweetwater Reservoir and the Sweetwater River; however, they are located to the east and west of the Project site.

16.12.1 Discussion:

a) ***Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?***

According to CDC, the entire Sweetwater Reservoir area is classified as a SMARA study area. The San Diego County General Plan Conservation and Open Space Element designates the Sweetwater Reservoir and surrounding area as MRZ 3 (Resource potentially present) (County of San Diego 2021c). The proposed Project would require ground-disturbing activities during construction of the proposed 0.1-acre concrete equipment pad and trenching for the electrical conduits. However, ground disturbance would not occur at a depth that creates potential to impact to mineral resources. No impacts would occur and mitigation measures would be required.

b) ***Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?***

As described in Response 16.12(a), the Sweetwater Reservoir is designated in the San Diego County General Plan Conservation and Open Space Element as MRZ 3. The proposed Project would involve ground disturbing activities, including the construction of a 0.1-acre concrete equipment pad and the trenching of utilities adjacent to the existing the Perdue WTP. However, given the small surface area of the proposed equipment pad and the proximity to an existing permanent structure, construction of the proposed Project would not substantially preclude the future availability of mineral resources within the vicinity of the Reservoir. No impacts would occur and no mitigation measures would be required.

16.13 NOISE

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the Project result in:				
a) Generation of a substantial temporary or permanent 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?	☐	☐	☒	☐
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
c) For a project located within a private airstrip or an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

16.13.1 Existing Setting:

California Government Code Section 65302(f) mandates that the legislative body of each county and city adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines established by the State Department of Health Services. Under these guidelines, single-family homes are "normally acceptable" in exterior noise environments up to 60 Community Noise Equivalent Level (CNEL) and "conditionally acceptable" up to 70 CNEL. Multiple-family residential uses are "normally acceptable" up to 65 CNEL and "conditionally acceptable" up to 70 CNEL. Schools, libraries, and churches are "normally acceptable" up to 70 CNEL, as are office buildings and businesses, commercial, and professional uses. The 70 CNEL maximum criteria developed by State Office of Noise Control serves as a general guideline for identifying community noise problems. Sensitive receptors including schools, libraries, hospitals, and nursing homes are unacceptable in exterior environments, which exceed 70 CNEL, while residential uses are unacceptable in exterior environments in excess of 65 CNEL. In addition, the County has adopted community noise control standards as part of the County's Noise Abatement and Control Ordinance (County Code of Regulatory Ordinances, Title 3, Division 6, Chapter 4). The Noise Ordinance defines limits for activities that generate excessive noise and sets noise level limits for land uses.

The predominant sources of noise affecting the Project site are from aircraft passing overhead. Other noise sources include traffic from the nearby SR-125, birds chirping, occasional dog barks, and outdoor activities associated with the nearby residences (e.g., leaf blowers, lawn mowers, vehicle starting, etc.). The Project site itself produces minimal noise levels due to low-density and lack of noise producing activities at the Reservoir.

The San Diego County Noise Ordinance (San Diego County Code Section 36, Chapter 4) and the County's General Plan both establish noise standards for the County. The County's noise regulations range from 45 A-weighted decibels (dBA) to 75 dBA, depending on the land use zoning and time of day (see Table 4).

Table 4. San Diego County Noise Standards

Zoning	Noise Level (dBA)	Time Period
Residential	45	10 PM to 7 AM
Residential	50	7 AM to 10 PM
Commercial	55	10 PM to 7 AM
Commercial	60	7 AM to 10 PM
Industrial	75	Any time
Source: County of San Diego 2008		

Noise pollution in certain areas of the Sweetwater CPA already exceeds the County's published noise standards (County of San Diego 2014). The greatest noise pollution exists along Interstate (I-) 805 with the CNEL reaching 79 decibels (dB). The Project area is characterized by largely undeveloped open space and the noise environment surrounding the Project area is influenced primarily by distant truck and automobile traffic. Within the Project vicinity, the greatest noise pollution occurs at SR-125, which produces levels between 73 and 76 dB, and along Bonita Road and Sweetwater Road. Bonita Road varies from 75 dB at the I-805 ramp to 60 dB at San Miguel Road. Sweetwater Road produces CNEL of 73 decibels at the I-805 ramp to 64 decibels in the vicinity of Quarry Road (County of San Diego 2014). The proposed Project is not located within an airport land use plan area and is not located within 2 miles of a public airport or within vicinity of a private airstrip.

16.13.2 Discussion:

a) ***Generation of a substantial temporary or permanent 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?***

Construction activities would require use of construction equipment for over a period of 1 to 2 week during installation of the Pilot AquaPhi™ system and 3 to 4 months during installation of the RES-BCT system. Typical noise levels from construction equipment are shown in Table 5. The Project site is located approximately 800 feet from the nearest sensitive receptors to the northeast. At this distance noise levels would range from 51 dBA to 61 dBA. At this noise level, construction equipment could create a temporary annoyance to nearby residences. However, noise levels would occur only sporadically since not all equipment would be operating at all times. Additionally, existing topography blocks the line of sight of the Project site to the nearest residence, which would reduce noise levels by an additional 5 dBA. Construction activities would comply with the County Noise Ordinance which prohibits operation of construction equipment between 7 PM and 7 AM and on Sundays and holidays. With adherence to these regulations, impacts would be less than significant and no additional mitigation measures would be necessary.

Table 5. Typical Construction Noise Levels

Equipment	Noise Level at 50 feet-dBA	Noise Level at 800 feet-dBa
Truck	75	51
Crane	85	61
Concrete truck	85	61
Drill Rig Truck	84	60
Source: Federal Highway Administration 2017.		

Operation of the proposed FPV system would not increase noise levels compared to existing conditions. Therefore, noise levels associated with the proposed FPV system would remain well within the standards established in the County's general plan and noise ordinance. No impacts would occur and no mitigation measures would be required.

b) ***Generation of excessive groundborne vibration or groundborne noise levels?***

The most substantial vibration sources associated with the proposed solar FPV system would result from site preparation and grading activities. However, vibration levels would remain well below the 0.1 inches per second (in/sec) threshold of annoyance at distances between 30 and 40 feet. The proposed Project would involve minimal grading and site preparation associated with the proposed concrete equipment pad and trenching for electrical conduits. These activities would not affect any nearby sensitive receptors would not result in the temporary or permanent introduction of groundborne vibration or groundborne noise (e.g., the nearest single-family residential areas are located approximately 0.5 to the south of the Project site). Therefore, impacts would be less than significant and no mitigation measures would be required.

c) ***For a project located within a private airstrip or an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?***

The nearest public airport, Brown Field Municipal Airport, is located approximately 8.5 miles from the Project site. The proposed Project would not involve the construction of any habitable structures and would not expose people residing or working in the Project site to excessive noise levels. No impacts would occur and no mitigation would be required.

16.14 POPULATION AND HOUSING

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the Project:				
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

16.14.1 Existing Setting:

The Project site is located in southwest unincorporated San Diego County, in the Sweetwater CPA located approximately 5 miles east of the City of Chula Vista. San Diego County is the second most populous of California's 58 counties, and the fifth largest county in the U.S. (County of San Diego 2024). San Diego is home to 3.1 million residents (County of San Diego 2024). Between 2010 and 2018, population in the unincorporated County grew by more than 5 percent, which was lower than the overall County's population growth of 8 percent (County of San Diego 2021a). Between 2010 and 2018, population in Sweetwater community decreased by 0.3 percent (County of San Diego 2021a). From 2018 to 2050, population in the unincorporated area is expected to increase 26 percent, from 513,123 to 647,233 (County of San Diego 2021a).

The Project site is vacant and there are no residents, housing units, or employees currently at the site. The nearest single-family residential areas are located approximately 0.5 to the south of the Project site.

There are no large scale planned housing or commercial developments within the immediate area. The roads near the Project site are used for thoroughfare travel and access to residential neighborhoods and some commercial businesses. The Project site is not zoned for residential use, and there are no existing residential structures within the Project site.

16.14.2 Discussion:

a) ***Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)?***

The Sweetwater Reservoir provides a water supply to local residents and the existing community. The proposed Project would not result in any change to the existing land use pattern or trigger substantial growth in the area. No residential or habitable structures would be constructed as a part of the proposed Project. Additionally, the proposed Project would not result in a substantial number, if any, of new full time positions. Further, the solar power generated by the proposed FPV system would be used to offset electricity use at the Perdue WTP and the Desalination Facility as well as the National City Wells site and a variety of small sites that support existing tanks, wells, and pump stations. No direct or indirect impacts to population would occur and no mitigation measures would be required.

b) ***Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?***

The Project site is located within the boundaries of the Sweetwater Reservoir. Construction of the proposed FPV system would not involve displacing existing residents or housing. No new housing would be needed following project completion. No impacts would occur and no mitigation measures would be required.

16.15 PUBLIC SERVICES

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the Project:				
a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the following public services: (i) Fire Protection?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
(ii) Police Protection?	☐	☐	☐	☒
(iii) Schools?	☐	☐	☐	☒
(iv) Parks?	☐	☐	☐	☒
(v) Other public facilities?	☐	☐	☐	☒

16.15.1 Existing Setting:

Fire protection within most of the Sweetwater CPA is provided by the Bonita-Sunnyside Fire Protection District (FPD). The District has two permanent fire stations and an approved tentative map for Bonita Meadow Estates includes a condition requiring dedication of a fire station off Proctor Valley Road. The District's average response time is 2 to 4 minutes, while the longest time is 5 to 6 minutes (County of San Diego 2014). The California Department of Forestry (CDF) also provides wildland brush protection to the southeastern portion of the District and its sphere of influence area. The closest CDF station is located at 2249 Jamacha Road. CDF is part of the County's Master Mutual Aid agreement, enabling them to respond to fires outside their area of responsibility when needed (County of San Diego 2014). The majority of the Sweetwater CPA – including the entirety of the project area – is not located within a fire hazard severity zone. The Sweetwater CPA, along with the Project site, is located in an area of Unincorporated Local Responsibility Area (LRA) (California Department of Forestry and Fire Protection [CAL FIRE] 2020).

The San Diego County Sheriff's department provides police protection to the Sweetwater CPA out of its Imperial Beach facility, located at 845 Imperial Beach Boulevard approximately 10 miles southwest of the Project site. Secondary support is provided by the County Sheriff's Lemon Grove division. Response time in Sweetwater ranges from 10 minutes for priority calls to 15 minutes for non-priority calls. Currently there are no plans for additional stations in the area. Improved service will result from increases in personnel and additional equipment when financial constraints are resolved (County of San Diego 2014).

The Sweetwater CPA is served primarily by three school districts: Chula Vista City Elementary School District, Sweetwater Union High School District, and Southwestern Community College District. The northeast corner of Sweetwater CPA is served by Cajon Valley Union School District. The nearest public schools are Sunnyside Elementary School, Zamorano Elementary, Freese Elementary and La Presa Elementary School.

16.15.2 Discussion:

a) ***Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the following public services:***

i) ***Fire protection?***

As described in Response 16.14(a), the proposed Project would not result in new development or population growth that would require or result in construction of any structures that would require additional fire protection services. No impacts would occur and no mitigation measures would be required.

ii) ***Police protection?***

As described in Response 16.14(a), the proposed Project would not result in new development or population growth that would require or result in construction of any structures that would increase the demand for police protection services and facilities. No impacts would occur and no mitigation measures would be required.

iii) ***Schools?***

As described in Response 16.14(a), the proposed Project would not result in new population growth that would generate new students or residents in the community. No impacts would occur and no mitigation measures would be required.

iv) ***Parks?***

As described in Response 16.14(a), the proposed Project would not result in new population growth that would increase the demand for new or expanded park facilities. No impacts would occur and no mitigation measures would be required.

v) ***Other public facilities?***

As described in Response 16.14(a), the proposed Project would not result in new population growth that would increase the demand for any other public facilities. No impacts would occur and no mitigation measures would be required.

16.16 RECREATION

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities, such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?	☐	☐	☐	☒

16.16.1 Existing Setting:

The County of San Diego Department of Parks and Recreation (DPR) is responsible for managing parks within the County. The DPR park system features 157 facilities across more than 57,000 acres of land, including parks, camping parks, sports parks, community centers, open space preserves and historic sites, as well as 380 miles of trails (County of San Diego 2023). The Sweetwater Summit Regional Park is located immediately southwest of the Reservoir and offers camping, hiking, cycling, and equestrian riding trails for visitors in its 500-acre space. Additionally, the Sweetwater Reservoir Riding and Hiking Trail located along the south side of the reservoir provides 5 miles of trail for hikers, equestrian users, bikers.

Additionally, a trail network that runs through portions of the Sweetwater Reservoir along Conduit Road and adjacent to the southern edge of the South Dike. The popular Sweetwater Reservoir Riding and Hiking Trail network consists of approximately 5 miles of trail used primarily for hiking, mountain biking, and horseback riding (refer to Figure 2). The Sweetwater Authority Shoreline Fishing Facility is located along a 2.5-mile stretch on the south side of Sweetwater Reservoir (Authority 2017). Bonita Golf Course is approximately 2,000 feet away from the Project area. There are no other neighborhood parks, regional parks, or other recreational facilities in the Project vicinity.

16.16.2 Discussion:

a) ***Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?***

Landside construction activities would result in the permanent disturbance of a 0.1-acre area for concrete equipment pad and temporary disturbance associated with utilities trenching. However, none of these activities would affect any of the recreational opportunities and resources. The proposed floating solar arrays would cover up to 9.6 acres of surface water; however, no recreational boat use is allowed on the reservoir. Therefore, construction and operation of the proposed FPV system would have no physical effect on the use existing recreational facilities. Further, the proposed Project would not increase the population by introducing new housing or residents that would increase the demand on existing residential facilities. No impacts would occur and no mitigation measures would be required.

b) ***Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?***

As described in Response 16.16(a), the proposed Project would not result in physical deterioration of or otherwise require the construction or expansion of recreational facilities. No impacts would occur and no mitigation measures would be required.

16.17 TRANSPORTATION

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the Project:				
a) Conflict with program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☐	☐	☒
b) Conflict or be inconsistent with CEQA Guidelines Section 15064.31 or will conflict with an applicable congestion management program, including, but not limited to, level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☒	☐
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
d) Result in inadequate emergency access?	☐	☐	☐	☒

16.17.1 Existing Setting:

Regional access to the Sweetwater Reservoir is provided by SR-125 and Paradise Valley Road/Jamacha Boulevard. The main access to the Perdue WTP and the Project site is provided through a gated checkpoint along Lakeview Avenue. Vehicle trips at the Sweetwater Reservoir itself are generally limited to operations and management activities associated with the reservoir.

[1] CEQA Guidelines Section 15064.3(c) provides that a lead agency "may elect to be governed by the provisions" of the section immediately; otherwise, the section's provisions apply July 1, 2020. Here, the District has not elected to be governed by CEQA Guidelines Section 15064.3. Accordingly, an analysis of VMT is not necessary to determine whether a project will have a significant transportation impact.

16.17.2 Discussion:

a) ***Conflict with program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?***

The proposed Project would not result in any changes to the public circulation system, including transit, bicycle, and pedestrian facilities. Therefore, the proposed Project would not conflict with any program plan, ordinance, or policy addressing the circulation system. The proposed Project would result in no impacts and no mitigation measures would be required.

b) ***Conflict or be inconsistent with CEQA Guidelines Section 15064.3 or will conflict with an applicable congestion management program, including, but not limited to, level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?***

As previously described, it is anticipated that 15 to 20 personnel would commute to the Project site for the during of construction activities lasting up to a total of 3 to 4 months. Additionally, there would be approximately 75-80 truck trips would deliver materials throughout the duration of the construction of construction activities, amounting to an average of less than 1 trip per day. Over the long-term operations and maintenance of the FPV system would involve semi-annual or annual inspections, which would occur concurrent with other maintenance activities at the reservoir. The amount of vehicle trips during construction and operation of the proposed FPV system would not conflict with an applicable congestion management program since as vehicle traffic would not approach 2,400 average daily trips or 200 peak-hour trips, which would require a traffic study under SANDAG's Congestion Management Program. Impacts would be less than significant and no mitigation measures would be required.

c) ***Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?***

The proposed Project would not require the development of new driveways or any other change to public roadway designs that could introduce incompatible uses or line-of-sight issues. The proposed Project would result in no impacts and no mitigation measures would be required.

d) ***Result in inadequate emergency access?***

The proposed Project would not conflict with an emergency response plan would not impair or otherwise interfere with emergency access to local roads. The proposed Project would not result in traffic delays that could substantially increase emergency response times or reduce emergency vehicle access. The proposed Project would result in no impacts and no mitigation measures would be required.

16.18 TRIBAL CULTURAL RESOURCES

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the Project:				
a) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k); or	☐	☐	☒	☐
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision(c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☐	☒	☐

16.18.1 Existing Setting:

Assembly Bill (AB) 52, which went into effect on July 1, 2015, established a consultation process with all California Native American Tribes on the NAHC List and required consideration of Tribal Cultural Values in the determination of Project impacts and mitigation. AB 52 established a new class of resources, tribal cultural resources, defined as a site feature, place, cultural landscape, sacred place or object, which is of cultural value to a Tribe that is either: (1) on or eligible for the California Historic Register or a local historic register; or (2) treated by the lead agency, at its discretion, as a traditional cultural resource per Public Resources Code 21074 (a)(1)(A)-(B).

Public Resources Code Section 21083.09, added by AB 52, required the California Natural Resources Agency to update Appendix G of the CEQA Guidelines to address tribal cultural resources. Pursuant to Government Code Section 11346.6, on August 8, 2016 the California Natural Resources Agency adopted and amended the CEQA Guidelines to include consideration of impacts to tribal cultural resources. These amendments separated the consideration of paleontological resources from tribal cultural resources and updated the relevant sample questions to add specific consideration of tribal cultural resources.

As described in the Cultural Resources Assessment that has been prepared for the proposed Project (Attachment 2), WSP's archaeologist submitted a Sacred Lands File (SLF) and Native American Contact List request to the NAHC on April 15, 2024. On April 29, 2024, the NAHC provided a Native American Contact List of 17 individual to contact Authority to fulfill its AB-52 government-to-government responsibilities. The San Pasqual Band of Diegueno Mission Indians, the Viejas Band of Kumeyaay Indians and Kwaaymii Laguna Band of Mission Indians expressed

specific interest in engaging in government-to-government consultation regarding proposed projects.

The SLF search returned results of the search indicating that the Project site was negative for tribal cultural resources. No previously recorded cultural resources were identified within the Project site and the NAHC determined that the project area was negative for tribal cultural resources.

16.18.2 Discussion:

a) ***Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:***

i) ***Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k)?***

As previously described, previous SLF records searches indicated no tribal cultural resources are located within the Project site. Additionally, as described in Section 16.5, *Cultural Resources*, no known cultural or tribal cultural resources are present within the Project site. Given the previous disturbance of the landside area of the Project site as well as the construction staging area it is highly unlikely that archaeological materials would be unearthed during grading and other construction activities associated within the proposed Project. Nevertheless, this issue will be examined in more detail within the forthcoming EIR, including a summary of AB 52 consultation efforts as well as supporting analysis from the Draft Cultural Resources Assessment that has been prepared by WSP and any additional applicable information. While the proposed Project is not expected to have impacts to Tribal Resources, the EIR will include recommendations and/or mitigation measures, if necessary, to address inadvertent discoveries of previously unknown buried archaeological and Tribal resources in the unlikely scenario that they are encountered during construction-related ground disturbance.

ii) ***A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1?***

As described in Response 16.5(b) and Response 16.18(a)(ii), previous records searches and on-site pedestrian surveys have not identified any archaeological resources within the Project site. Nevertheless, this issue will be examined in more detail within the forthcoming EIR, including a summary of AB 52 consultation efforts as well as supporting analysis from the Cultural Resources Assessment that has been prepared by WSP and any additional applicable information.

16.19 UTILITIES AND SERVICE SYSTEMS

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the Project:				
a) Require or result in the construction of new or expanded water, wastewater treatment or stormwater drainage, electrical power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☒	☐
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	☒	☐
c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
d) Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☒	☐
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☒	☐

16.19.1 Existing Setting:

The Authority provides water service to the surrounding service area that includes National City, Bonita, and the western and central portions of Chula Vista. The Perdue WTP, which is adjacent to the Project site, treats water from the Sweetwater Reservoir before it is distributed to the Authority's customers. Electrical power and utility connections at the Sweetwater Reservoir are primarily provided by SDG&E. An existing 12 kV distribution switchgear is located at the Perdue WTP. Wastewater services at the Sweetwater Reservoir are provided by the San Diego County San Diego District. There are a total of 56 active solid waste facilities currently operate in San Diego County, 8 of which are landfills. The Otay Landfill Composting Operation is the nearest landfill, located at 1700 Maxwell Road, Chula Vista, approximately 6.4 miles from the Project site.

16.19.2 Discussion:

a) ***Require or result in the construction of new or expanded water, wastewater treatment or stormwater drainage, electrical power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?***

The proposed Project would be limited to the installation of the proposed FPV system. The proposed Project would not involve the installation of new or expansion of existing water, wastewater, storm drain, natural gas, or telecommunication facilities. Construction activities

would require a temporary increase in water usage (e.g., for dust suppression). However, ground disturbance would be limited to the proposed 0.1-acre equipment pad and 65-feet of trenching; therefore, construction activities would not be expected to create a substantial increase in water demand. The proposed Project would not increase demand for wastewater treatment, stormwater drainage, natural gas, or telecommunications facilities, such that additional facilities may be required in the future.

As described in Section 9, *Project Description*, the proposed Project would involve the installation of two separate solar arrays, including the AquaPhi™ (<0.2 acre and 100 kW) and the RES-BCT (up to 9.4 acres and providing up to a maximum of approximately 3.7 MW). A preliminary evaluation of the electrical distribution infrastructure at the Sweetwater Reservoir determined that the 12 kV distribution switchgear at the Perdue WTP would be a feasible interconnection point for an FPV system. Installation of the proposed FPV system would supply power to the SDG&E distribution grid and would operate parallel with SDG&E.

The placement of electrical conduits would require approximately 65 feet of underground trenching from the reservoir's high-water mark to the proposed equipment pad. The equipment pad would contain a transformer, switchboards, and inverters to turn the DC into an AC for electrical distribution purposes. Electrical conduits would run above ground from the equipment pad and connect to the 12 kV SDG&E transmission line and ultimately, an SDG&E substation.

Minor alterations to SDG&E existing facilities may need to occur; however, construction of new buildings is not anticipated as a result of the proposed Project. Results of the Rule 21 interconnection study found that Ground fault Protection and Reclosing blocking and 3 Phase Interrupting SCADA Recloser are required upgrades.

Overall, impacts to existing utilities and service systems would be less than significant and no mitigation measures would be required.

b) ***Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?***

As described in Response 16.18(a), the proposed Project would require a temporary increase in water usage during construction activities (e.g., for dust suppression). However, operational activities would not be expected to create a substantial increase in water demand. Impact would be less than significant and no mitigation measures would be required.

c) ***Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?***

The proposed Project would be limited to the construction of the proposed FPV system. The project would not generate wastewater or increase demand of existing wastewater treatment facilities. The proposed Project would not require construction of new wastewater treatment facilities, nor would it require the expansion of existing facilities. No impacts would occur and no mitigation measures would be required.

d) ***Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?***

Construction of the proposed Project would generate minor amounts of construction wastes associated with grading and ground disturbance. Excavated soils would either be re-used on-site or transported to a local permitted landfill, as needed. However, removed debris and other solid wastes generated by the proposed Project would be minor and would be well within the existing capacity of landfills in the region. For example, Otay Landfill, located approximately 6.4 miles northeast of the Project site, has a remaining capacity of 21,194,008 cubic yards (CalRecycle 2016). Construction activities would comply with the County's Integrated Waste Management Plan which presents strategies to assist in the siting of solid waste disposal facilities. All waste generated during construction of the proposed Project would be handled and disposed of in compliance with all applicable federal, state and local statues and regulations related to solid waste. Following the completion of construction activities, operation of the proposed Project would not generate solid waste. Therefore, impacts related to landfill capacity and solid waste regulations would be less than significant and the proposed Project would not require or result in the construction of new solid waste facilities, nor would it require the expansion of existing facilities.

e) ***Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?***

The proposed Project would comply with all applicable federal, state, and local statutes and regulations related to solid waste and diversion from landfills. Therefore, impacts would be less than significant and no mitigation measures would be required.

16.20 WILDFIRE

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
If located in or near state responsibility areas or lands classified as a very high fire hazard severity zones, **Would the Project:**				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☐	☒
c) Require the installation or maintenance of associated infrastructure (e.g., roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☒	☐
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☒	☐

16.20.1 Existing Setting:

San Diego County Fire, as well as state-owned stations staffed with CAL FIRE responders, provide fire protection services in the County of San Diego. California Government Code Section 65302(g)(3) requires the Safety Element of a General Plan to identify and update mapping, information, and goals and policies to address wildfire hazards. As part of this requirement, any jurisdiction that includes State Responsibility Areas or Very High Fire Hazard Severity Zones in the Local Responsibility Areas, is required to transmit the updated Safety Element to the Board for review and approval. The County General Plan identifies Very High and High Fire Hazard Severity Zones within unincorporated San Diego County. The Project site is not located within a Very High or High Hazard Severity Zone. CAL FIRE designates the proposed Project site within an area of wild land urban interface and moderate fire hazard severity (County of San Diego 2011b).

All of the major roads and state highways are designated as local emergency evacuation routes within the County of San Diego.

16.20.2 Discussion:

a) ***Substantially impair an adopted emergency response plan or emergency evacuation plan?***

As described in Responses 16.9(f) and 16.17(d), the proposed Project would not conflict with an emergency response plan would not impair or otherwise interfere with emergency access to local roads. The proposed Project would not result in traffic delays that could substantially increase emergency response times or reduce emergency vehicle access. The proposed Project would result in no impacts and no mitigation measures would be required.

b) ***Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?***

The Project site is located outside of the Fire Hazard Severity Zones for both State Responsibility Areas and Local Responsibility Areas (County of San Diego 2021b). Additionally, the proposed Project would not result in the development of habitable structures that could be exposed to fire risk. The proposed Project would have no impacts related to exposing people or structures to a significant risk of loss, injury or death involving wildland fires. Therefore, no impacts are anticipated to occur and no mitigation measures would be required.

c) ***Require the installation or maintenance of associated infrastructure (e.g., roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?***

Landside construction associated with the proposed Project would include electrical conduits and equipment pad to house a transformer, switchboards, and inverters. As described in Section 16.20(b), the Project site is not located within a fire hazard severity zone and the installation and operation of electrical conduits and associated equipment would not substantially exacerbate fire risk. It is likely that the Fire Authority with jurisdiction in the area would require a fire break (i.e., vegetation management) around all electrical facilities to

minimize the likeliness of wildfires. The Authority would accommodate for that fire break requirement. The implementation of the proposed Project would be unlikely to expose people or structures to a significant risk of loss, injury or death involving wildland fires, nevertheless, this issue will be examined in more detail in the forthcoming EIR.

d) ***Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?***

The FPV system would be installed just upstream of Sweetwater Dam, and engineering for the anchoring systems for the FPV panels would need to be coordinated and approved by the DSOD. While it is expected that implementation of the proposed Project would be unlikely to expose people or structures to a significant risk, including downslope or downstream flooding or landslides, this anchoring systems issue will be examined in more detail during the design phase of the Project and in the forthcoming EIR.

16.21 MANDATORY FINDINGS OF SIGNIFICANCE

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wild-life population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of rare or endangered plants or animals, or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? (Cumulatively considerable means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	☐	☐	☒	☐
c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐

a) ***Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to decrease below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of major periods of California history or prehistory?***

The analysis conducted in this IS concludes that implementation of the proposed Project has the potential to have a significant impact on the environment and that mitigation measures

shall be implemented if the proposed Project moves forward. As evaluated in, Section 16.4, *Biological Resources*, Section 16.5, *Cultural Resources*, Section and 16.10, *Hydrology and Water Quality* impacts on these resources could be potentially significant if no mitigation measures are implemented. These issues will be examined in more detail within the forthcoming EIR and mitigation measures will be developed. While potential impacts related to Aesthetics, Hazardous and Hazardous Materials, Tribal Resources, and Wildfire are not considered significant, these environmental topics will also be further discussed in the EIR.

The upcoming EIR analysis will rely on the supporting draft technical studies that have been prepared by WSP (Attachments 1-4) and any additional applicable information, including engineering assessments and stakeholder comment, and will include recommendations and/or mitigation measures to address potential impacts, as necessary.

b) ***Does the project have impacts which are individually limited, but cumulatively considerable? (Cumulatively considerable means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)***

Cumulative projects will be identified and the proposed Project's contribution to cumulatively significant impacts will be examined in more detail within the forthcoming EIR. This analysis will rely on the supporting technical studies that have been prepared by WSP, engineering assessments, stakeholder input, and will include recommendations and/or mitigation measures to address potential impacts, as necessary.

c) ***Does the project have environmental effects which will have substantial adverse effects on human beings, directly or indirectly?***

As previously described in Response 16.21(a), the analysis conducted in this IS concludes that implementation of the proposed Project has the potential to have a substantial adverse impact on the physical environment and thereby indirectly on human beings if mitigation measures are not implemented. These issues will be examined in more detail within the forthcoming EIR. This analysis will rely on the supporting draft technical studies that have been prepared by WSP (Attachments 1-4), future engineering assessments, and stakeholder comment, and will include recommendations and/or mitigation measures to address potential impacts, as necessary.

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December 5, 2024

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Subject: Draft Aesthetics and Visual Resources Study for the Proposed Sweetwater Reservoir Floating Photovoltaic System Project

WSP USA Environment & Infrastructure Inc. (WSP; formerly Wood Environment & Infrastructure Solutions, Inc.) is pleased to submit this Aesthetics and Visual Resources Study addressing the Sweetwater Reservoir Floating Photovoltaic System Project (Project), proposed by the Sweetwater Authority (Authority). The proposed system would be installed in two phases:

The Sweetwater Reservoir is formed by Sweetwater River and Sweetwater Dam located in southwestern San Diego County. The Project site would include a 9.6-acre area located northwest area of the Sweetwater Reservoir approximately 750 feet from the Sweetwater Dam.

- AquaPhi™ Pilot: A pilot solar array that provides autonomous tracking of the sun for increased energy production. This pilot array would cover less than 0.2 acre and provide 100 kilowatts (kW) of solar capacity. This pilot solar array would help inform decision making regarding the design of the Renewable Energy Self-Generation, Bill Credit Transfer (RES-BCT) system.
- RES-BCT System: An approximately 9.4-acre array providing up to a maximum of approximately 3.7 megawatts (MW) of solar energy production. This solar array would help the Authority meet its sustainability goals and would be used to offset existing Authority energy use at the Perdue WTP as well as other facilities owned and operated by the Authority.

This technical memorandum discusses the existing conditions and potential impacts to aesthetics and visual resources associated with construction and operation of the proposed Project. This qualitative analysis relies on a thorough review of the conceptual design drawings provided by the Authority as well as photographs taken at the Project site and the surrounding vicinity.

1 INTRODUCTION

The Project site is located on the Sweetwater Reservoir near the Robert A. Perdue Water Treatment Plant (Perdue WTP). The Sweetwater Reservoir is located in San Diego County, approximately 7 miles upstream from the San Diego Bay, and surrounded by the unincorporated communities of Spring Valley to the north, and Bonita and Sunnyside to the south and west. The U.S. Fish and Wildlife Service (USFWS) San Diego National Wildlife Refuge (Refuge) is located on the east side of the Reservoir.

The proposed Project would involve the installation of two separate solar arrays, including the AquaPhi™ (<0.2 acre and 100 kilowatts [kW]) and the RES-BCT (9.4 acres and 3.75 megawatts [MW]), which are described further below. A preliminary evaluation of the electrical distribution infrastructure at the Sweetwater Reservoir determined that the 12 kilovolt (kV) distribution switchgear at the Perdue WTP would be a feasible interconnection point for a Floating Photovoltaic (FPV) system. Installation of the FPV system would supply power to the SDG&E distribution grid and would operate parallel with SDG&E.

1.1 PILOT AQUAPHI™

The Pilot AquaPhi™ system would involve the installation of a 0.2-acre 100 kW FPV system at the northwest area of the Sweetwater Reservoir approximately 750 feet from the Sweetwater Dam (see Figure 1). The Pilot AquaPhi™ system would utilize autonomous thruster technology that would replace the need for traditional anchoring and mooring. Thrusters attached to the bottom of the High-Density Polyethylene (HPDE) floats would be controlled by a Direct Current (DC) motor drive, and autopilot controller would enable automatic rotational tracking of the sun. The specific use of the electricity produced by the Pilot AquaPhi™ system is not yet determined; it may provide power to an existing meter at the Perdue WTP site or provide off-grid power to other equipment at the reservoir.

The autonomous tracking associated with the Pilot AquaPhi™ system would result in up to 17-percent more energy production as compared to a FPV system that is anchored in place. The performance of the Pilot AquaPhi™ system would factor into the decision making for the RES-BCT system. If this autonomous thruster technical is suitable for the RES-BCT system, it would avoid the need for anchoring and reduce the total system footprint due to increased energy production per acre.

1.2 RENEWABLE ENERGY SELF-GENERATION, BILL CREDIT TRANSFER (RES-BCT)

The proposed RES-BCT system would involve the installation of a second larger photovoltaic system on the northwestern surface of the reservoir, adjacent to the proposed Pilot AquaPhi™ system. The proposed RES-BCT system would include accompanying grid-interactive inverters and associated equipment. The Authority is considering two separate alternative layouts for the RES-BCT system:

- Design Alternative 1 Layout. The Design Alternative 1 layout would involve the installation of an approximately 9.4-acre array of solar panels attached to a buoyant HPDE racking system that would float atop the surface of Sweetwater Reservoir. The solar array would be fixed in place using cables fastened along all four sides of the rectangular HDPE floats and attached to concrete block anchors. These anchors would be sunk and placed at the bottom of the reservoir. Beyond the placement of the anchors, no digging, drilling, or other disturbance of the reservoir would be required. The anchors would be designed for all anticipated water level fluctuations from maximum to minimum pool depths. Electrical conduits would be placed on floats to connect solar modules to the land-based equipment pad and the existing 12 kV line managed by SDG&E.

- Design Alternative 2 Layout. The Design Alternative 2 would involve the installation of approximately 7.4 acres of the reservoir's surface water area for seven floating solar islands. Similar to the Pilot AquaPhi™ system, the Design Alternative 2 layout would use autonomous thrusters technology to position floating solar islands, eliminating the need for traditional underwater anchoring and mooring. The autonomous underwater thrusters attached to the floating racking system would maintain the system's position while automatically rotating to track the sun and increase energy production. Autonomous solar tracking technology would allow for similar levels of energy production at a smaller project footprint compared to Design Alternative 1. Electrical conduits for the Design Alternative 2 layout would be placed on floats to connect solar modules to the land-based equipment pad and existing 12kV line managed by SDG&E.


Residential
Residential
Sweetwater Authority Gate
Robert A. Perdue Water Treat ment Plant
125
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Sweetwater Authority Gate
Robert A. Perdue Water Treat ment Plant
Sweetwater Reservoir Fishing Program
San Diego National Wildlife Refuge
Sweetwater Summit Regional Park
Residential / Agricultural
125
SDG&E Substation
LEGEND
Existing SDG&E 12kV Line
Electrical Conduit
Pilot AquaPhi Rotational Zone
Pilot AquaPhi Solar Array
Equipment Pad


Residential
Residential
Sweetwater Authority Gate
Robert A. Perdue Water Treat ment Plant
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Sweetwater Authority Gate
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Sweetwater Reservoir Fishing Program
San Diego National Wildlife Refuge
Sweetwater Summit Regional Park
Residential / Agricultural
125
SDG&E Substation
LEGEND
Existing SDG&E 12kV Line
Electrical Conduit
Anchoring
RES-BCT Solar Rotational Zone
RES-BCT Solar Array Layout
Equipment Pad


Residential
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Residential / Agricultural
SDG&E Substation
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LEGEND
Existing SDG&E 12kV Line
Electrical Conduit
RES-BCT Solar Rotational Zone
RES-BCT Solar Array Layout
Equipment Pad

Under both the Design Alternative 1 and Design Alternative 2 layouts, an approximately 0.1-acre concrete equipment pad would be constructed on the shoreline, immediately east of the Perdue WTP (refer to Figures 2 and 3). The equipment pad would contain a transformer, switchboards, and inverters to turn the DC into an Alternate Current (AC) for electrical distribution purposes. Electrical conduits would run above ground from the equipment pad and connect to the 12 kV SDG&E transmission line and ultimately, an SDG&E substation.

Minor alterations to SDG&E existing facilities may need to occur; however, construction of new buildings is not anticipated as a result of the proposed Project. Results of the Rule 21 interconnection study found that Ground fault Protection and Reclosing blocking and 3 Phase Interrupting SCADA Recloser are required upgrades.

2 SWEETWATER COMMUNITY PLAN RESOURCES POLICIES

The Project site is located within the Sweetwater Community Planning Area (CPA) and subject to the policies of the Sweetwater Community Plan. The Community Character Element of the Sweetwater Community Plan describes:

> *"The area is primarily a valley and accompanying hills bisected by the Sweetwater River floodplain, with scenic and historic Sweetwater Dam controlling the river's flow. Surrounded as it is by highly urbanized areas, the Sweetwater Planning Group has been striving to preserve the rural features which have made this valley unique. Large lots, hiking and riding trails, sizable setbacks, large open spaces and unobstructed views of these open spaces are held in high regard by the residents."*

The Conservation Element of the Sweetwater Community Plan describes:

> *"The Sweetwater CPA possesses landforms of great scenic beauty. Natural lands, however, are susceptible to development pressure. The Resource Conservation Areas (RCA's) are one of the tools available that can help preserve these sensitive areas in a manner that satisfies public and/or private objectives."*

The Scenic Highways Element of the Sweetwater Community Plan describes:

> *"The following roadways in the Sweetwater CPA are identified in the County Scenic Highway System: Bonita Road, San Miguel, Guajolote and Sweetwater Road. None of these roads, as yet, have been adopted by the State as a Scenic Highway due to the time and cost factors involved in the process. In the absence of the completion of the state adoption process the policies described below are intended to preserve these areas.*
>
> *Other roads within Bonita that should be considered for design review are San Miguel Road, Quarry Road and Proctor Valley Road. These roads should be reviewed for their scenic values, unique vegetation and preservation of the rural, rustic style of structures that have long characterized the Valley."*

The Recreation Element specifically identifies the Sweetwater Reservoir as "part of the open space network." However, none of these elements identify any policies or recommendations that would be applicable to the preservation of views to and from the Project site, including the 9.6 acres of water surface that would be affected by the proposed FPV system. While the Project site is located within the Sweetwater River Floodplain RCA the significant resources within this RCA are limited to riparian and woodland habitats, vegetation adjacent to the riparian areas, rare vernal pools, and sensitive plant and bird species. The Project site is visible from the Mother Miguel Mountain RCA. Significant resources within this area include the large undisturbed area of coastal sage scrub, chamise chaparral, and grasslands. This area is identified as portion of the scenic viewshed of the eastern Sweetwater Area; however, no policies or recommendations related to views of the Sweetwater Reservoir from this RCA are identified in the Conservation Element or any other element of the Sweetwater Community Plan.

3 SPRING VALLEY COMMUNITY PLAN RESOURCES POLICIES

The Project site is also located within the Spring Valley CPA and subject to the policies of the Spring Valley Community Plan. The Community Background section and the Conservation and Open Space (COS) Element describes:

> *"Scenic resources and highways Spring Valley is part of the County of San Diego's Trails plan. The trail plan in Spring Valley starts at the west end of Sweetwater Lake and ends at the Sweetwater Dam, extending along the north edge. A section goes from the east end of the lake up to Lookout Mountain."*

Appendix B Resource Conservation Areas also describes lands requiring special attention in order to conserve resources in a manner best satisfying public and private objectives. Resource conservation areas include, but are not limited to, groundwater problem areas, coastal wetlands, native wildlife habitats, construction quality sand areas, littoral sand areas, astronomical dark sky areas, unique geological formations, and significant archaeological and historical sites. Specific criteria used in selecting resources worth of conservation include: "[a]reas which provide the scenic mountainous backdrop to development within the community."

As previously described, the Project site is located within the Sweetwater River Floodplain RCA. Resources within this area include

> *"…riparian, riparian woodland, oak woodland, Coastal sage, chaparral, and grassland habitats. These habitats are important for wildlife, supporting a great diversity including many threatened and endangered species. Resources to be protected include trees, including willows, sycamores, cottonwoods, and oaks; riparian vegetation, including cattails, sedges, rushes, and aquatic vegetation; and native nonriparian vegetation including Coastal sage, chaparral and grasslands. Adjacent native vegetation should be conserved as viable edge habitats contributing to wildlife diversity of the local ecosystem."*

As previously described, none of these resources would be affected by the proposed FPV system. While the Project site is located within the Sweetwater River Floodplain RCA the significant resources within this RCA are limited to riparian and woodland habitats, vegetation adjacent to the riparian areas, rare vernal pools, and sensitive plant and bird species. No policies or recommendations related to views of the Sweetwater Reservoir from this RCA are identified in the COS Element or any other element of the Sweetwater Community Plan.

4 METHODOLOGY

At the request of the Authority, WSP has prepared five photosimulations to support the visual resources analysis. These photosimulations are based on photographs taken by Authority personnel from locations with prominent views of the Project site (see Figure 4). WSP worked closely with the Authority to understand the design parameters of the proposed FPV array and developed a three dimensional model of the proposed Project. This model was used to develop photosimulations depicting the view from each photopoint location following the completion of the proposed Project. These photosimulations are used to illustrate potential impacts to visual character.

WSP also prepared a qualitative glare analysis based on the principles determining the elevation and directionality of glare.

5 VISUAL RESOURCES ASSESSMENT

Visual resources generally refer to important scenic assets that contribute to visual setting or character of a place. The natural environment plays an important role in defining the visual setting. Recognized natural features may contribute to a community's aesthetic character and visual quality, including but not limited to:

- Mountain peaks or ridgelines;
- Oceans or other water bodies;

- Beaches and dunes;
- Bluffs or cliff faces;
- Large expanses of open sky open or green spaces of scenic value; and
- Unique geologic features or formations.

Per the California Environmental Quality Act (CEQA), significant impacts to visual resources can occur when proposed development obscures or otherwise detracts from existing recognized natural features.

a) Have a substantial adverse effect on a scenic vista?

A "scenic vista" is defined as a view of natural environmental, historic, and/or architectural features that possesses visual and aesthetic qualities of value to the community. The term "vista" generally implies an expansive view, usually from an elevated point or open area. As described above, the Sweetwater Community Plan and Spring Valley Community Plan do not identify any specific scenic vistas or scenic view corridors or related polices or recommendations. Therefore, the proposed Project would not have any adverse effects on scenic vistas or scenic qualities protected under the Community Plans.

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway?

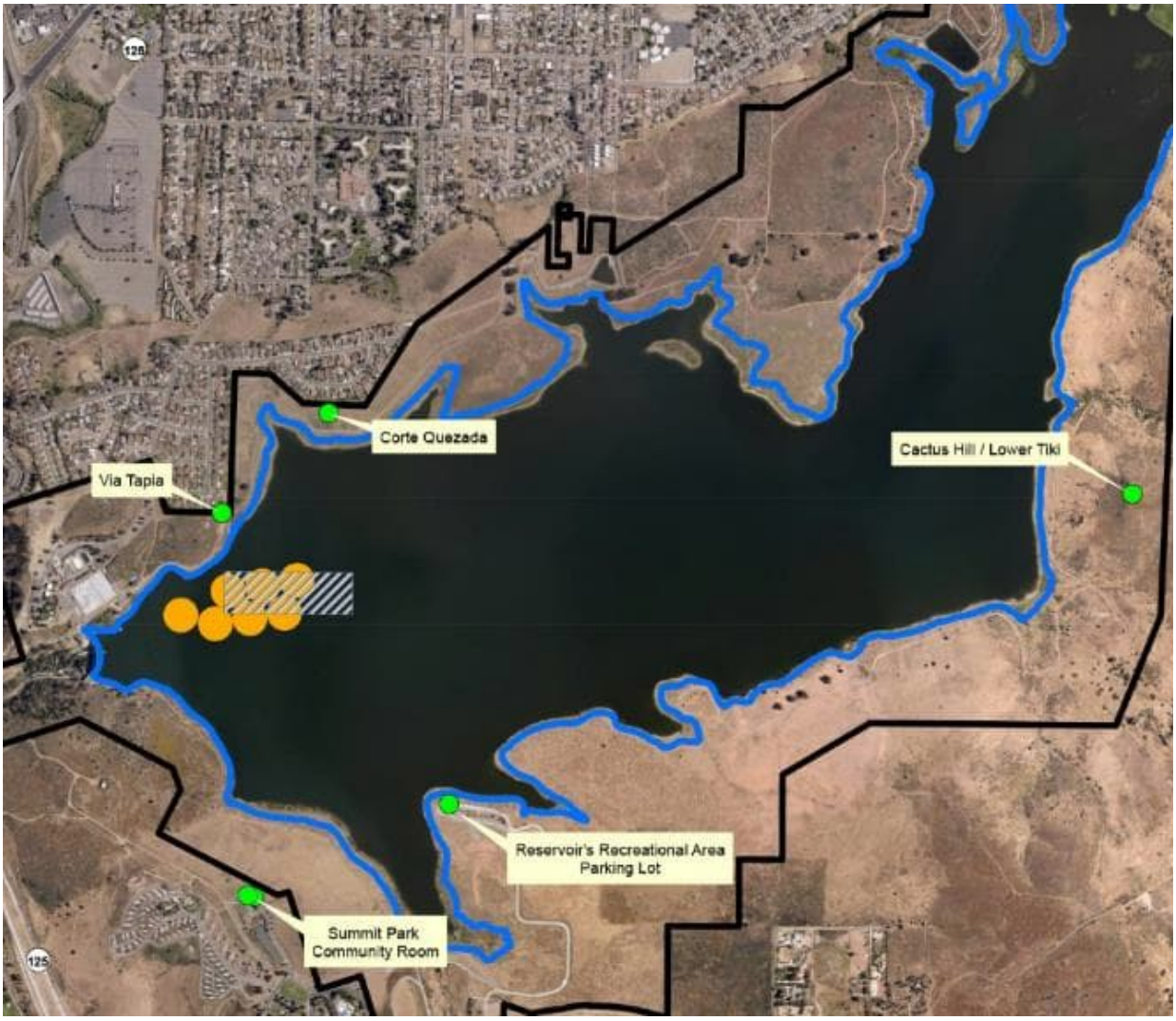
There are no state scenic highways in the vicinity of the Project site. The nearest designated scenic highway, State Route (SR-) 75, is located approximately 4 miles to the west (California Department of Transportation [Caltrans] 2022). The nearest eligible highway is another portion of SR-75 located approximately 4 miles northwest of the Project site. Due to the distance and development between the Project site and SR-75, the proposed Project would not affect any scenic resources within a State scenic highway. Bonita Road, San Miguel Road, Guajolote Road, and Sweetwater River Road in the Project vicinity are designated by the County as first priority scenic routes (County of San Diego 2011b); however, the Project site is not visible from these roads either.

The Scenic Highways Element of the Sweetwater Community Plan identified roads within Bonita that should be considered for design review including San Miguel Road and Quarry Road. However, the Project site is not visible from San Miguel Road (left) or Quarry Road (right).

The proposed Project would result in minor grading of a 0.1-acre equipment pad and 65-feet of utilities trenching. No trees would be removed as a part of these construction activities. Additionally, this area is located in close proximity to the Perdue WTP; the topography in this area is not considered a scenic rock outcropping and minor grading activities at the Project site would not substantially affect recognized scenic resources in this area. Further No historic buildings would be affected by the proposed Project.

c) In nonurbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?

The Project site includes approximately 9.6 acres of surface water and 0.1-acre previously disturbed area located immediately east of the Perdue WTP. The views of the Project site, which are captured in Key View Points 1 through 5 are characterized by open water, hilly terrain, and vegetated open space. Potential impacts to the visual character as a result of the proposed Project are discussed further below:



Key View Point Location 1. Via Tapia

Key View Point 1 depicts the proposed RES-BCT array from the Authority maintenance road adjacent to Via Tapia. This location, which is not publicly accessible provides mid-ground views of the proposed FPV system (Design Alternative 1 above and Design Alternative 2 below). The floating solar array is visually prominent in these photosimulations given the topography of the view point and the proximity of the viewer to the array.

Key View Point Location 2. Corte Quezada

Key View Point 2 depicts the proposed RES-BCT array from the Authority maintenance road adjacent to Corte Quezada. This location, which is not publicly accessible provides mid- to background views of the proposed FPV system (Design Alternative 1 above and Design Alternative 2 below). While the floating array is still visually prominent it is less so as compared to Key View Point 1, due to a greater distance between the viewer to the array.

Key View Point Location 3. Cactus Hill / Lower Tiki

Key View Point 3 depicts the proposed RES-BCT array from Cactus Hill / Lower Tiki, which is located along the 5.2-mile Cactus Hill Loop Trail. This location, which is publicly accessible and heavily used by hikers, runners, dog walkers, bird watchers, etc., provides background views of the proposed FPV system (Design Alternative 1 above and Design Alternative 2 below). The floating array is not visually prominent and generally blends in with the development at the edge of the reservoir.

Key View Point Location 4. Reservoir's Recreational Parking Area

Key View Point 4 depicts the proposed RES-BCT array from the Reservoir's Recreational Parking Areas. This location, which is open to the public on a limited basis, provides background views of the proposed FPV system (Design Alternative 1 above and Design Alternative 2 below). However, due to the relatively low elevation of this location and the low profile of the array, this FPV system is barely visible in these photosimulations.

Key View Point Location 5. Sweetwater Summit Regional Park Community Room

Key View Point 5 depicts the proposed RES-BCT array (Design Alternative 1 above and Design Alternative 2 below) from the Sweetwater Summit Regional Park Community Room. Due to the elevation of the community room, the proposed FPV system is visible in the background. However, sweeping views of the lake and the hilly topography in the background remain.

Construction-Related Impacts

Construction activities associated with the proposed Project would be visible from close distances, including Key View Points 1 and 2 and other similar locations that are not publicly accessible along the north shoreline of the reservoir. In contrast, these activities would be imperceptible from public view locations provided at farther distances (e.g., Key View Points 3, 4, and 5). Heavy construction equipment (e.g., cranes) and haul trucks would be temporarily visible along the shoreline during grading and construction of the 0.1-acre equipment pad and during trenching of utilities. Additionally, the assembly of the floating solar arrays, including the use of boats(s) to launch the arrays, would also be temporarily visible on the waterfront. The 4-acre construction staging area, however, would be located behind the Perdue WTP and would not be visible from public viewing locations.

In general, construction activities would not interrupt or distract from the existing the character defining features of the public views from Key View Points 3, 4, and 5, including the sweeping views of the lake in the foreground and the distant view of the hills in the background. Additionally, construction of the Pilot AquaPhi™ system component is anticipated to over a period of 1 to 2 weeks. The RES-BCT system would occur over a period of 3 to 4 months. Therefore, any minor construction-related impacts to visual character would be temporary. Overall construction-related impacts would be less than significant.

Operational Impacts

Following the completion of construction activities approximately 9.6 acres of the water surface at the Sweetwater Reservoir would be covered with the proposed FPV system. Depending on the water level of the reservoir, this array could cover between 1 and 2 percent of the total surface area of the reservoir. As described for the construction-related impacts, the views of the proposed FPV system would be most prominent from the north shoreline of the reservoir, including Key View Points 1 and 2 and other along the Authority's maintenance road. The floating solar array is the most visually prominent from the north shoreline of the reservoir, which it distracts from the sweeping views of the lake in the foreground and mid-ground. As demonstrated in Key View Point 1, the proposed FPV system serves as an extension of the Authority's existing infrastructure on the edge of the reservoir. These impacts could be considered potentially significant if they would be experienced from publicly accessible view points. However, the north shoreline of the reservoir is generally inaccessible to the public. Views of the reservoir from this location would be limited to Authority maintenance personnel at the Perdue WTP or driving along the maintenance roads. Therefore, impacts to visual character along the north shoreline of the lake would be less than significant.

It is important that while the floating solar array may also be visible from resident's backyards along Via Tapia and Cortze Quezada, CEQA case law has established that only public views, not private views, need be analyzed under CEQA. For example, in *Association for Protection etc. Values v. City of Ukiah* (1991) 2 Cal. App. 4th 720, the court determined that "we must differentiate between adverse impacts upon particular persons and adverse impacts upon the environment of persons in general. As recognized by the court in *Topanga Beach Renters Assn. v. Department of General Services* (1976) 58 Cal.App.3d 188, "[all] government activity has some direct or indirect adverse effect on some persons. The issue is not whether [the project] will adversely affect particular persons but whether [the project] will adversely affect the environment of persons in general." Similarly, in *Mira Mar Mobile Community v. City of Oceanside* (2004) 119 Cal. App.4th 477, the court upheld an Environmental Impact Report's (EIR's) determination that impacts on public views would be significant but impacts on private views were not significant.

The proposed FPV system would also be visible from more distant, but publicly available views from the southern shoreline, including Cactus Hill (Key View Point 3) and Sweetwater Summit Regional Park (Key View Point 5). These recreational resources are generally open to the public year round. Additionally, the proposed FPV system would be visible from the Authority's Recreational Area (Key View Point 4), which is open to the public on Friday through Monday. Views of the floating solar array are provided from distances of over 1.5 miles (Key View Point 3) to approximately 0.5 miles (Key View Point 4 and 5). At these distances the floating solar array appear much less prominent in the mid-ground and background of the views. The proposed FPV system does not interrupt the sweeping foreground views of the reservoir or the background views of the hilly terrain. Given the distance from Key View Point 3, the floating solar array would be nearly imperceptible. Similarly, the floating solar array would

be nearly imperceptible from Key View Point 4. While this viewing location is closer to the proposed FPV system, given the elevation of the site relative to the surface water, and the low profile of the solar array, the proposed FPV system would be difficult to distinguish.

The proposed FPV system would be most visible from Key View Point 5 from the Sweetwater Summit Regional Park Community Room. This viewing location is approximately 0.5 miles from the floating solar array, but is provided a topographic high overlooking the reservoir. The height differential between the viewing location at Key View Point 5 and the proposed FPV system is approximately 70 feet. At this angle, more surface area of the solar panels is visible to the viewer in the mid-ground of this view. While this interruption of the mid-ground view could be distracting, sweeping views of the reservoir remain available along with background views of the hilly terrain. Additionally, given the dark color of the solar panels, the contrast between the proposed FPV system and the water surface would be minimal and reduce potential impacts to visual character from this viewing location.

In summary, the view of the proposed FPV system is most prominent from the north shoreline of the reservoir, which is not publicly accessible. While views of the proposed FPV system are also provided along the south shoreline of the reservoir, these views are more distant, ranging from approximately 1.5 miles (Key View Point 3) to approximately 0.5 miles (Key View Point 5). The proposed FPV system generally blends into the background views, particularly at elevations close to the water surface (e.g., Key View Point 4). At greater elevations (e.g., Key View Point 5), more surface area of the solar panels is visible to the viewer and could potentially be distracting to the view. However, the color of the solar panels minimizes the contrast between the water surface and reduces potential impacts. Additionally, given the presence of existing development along the north shoreline (e.g., Perdue WTP), the solar panels do not present incompatible uses/development. The proposed Project would not substantially obscure or distract from the character defining features of the views along the south shoreline of the reservoir. Further, the proposed Project would not conflict with any specific policies or recommendations from the Sweetwater Community Plan or the Spring Valley Community Plan. The Community Character and Conservation elements note the scenic qualities of the Sweetwater River floodplain and the Recreation element identifies the Sweetwater Reservoir as "part of the open space network." However, none of these elements identify any policies or recommendations that would be applicable to the preservation of views to and from the Project site, including the 9.6 acres of surface waters that would be affected by the proposed FPV system.

Therefore, the proposed Project would result in less than significant impacts.

d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

The proposed Project would not require any nighttime lighting that would affect nighttime views in the area. Based on the Federal Aviation Administration's (FAA's) Technical Guidance for Evaluating Selected Solar Technologies on Airports, glare from solar panels is approximately equal to the glare from water surfaces. As such the potential impacts of glare as a result of the floating solar panels would be similar to the surface water in the Sweetwater Reservoir. Nevertheless, the issue daytime glare impacts has been examined in further detail.

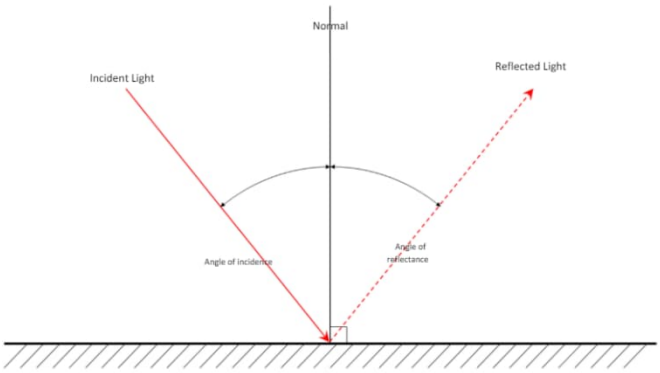
As described in Section 3, *Methodology*, the basics of glare, excerpted from Colton 2014, are provided below:

Glare is caused by reflected sunlight. The purpose of solar panels is to convert sunlight into electricity. By design, therefore, solar panels do not reflect substantial amounts of sunlight. Since sunlight will not produce electricity if reflected, to the extent that sunlight is reflected, solar panels lose their capacity to generate electricity. In general, since the whole concept of efficient solar power is to absorb as much light as possible, while reflecting as little light as possible, standard solar panels produce less glare and reflection than does standard window glass.

Basic principles of light and mathematics can be used to document the potential of solar glare occurring to the detriment of properties that abut a solar array. Two basic concepts need to be understood to assess the glare potential: 1) the vertical nature of glare (i.e., "elevation" or "altitude", terms which are used interchangeably); and 2) the horizontal nature of glare (i.e., "azimuth").

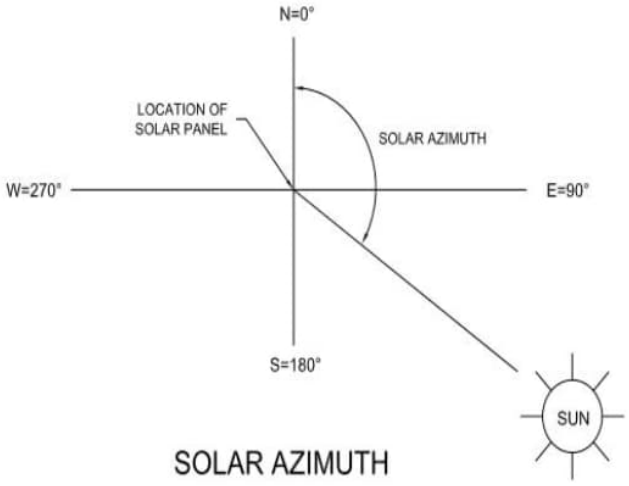
The basic concept to understand in any discussion of glare elevation involves the relationship between the "angle of incidence" and the "angle of reflectance."

- The "angle of incidence" is the angle at which light strikes the surface (at the point where the normal intersects the surface).
- The "angle of reflectance" is the angle formed by the reflected beam of light and the same perpendicular line at the point of incidence.



Since light travels in a straight line, the angle of incidence is always equal to the angle of reflectance. At any angle of reflectance, as a potential observer is farther and farther away from the solar panel, the elevation of the reflected sunlight (i.e., any glare) is more likely to be above the observer and thus not seen.

Determining the azimuth of the sun is important for purposes of determining the directionality of glare. At any given location, the sun not only moves across the sky every day, but its path in the sky changes during various times of the year. (Due to the Earth's tilt, sun appears higher in the sky during the summer, whereas the sun appears lower in the sky during the winter.) This, in turn, alters the destination of resultant reflections. Since light travels in a straight line, the sun's movement more to the north or more to the south in different seasons affects the direction of reflection since the angle of reflection will be the same as the angle at which the sun hits the solar panel.



Reflections facing south at low to moderate angles of inclination near horizontal reflections are confined to: (a) just north of due east to approaching southeast; and (b) just north of due west to approaching southwest. Reflections at any given vertical angle happen twice a day in opposite directions. Reflections to the west occur in the morning (with the sun in the east); reflections to the east occur in the afternoon/evening (with the sun in the west). In contrast, during the day, reflections are skyward.

For glare to pose a nuisance value to a neighboring property, that property must be both at the elevation of the glare and in the direction of the glare at the same time. A consideration of one or the other of these steps might render the other moot.

Based on the conceptual description of the proposed Project information provided by the Authority, we understand that the solar panels would be placed on a tilted racking system, with a south-facing 5- or 12-degree tilt to maximize efficiency. It is estimated that this system would reflect approximately 2 percent of incoming light back into the atmosphere. (However, it should be noted that fixed installations, such as Design Alternative 1, generally reflect more light when the panels are not directly facing the sun. Fixed mount panels directly face the sun for only a few minutes of the day, at most.)

For glare to be visible, the viewer must be looking down on the top of the solar panels. There is a residential neighborhood located approximately 1,500 feet to the north of the Project site, which is located more than 50 feet

above the surface water elevation. Additionally, Sweetwater Summit Regional Park and the associated trail network is located approximately 0.5 miles to the south. The park is located approximately 70 feet above the surface water. However, as previously described, glare from fixed south-facing solar panels would be directed to the east and the west. As such, there would be no impact to these glare sensitive receptors to the north or south. The trail located to the east of the solar array are located more than 1 mile from the array and at an elevation of approximately 20 feet above the surface water elevation. At this distance trail users would not experience potential glare from the proposed FPV system.

The Design Alternative 2 configuration would autonomously track the sun; therefore, the system would capture more sunlight as compared to a fixed system. Design Alternative 2 would increase the amount of energy produced, while minimizing potential glare. Therefore, potential glare would be further reduced as compared to Design Alternative 1.

6 RECOMMENDATIONS

No significant impacts to aesthetics and visual resources have been identified as a result of the proposed Project. Nevertheless, the following recommendations have been provided to further reduce glare. These recommendations may be considered as a part of the AquaPhi™ Pilot system prior to installation of the large RES-BCT system.

It is understood that solar panels are inherently designed to reduce glare. Since silicon is naturally reflective, all solar panels are coated with anti-reflective materials that allow light to pass through the silicon and minimize reflection. (The dark appearance of solar panels is caused by anti-reflective coatings combined with the monocrystalline wafers to maximize absorption).

In addition to the anti-reflective coatings, the surfaces of solar panels can be roughened, a process called “stippling.” (Stippled surfaces – sometimes referred to as “dimpled” surfaces – diffuse reflection. The basic concept behind stippling is for the surfaces of the glass to be textured with small types of indentations. As a result, stippling allows more light energy to be channeled/ transmitted through the glass while diffusing the reflected light. This causes light reflecting off the solar panel to look hazy and less defined than the reflection from standard glass.

Light-trapping, which uses mirrors and natural surface textures to “trap” light within the layers of the solar cell, could also be considered. This approach allows even less light to reflect/escape the solar panel.

During the initial implementation of the AquaPhi™ Pilot system the Authority should conduct monitoring of glare from Key View Points 1, 2, and 5. These locations should be visited in the Spring, Fall, Summer, and Winter at dawn, dust, and noon. While not anticipated based on the analysis provided above, if direct glare is visible from these locations the proposed design and/or the proposed location of the RES-BCT should be reviewed using ForgeSolar, a commercial software based on the Solar Glare Hazard Analysis Tool (SGHAT), or similar modeling tool(s) available to evaluate the potential for glare from a photovoltaic system. If necessary, the design and/or the location of the RES-BCT should be revised to address these issues prior to assembly and deployment.

7 REFERENCES

Colton, R.D. 2014. Assessing Rooftop Solar PV Glare in Dense Urban Residential Neighborhoods: Determining Whether and How Much of a Problem. Fisher, Sheehan and Colton. Public Finance and General Economics. Belmont, MA 02478.

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Sincerely,

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November 11, 2024

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Subject: **Draft Biological Resources Technical Report for the Sweetwater Reservoir Floating Photovoltaic System Project, San Diego, California**

1 INTRODUCTION

The Sweetwater Authority (Authority) is proposing the installation of a floating photovoltaic (FPV) system on the Sweetwater Reservoir to accomplish the goals of the Authority's Sustainability Action Plan and Drought Response Plan. The proposed system would be installed in two phases: AquaPhi™ Pilot, a pilot solar array that provides autonomous tracking of the sun for increased energy production. This pilot array would cover less than 0.2 acres and provide 100 kilowatts (kW) of solar capacity. Renewable Energy Self-Generation, Bill Credit Transfer (RES-BCT) Array, an FPV array providing up to a maximum of approximately 3.7 megawatts (MW) of solar energy production. This solar array would be used to offset existing Authority energy use at the Robert A. Perdue Water Treatment Plant (WTP) as well as other facilities owned and operated by the Authority, providing up to 67 percent of the Authority's energy needs in a sustainable way. The Authority is considering two different initial alternatives for the RES-BCT: a rectangular FPV array, covering an approximately 9.5-acre area (Alternative 1), and a second alternative consisting of multiple AquaPhi™ islands, covering an approximate 7.4-acre area of the Reservoir surface (Alternative 2).

For purposes of this biological resources technical report, an overall study area of approximately 120.27 acres was evaluated and is described herein (see Figure 1). The study area encompasses the two solar arrays, temporary construction and staging areas, a temporary launch ramp, and office and storage space. The study area includes developed lands containing Authority infrastructure, dirt and paved roads, and undeveloped open space areas. WSP was contracted by the Authority to prepare a Biological Resources Technical Report to identify the biological resources within the study area and potential impacts associated with implementation of the proposed Project.

1.1 PROJECT LOCATION

The Sweetwater Reservoir is located approximately 7 miles east of the San Diego Bay and approximately 4 miles northeast of the City of Chula Vista. More locally, the Reservoir is surrounded by the unincorporated communities of Spring Valley to the north and Bonita to the south and west (see Figure 1). In addition to open space areas managed by the Authority and existing water facilities, single family residential homes, intermixed with some general commercial and industrial land uses, are located to the north of the Sweetwater Reservoir. Open space and recreation areas are located immediately to the southwest of the Reservoir, including Sweetwater Summit Regional Park and the Bonita Golf Course. The San Diego National Wildlife Refuge, which spans 11,152 acres from Jamul to communities in Spring Valley and eastern Chula Vista, is located approximately 500 feet from the southern edge of Sweetwater Reservoir. The refuge is the U.S. Fish and Wildlife Service's (USFWS's) contribution to the Multiple Species Conservation Program (MSCP), a landscape-wide habitat conservation plan to preserve habitat and species while allowing appropriate development. The Authority's Loveland Reservoir is located approximately 17 miles

upstream (northeast) of the Sweetwater Reservoir and serves as a holding area for water that is released to the Sweetwater Dam.

1.2 PROJECT DESCRIPTION

The study area is located at western end of the Sweetwater Reservoir. Project components include the AquaPhi™ Pilot and RES-BCT systems (including cables, panels, and anchoring systems), construction staging, material storage, and site access. The AquaPhi™ Pilot system would involve the installation of a 0.2-acre 100 kW floating photovoltaic system at a western area of the Sweetwater Reservoir, approximately 750 feet from the Sweetwater Dam (see Figure 2). The AquaPhi™ Pilot system would utilize autonomous thruster technology that would replace the need for anchoring and mooring. Thrusters attached to the bottom of the High-Density Polyethylene (HDPE) floats would be controlled by a DC-motor drive and an autopilot controller would enable automatic rotational tracking of the sun. The specific use of the electricity produced by the AquaPhi™ Pilot system is to be determined; it may provide power to an existing meter at the Perdue WTP site or provide off-grid power to other equipment at the Reservoir.

The autonomous tracking associated with the AquaPhi™ Pilot system would result in up to 17 percent more energy production as compared to an FPV system that is non-rotational and anchored in place.

The proposed RES-BCT system would involve the installation of a photovoltaic system on the surface of the Reservoir, adjacent to the proposed AquaPhi™ Pilot system (see Figure 2). The proposed RES-BCT system would include accompanying grid-interactive inverters and associated equipment. The Authority is considering two separate alternative layouts for the RES-BCT system:

Alternative 1 Layout. The RES-BCT Alternative 1 layout would involve the installation of an approximately 9.4-acre array of solar panels attached to a buoyant HPDE racking system that would float atop the surface of Sweetwater Reservoir. The solar array would be fixed in place using cables fastened along all four sides of the rectangular HDPE floats and attached to concrete block anchors. These anchors would be sunk and placed at the bottom of the Reservoir. Beyond the placement of the anchors, no digging, drilling, or other disturbance of the Reservoir is currently being proposed. The anchors would be designed for all anticipated water level fluctuations from maximum to minimum pool depths. Electrical conduits would be placed on floats to connect solar modules to the land-based equipment pad and the existing 12 kilovolt (kV) line managed by San Diego Gas & Electric (SDG&E).

Alternative 2 Layout. The RES-BCT Alternative 2 would involve the installation of approximately 11.7 acres (7.4 acres of solar arrays and 4.3 acres for the solar array rotational zones) of the Reservoir's surface water area to float seven floating solar islands. Similar to the AquaPhi™ pilot system, the Alternative 2 layout would use autonomous thrusters technology to position floating solar islands, eliminating the need for underwater anchoring and mooring. The autonomous underwater thrusters attached to the floating racking system would maintain the system's position while automatically rotating to track the sun and increase energy production. Electrical conduits under the Alternative 2 layout would be placed on floats to connect solar modules to the land-based equipment pad and existing 12kV line managed by SDG&E.

Under both the Alternative 1 and Alternative 2 layouts, an approximately 0.10-acre concrete equipment pad would be constructed on the shoreline, immediately east of the Perdue WTP (see Figure 2). The equipment pad would contain a transformer, switchboards, and inverters to turn the Direct Current (DC) into an Alternating Current (AC) for electrical distribution purposes. Electrical conduits would run above ground from the equipment pad and connect to the 12 kV SDG&E transmission line and, ultimately, an SDG&E substation.

Minor alterations to SDG&E existing facilities may need to occur; however, construction of new buildings is not anticipated as a result of the proposed Project. An overview of project features is provided as Figure 2. Results of the Rule 21 Interconnection Study found that Ground Fault Protection and Reclosing Blocking and 3 Phase Interrupting SCADA Recloser are required upgrades.

1.2.1 CONSTRUCTION

Construction of the AquaPhi™ Pilot system component is anticipated to begin in November 2025 and would occur over a period of 1 to 2 weeks. The RES-BCT system would be installed approximately one year later following the completion of design, permitting, and interconnection agreements. For the purposes of this analysis, construction of the proposed RES-BCT system is anticipated to begin in August 2026 and would occur over a period of 3 to 4 months.

For both the AquaPhi™ Pilot system and the RES-BCT system, the solar array, system floats, motors, and electronics would all be assembled on land and then deployed to the designated location on the Reservoir. A temporary ramp would be placed along the shore of the Reservoir (just south of the SDCWA aqueduct outfall) to deploy the system onto the Reservoir using a boat for the final installation and commissioning of the floating photovoltaic array and anchoring.

Permanent ground disturbance on the east side of the already developed treatment plant facilities would be limited to the construction of the 0.1-acre concrete equipment pad, the installation of a battery energy storage system, and the placement of electrical conduits. The placement of electrical conduits would require approximately 65 feet of underground trenching from the Reservoir's high-water mark, under an existing dirt road, to the proposed equipment pad.

Anticipated construction equipment would include a telehandler, delivery trucks, a crane, a concrete truck, a drilling rig, and a boat. Approximately 75-80 truck trips would deliver materials throughout the duration of the construction. It is anticipated that there would be 15-20 personnel for construction commuting from local housing accommodations. There would be two small, gas-powered pieces of equipment to receive the material pallets.

Temporary construction and staging areas, totaling approximately 4 acres for material storage, would be located in a paved area off of Lakeview Avenue outside of the Perdue WTP, on Sweetwater Reservoir Road, and on a previously disturbed dirt road along the shoreline of the Reservoir (see Figure 2). Additionally, approximately 0.3 acre at the end of Sweetwater Reservoir Road would be used for the construction of a temporary floating solar assembly and deployment ramp. During construction, there would be four to five containers on site occupying a total of approximately 1 acre of the paved area off of Lakeview Avenue. One container would be used as an office and the remaining would be used to store materials.

1.2.2 MAINTENANCE

A full maintenance plan is being developed concurrently with the development of the FPV regulatory approvals, to ensure maintenance activities would fully be compliant with applicable environmental regulations, including those governing drinking water and water quality. It is expected that periodic maintenance activities would involve the monthly inspection of solar panels, floats, mooring, anchors, electrical and onshore equipment. Some operations and maintenance activities (e.g., panel cleaning) would require workers to walk on the arrays using walkway sections specifically designed for maintenance. Panel cleaning would be performed manually with a dry soft cloth, using no water or solvents, a vacuuming system may be used to collect debris. Panel cleaning is anticipated to be required at least once per year.

Maintenance activities would also include anti-fouling beneath floating panels to prevent or remove fouling organisms (e.g. algae, seaweed, mussels). Anti-fouling methods may include application of anti-stick coatings, biocides, or ultrasonic transducers; however, specific methods for the proposed Project have not yet been determined. Frequency of anti-fouling is recommended once every 2 to 3 years.

System performance would be constantly monitored remotely. It is anticipated that a contractor would be hired to perform all required maintenance activities. The proposed Project would not result in the need for new full-time staff for day-to-day operations at the Perdue WTP.

1.2.3 TEMPORARY RELOCATION

While operational, it is anticipated that the AquaPhi™ Pilot system and/or RES-BCT system may need to be temporarily disconnected and/or relocated to allow for Reservoir maintenance activities or for other currently unknown reasons. This would involve disconnecting the cables attaching the FPV systems to the concrete anchors and towing the floating photovoltaic systems by boat to another location near the northern shoreline of the Reservoir, where they would be located for a period of days or weeks. During this relatively short period, the Perdue WTP would operate using power provided by SDG&E, similar to existing conditions. Following the completion of Reservoir maintenance activities, the FPV systems would be towed back into place and re-attached to the concrete anchors.

1.2.4 DECOMMISSIONING

Once the FPV system has reached the end of its functional life (expected to be up to 25 years), it would be removed from the Reservoir site, disassembled, and recyclable components would be taken to an appropriate universal waste handler. The solar panels would be recycled or disposed of accordingly.

2 SITE DESCRIPTION AND PHYSIGOGRAPHY

2.1 TOPOGRAPHY

The study area is located in Section 17, Township 17 south, Range 01 west on the U.S. Geological Survey's (USGS's) 7.5-minute National City, California quadrangle and is within Assessor Parcel Numbers (APN) 585-161-01-00 and 585-161-04-00. at the southwestern end of a wide, relatively flat valley, partly inundated by the Sweetwater Reservoir. The study area ranges from gently sloped areas in the northwestern part of the study area to steeper slopes along the Reservoir shoreline to the relatively flat Reservoir. Elevation in the study area ranges from approximately 174 feet to 310 feet above mean sea level (MSL), generally sloping from northwest toward the southeast.

2.2 HYDROLOGY

The Sweetwater River's headwaters are in the Cuyamaca and Laguna Mountains, with a 182-square mile watershed located upstream of the Reservoir. During winter and spring months, the Sweetwater River flows through the study area from natural runoff and periodic water transfers from the Loveland Reservoir. Incoming water is held by Sweetwater Reservoir Dam and, which was originally constructed between 1886 and 1888, depending on volume received and extant Reservoir level, floods the portion of the study area within the Reservoir boundaries, at depths contingent on the topographical bottom elevations. The capacity of the Sweetwater Reservoir extends to 239 feet (') AMSL with the elevation of the dam spillway at the western edge of the Reservoir. Emergency overflow water from the Sweetwater Reservoir passes through the Sweetwater Dam into the Sweetwater River. Overflow is defined as water passage above the 239-foot elevation that moves into the South Spillway. The South Spillway discharges into natural riparian area. From there, water continues downstream along the Sweetwater River corridor. A sedimentation/drainage basin is located immediately south of the South Dike. This basin drains via a storm drain system under SR-125 and San Miguel Road and eventually discharges into an unnamed tributary, and ultimately San Miguel Creek, immediately south of San Miguel Road and south of the study area.

2.3 SOILS

Most of the terrestrial areas of the study area are in the San Miguel Rocky Silt Loam series, with a small section at the northern border mapped in the Olivenhain Cobbly Loam series. Soils associated with the Sweetwater River to the west of the Sweetwater Reservoir Dam are mapped as Riverwash (Natural Resources Conservation Service [NRCS] 2024). San Miguel Rocky Silt Loam typically consists of deep metavolcanic-derived silt soils overlaying a clay layer and makes up the vast majority of the study area. Olivenhain Cobbly Loam is a complex, clayey series consisting of well drained loams with heavier clay intrusions and cobbles. This series occurs in one small section along the northern edge of the study area. The Sweetwater River area and Sweetwater Reservoir soils are classified

as Riverwash, consisting of a rocky canyon floor typically overlain with shallow deposits of stream sediments, bounded by steep, rocky cliffs. (see Figure 3).

2.4 VEGETATION COMMUNITES AND HABITATS

Vegetation in the study area includes native and disturbed native communities, as well as developed areas associated with Reservoir infrastructure. Vegetation communities include coastal sage scrub, coastal sage scrub – disturbed, and riparian woodland (see Table 1 and Figure 4). Other mapped designations include open water and developed which includes existing facilities and managed areas. Each of the vegetation communities are discussed in further detail below and depicted in Figure 4. Vegetation data was provided by Authority Biologist Peter Famolaro.

Table 1. Vegetation Communities and Habitats in the Study Area

Vegetation Community	Acres
Coastal Sage Scrub	10.10
Coastal Sage Scrub - Disturbed	2.33
Riparian Woodland	0.21
Open Water	88.06
Developed	19.58
Total	**120.28**

Notes: Vegetation data provided by Sweetwater Authority 2024.

2.4.1 COASTAL SAGE SCRUB (10.10 ACRES)

Coastal sage scrub habitat is located on both sides of the Reservoir in the study area, with a larger patch to the north and a smaller patch along the southern border of the study area. The northern patch is surrounded mostly by disturbed areas with the Reservoir to the east. Associated species include California buckwheat (*Eriogonum fasciculatum*), California sagebrush (*Artemisia californica*), and coast cholla (*Cylindropuntia prolifera*), with areas of San Diego sunflower (*Bahiopsis laciniata*), laurel sumac (*Malosma californica*), and other species. Understory components include native and non-native species. In the study area the community's growth pattern includes areas of dense shrubs, 3 to 5 feet tall to very open phases. The extent and distribution of coastal sage scrub has been greatly reduced from historical levels in coastal Southern California and is considered a sensitive habitat. It often supports a higher number of sensitive plant and wildlife species than the surrounding upland communities.

2.4.2 COASTAL SAGE SCRUB – DISTURBED (2.33 ACRES)

Three areas of coastal sage scrub – disturbed habitat are located on the north side of the Reservoir in the western part of the study area. These areas are bordered by developed lands. The species associated with this community are the same as those of coastal sage scrub; however, they have experienced disturbance from activities associated with the adjacent roads and/or infrastructure.

2.4.3 RIPARIAN WOODLAND (0.21 ACRE)

One small band of riparian woodland occurs below the Sweetwater Reservoir Dam. This habitat includes areas of high-stature woodlands dominated by arroyo willow (*Salix lasiolepis*), black willow (*Salix gooddingii*), and western sycamore (*Platanus racemosa*). A band of riparian scrub habitat also occurs along much of the current shoreline of the Reservoir, dominated by arroyo willow and red willow (*Salix laevigata*), approximately 10 to 15 feet wide and generally consisting of a single row of 10- to 20-foot-tall trees.

2.4.4 OPEN WATER (88.06 ACRES)

Open water describes portions of the Reservoir which currently hold water within in the study area boundary. The Sweetwater Reservoir is a surface water Reservoir that was created with construction of the Sweetwater Dam. It is

managed primarily for drinking water but includes other added benefits such as plant and wildlife habitat for a variety of species.

2.4.5 DEVELOPED (19.58 ACRES)

Developed areas include bare ground, mostly bare disturbed areas, maintained dirt roads, paved roads, structures, and areas actively maintained to exclude naturally occurring vegetation. Developed areas of the study area include the dam, Reservoir facilities/infrastructure, associated landscaping, and paved access roads.

3 BIOLOGICAL RESOURCES ASSESSMENT METHODS

WSP conducted a search of the California Natural Diversity Database (CNDDB) and the USFWS sensitive species database. A search area encompassing the study area and similar habitats in the surrounding areas was used to guide the searches (see Figures 5a through 5c). Identified records were further filtered based on habitat types on-site and likelihood of occurrence. Previous surveys of projects that encompassed the study area were also referenced and include Amec Foster Wheeler (2017), McMillan Biological Consulting (2006), and the Authority (2005). An assessment of the study area location in relation to the known range of sensitive species of the region was also conducted, focusing on the habitat/microhabitat resources available on-site. Input, including geographic information system (GIS) data, on observations of biological resources previously observed within the study area was also solicited from Authority biologist Peter Famolaro, who has worked on the Sweetwater Reservoir since the mid-1990s (see Figure 5d [P. Famolaro 2024]). GIS data from Mr. Famolaro ranges from 1998 through 2022. The purpose was to identify sensitive species known from the region and assess their potential for occurrence in the study area. Those species with no potential to occur within the study area based on the habitat assessment and background review were discounted and are not discussed in this report.

In addition to the resources mentioned above, WSP conducted extensive research of literature related to energy projects and biological resources. It quickly became evident that the proposed FPV is unique and, therefore, literature and information from similar projects is not readily available. Research focused on solar energy but also included other types of energy projects, including wind energy as well as other related subjects, such as avian collisions with power lines, monitoring efforts to inform understanding of avian and solar interactions, analysis of avian mortality at solar energy facilities, and potential impacts of solar installations on bird migration. Most of the literature found is related to impacts associated with birds but also includes studies regarding potential impacts on bats.

Vegetation communities and habitat GIS data was provided by the Authority. This data was used to create the vegetation map, assess the potential and likelihood for sensitive species to occur within the study area, and determine acreages of vegetation communities within the study area. The delineation of jurisdictional waters included a literature review and desktop analysis. WSP biologists conducted a literature review to identify potentially jurisdictional waters in the survey area including the following resources: recent aerial imagery from 2022 (DigitalGlobe 2023) (Figure 6); historical aerial photos (1994-2023) to identify changes in hydrology over time (Google Earth Pro 2023); USGS topographic maps to determine the presence of any drainages or other mapped water features; USFWS National Wetlands Inventory (NWI) maps to identify areas mapped as wetland features (USFWS 2023); Sweetwater Reservoir annual peak elevation data from 1990 through 2024 (Table 4 [Authority 2024]); and a review of the Draft Resource Delineation Report for the Sweetwater Reservoir Aeration and Destratification Project (WSP 2023) which occurred in the same location as the study area for the proposed Project. The delineation results for this proposed Project are based on those findings from the 2023 delineation report.

4 SENSITIVE SPECIES AND OTHER BIOLOGICAL RESOURCES

4.1 SENSITIVE SPECIES

Sensitive species are those recognized by federal, state, or local agencies as being potentially vulnerable to impacts because of rarity, local or regional reductions in population numbers, isolation/restricted genetic flow, or other factors. The distribution of historical sensitive species observations in the immediate Project vicinity is included in Figures 5a through 5d. For the purposes of this biological resources technical report, only those species that are either known to occur or with high potential to occur within the study area are addressed below. Sensitive plant and wildlife species with potential to occur in the study area are identified in Table 2 and Table 3, respectively.

Relevant state and federal regulations intended to conserve and protect individual species and their habitat, or particular taxa are discussed in the following sections.

4.1.1 FEDERAL REGULATIONS

4.1.1.1 Federal Endangered Species Act

The federal Endangered Species Act (ESA) protects plants and wildlife and their habitats that are listed as endangered or threatened by the U.S. Fish and Wildlife Service (USFWS). Section 9 of the ESA prohibits the taking of ESA-protected wildlife and lists prohibited actions. The ESA defines take as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct" (50 Code of Federal Regulations [CFR] §17.3). The ESA also governs the removal, possession, malicious damage, or destruction of endangered plants on federal land. Pursuant to the requirements of the ESA, an agency proposing a project or reviewing a proposed project within its jurisdiction (action agency) must determine whether any federally listed species may be present in the proposed Project area and determine whether the proposed Project would have a significant effect upon such species or its habitat.

4.1.1.2 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) implements international treaties between the U.S. and other nations to protect migratory birds and their parts, eggs, and nests from activities such as hunting, pursuing, capturing, killing, selling, and shipping, unless expressly authorized by regulation or permit. Regulations governing migratory bird permits are found in 50 CFR Part 13 – General Permit Procedures and 50 CFR Part 21 – Migratory Bird Permits.

4.1.1.3 Bald and Golden Eagle Protection Act

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S. Code [USC] §§668-668d [BGEPA]) which was originally passed in 1940 and has been amended several times. The BGEPA prohibits the take, possession, sale, purchase, barter, offer to sell, transport, export, or import of any bald or golden eagle, alive or dead, including their parts (including feathers), nests, eggs. The USFWS regulates activities that may result in the take of bald eagles or golden eagles. Take is defined as "pursuing, shooting, shooting at, poisoning, wounding, killing, capturing, trapping, collecting, molesting, and disturbing" bald or golden eagles, and as activities causing: "(1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior".

4.1.2 STATE REGULATIONS

4.1.2.1 California Endangered Species Act

The California Department of Fish and Wildlife (CDFW) administers the California Endangered Species Act (CESA), which prohibits the "take" of plant and animal species designated California Fish and Game Commission as endangered or threatened in California. Under CESA, take is defined as "hunt, pursue, catch, capture, or kill, or

attempt to hunt, pursue, catch, capture, or kill." The CESA establishes policy that state agencies should not approve projects that would "jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of habitat essential to the continued existence of those species if there are reasonable and prudent alternatives consistent with conserving the species or its habitat that would prevent jeopardy."

4.2 SPECIAL-STATUS PLANT SPECIES

Special-status plants include those listed as threatened or endangered, proposed for listing, or candidates for listing under ESA and/or CESA; and those species included in the California Rare Plant Rank (CRPR) inventory, which is maintained by the California Native Plant Society (CNPS). All sensitive plant species known to occur or with potential to occur in the study area addressed in Table 2.

Table 2. Sensitive Plant Species Known or Potentially Occurring in the Study Area

Scientific Name	Common Name	Status[1] (Federal/ State)	Habitat	Potential for Occurrence
Acanthomintha ilicifolia	San Diego thornmint	FT/SE	Coastal sage scrub, chaparral, grasslands, and vernal pools	*Very Low* – Closest known population of San Diego thornmint is Proctor Valley, a few miles to the south. This species is not expected within the study area. The species would have been detected during 2004 and 2005 surveys if present (Authority 2005).
Adolphia californica	California adolphia	CNPS 2B.1	Coastal sage scrub, chaparral, and grasslands	*Present* – Patches of California adolphia were recorded within the study area in both coastal sage scrub and eucalyptus woodland understory (Authority 2005).
Ambrosia monogyra	singlewhorl burrobrush	CNPS 2B.2	Chaparral and Sonoran desert scrub	*High* – Reported near the SR-125 bridge crossing along the shoulder of Conduit Road in 2017 (Amec 2017). May occur in coastal sage scrub habitat in the study area although it has not been observed there.
Ambrosia pumila	San Diego ambrosia	FE/ CRPR 1B.1	Coastal sage scrub, chaparral, grasslands, and vernal pools	*Very Low* – San Diego ambrosia is known several miles to the east along the Sweetwater River. This species is not expected within the study area. The species would have been detected during 2004 and 2005 surveys if present. The study area lacks suitable clay soils for this species (Authority 2005).
Atriplex pacifica	Pacific saltscale	CRPR 1B.2	Coastal sage scrub, coastal dunes, and playas	*Low* – Known from the region, but significant areas of alkaline soil, that the species is typically associated with is lacking.
Bahiopsis laciniata	San Diego sunflower	CRPR 4.3	Coastal sage scrub and chaparral	*Present* – Significant component of much of the coastal sage scrub in the Sweetwater Dam area, particularly on south-facing slopes (Authority 2005).

Table 2. Sensitive Plant Species Known or Potentially Occurring in the Study Area

Scientific Name	Common Name	Status[1] (Federal/ State)	Habitat	Potential for Occurrence
Bloomeria clevelandii	San Diego goldenstar	CRPR 1B.1	Coastal sage scrub, chaparral, grasslands, and vernal pools	*Moderate* – Known from region including the Sweetwater Reservoir property a couple of miles east, potentially suitable habitat in coastal sage scrub habitat in the study area, particularly associated with heavier soils.
Brodiaea orcuttii	Orcutt's brodiaea	CRPR 1B.1	Coniferous forest, chapparal, woodlands, meadows and seeps, grasslands, and vernal pools	*Low* – Known from region, occurs in moist grasslands and meadows. Some areas of potentially suitable habitat within the vicinity of the study area although it has not been observed within the study area.
Calochortus dunnii	Dunn's mariposa lily	CRPR 1B.2	Coniferous forest, chapparal, and grasslands	*Low* – Known from region but typically occurs at somewhat higher elevations.
Convolvulus simulans	small-flowered morning glory	CRPR 4.2	Grasslands and vernal pools	*Low to Moderate*– Not detected but could potentially occur in the study area. This species is found at several locations around the Reservoir (Authority 2005).
Corethrogyne filaginifolia var. *incana*	San Diego sand aster	CRPR 1B.1	Coastal sage scrub, coastal bluff scrub, and chaparral	*Moderate* – Known from region, potentially suitable habitat in coastal sage scrub habitat where suitable soils may be present although it has not been observed in the study area.
Cylindropuntia californica var. *californica*	snake cholla	CRPR 1B.1	Coastal sage scrub and chaparral	*Low* – Not detected in study area. The potential for occurrence within the study area is low as it would have been evident if present.
Deinandra conjugens	Otay tarplant	FT/ SE, CRPR 1B	Coastal sage scrub and grasslands	*Low* – Large populations of Otay tarplant occur east of the study area. This species was not detected during 2004 and 2005 surveys of the area. The potential for future occurrence is considered low due to close proximity of neighboring populations (Authority 2005). The study area lacks suitable clay soils for this species (Authority 2024).
Deinandra paniculata	paniculate tarplant	CRPR 4.2	Coastal sage scrub and grasslands	*Very Low* – Known from region, potential to occur in coastal sage scrub in study area although it has not been observed there in decades of surveys (Authority 2005).
Dichondra occidentalis	western dichondra	CRPR 4.2	Coastal sage scrub, chaparral, woodlands, and grasslands	*Low* – Known from region, potential habitat in coastal sage scrub habitat in study area although it has not been observed there.
Dudleya variegata	variegated dudleya	CRPR 1B.2	Coastal sage scrub, chaparral, woodlands, grasslands, and vernal pools	*Low* – Not detected within the study area but could potentially occur. Variegated dudleya is known to occur on the Sweetwater Reservoir property, east of the study area (Authority 2005).

Table 2. Sensitive Plant Species Known or Potentially Occurring in the Study Area

Scientific Name	Common Name	Status[1] (Federal/ State)	Habitat	Potential for Occurrence
Ericameria palmeri var. *palmeri*	Palmer's goldenbush	CRPR 1B.1.	Coastal sage scrub and chaparral	*Very Low* – Not detected in study area. The potential for occurrence within the study area is very low as it would have been evident if present (Authority 2005).
Eryngium aristulatum var. *parishii*	San Diego button celery	FE/ CRPR 1B.1	Coastal sage scrub, chapparal, grasslands, and vernal pools	*Very Low* – Known from southern San Diego County, but typically from higher quality vernal pool habitat. Restored vernal pools on Sweetwater Reservoir property (Authority 2016) and adjoining San Diego National Wildlife Refuge support this species. Generally poor-quality habitat within the study area, consisting of artificial depressions associated with roads and past disturbance, are present in the study area. This species has not been observed in the study area.
Ferocactus viridescens	San Diego barrel cactus	CRPR 2B.1	Coastal sage scrub, chaparral, grasslands, and vernal pools	*Present* – Observed is coastal sage scrub habitat throughout the study area. The most significant numbers were located in the northwestern and eastern portions of the study area (Authority 2005).
Harpagonella palmeri	Palmer's grapplinghook	CRPR 4.2	Coastal sage scrub, chaparral, and grasslands	*Moderate* – Identified just west of the study area. Potential to occur in coastal sage scrub in study area although it has not been observed there.
Holocarpha virgata ssp. *Elongata*	graceful tarplant	CRPR 4.2	Coastal sage scrub, chaparral, woodlands, and grasslands	*Moderate* – Historically recorded from the eastern end of the Sweetwater Reservoir property (Calflora 2024) and additional areas on and immediately off the Reservoir property (McMillan 2000 and 2005) and potential habitat occurs in the coastal sage scrub habitats of the study area; however, this species has not been observed in the study area.
Hordeum intercedens	vernal barley	CRPR 3.2	Coastal sage scrub, coastal dunes, grasslands, and vernal pools	*High* – Historically detected south of the study area in disturbed, trailside habitat (Amec 2017). Potential to occur in coastal sage scrub in study area although it has not been observed there.
Isocoma menziesii var. *decumbens*	decumbent goldenbush	CRPR 1B.2	Coastal sage scrub (often disturbed areas, sandy) and chaparral	*High* – Historically observed southeast of study area in coastal sage scrub habitat (Amec 2017). Potential to occur in coastal sage scrub habitats in study area although it has not been observed there.

Table 2. Sensitive Plant Species Known or Potentially Occurring in the Study Area

Scientific Name	Common Name	Status[1] (Federal/ State)	Habitat	Potential for Occurrence
Iva hayesiana	San Diego marsh elder	CRPR 2B.2	Marshes and playas	*Low* – San Diego marsh elder is common in riparian wetlands and moist drainages in the eastern limits of the Sweetwater Reservoir property. The potential for occurrence in the study area is low as it would have been evident if present. Not observed in the study area (Authority 2005).
Juncus acutus ssp. *leopoldii*	southwestern spiny rush	CRPR 4.2	meadows and seeps, and marshes (coastal salt), occasional in non-wetlands	*Low* – Not present in study area. Southwestern spiny rush occurs at several locations on the Sweetwater Reservoir property. The potential for occurrence within the study area is low as it would have been evident if present (Authority 2005).
Lepidium virginicum var. *robinsonii*	Robinson's peppergrass	CRPR 4.3	Coastal sage scrub and chaparral	*Low* – Occurs in upland areas within vernal pool fields. Historical localities from study area vicinity, but site lacks vernal pool habitat.
Nama stenocarpa	mud nama	CRPR 2B.2	Marshes, lake margins, and riverbanks	*Moderate* – Known from region, lake margin habitat (McMillan 2000). Potential habitat in study area although it has not been observed there.
Navarretia fossalis	spreading navarretia	FE/ CRPR 1B.1	Chenopod scrub, marshes (freshwater), playas, and vernal pools	*Very Low* – Typically associated with good quality vernal pool habitat. Although the species is known from the Sweetwater Reservoir area (Authority 2016), generally poor-quality habitat, consisting of artificial depressions associated with roads and past disturbance, are present in the study area. This species has not been observed within the study area.
Pogogyne nudiuscula	Otay mesa mint	FE/ CRPR 1B.1	Vernal pools	*Very Low* – Known from southern San Diego County, but typically from higher quality vernal pool habitat. Restored vernal pools on Sweetwater Reservoir property (Authority 2016) and adjoining San Diego National Wildlife Refuge support this species. Generally poor-quality habitat is present in the study area, consisting of artificial depressions associated with roads and past disturbance. This species has not been observed within the study area.
Romneya coulteri	Coulter's matilija poppy	CRPR 4.2	Coastal sage scrub and chaparral	*Low* – Common in coastal sage scrub and disturbed habitat in the region, but this generally showy species has not been detected or recorded within the study area.

Table 2. Sensitive Plant Species Known or Potentially Occurring in the Study Area

Scientific Name	Common Name	Status[1] (Federal/ State)	Habitat	Potential for Occurrence
Salvia munzii	Munz's sage	CRPR 2B.2	Coastal sage scrub and chaparral	*High* – Individuals observed in the revegetated areas associated with the SR-125 bridge at Conduit Road (Amec 2017) and areas to the east around the Reservoir (Authority Biologist data). Potential to occur in coastal sage scrub habitats in study area although it has not been observed there.
Selaginella cinerascens	ashy spike-moss	CRPR 4.1	Coastal sage scrub and chaparral	*Present* – Detected in coastal sage scrub habitat in the study area. The most significant patches occurred in the eastern portion of the study area (Authority 2005).
Senecio aphanactis	California groundsel	CRPR 2B.2	Coastal sage scrub, chaparral, and woodlands	*Moderate* – Known from the region, potentially suitable habitat occurs in open coastal sage scrub habitat in study area although not observed in the study area.
Stemodia durantifolia	purple stemodia	CRPR 2B.1	Sonoran desert scrub (often mesic, sandy)	*Low* – Historically known to occur in Sweetwater Reservoir area. Occurs in wetland habitats. Habitat is not present within study area.
Suaeda esteroa	estuary seablite	CRPR 1B.2	Marshes (coastal salt)	*Moderate* – Known from upper Sweetwater Reservoir area (Calflora 2024), when Reservoir bottom and shoreline is temporarily exposed due to drawback or evaporation, leaving saline soil conditions. Typical alkaline wetland habitat for the species is not present in the study area; however, this species is known to occur in exposed portions of Reservoir bottom and shoreline where alkali conditions temporarily occur with drawdown and evaporation, leaving saline soil conditions.

Notes:
[1] **Status:** Federal/State/CNPS List. **Federal:** FT = Federally Threatened, FE = Federally Endangered. **State:** SE = State Endangered. **California Native Plant Society (CNPS) California Rare Plant Rank (CRPR):** 1B.1 = plants rare, threatened, or endangered in California and elsewhere, seriously threatened in California; 2B.1 = plants rare, threatened or endangered in California, but more common elsewhere, seriously threatened in California; 2B.2 = plants rare, threatened or endangered in California, but more common elsewhere, fairly threatened in California; 4B.2 = plants of limited distribution, fairly threatened in California.

4.3 SPECIAL-STATUS PLANT SPECIES KNOWN TO OCCUR

Four special-status plant species have been detected in the study area during surveys conducted to date: California adolphia (*Adolphia californica*), San Diego sunflower (*Bahiopsis laciniata*), San Diego barrel cactus (*Ferocactus viridescens*), and ashy spike moss (*Selaginella cinerascens*) as described in Table 2.

4.3.1 CALIFORNIA ADOLPHIA (ADOLPHIA CALIFORNICA)

California adolphia is a deciduous shrub and a CRPR 2B.1 species. This winter- to spring-blooming (December – May) shrub is known from western San Diego County and northwestern Baja California. It generally occurs on clay soils,

in dry canyons and washes in chaparral, coastal scrub, and valley and foothill grassland at elevations of 148 to 2,428 feet (CNPS 2024). California adolphia is still found at a variety of coastal San Diego locales. Populations of California adolphia are declining due to urban expansion and the rapid destruction of coastal sage scrub (Reiser 2001). This species was observed in the western part of the study area and adjacent to its western boundary during 2004 rare plant surveys (McMillian 2005).

4.3.2 SAN DIEGO SUNFLOWER (BAHIOPSIS LACINIATA)

San Diego sunflower is a perennial shrub and a CRPR 4.3 species. San Diego sunflower is a yellow-flowered, spring-blooming (February – June), xerophytic shrub that occurs in coastal sage scrub habitat. This species occurs in southern San Diego County and northwestern Baja California. The primary threats to this species are urbanization and development (CNPS 2024). This species was recorded at four locations mapped as developed and coastal sage scrub–disturbed in the western part of the study area during 2017 surveys (Amec 2017).

4.3.3 SAN DIEGO BARREL CACTUS (FEROCACTUS VIRIDESCENS)

San Diego barrel cactus is a perennial stem succulent and a CRPR 2B.1 species. It is limited to San Diego County and Baja California. In San Diego County, this species is occasional on dry slopes below 4,922 feet and is found along the coastal slope from Oceanside south to Boundary Monument. Its blooming period is May – June. This species is threatened by urbanization, off-road vehicles, and commercial exploitation (CNPS 2024). Barrel cactus was detected in disturbed habitat in the western and northern parts of the study area, in the understory of the coastal sage scrub habitat in the eastern part of the study area, and adjacent the western boundary of the study area during 2004 rare plant surveys (McMillian 2005).

4.3.4 ASHY SPIKE-MOSS (SELAGINELLA CINERASCENS)

Ashy spike-moss is a perennial rhizomatous herb and a CRPR 4.1 species. It is a non-flowering plant that occurs on dry exposed soils within coastal sage scrub, chaparral, and grassland habitats at elevations of 65 to 2,100 feet (CNPS 2024) in Orange County, San Diego County, northwestern Baja California, Mexico. The primary threat to this species is development and potentially foot traffic and non-native plants (CNPS 2024). This species was primarily found in the understory of coastal sage scrub habitat in the eastern part of the study area during 2004 rare plant surveys (McMillian 2005).

4.4 SPECIAL-STATUS PLANT SPECIES WITH POTENTIAL TO OCCUR

Four special-status plant species have high potential to occur in the study area: singlewhorl burrobrush (*Ambrosia monogyra*), vernal barley (*Hordeum intercedens*), decumbent goldenbush (*Isocoma menziesii* var. *decumbens*), and Munz's sage (*Salvia munzii*). These species have not been detected in the study area and are discussed in more detail below.

4.4.1 SINGLEWHORL BURROBRUSH (AMBROSIA MONOGYRA)

Singlewhorl burrobrush is a perennial shrub and a CRPR 2B.2 species. This species occurs in sandy soil in chaparral, sage scrub, and Sonoran desert scrub. Its blooming period is August – November. This species is believed to be threatened by trail maintenance and invasive non-native plant species (CNPS 2024). A few individuals of this species were detected west of the SR-125 bridge crossing along the shoulder of Conduit Road, approximately 0.25 mile east of the dam during 2017 rare plant surveys (Amec 2017). This species has not been detected in the study area.

4.4.2 VERNAL BARLEY (HORDEUM INTERCEDENS)

Vernal barley is an annual grass and a CRPR 3.2 species. It flowers typically from March to May. This grass was detected approximately 1 mile southwest of the study area in disturbed, trailside habitat during the 2017 rare plant surveys (Amec 2017). This species has not been observed in the study area.

4.4.3 DECUMBENT GOLDENBUSH (ISOCOMA MENZIESII VAR. DECUMBENS)

Decumbent goldenbush is a perennial shrub and a CRPR 1B.2 species. Decumbent goldenbush is an often low-growing shrub with a gray, hirsute appearance to the foliage. Flowers are in bright yellow; rayless heads that appear in April to November. A patch of 17 individuals was noted on and above the South Abutment Access Road on the

lower slopes of the hill in coastal sage scrub approximately one quarter mile south of the study area during 2017 rare plant surveys (Amec 2017). This species has not been observed in the study area.

4.4.4 MUNZ'S SAGE (SALVIA MUNZII)

Munz's sage is a perennial evergreen and a CRPR 2B.2 species. It occurs frequently below 1,640 feet elevation in coastal sage scrub in the south foothill and coastal region of San Diego County. Its blooming period is February – April. This species is threatened by development (Reiser 2001). This species was detected approximately one-half mile southwest of the study area in coastal sage scrub west of the SR-125 bridge crossing in in the areas of higher quality coastal sage scrub during 2017 rare plant surveys (Amec 2017). This species has not been observed in the study area.

4.5 SPECIAL-STATUS WILDLIFE SPECIES

Sensitive wildlife species include those listed as threatened or endangered, proposed for listing, or candidates for listing by the USFWS and CDFW; those considered sensitive by the CDFW; bald eagle (*Haliaeetus leucocephalus*) and golden eagle (*Aquila chrysaetos*), under the BGEPA; or birds listed on the USFWS Birds of Conservation Concern list. All sensitive wildlife species with potential to occur are addressed in Table 3. For the purposes of this study, only those species that are either known to occur (present) or with high potential to occur within the study area are discussed in further detail in this report.

Table 3. Sensitive Wildlife Species Known or Potentially Occurring in the Study Area

Scientific Name	Common Name	Status[1] (Federal/ State)	Habitat	Potential for Occurrence
Invertebrates				
Branchinecta sandiegonensis	San Diego fairy shrimp	FE/None	Vernal pools and other shallow non-vegetated ephemeral basins	*Very Low* – No vernal pool habitat is present in the study area.
Streptocephalus woottoni	Riverside fairy shrimp	FE/None	Vernal pools and other shallow non-vegetated ephemeral basins	*Very Low* – No vernal pool habitat is present in the study area.
Euphydryas editha quino	Quino checkerspot butterfly	FE/None	Coastal sage scrub, grasslands, and vernal pools	*Low* – The study area is located within the USFWS designated survey area for the species and there are historical records known from the vicinity. However, the species habitat assessment conducted in 2004 revealed that the potential for species occurrence is low within the study area due to the lack of larval host plants, disturbance, and habitat fragmentation (Authority 2005)
Amphibians				
Anaxyrus californicus	arroyo toad	FE/CSC	Exposed sandy and gravelly river bottoms, floodplain terraces, coastal sage scrub, chaparral with loose sandy soils for burrowing	*Very Low* – This species has not been recorded in the study area. Previously recorded in the eastern part of Sweetwater Reservoir in 1997; however, due to lack of suitable habitat, this species is not expected within the study area (Authority 2005).

Table 3. Sensitive Wildlife Species Known or Potentially Occurring in the Study Area

Scientific Name	Common Name	Status[1] (Federal/ State)	Habitat	Potential for Occurrence
Spea hammondii	western spadefoot	FPT/CSC	Open areas with sandy or gravelly soil, washes, floodplains, temporary ponds (depressions), and vernal pools	*Low* – This species has not been detected within the study area. Known to occur to the east (both on and beyond Authority property). Potential for occurrence within the study area is considered low due to mostly unsuitable habitat (Authority 2005).
Reptiles				
Anniella pulchra pulchra	silvery legless lizard	None/CSC	Coastal sand dunes, sandy washes, and alluvial fans	*Low* – Known from region and suitable open habitat with friable, well-drained soil present. Detected in the eastern part of the Sweetwater Reservoir property. Could potentially occur within suitable habitat in the study area (Authority 2005). Has not been detected in the study area.
Aspidoscelis hyperythra	orange-throated whiptail	None/ CDFW WL	Coastal sage scrub, chaparral, and grasslands	*Present* – Recorded in the study area during 2004 surveys (Authority 2005) and documented in the study area in 2016 and 2020 by Authority biologist Peter Famolaro.
Aspidoscelis tigris stejnegeri	coastal whiptail	None/CSC	Sparsely vegetated chaparral, woodland, and riparian areas	*Low to Moderate* – Although potential habitat may occur within the study area, this species has never been detected in the study area.
Crotalus ruber	red-diamond rattlesnake	None/CSC	Coastal sage scrub, chaparral, and grasslands	*Moderate* – This species has not been detected within the study area; however, it is known to several locations around the Sweetwater Reservoir. This species could potentially occur within suitable habitat in the study area (Authority 2005).
Emys marmorata	western pond turtle	FPT/CSC	Aquatic and riparian habitats, ponds, pools, lakes, or reservoirs with open areas for basking	*Low* – Known to occur in eastern portions of the Sweetwater Reservoir (P. Famolaro pers. comm. 2017) Could potentially nest in upland habitat adjacent to the lakeshore in coastal sage scrub or grasslands. Can nest at distances of 500 feet or more from water, although typically closer. Species presence within study area is unknown but could occur given the proximity and connectivity of existing records (Authority 2005).

Table 3. Sensitive Wildlife Species Known or Potentially Occurring in the Study Area

Scientific Name	Common Name	Status[1] (Federal/ State)	Habitat	Potential for Occurrence
Phrynosoma blainvillii	coast horned lizard	None/CSC	Loose sandy soils with open areas for backing, coastal sage scrub, chaparral, grasslands, oak woodland, riparian woodland, and coniferous forest	*Moderate* – Not detected within the study area; however, coast horned lizards have been recorded in the eastern part of the Sweetwater Reservoir property. This species could potentially occur within suitable habitat in the study area (Authority 2005).
Plestiodon skiltonianus interparietalis	Coronado skink	None/ CDFW WL	Coastal sage scrub, chaparral, oak woodland, and grassland	*Present* – Has been detected within the study area (Authority 2005). Habitat for this species exists within the study area.
Thannophis hammondii	two-striped gartersnake	None/CSC	Perennial or seasonal streams with rocky or sandy bottom, stock ponds, and other artificial water bodies	*Low* – This species has not been detected in the study area. This species has been recorded within the Sweetwater River, immediately east of Sweetwater Reservoir property; however, potential for occurrence in study area is considered low due to lack of suitable habitat.
Birds				
Accipiter cooperii	Cooper's hawk	None/ CDFW WL	Coastal sage scrub, chaparral, oak woodland, grassland, urban sites for foraging; wooded sites for nesting	*Present* – Detected during 2004 surveys. Species has been known to nest in eucalyptus trees within the study area (Authority 2005).
Accipiter striatus	sharp-shinned hawk	None/ CDFW WL	Coastal sage scrub, grassland, chaparral, woodland (natural and urbanized)	*High for foraging onsite, Low for nesting* – Sharp-shinned hawk has not been recorded in the study area; however, this species has been observed irregularly between late fall and early spring on the Sweetwater Authority property, utilizing both scrub and wooded habitats. Suitable habitat occurs within the study area and species foraging is expected (Authority 2005); however, the potential for this species to nest within the study area is considered low due to a lack of nesting habitat and this species is not known to breed in the region.
Agelaius tricolor	tricolored blackbird	None/ ST, CSC	Herbaceous wetlands, agricultural areas, grassland. Nesting in freshwater marsh	*Low* – Tricolored blackbird has not been recorded in the study area. This species is found infrequently at the Sweetwater Reservoir. Although the likelihood is low, this species could occur in the study area as suitable marsh-riparian scrub habitat occurs adjacent to the site below the dam.

Table 3. Sensitive Wildlife Species Known or Potentially Occurring in the Study Area

Scientific Name	Common Name	Status[1] (Federal/ State)	Habitat	Potential for Occurrence
Aimophila ruficeps canescens	rufous-crowned sparrow	None/ CDFW WL	Coastal sage scrub, grassland-coastal sage scrub intergrades, associated with steep rocky sites	*High*– Has been recorded in open coastal sage scrub and disturbed habitat southwest of the Dam and within the study area (Authority 2005).
Ammodramus savannarum	grasshopper sparrow	None/CSC	Grassland	*Low* – Known to breed in the general vicinity of the study area (Amec 2017); however, presence within study area is considered low due to lack of suitable habitat.
Artemisiospiza belli belli	Bell's sparrow	None/ CDFW WL	Coastal sage scrub and chaparral	*Low* – Although this species was recorded in the study area by Authority biologist Peter Famolaro in 2021, the species has declined along the coast, including the Sweetwater Reservoir site. Although suitable habitat exists within the study area, the potential for occurrence is considered low (Authority 2005).
Athene cunicularia	burrowing owl	None/CSC	Grasslands, agricultural fields, and coastal sand dunes. Nests in burrows, excavated by ground squirrels or other mammals	*Low* – The Sweetwater Reservoir property formerly supported burrowing owl, but the breeding colonies have been absent for greater than ten years. Observation of burrowing owl on the Sweetwater Reservoir property have been made more recently in grassland habitat on the south side of the Reservoir, but multiple birds have yet to be found. The likelihood of future occurrence within the study area is considered very low given the general unsuitability of existing habitats (Authority 2005).
Aythya americana	redhead	None/CSC	Lacustrine waters, foothills and coastal lowlands, and along the coast and Colorado River; nests in fresh emergent wetland bordering open water.	*High for wintering*, *Low for nesting* – Reported as common visitor to the Reservoir by Authority biologist Peter Famolaro.
Buteo regalis	ferruginous hawk	None/ CDFW WL	Grassland, open country	*Moderate for winter foraging* – Winter visitor may forage over many of the habitats within the study area.

Table 3. Sensitive Wildlife Species Known or Potentially Occurring in the Study Area

Scientific Name	Common Name	Status[1] (Federal/ State)	Habitat	Potential for Occurrence
Buteo swainsoni	Swainson's hawk	None/ST	Grassland, agricultural areas, and mixed woodlands. Nest in riparian woodlands	*Moderate for winter foraging* – Rare winter visitor may forage over many of the habitats within the study area. Historically reported in the Sweetwater Dam area; however, the potential for this species to nest in the study area is considered low as it is not known to breed in the region.
Campylorhynchus brunneicapillus sandiegensis	coastal cactus wren	BCC/CSC	Coastal sage and maritime succulent scrub, closely associated with dense patches of coast cholla (*Opuntia prolifera*), or prickly pear cactus (*Opuntia littoralis*) for nesting	*Moderate to High* – Historically reported from Sweetwater Dam vicinity (Amec 2017), recorded in the study area by Authority biologist Peter Famolaro in 2010. However, known nesting sites are outside of the study area.
Chaetura vauxi	Vaux's swift	None/CSC	Coniferous or mixed coniferous forest for nesting, and occasionally buildings and chimneys, aquatic habitat for foraging	*Low for wintering , no nesting* – Reported as uncommon visitor to the Reservoir by Authority biologist Peter Famolaro.
Circus hudsonius	northern harrier	BCC/CSC	Coastal sage scrub, grassland, mudflats, coastal marshes, open fields for foraging; nests in open grassland	*Present for foraging onsite, Very Low for nesting* – Observed during 2004 surveys foraging over coastal sage scrub habitat in study area. The species occurs regularly at Sweetwater Reservoir, utilizing most low growing vegetation types (Authority 2005). Study area is used for foraging; however, nesting is uncommon in the region (Amec 2017).
Elanus leucurus	white-tailed kite	None/CFP	Coastal sage scrub, grassland, weedy sites, and marshes for foraging. Riparian, sycamore, and oak woodland areas for nesting	*Present for foraging onsite, Very Low for nesting* – Detected during 2004 surveys within the study area. This species is a known breeder to Sweetwater Reservoir in riparian woodland and other densely wooded areas (Authority 2005). Eucalyptus woodland, just south of the Dam, has been commonly used for roosting (Authority 2005). Due to a lack of nesting habitat, the potential for this species to nest in the study area is considered very low.

Table 3. Sensitive Wildlife Species Known or Potentially Occurring in the Study Area

Scientific Name	Common Name	Status[1] (Federal/ State)	Habitat	Potential for Occurrence
Empidonax traillii/ E. t. extimus *subspecies *extimus* only	willow flycatcher/ southwestern willow flycatcher	FE/SE	Riparian woodlands and thickets, closely associated with aquatic or saturated soils	*Low* – Willow flycatchers have been recorded during spring migration (subspecies unknown) in riparian woodland and coastal sage scrub in the middle and eastern portions of the Sweetwater Authority property. They have also been identified as infrequent or sporadic breeding residents (subspecies *extimus*) in dense riparian woodland of the same area. Despite these records, the likelihood of occurrence within the study area is considered extremely low given the lack of riparian habitat in the study area, lack of established breeding colony in the nearby vicinity, and low remaining willow flycatcher population in California, especially for subspecies *extimus* (Authority 2005).
Eremophila alpestris actia	California horned lark	None/ CDFW WL	Sandy shores, grassland, agriculture, and open scrublands	*Moderate* – Not recorded within the study area. California horned lark occurs at other locations around the Sweetwater Reservoir, including observations of nesting. This species could potentially occur within the study area, although habitat is less suitable than other areas of the Reservoir (Authority 2005).
Falco comumbarius	merlin	None/ CDFW WL	Grassland, coastal lowlands, agricultural areas, and marshes	*Low* – Has not been detected within the study area; however, this species has been recorded irregularly between mid-fall to early spring at the Sweetwater Reservoir (Authority 2005).
Gavia immer	common loon	None/CSC	Aquatic habitat, primarily saltwater (bays and lagoons), but also on inland freshwater lakes	*Low to Moderate* – Common loon has been observed in the Sweetwater Reservoir in rare or infrequent occurrence. This species could utilize aquatic habitat of the Reservoir with the study area although it has not been observed there (Authority 2005).

Table 3. Sensitive Wildlife Species Known or Potentially Occurring in the Study Area

Scientific Name	Common Name	Status[1] (Federal/ State)	Habitat	Potential for Occurrence
Haliaeetus leucocephalus	bald eagle	BGEPA/ SE, CFP	Primarily found near areas of open water. Uses open woodland and snags for roosting.	*Present for roosting/foraging, Moderate for future nesting* – Bald eagle foraging has been recorded within study area and regularly roosts in eucalyptus trees within the southern limits of the study area (P. Famolaro). Nesting has occurred to east and there is potential this could also occur in the eucalyptus trees within the study area.
Icteria virens	yellow-breasted chat	None/CSC	Riparian woodland and scrub	*Low* – Yellow breasted chat is a common breeder to the eastern limits of the Sweetwater Reservoir (Authority 2005) and known in willow habitat just below the Sweetwater Dam and downstream (P. Famolaro pers. comm. 2017). Species is not likely to occur within the study area due to a lack of riparian habitat. Not detected during 2004 (Authority 2005) or 2017 surveys. Known to the study area in willow habitat just below the Sweetwater Dam and downstream (P. Famolaro pers. comm. 2017)
Lanius ludovicianus	loggerhead shrike	None/CSC	Open coastal sage scrub and chaparral, grasslands, and agricultural sites. Nests in low tress or dense shrubs.	*Low to Moderate* – Not recorded in the study area but has been observed to the east on Sweetwater Reservoir property in expansive grassland and sparse shrub habitat. Species could occur in study area, although habitat in the Study area is less than suitable for this species (Authority 2005).
Larus californicus	California gull	None/ CDFW WL	A variety of coastal and inland habitats, including beaches, bays, freshwater lakes, mudflats, agricultural, and urbanized sites.	*Present for visitor, Low for nesting* – Often occurring within the study area (Authority 2005); however, the potential for this species to nest within the study area is considered low as this species is not known to breed in the region.

Table 3. Sensitive Wildlife Species Known or Potentially Occurring in the Study Area

Scientific Name	Common Name	Status[1] (Federal/ State)	Habitat	Potential for Occurrence
Nannopterum auritum	double-crested cormorant	None/ CDFW WL	Most open aquatic habitats (bays. Lagoons, lakes, ponds). Uses woodlands in or near water for rookeries	*Low to Moderate* – Observed during 2004 surveys. This species utilizes all areas of the Sweetwater Reservoir but can often be found on the log boom within the study area. Breeding rookeries have been established irregularly within the upper limits of the Reservoir as well as the eucalyptus woodland immediately south of the dam (Authority 2005). Due to its irregular breeding within the upper limits of the Reservoir and because it has not been recorded nesting in or near the study area, the potential for this species to nest in the study area is considered low to moderate.
Pandion haliaetus	osprey	None/ CDFW WL	Associated with aquatic, open water for foraging, woodland/snags for roosting. Nests in trees and artificial sites (constructed platforms)	*High for foraging, no nesting onsite* – Detected within the study are during 2004 surveys; however, nesting has not occurred on the Sweetwater Reservoir property (Authority 2005).
Pelecanus erythrorhynchos	American white pelican	BCC/CSC	Salt and freshwater habitats (bays, lagoons, estuaries, ponds, and lakes)	*High for wintering, no nesting onsite* – Observed within the study area during 2004 surveys. The species occurs frequently at the Sweetwater Reservoir with highest occurrence during the winter and early spring. Often found in more shallow area of the Reservoir (delta and coves) foraging in large groups (Authority 2005). However, this species is not known to nest in the region.
Polioptila californica californica	coastal California gnatcatcher	FT/CSC	Coastal sage scrub, maritime succulent scrub, and chaparral	*Present* – Focused surveys within and immediately adjacent to the study area in 2004 recorded 11 to 13 breeding pairs of coastal California gnatcatcher. All coastal sage scrub habitat within the study area is considered occupied. The Sweetwater Reservoir property supports a relatively high population of this species (Authority 2005). Additionally, this species has been documented within the study area every year from 1998 to 2022 by Authority biologist Peter Famolaro.

Table 3. Sensitive Wildlife Species Known or Potentially Occurring in the Study Area

Scientific Name	Common Name	Status[1] (Federal/ State)	Habitat	Potential for Occurrence
Sternula antillarum browni	least tern	FE/SE, CFP	Beaches, dry mud or salt flats, sandy margins of lakes, rivers, and ponds	*Low for wintering, no nesting onsite* – Reported as uncommon visitor to the Reservoir by Authority biologist Peter Famolaro.
Vireo bellii pusillus	least Bell's vireo	FE/SE	Riparian woodlands and scrub	*Present but atypical/irregular*– A pair was detected in 2005 within coastal sage scrub habitat within the study area. Occurrence in coastal sage scrub is considered atypical but may persist for a few years due to high territory fidelity by this species (Authority 2005). Historical localities have been recorded outside of study area, in willow habitat just below the Sweetwater Dam and downstream (P. Famolaro pers. comm. 2017). Additionally, this species has been documented within the study area in 2002, 2005, 2011, and 2016 by Authority biologist Peter Famolaro.
Mammals				
Antrozous pallidus	pallid bat	None/CSC	Roosting in caves, mining tunnels, rock crevices, and buildings	*High for foraging* – This species has not been recorded within the study area; however, it has been recorded in the vicinity of the Sweetwater Reservoir and could potentially occur within the study area (Authority 2005).
Choeronycteris mexicana	Mexican long-tongued bat	None/CSC	Roosting in caves, mining tunnels, and buildings	*High for foraging* – This species has not been recorded within the study area; however, it has been recorded in the vicinity of the Sweetwater Reservoir and could potentially occur within the study area (Authority 2005).
Corynorhinus townsendii	Townsend's big-eared bat	None/CSC	Roosting in caves, mining tunnels, and buildings	*High for foraging* – This species has not been recorded within the study area; however, it has been recorded in the vicinity of the Sweetwater Reservoir and could potentially occur within the study area (Authority 2005).
Eumops perotis californicus	western mastiff bat	None/CSC	Roosting in tunnels, rock crevices, trees, and buildings	*High for foraging* – This species has not been recorded within the study area; however, it has been recorded in the vicinity of the Sweetwater Reservoir and could potentially occur within the study area (Authority 2005).

Table 3. Sensitive Wildlife Species Known or Potentially Occurring in the Study Area

Scientific Name	Common Name	Status[1] (Federal/ State)	Habitat	Potential for Occurrence
Lepus californicus bennettii	San Diego black-tailed jackrabbit	None/CSC	Semi-open habitats, coastal sage scrub, chaparral, and grassland	*Moderate* – Observed in coastal sage scrub near shoreline access road during 2017 surveys (Amec 2017) and occurs at various locations around the Reservoir and could potentially occur within suitable habitat in the study area (Authority 2005).
Macrotus californicus	California leaf-nosed bat	None/CSC	Roosting in caves, mining tunnels, and buildings	*High for foraging* – This species has not been recorded within the study area; however, it has been recorded in the vicinity of the Sweetwater Reservoir and could potentially occur within the study area (Authority 2005).
Neotoma lepida intermedia	San Diego desert woodrat	None/CSC	Coastal sage scrub, maritime succulent scrub, chaparral, associated with cactus and rock outcrops	*Moderate* – This species has not been recorded within the study area; however, it was recorded in the vicinity of the Sweetwater Reservoir just west of the study area in 1994 and could potentially occur within suitable habitat in the study area (Authority 2005).
Nyctinomops femorosaccus	Pocketed free-tailed bat	None/CSC	Roosting in caves and rock crevices, and rugged canyons with high cliffs	*High for foraging* – Historical localities from the vicinity of the Sweetwater Dam. This species can roost in caves and structures (Amec 2017).
Taxidea taxus	American Badger	None/CSC	Grassland, open areas of coastal sage scrub and chaparral	*Low* – Suitable habitat throughout the grassland and scrub habitats, but species is very uncommon in San Diego County.

Notes:
[1] **Status:** Federal/State. **Federal:** FT = Federally Threatened, FE = Federally Endangered, FPT = Federally proposed for listing as Threatened, BCC = Birds of Conservation Concern, BGEPA = Bald and Golden Eagle Protection Act. **State:** SE = State Endangered, CSC = California Species of Special Concern, CFP = State Fully Protected, WL = California Department of Fish and Wildlife Watch List.

4.5.1 SPECIAL-STATUS WILDLIFE SPECIES KNOWN TO OCCUR

Ten special-status wildlife species have been detected within the study area including orange-throated whiptail (*Aspidoscelis hyperythra*), Coronado skink (*Plestiodon skiltonianus interparietalis*), Cooper's hawk (*Accipiter cooperii*), coastal cactus wren (*Campylorhynchus brunneicapillus sandiegensis*), northern harrier (*Circus hudsonius*), white-tailed kite (*Elanus leucurus*), bald eagle (*Haliaeetus leucocephalus*), California gull (*Larus californicus*), coastal California gnatcatcher (*Polioptila californica californica*), and least Bell's vireo (*Vireo bellii pusillus*). These species as well as others with potential to occur on site are discussed below.

4.5.1.1 Orange-Throated Whiptail (*Aspidoscelis hyperythra*)

The orange-throated whiptail, recognized as a CDFW Watch List species, ranges from the Santa Ana River in Orange County, California to the tip of Baja California, Mexico (Stebbins 2003). However, this subspecies is restricted to extreme southwest California and northwest Baja California Norte, Mexico (Stebbins 2003). In southwestern California, it is found on coastal slopes of the Peninsular Ranges in Los Angeles, San Bernardino, Orange, Riverside, and San Diego counties (Zeiner et al. 1988). Habitats associated with orange-throated whiptail are open associations of chaparral, coastal sage scrub, and grasslands. This subspecies is often found in washes, streams, terraces, and

other sandy areas, typically with patches of brush and rocky hillsides. They are diurnal, retreating to their burrows when ground temperatures are too warm in summer and reemerging once the ground has cooled to an ambient temperature. The primary threat to orange-throated lizard is development, resulting in highly fragmented populations (Stebbins 2003). Open scrub and grasslands with wood fragments for primary prey (termites) provide suitable habitat for the species within the study area. This species was recorded during 2004 surveys in coastal sage scrub within the study area (Authority 2005) and also has been historically reported from Sweetwater Dam area (refer to Figure 5a).

4.5.1.2 Coronado Skink (*Plestiodon skiltonianus interparietalis*)

The Coronado skink, recognized as a CDFW Watch List species, ranges from inland Southern California, through the north Pacific coast region or norther Baja California, Mexico (Nafis 2024). In southwestern California, it is found on the coastal plain and peninsular ranges west of the deserts from Riverside County south to the Mexican border. Habitats associated with Coronado skink are chaparral, coastal sage scrub, oak woodlands, pinyon-juniper, and riparian woodlands to pine forests, but it is often restricted to the more mesic areas within these associations (Jennings and Hayes 1994). They are diurnal and are typically active from early spring through early fall and in early mornings and late afternoons during summer months. The primary threat to orange-throated lizard is habitat loss (Nafis 2024). Open Coastal sage scrub areas provide suitable habitat for the species within the study area. This species has been observed within the study area (Authority 2005).

4.5.1.3 Cooper's Hawk (*Accipiter cooperii*)

The Cooper's hawk, recognized as a CDFW Watch List species, is distributed throughout North America and northern South America (Johnsgard 1990). Cooper's hawk breeds from southern Canada, south into Baja California, Mexico (Johnsgard 1990). Cooper's hawk is a common winter visitor and common local summer resident in the coastal lowland and foothill canyons of San Diego County and in urban areas of the city of San Diego (Unitt 2004). Cooper's hawks breed from February to August, and nest up high in trees with oaks and eucalyptus as their preferred trees in California. They forage primarily on medium-sized birds but are also known to eat small mammals such as ground squirrels. Although Cooper's hawk has declined in California in recent decades due to urbanization and loss of habitat, it has adapted to the urban environment and its numbers have increased (Unitt 2004). Cooper's hawk was detected during 2004 survey and has been known to nest in eucalyptus woodland within the study area (Authority 2005).

4.5.1.4 Coastal Cactus Wren (*Campylorhynchus brunneicapillus sandiegensis*)

The coastal Southern California population of cactus wren is recognized as a California Species of Special Concern by CDFW throughout its range, which is restricted, as far as is known, to coastal lowlands from the San Juan Creek drainage basin in Orange County south to the Colorado River drainage basin in extreme northwestern Baja California (Rea and Weaver 1990). This subspecies is found only in coastal sage scrub with extensive stands of tall prickly pear or cholla cacti. Once widespread in San Diego County, by 1990 it had been reduced to fewer than 400 pairs in about 55 colonies. Most of these are threatened by proposed developments, and most are doubtfully viable, as they consist of only one to four pairs. The long-term viability of almost all others is questionable because of habitat fragmentation and degradation. Some of the larger colonies occur near Lake Jennings and around the San Diego Wild Animal Park (Amec 2017). Coastal cactus wren has been historically reported from Sweetwater Dam vicinity (Amec 2017), were detected approximately one-third of a mile southeast of the study area during 2017 surveys (Amec 2017) and were recorded in the study area by Authority biologist Peter Famolaro in 2010. Potential habitat in the form of cactus thickets occur in the study area within portions of the coastal sage scrub.

4.5.1.5 Northern Harrier (*Circus hudsonius*)

The northern harrier, recognized as a California Species of Special Concern by CDFW, is distributed throughout North America and Eurasia (Johnsgard 1990). Northern harrier breeds from northern Alaska and Canada, south into roughly the northern two-thirds of the western U.S., and the northern one-third of the eastern U.S. San Diego County lies at the southwest edge of the harrier's breeding range in North America (Johnsgard 1990). Northern harrier is an uncommon to fairly common winter visitor and rare and local summer resident in the coastal lowlands of San Diego County (Unitt 2004). It is disappearing as a breeding resident from the county (Unitt 2004). Harriers

breed in marshes and grasslands, and forage in grasslands, agricultural fields, wetlands, and open coastal sage scrub. Harriers have declined in California in recent decades but can be locally abundant where suitable habitat remains free of disturbance, especially from intensive agriculture (Zeiner et al. 1990). The breeding population, especially in coastal Southern California, is reduced because of destruction of native wetland, meadow, and grassland habitats, and burning and plowing of nesting areas during early stages of the breeding cycle. An adult female northern harrier was observed foraging approximately one mile southeast of the study area during 2017 surveys (AMEC 2017). Northern harrier was observed foraging over coastal sage scrub habitat during 2004 surveys and occurs regularly at Sweetwater Reservoir, utilizing most low growing vegetation types (Authority 2005). Non-native grassland habitats within the study area provide foraging opportunities; however, the potential for nesting in the study area is considered to be very low as nesting in the region is uncommon (AMEC 2017).

4.5.1.6 White-Tailed Kite (*Elanus leucurus*)

White-tailed kite is a State Fully Protected Species that is distributed throughout North America, Central America, and South America (Johnsgard 1990). This species is a permanent resident in much of California including coastal areas, west of the Sierra Nevada foothills, the central valley, and arid regions of southern California (Western Riverside County 2020). White-tailed kite is widespread over the coastal slope of San Diego County from Camp Pendleton to Otay lakes (Unitt 2004). This species is commonly associated with agricultural areas (Grinnell and Miller 1944), but also inhabits grasslands, savannas, open sage scrub, meadows, wetlands, and oak woodlands. White-tailed Kites build their nest in the crowns of trees, especially in coast live oak, or on clumps of mistletoe (Unit 2004). They occasionally use large shrubs such as scrub oak or toyon (Unitt 2004). Their nests are typically located near open foraging areas (CDFW 2021). White-tailed Kite forages on small mammals, birds, lizards, and insects (Dunk 1995). In recent years, this species has become increasingly less common in southern California. White-tailed kite was detected within the study area during 2004 surveys and eucalyptus woodland, just south of the Dam, has been commonly used for roosting (Authority 2005). This species is a known breeder to Sweetwater Reservoir in riparian woodland and other densely wooded areas (Authority 2005). However, due to a lack of nesting habitat, the potential for this species to nest in the study area is considered very low (P. Famolaro 2024).

4.5.1.7 Bald Eagle (*Haliaeetus leucocephalus*)

Bald eagle is protected under the federal BGEPA, is listed as endangered by the state, and is a State Fully Protected Species. Bald eagle historically bred in Southern California; however, occurrence is typically now wintering observations in the vicinity of freshwater lakes where fish and waterfowl can be taken as prey. Former population declines have been attributed to the use of DDT. As a result of the U.S. ban on DDT, bald eagle populations have rebounded. Threats to the bald eagle still exist including starvation, particularly for young inexperienced eagles, illegal hunting, electrocution from overhead power lines, and collisions with vehicles. At the Sweetwater Reservoir, bald eagles have been a rare winter visitor or resident (Authority 2005). This species has been recorded within the study area and regularly roosts in eucalyptus trees within the southern limits of the study area. Nesting has occurred to the east and there is a potential this could also occur in the eucalyptus trees within the study area (P. Famolaro 2024).

4.5.1.8 California Gull (*Larus californicus*)

California gull, recognized as a CDFW Watch List species, is distributed throughout North America. This species is found in regions on Mexico, the west coast of the United States, the Great Plains, and western Canada. California gull is a migrant and winter visitor to a variety of coastal and inland habitats, including beaches, bays, freshwater lakes, mudflats, agricultural areas, and urbanized sites (Authority 2005). Adults roost in large concentrations along shorelines, landfills, pastures, and islands (CDFW 2021). In winter, they frequent landfills, fields, and pastures where they feed on garbage, carrion, earthworks, adult insects, and larvae (CDFW 2021). On breeding grounds, young are fed larval insects, brine shrimp, young birds, garbage, earthworms, and insects (CDFW2021). California gulls nest on sparsely vegetated areas of isolated islands in alkali or freshwater lakes and salt ponds in California. Nests are a scrape lined with grasses, feathers, or rubble (CDFW 2021). California gull occurs often in the study area (Authority 2005); however, the potential for this species to nest within the study area is considered low as this species is not known to breed in the region (Authority 2005).

4.5.1.9 Coastal California Gnatcatcher (*Polioptila californica californica*)

The coastal California gnatcatcher, federally threatened and a California Species of Special Concern, is a small resident insectivorous bird species whose occurrence is strongly associated with the sage scrub habitats found throughout southern California and extending into northern Baja California, Mexico. Although gnatcatchers have a close association with sage scrub, this species has also been documented using coastal sage-chaparral scrub, chamise chaparral and other scrub habitat types (Campbell et al. 1998, Bontrager 1991). Habitat destruction, fragmentation, and modification have led to this species' decline (USFWS 1993). Loss of habitat to agriculture and urban development were leading challenges to conserving the species until the interval between 2003 and 2007 when widespread fires consumed one-third of the habitat in the U.S range of the species that USFWS believed to be suitable for the coastal California gnatcatcher (USFWS 2010). The gnatcatcher breeding season extends from mid-February through mid-August, although earlier starts and later seasons have been observed (USFWS 1993). During the breeding season, territories range from 2 to 14 acres (USFWS 2010) and during the non-breeding season can be as big as 35 acres (Preston et al. 1998). Federally designated critical habitat for this species encompasses the study area (see Figure 5c). Coastal California gnatcatcher is historically known from the study area, and the species was detected in coastal sage scrub habitat throughout the study area during 2004 (Authority 2005) and 2017 (Amec 2017) surveys. Additionally, this species has been documented within the study area every year from 1998 to 2022 by Authority biologist Peter Famolaro. All coastal sage scrub on the site is considered occupied by the species.

4.5.1.10 Least Bell's Vireo (*Vireo bellii pusillus*)

Least Bell's vireo is a federal and state endangered bird species that occurs in riparian scrub habitat in the region. The least Bell's vireo is listed as endangered under the ESA and endangered under the CESA. The least Bell's vireo is a small, migratory songbird that breeds in southern California and northwestern Baja California, Mexico from April through July. It nests and forages almost exclusively in lowland riparian woodland. This species is typically associated with willow, cottonwood, mulefat, or other riparian plant species, and often in areas with high structural diversity, including overstory trees and understory saplings and shrubs. A pair of least Bell's vireos was detected in 2005 in coastal sage scrub habitat within the study area. Occurrence in coastal sage scrub is considered atypical but may persist for a few years due to high territory fidelity by this species (Authority 2005). Historical localities have been recorded outside of study area, in willow habitat just below the Sweetwater Dam and downstream (P. Famolaro pers. comm. 2017). Additionally, this species has been documented within the study area in 2002, 2005, 2011, and 2016 by Authority biologist Peter Famolaro.

4.5.2 SPECIAL-STATUS WILDLIFE SPECIES WITH POTENTIAL TO OCCUR

One sensitive wildlife species was determined to have high potential to occur in the study area based on habitats on site and occurrence in the vicinity: rufous-crowned sparrow (*Aimophila ruficeps canescens*). The six bat species in Table 3 have a low potential to roost in the study area but have a high potential for foraging in a variety of open areas within the study area. Additionally, foraging and nesting birds in general have a high potential for occurring within the study area.

4.5.2.1 Sharp-Shinned Hawk (*Accipiter striatus*)

The sharp-shinned hawk is recognized as a CDFW Watch List species. Its range is throughout North America and Central America and includes areas of South America. The sharp-shinned hawk breeds from Alaska southward throughout much of Canada, the northern portions of the lower 48 states, the Rocky Mountains and mountains of the far west, parts of the Gulf States, and the highlands of Mexico. The range of the sharp-shinned hawk for nesting is from northwestern Alaska, Yukon, northern Saskachewan, central Manitoba, northern Ontario, central Quebec, Newfoundland, south to California, Mexico, Texas, Louisiana, Tennessee, South Carolina, and Alabama (County of Riverside 2008). Sharp-shinned hawk is a fairly common migrant and winter resident throughout California, except in areas of deep snow (CDFW 2021). It is widespread but uncommon winter visitor to San Diego County that is found in a wide variety of habitats but more frequently in areas with trees or tall shrubs (Unitt 2004). Sharp-shinned hawk feeds predominantly on small birds but also on small mammals, insects, reptiles, and amphibians. This species often forages in openings at edges of woodlands, hedgerows, brushy pastures, and shorelines, especially where migrating birds are found (CDFW 2021). They roost in intermediate to high canopy forest and usually nests in dense, small

tree stands of conifers with little ground cover and near water (CDFW 2021). This species has not been recorded in the study area; however, it has been observed irregularly between late fall and early spring on the Sweetwater Authority property, utilizing both scrub and wooded habitats. Suitable habitat occurs within the study area and species foraging is expected (Authority 2005); however, the potential for this species to nest within the study area is considered low due to a lack of nesting habitat and this species is not known to breed in the region.

4.5.2.2 Rufous-Crowned Sparrow (*Aimaphila ruficeps canescens*)

The rufous-crowned sparrow is recognized as a CDFW Watch List species. Its range is discontinuous and includes many small and isolated populations throughout the western U.S. and Mexico. Rufous-crowned sparrow is a resident of southwest California on the slopes of the coastal ranges from Los Angeles County south to Baja California Norte. In San Diego County, this species is known to occur along the coast within Camp Pendleton, Torrey Pines State Reserve, and Point Loma with denser populations in lower elevation areas in eastern Camp Pendleton, Fallbrook Naval Weapons Station, Mission Trails Regional Park, Miramar east to San Vicente Reservoir and Lake Jennings, and from Sweetwater Reservoir east to Rancho Jamul (Unitt 2004). Rufous-crowned sparrow is widespread over the coastal lowland and foothills of San Diego County in sage scrub, broken or burned chaparral, and grassland with scattered shrubs (Unitt 2004). Rufous-crowned sparrow's population and range have reduced over much of San Diego County due to habitat fragmentation (Unitt 2004). It prefers open shrubby habitat on rocky, xeric slopes and fairly steep south-facing slopes with about 50 percent cover of low shrubs (Unitt 2004). Thrives in areas that have recently been burned, and will stay in such open, disturbed habitats for years until the chaparral matures. Rufus-crowned sparrows breed from March through June with a peak in May. They nest primarily on ground and rarely in low shrubs. Rufous-crowned sparrow forages on or near the ground, primarily feeding on small grass and forb seeds, fresh grass stems, and tender plant shoots during the fall and winter and occasionally eating insects such as ants, grasshoppers, ground beetles and scale insects (CDFW 2021). This species has been recorded in open coastal sage scrub and disturbed habitat southwest of the Sweetwater Dam and within the study area (Authority 2005).

4.5.2.3 Redhead (*Aythya americana*)

The redhead, a California Species of Special Concern, is a medium-sized diving duck. This species is easily distinguished from most other ducks by the male's copper colored head and pale blue bill during the breeding season. Its range is throughout North America. During breeding season, they are found in northern part of the United States, into Canada. Redheads migrate south to winter in warmer climates of the United States, Mexico, Guatemala, Cuba, and the Bahamas. In San Diego County, Redheads winter in Mission Bay and they occasionally appear on lakes and lagoons elsewhere. It is mainly a winter visitor but also breeds in small numbers along the County's north coast; San Diego County represents the southern tip of the species' breeding range along the Pacific coast of North America (Unitt 2004). This species nests in fresh emergent wetland bordering open water. Their nests are built with marsh plants in tall, emergent vegetation with open water nearby and usually over shallow water but occasionally on dry ground. Redheads primarily eat leaves, stems, seeds, and tubers of aquatic plants and smaller amounts of aquatic insects during fall and winter. On breeding grounds, they eat more insects and snails than plants (CDFW 2021). They rest on open water, often far from shore, but stay in shallow water near protected shorelines during periods of high winds (CDFW 2021). This species has been reported as a common visitor to the Sweetwater Reservoir (P. Famolaro 2024); however, the potential for this species to nest within the study area is considered low since it is not known to breed in the region.

4.5.2.4 Double-Crested Cormorant (*Nannopterum auritum*)

The double-crested cormorant, a California Species of Special Concern, is common and widespread species that is distributed throughout North America. They breed from Alaska eastward to Newfoundland southward, in isolated colonies, to California, Florida, Mexico and Belize (County of Riverside 2008). It is located along the entire Pacific coast from the Aleutians to southern Baja and along the Atlantic coast from Newfoundland south to Florida. The species winters from Alaska eastward to New England southward to California, Florida, Mexico, and Belize but is absent from the northernmost portion of the breeding range (County of Riverside 2008). In California, this species is a yearlong resident along the entire coast and on inland lakes, in fresh, salt, and estuarine waters (CDFW 2021).

The double-crested cormorant occurs commonly as a nonbreeding visitor at both freshwater and saltwater locations in San Diego County and is a localized breeding resident to most open aquatic habitats, including bays, lagoons, lakes, and ponds (Authority 2005). They build nests of stick and debris, usually in a tree surrounded by water or on the ground in a site isolated from predators (Unitt 2004). Double-crested cormorants feed mainly on fish but also on crustaceans and amphibians (CDFW 2021). They dive from the water surface to pursue prey underwater. They rest in daytime and roost overnight beside water on offshore rocks, islands, steep cliffs, dead tree branches, wharfs, jetties, or transmission lines (CDFW 2021). This species was observed during 2004 surveys and is known to utilize all areas of the Sweetwater Reservoir (Authority 2005). Breeding rookeries have been established irregularly within the upper limits of the Reservoir as well as the eucalyptus woodland immediately south of the dam (Authority 2005). Due to its irregular breeding within the upper limits of the Reservoir and because it has not been recorded nesting in or near the study area, the potential for this species to nest in the study area is considered low to moderate.

4.5.2.5 Osprey (*Pandion haliaetus*)

The osprey is recognized as a CDFW Watch List species. Osprey is a diurnal fish-eating large raptor that is found on every continent except Antarctica. In North America, it is found from northwestern Alaska to Baja California, Mexico and Florida (County of Riverside 2008). In North America, osprey breeds from Alaska and Newfoundland south to the Gulf Coast and Florida, wintering to the south, from southern United States through Argentina. In California, the osprey breeds in northern California rom Cascad Ranges south to Lake Tahoe and along the coast south to Marin County (CDFW 2021). In San Diego County, the osprey has become a year-round resident in small numbers both along the coast and on inland lakes (Unitt 2004). Osprey nests on a platform of sticks at the top of large snags, dead-topped trees, on cliffs, or on human made structures (CDFW 2021). This species preys mostly on fish but also eats small mammals, birds, reptiles, amphibians, and invertebrates. They require open, clear waters for foraging (CDFW2021) and woodlands or snags for roosting. This species was detected in the study area during 2004 surveys (Authority 2005); however, nesting has not occurred on the Sweetwater Authority property (Authority 2005).

4.5.2.6 American White Pelican (*Pelecanus erythrorhychos*)

The American white pelican is listed on the USFWS Birds of Conservation Concern List and is recognized as a California Species of Special Concern. Its range is throughout much of North America. They nest in large colonies on islands in remote brackish and freshwater lakes of inland North America and winter on the Pacific and Gulf of Mexico coasts from central California and Florida south into Mexico and Costa Rica. In California, this species now nests only at large lakes in Klamath Basin, Clear Lake National Wildlife Refuge in particular (CDFW 2021). The number of white pelicans wintering in San Diego County varies greatly. Although the white pelican has no consistent site in San Diego County, some typical places it can be found along the coast include the Buena Vista Lagoon, the southernmost basin of San Diego Bay (Unitt 2004). The most common lakes with white pelican include Lake O'neill, Henshaw, Wohlford, and Hodges (Unitt 2004). They nest at large freshwater and saltwater lakes, usually on small islands or remote dikes. Their nesting site must be flat or gently sloping, lacking shrubs or other obstructions that would impede taking flight, free from human disturbance, and usually with loose dirt suitable for nest mounds (CDFW 2021). They roost at night along the edge of water, on beaches, sandbars or driftwood, but not in trees (CDFW 2021). The white pelican feeds in water of various depths where it dives for prey from the surface, scooping them up in their pouch. They prey almost entirely on fish but occasionally on amphibians and crustaceans (CDFW 2021). This species was observed in the study area during 2004 surveys (Authority 2005) and is known to occur frequently at the Sweetwater Reservoir with highest occurrence during the winter and early spring (Authority 2005). However, nesting has not occurred on the Sweetwater Authority property (P. Famolaro 2024) and this species is not known to nest in the region.

4.5.2.7 Bats

As identified in Table 3, six species of bats that are considered California Species of Special Concern have a high potential for foraging within the study area: pallid bat (*Antrozous pallidus*), Mexican long-tongued bad (*Choeronycteris mexicana*), Townsend's big-eared bat (*Corynorhinus townsendii*), western mastiff bat (*Emops perotis californicus*),

Calironia leaf-nosed bat (*Macrotus californicus*), and pocketed free-tailed bat (*Nuctinomops femorosaccus*). Suitable foraging habitat for these bats is present throughout the study area including grassland, open areas of coastal sage scrub, and water sources. Due to a general lack of vertical structures suitable for roosting, roosting bats are not expected to occur in the study area (P. Famolaro 2024).

4.5.3 OTHER NESTING AND FORAGING BIRDS

The various habitats found within the study area provide suitable nesting and foraging habitat for a variety of avian species. Nesting and foraging birds are protected by the MBTA and similar provisions of the California Fish and Game Code. Large trees provide nesting opportunities for raptors such as red-tailed hawk (*Buteo jamaicensis*) and America kestrel (*Falco sparverius*) which have been observed in the vicinity of the study area during the 2017 site reconnaissance (Amec 2017). A double crested cormorant (*Phalacrocorax auritus*) was observed during a survey nesting within eucalyptus woodland in the vicinity of the study area (Amec 2017). The coastal sage scrub habitat is likely to be utilized by passerine and non-passerine landbird species such as California towhee (*Pipilo crissalis*) and mourning doves (*Zenaida macroura*). Facility structures (e.g., the dam and buildings) within the study area also provide nesting habitat for species such as black phoebe (*Sayornis nigricans*), house finch (*Carpodacus mexicanus*), and swallows. Numerous swallows have been observed flying around the dam and spillway area during the 2017 site reconnaissance (Amec 2017). There is potential for raptors and other early nesting species such as hummingbirds to initiate nests as early as January; however, in general, the peak avian nesting season is February through August.

Habitats found within the study area provide suitable foraging habitat for a number of terrestrial and aquatic avian species. Coastal sage scrub, coastal sage scrub (disturbed), and riparian woodland habitat provide foraging opportunities for many terrestrial species that have been detected on the Sweetwater Reservoir property, including red-tailed hawk (*Buteo jamaicensis*), California quail (*Callipepla californica*), Anna's hummingbird (*Calypte anna*), and Say's phoebe (*Sayornis saya*). Additionally, the Reservoir provides foraging opportunities for many aquatic species including American coot (*Fulica americana*), belted kingfisher (*Megaceryle alcyon*), caspian tern (*Hydroprogne caspia*), great blue heron (*Ardea herodias*), great egret (*Ardea alba*) snowy egret (*Egretta thula*), and western gull (*Larus occidentalis*). Comprehensive lists of both aquatic and terrestrial avifauna that regularly or seasonally use the Sweetwater Reservoir and/or its variety of surrounding habitats are provided as Appendices B and C.

4.6 FEDERALLY DESIGNATED CRITICAL HABITAT

Federally designated critical habitat for Otay tarplant and coastal California gnatcatcher exists within the terrestrial portions of the study area (see Figure 5c).

4.7 AQUATIC AND TERRESTRIAL AVIFAUNA

Since the mid 1990's, Sweetwater Authority biologist Peter Famolaro has collected and compiled data of both aquatic and terrestrial avifauna that regularly or seasonally use the Sweetwater Reservoir and/or its variety of surrounding habitats. Avian data collected at Sweetwater Reservoir during the annual Christmas Bird Count reveals a total of 156 species of birds that have been detected between 1996 and 2023 (Appendix B). Of the 156 species, 65 (approximately 42 percent) of those are aquatic birds and 91 (approximately 58 percent) are terrestrial birds.

In addition to the Christmas Bird Count data, a list of wildlife species known to occur within the study area was compiled by Authority biologist Peter Famolaro (see Appendix C). This list includes 71 species of birds including 56 water birds (approximately 79 percent) and 15 (approximately 21 percent) terrestrial birds.

4.8 MIGRATORY BIRD TREATY ACT OF 1918

The MBTA is a cornerstone of bird protection in the U.S. to ensure the conservation of migrating birds and the sustainability of these bird species. Passed in 1918, the MBTA implements treaties between the U.S. and other countries to protect migratory birds due to the dramatic decline of bird populations. It applies to nearly 1,100 bird species in the United States. The MBTA prohibits the take, including killing, capturing, selling, trading, and transport, of protected migratory bird species, including feathers or other parts of birds, nests, eggs, or products

without prior authorization by the USFWS. The purpose of the MBTA also prohibits interfering with the life cycle of migrating birds, essentially protecting their habitat as well.

The MBTA and the Sweetwater Reservoir are intrinsically linked because the Reservoir provides habitats for migrating birds that are protected by the Act. The Sweetwater Reservoir serves as a stopover habitat for various migrating birds, while the MBTA provides a legal framework for protecting migrating birds that rely on Sweetwater Reservoir during their migration.

4.9 PACIFIC FLYWAY AND WILDLIFE CORRIDORS

4.9.1 PACIFIC FLYWAY

The Pacific Flyway is one of the four major north to south migrating routes for birds in North America. Every year, millions of migrating birds travel some or all the distance, both in the spring and fall, following food sources, heading to breeding grounds, or traveling to overwinter sites.

Sweetwater Reservoir's importance to migratory birds stems from its role as a stopover habitat. The Reservoir ecosystem provides a rest and refueling location where migrating birds can rest, replenish their energy reserves, and find food before continuing their journey. The Reservoir ecosystem, including the surrounding wetlands, can provide a rich source of food, such as insects, fish, and aquatic plants, depending on the bird species. The Reservoir ecosystem also provides a safe stopover location for migrating birds. Open water areas provide escape from predators on land, while vegetation offers shelter and nesting opportunities for some species.

4.9.2 WILDLIFE CORRIDORS

Wildlife corridors include both local movement routes and regional corridors and linkages. Local movement routes often connect resources on a localized level, often on a daily or nightly basis, such as water sources, foraging areas, and den/cover sites. Regional movement corridors or linkages connect larger patches of open space and are important to wildlife for seasonal movements, and for the long-term genetic flow between subpopulations. For large mammals, regional corridors are often required to provide a network of large-scale foraging or hunting areas. Corridors can be continuous habitat features, or "stepping stones" such as rest areas along a bird migration route. Corridors often follow linear topographical, water, or vegetation features.

The study area includes developed and natural lands adjacent to the Sweetwater Reservoir as well as a portion of the Reservoir itself, adjacent to an area that forms an east-west connection between the coast and open space areas of southeastern San Diego County. The study area is situated just north of a segment of this corridor that is likely on the south side of Sweetwater Dam, as well as an area that connects open space areas to the north and south on a local level. The Reservoir is also likely a local water access route for species in the surrounding habitats.

4.10 JURISDICTIONAL WATERS

4.10.1 HYDROLOGY

The study area lies in the Sweetwater River Watershed which encompasses 230-square miles and includes the Sweetwater Reservoir and the Loveland Reservoir. Seasonally, in the winter and spring months, the Sweetwater River flows into the Sweetwater Reservoir from natural runoff and periodically from water transfers from Loveland Reservoir. Incoming water is held by Sweetwater Reservoir Dam. The capacity of the Sweetwater Reservoir extends to 239' AMSL with the elevation of the dam spillway at the western edge of the Reservoir. Annual rainfall in the area (measured from 1990 to 2019) averages 11.15 inches as registered at the El Cajon Station (U.S. Department of Agriculture [USDA] 2020 from Authority 2020). From the Sweetwater Reservoir Dam, water flows approximately 8.3 miles west through the Sweetwater River before discharging into San Diego Bay.

The study area receives water from the Sweetwater River flowing from the east and is periodically inundated based on storage capacity and water use needs of the Sweetwater Reservoir. The capacity of the Sweetwater Reservoir

extends to 239' with the elevation of the dam spillway at the western edge of the Reservoir. Sweetwater Reservoir peak elevation data (1990-2023) is presented in Table 4 below as provided by the Sweetwater Authority (Authority 2023).

Table 4. Sweetwater Reservoir Annual Peak Elevations (1990-2024)

Year	Date of Annual Peak Elevation	Elevation (feet AMSL)
1990	May 1	220.0
1991	April 5	230.3
1992	March 30	223.3
1993	January 19	**239.5**
1994	January 1	231.4
1995	April 21	239.3
1996	January 14	231.3
1997	April 27	226.0
1998	May 19	**239.1**
1999	January 29	235.0
2000	March 6	226.1
2001	April 24	225.2
2002	May 1	213.2
2003	May 4	224.6
2004	May 29	223.5
2005	March 11	233.9
2006	March 5	231.7
2007	July 11	221.9
2008	March 24	223.8
2009	April 22	220.9
2010	April 14	229.0
2011	June 4	230.1
2012	February 16	231.8
2013	February 11	220.8
2014	April 11	198.6
2015	March 5	197.7
2016	February 1	197.0
2017	March 23	224.6
2018	January 1	213.1
2019	March 24	224.7
2023	June 16	229.19

Notes: Data provided by Authority 2023. AMSL = above mean sea level

The study area includes areas both above and below the high-water boundary (239') of the Sweetwater Reservoir (see Figures 2 and 6). The major Project components (solar arrays and associated infrastructure) would be located on the Reservoir surface, below the 239' elevation boundary. Some components of the Proposed Project would be built in the vicinity of the treatment plan, an existing water treatment facility. The proposed Project would also

involve temporary construction and staging areas located mostly above the 239' boundary on paved surfaces or previously disturbed areas.

4.10.2 REGULATED WATERS

The capacity of the Sweetwater Reservoir extends to elevation 239' amsl, with the elevation of the dam spillway at the western edge of the Reservoir. The last time water spilled over the Sweetwater Dam (239') was in 1998 (Authority 2023). Coordination between the Authority and U.S. Army Corps of Engineers (USACE) for previous projects in the vicinity has identified the 239' elevation as the area regulated under the Clean Water Act. The USACE, in combination with the U.S. Environmental Protection Agency (USEPA), reserves the ultimate authority in making the final determination of presence and extent of waters of the U.S. (WUS), including wetlands.

No wetlands are present within the study area, but open waters of the Sweetwater Reservoir are present and would be impacted by the proposed Project. It is likely that permits would be required under Section 404 of the Clean Water Act from the USACE, Section 401 Water Quality Certification from the Regional Water Quality Control Board (RWQCB), and Section 1602 of the State Fish and Game Code from the CDFW.

5 EVALUATION OF BIOLOGICAL RESOURCES

The biological value of a site is based on a number of factors including habitat types present, quality of habitat, diversity of biological resources present, potential to support sensitive biological resources, patch size, and connectivity to other high-quality habitat, among others. The Sweetwater Reservoir comprises the vast majority of habitat found within the study area and is a crucial resource for both resident and migratory birds, particularly aquatic birds. The Reservoir itself contains several habitats of its own including open water, mud flats, and freshwater marsh which all provide a variety of resources for aquatic and terrestrial birds. The Reservoir provides important roosting and foraging habitat to both resident and migratory birds, as well as important stopover habitat for migrating birds due to its proximity to the Pacific Flyway. For these reasons, the portion of the Reservoir within and surrounding the study area is considered to be of high biological value.

Terrestrial portions of the study area support some areas of native habitat, such as coastal sage scrub and open water with a substantial portion of disturbed habitat and developed lands. The coastal sage scrub in the study area is considered to be of high biological value as, for the most part, it is contiguous with more expansive areas of coastal sage scrub that support special-status species, such as coastal California gnatcatcher, coastal cactus wren, rufous-crowned sparrow, and orange-throated whiptail. Further, these areas support moderate plant species diversity and provide vegetative cover for wildlife species that may be using the area as a wildlife corridor, such as mule deer (*Odocoileus hemionus*) and coyote (*Canis latrans*). Areas of coastal sage scrub that are not contiguous with more expansive areas of coastal sage scrub are considered to be of moderate value because even though they are isolated and small in size, they support special-status plant species, such as San Diego sunflower, and provide habitat for smaller wildlife species and nesting birds. For these reasons, the terrestrial portions within and surrounding the study area are considered to be of moderate biological value.

Overall, the aquatic and terrestrial habitats within and surrounding the study area provide important aquatic and terrestrial resources for a variety of plant and wildlife species and also form part of a valuable wildlife corridor to adjacent open spaces. Therefore, they and are considered to be, for the most part, of moderate to high biological value.

6 PROJECT IMPACTS

The proposed FPV system would involve installation of the AquaPhi™ Pilot and RES-BCT systems, cables and concrete block anchors for RES-BCT Alternative 1, and an associated land-based equipment pad as well as temporary construction staging and access areas. Two potential alternatives are presented herein for the RES-BCT system. Permanent impacts associated with the photovoltaic arrays and the land-based equipment pad include 0.43 acre of permanent impacts for the AquaPhi™ Pilot system (includes the rotational zone of the solar array [see

Figures 2 and 7]), 9.52 acres for the RES-BCT Alternative 1 system, and 11.82 acres for the RES-BCT Alternative 2 system (includes the rotational zones of the solar arrays [see Figures 2 and 7]). Temporary impacts would be the same for each system and would include construction work areas as well as staging and access areas, totaling at approximately 2.34 acres. Total impacts (permanent and temporary) would be 2.77 acres for the AquaPhi™ Pilot system, 11.86 acres for the RES-BCT Alternative 1, and 14.16 acres for RES-BCT Alternative 2. Project impacts are summarized in Table 5 and illustrated in Figure 7.

Table 5. Project Impacts

Impact	AquaPhi™ Pilot	RES-BCT Alternative 1	RES-BCT Alternative 2
Permanent Impacts from Solar Array(s) (Including Electrical Conduits) (acres)	0.33*	9.42	11.72*
Permanent Impacts from Land-Based Equipment Pad (acres)	0.10	0.10	0.10
Total Permanent Impacts (acres)	**0.43**	**9.52**	**11.82**
Temporary Impacts from Staging and Access (acres)	2.34	2.34	2.34
Total Impacts (permanent and temporary) (acres)	**2.77**	**11.86**	**14.16**

Notes: * Permanent impacts for the AquaPhi™ Pilot and RES-BCT Alternative 2 systems include the rotational zones of the solar arrays.

6.1 VEGETATION COMMUNITIES

Project impacts were calculated based on engineering plans overlain with habitats mapped on site and include the following physical structure replacements and improvements for the three proposed systems (AquaPhi™ Pilot, RES-BCT Alternative 1, and RES-BCT Alternative 2):

- Permanent impacts associated with photovoltaic solar arrays
- Permanent impacts associated with the land-based equipment pad and associated utilities (all three systems)
- Temporary impacts associated with Project construction activities (staging and access)

With the exception of the land-based equipment pad (0.10 acre) permanent impacts associated with each system would occur entirely to open water of the Sweetwater Reservoir. The proposed Project would result in the following permanent impacts: a total of 0.43 acre for the AquaPhi™ Pilot system, 9.52 acres for RES-BCT Alternative 1, and 11.82 acres for RES-BCT Alternative 2 (Table 5).

The proposed Project has been designed to locate construction vehicle traffic, staging, and access areas on either paved or previously disturbed areas to the extent practicable in order to minimize temporary impacts to native habitats. Temporary impacts are defined as the crushing or removal of vegetation that would be restored in place to pre-Project conditions upon completion of the proposed Project. Temporary impacts would be the same for each of the three systems and encompass 2.34 acres and include areas mapped as coastal sage scrub, developed, and open water. Project impacts to vegetation communities within the study area are shown on Figure 7 and summarized in Table 6.

Table 6. Impacts to Vegetation Communities/Habitat per Phase and Alternative

Vegetation Community/Habitat	Permanent Impacts (acres)	Temporary Impacts (acres)	Total Impacts (acres)
AquaPhi™ Pilot			
Coastal Sage Scrub	0.10	0.51	0.61
Developed	0	1.58	1.58
Open Water	0.33	0.25	0.58
Pilot Total	**0.43**	**2.34**	**2.77**
RES-BCT Alternative 1			
Coastal Sage Scrub	0.10	0.51	0.61
Developed	0	1.58	1.58
Open Water	9.42	0.25	9.67
Alternative 1 Total	**9.52**	**2.34**	**11.86**
RES-BCT Alternative 2			
Coastal Sage Scrub	0.10	0.51	0.61
Developed	0	1.58	1.58
Open Water	11.72	0.25	11.97
Alternative 2 Total	**11.82**	**2.34**	**14.16**

6.2 SPECIAL-STATUS SPECIES

6.2.1 SPECIAL-STATUS PLANTS

Four special-status plant species have been detected in the study area during surveys conducted for past Authority projects: California adolphia, San Diego sunflower, San Diego barrel cactus, and ashy spike moss. These special-status plant species can likely be avoided by the proposed Project since the vast majority of permanent impacts would occur in open water on the Reservoir. The one exception to this is the land-based equipment pad which would result in a permanent impact of 0.10 acre of coastal sage scrub habitat that could potentially support these special-status plants. Additionally, all of the temporary impacts that would be used for construction traffic, staging, and access would occur in areas that are either paved or have been previously disturbed with little to no vegetation present. Therefore, approximately 0.10 acre of potential habitat would be permanently impacted in an area where none of the special-status plants have been previously recorded. Project impacts to special-status plant species are not expected; however, mitigation measures stated in Section 7.1, *Vegetation Communities* and Section 7.2, *Special-Status Species* would ensure that potential impacts to special-status plants are avoided or minimized.

6.2.2 SPECIAL-STATUS WILDLIFE

Eight special-status wildlife species have been detected or have a high potential to occur within the study area: Coronado skink, orange-throated whiptail, Cooper's hawk, coastal cactus wren, bald eagle, coastal California gnatcatcher, least Bell's vireo, rufous-crowned sparrow. These special-status wildlife species can likely be avoided by the proposed Project since the vast majority of permanent impacts would be incurred on the Reservoir in open water. The one exception to this is the land-based equipment pad which would result in a permanent impact of 0.10 acre of coastal sage scrub habitat that could potentially support these special-status species. Additionally, all of the temporary impacts that would be used for construction traffic, staging, and access would occur in areas that are either paved or have been previously disturbed with little to no vegetation present. Therefore, only a small area (0.10 acre) of habitat, located at the edge of the patch of coastal sage scrub and adjacent to developed lands, that supports these species would be permanently impacted. Mitigation measures, as described in Section 7, *Mitigation Measures and Recommendations* would be implemented in order to avoid and minimize impacts to special-status wildlife species.

6.2.2.1 Federally Listed Species

Although the permanent impact to native coastal sage scrub habitat is consolidated to one 0.10-acre equipment pad area, it is located toward the edge of a patch of coastal sage scrub habitat that is known to be occupied by coastal California gnatcatcher. Vegetation removal and use of heavy equipment would be necessary. Approximately, 0.10 acre of coastal sage scrub habitat occupied by coastal California gnatcatcher would be removed by the Project. Additionally, construction equipment and traffic adjacent to coastal sage scrub habitat has the potential to generate indirect disturbance from noise and dust. Due to the small area of permanent impacts and with implementation of mitigation measure is Section 7, *Mitigation Measures and Recommendations* the proposed Project is not expected to have adverse impacts to coastal California gnatcatcher.

Least Bell's vireo has also been recorded in coastal sage scrub and developed habitats within the study area; however, permanent impacts to coastal sage scrub habitat would be limited to 0.10 acre and no permanent impacts would occur to developed lands. Additionally, typical habitat (riparian scrub and riparian woodland) for least Bell's vireo would not be impacted by project activities. Although this habitat does exist to the west of the study area, (below the Sweetwater Dam) the closest project component is over 500 feet away from it. Construction equipment and traffic would utilize a dirt road that traverses through the coastal sage scrub habitat and has the potential to generate indirect disturbance from noise and dust. Construction traffic along this route is expected to be sporadic in nature however it may overlap with the nesting season. Localized construction where noise could exceed regulatory limits (i.e., 60 dBA L_{eq}) during the nesting season for both gnatcatcher and least Bell's vireo would require additional attenuation (e.g., temporary noise screens or sound barriers). Mitigation measures, as described in Section 7, would be implemented in order to avoid and minimize impacts to these species.

6.3 POTENTIAL WILDLIFE IMPACTS RESULTING FROM SOLAR FACILITIES

6.3.1 LOSS OF HABITAT

The proposed Project would result in the permanent loss of coastal sage scrub habitat and open waters of the Sweetwater Reservoir (refer to Table 6). The coastal sage scrub habitat supports several special-status species that are either known to occur or have a high potential to occur within the study area. Permanent impacts to coastal sage scrub habitat would be relatively minimal, totaling 0.10 acre. The permanent impact would be located at the edge of a large patch of coastal sage scrub habitat that is adjacent to lands developed with facility buildings and other infrastructure. Mitigation measures, as described in Section 7, *Mitigation Measures and Recommendations*, would be implemented in order to avoid and minimize impacts to coastal sage scrub habitat.

The proposed Project would also result in the permanent loss of open water habitat for each system. The proposed AquaPhi™ Pilot would result in a permanent loss of 0.33 acre, the RES-BCT Alternative 1 would result in the loss of 9.42 acres, and the RES-BCT Alternative 2 would result in the loss of 11.72 acres (see Table 6). Permanent impacts to open water habitat would result in the loss of foraging, and roosting habitat for water dependent bird species that are either known to occur of have a high potential to occur in the vicinity of the study area, some of which include osprey, American white pelican, double-crested cormorant, and California gull.

With full capacity of the Reservoir, the greatest permanent impact of the three systems (RES-BCT Alternative 2, 11.72 acres) would result in the permanent loss of approximately 1.3 percent of the Reservoir's surface area. Therefore, permanent impacts to open water habitat would result in a relatively small area of the Sweetwater Reservoir. Additionally, the solar arrays would be located in the western-most corner of the Reservoir where most of the Reservoir's anthropogenic disturbances exist, with residential neighborhoods located just north of the study area. Major components of the Reservoir's infrastructure (i.e., Sweetwater Dam, the South Spillway, Perdue WTP, and other developed infrastructure supporting the operation and maintenance of the Reservoir) is located in this part of the Reservoir. Therefore, loss of habitat is not expected to have a significant negative effect on local or migrating wildlife.

6.3.2 AVIAN COLLISIONS, ELECTROCUTION, SOLAR FLUX, AND ENTRAPMENT

Although avian interactions with floating solar facilities are not well understood, the primary threats from solar facilities in general are from collisions with solar array equipment and transmission lines as well as electrocution from substation and distribution lines (Hathcock 2018). Terrestrial solar facilities can increase the risk of collisions due to sky reflection or "lake effect." However, this phenomenon is known to occur at large solar farms in desert locations where birds mistake fields of solar panels for waterbodies. Studies that address the potential for bird strikes on FPV systems within bodies of water are limited at this time. With the maximum extent of coverage of solar arrays for the proposed Project in open water habitats being approximately 1.3 percent of total Reservoir capacity, it is unlikely that bird strikes on solar arrays would be significant.

Other common avian collision impacts associated with solar facilities include collisions with towers, electrical lines, guy wires, or other components that are not easily visible. The three proposed systems do not include the use of towers, overhead transmission lines, or other equipment that would be located above the height of the solar panel arrays, creating potential causes of collisions or electrocution. Electrical lines would be installed in conduits and would either be on the surface of the Reservoir (AquiPhi™ Pilot and RES-BCT Alternative 1) with the use of floats or submerged below the Reservoir surface (RES-BCT Alternative 2). Therefore, collisions with aboveground electrical components are not expected to occur.

Solar flux is intense radiant energy focused by a mirror solar array onto a power-generating tower. Objects that pass through solar flux, including insects and birds, encounter extreme heat and may experience varying levels of burns that may result in the direct or indirect mortality of birds (Kagan et al. 2014). Solar flux is unique to power tower solar facilities and therefore is not expected to occur with the proposed Project.

Entrapment under solar arrays could be a potential hazard for diving birds (i.e., grebes and diving ducks). Small fish might be attracted to these areas for use as a refugium or a nursery. Diving birds in pursuit of these fish could potentially get trapped under the solar arrays. The potential for entrapment could be prevented or reduced with implementation of the mitigation measures in Section 7, *Mitigation Measures and Recommendations*.

Although the proposed Project is not expected to result in significant impacts related to avian collisions, electrocution, or entrapment, mitigation measures are provided in Section 7, *Mitigation Measures and Recommendations* to avoid and minimize impacts, if deemed necessary. Additionally, implementation of a rigorous avian mortality survey and monitoring program, combined with adaptive management measures (Section 7.5.1), would help to identify and mitigate any (anticipated or unanticipated) impacts related to avian collisions, electrocution, or entrapment.

6.3.3 AVIAN AND BAT ATTRACTANT

The proposed Project solar arrays would provide surfaces that could potentially be used by birds or bats for perching, roosting, or nesting. Polarized light caused by photovoltaic panels has been observed to attract insects that could attract other sensitive wildlife, such as birds and bats; however, the magnitude of this effect is unknown, since no comprehensive scientific studies have been conducted for this potential phenomenon (Horvath et al. 2010). Foraging, perching, or roosting birds or bats could potentially incur burns from the heat of the photovoltaic panels. Nests that are built on a solar array could potentially be abandoned during maintenance activities or when panels adjust their orientation. Mitigation measures, as described in Section 7, *Mitigation Measures and Recommendations*, would be implemented in order to avoid and minimize impacts to birds and bats resulting from perching, roosting, or nesting on solar arrays. In addition, implementation of a rigorous avian mortality survey and monitoring program, combined with adaptive management measures (Section 7.5.1), would help to identify and mitigate any (anticipated or unanticipated) impacts related to birds and bats perching, roosting, or nesting on solar arrays.

6.3.4 MIGRATORY BIRDS

Beyond the listed species discussed in Section 6.3.4.1, the study area provides suitable nesting habitat for a variety of avian species. All vegetation, native or non-native, as well as some of the structures (e.g., facility buildings),

provide habitat that may be used for nesting. Cooper's hawk, a California Species of Special Concern, has been known to nest in eucalyptus trees within the study area (Authority 2005). Rufous-crowned sparrow, a CDFW Watch List species and cactus wren, a California Species of Special Concern, both have potential to nest within coastal sage scrub habitats within the study area. Impacts to nesting birds protected by the MBTA, the California Fish and Game Code, and those considered under the California Environmental Quality Act could occur if vegetation removal or construction is conducted during the breeding season (i.e., February through August). Mitigation measures, as described in Section 7, would be implemented to avoid and minimize impacts to these species.

6.3.5 OTHER SPECIES OF CONCERN

Several other Species of Special Concern have potential to occur within the open water and scrub habitats of the study area including sharp-shinned hawk, norther harrier, white-tailed kite, California gull, double-crested cormorant, osprey, American white pelican, and San Diego black-tailed jackrabbit. Loss of potential habitat and individuals could occur during vegetation removal and construction operations. Mitigation measures, as described in Section 7, would be implemented in order to avoid and minimize impacts to these species.

6.3.6 BATS

Although bats are not expected to roost within the study area (P. Famolaro 2024), suitable foraging habitat does exist. Impacts to terrestrial foraging habitat would be relatively small (0.10 acre); however, impacts to aquatic habitat (Reservoir) would be up to 11.72 acres or approximately 1.3 percent of the Reservoir's surface. Due to the relatively small percentage of Reservoir that would be impacted, the proposed project is not expected to have significant effect on foraging bats. However, construction equipment and traffic adjacent to habitat has the potential to generate indirect disturbance from noise and dust. Mitigation measures, as described in Section 7, *Mitigation Measures and Recommendations* would be implemented in order to avoid and minimize impacts to bats.

6.4 FEDERALLY DESIGNATED CRITICAL HABITAT

The proposed Project would result in temporary and permanent impacts to federally designated critical habitat for Otay tarplant and coastal California gnatcatcher. Temporary impacts, associated with construction staging and access, would include 1.95 acres to Otay tarplant critical habitat and 1.82 acres to coastal California gnatcatcher critical habitat. Permanent impacts, associated with the equipment pad and electrical conduits, would include 0.10 acre to Otay tarplant and coastal California gnatcatcher critical habitat. Due to the small area of permanent impacts (0.10 acre) and with implementation of the mitigation measures, project impacts are not expected to have an adverse effect on critical habitat. Mitigation measures, as described in Section 7, *Mitigation Measures and Recommendations* would be implemented in order to avoid and minimize impacts to critical habitat.

6.5 PACIFIC FLYWAY AND WILDLIFE CORRIDORS

The Sweetwater Reservoir is a crucial resource for numerous species of birds (see Table 3 and Appendices B and C), particularly aquatic birds. The Reservoir provides important roosting and foraging habitat for resident and migrant birds, as well as stopover habitat for migrating birds due to its proximity to the Pacific Flyway. As described above in Sections 6.3.1 and 6.3.2, impacts associated with the Pacific Flyway and aquatic birds would include loss of habitat and potential for collisions, electrocution, and entrapment. However, the proposed project would result in a maximum permanent loss of 1.3 percent of the Reservoir's surface. With 98.7 percent of the Reservoir's surface water remaining available for aquatic birds, loss of habitat is not expected to have a significant negative effect on resident or migrating wildlife. Additionally, mitigation measures, as described in Section 7, *Mitigation Measures and Recommendations*, would be implemented in order to avoid and minimize impacts related to migratory birds and collisions, electrocution, and entrapment. Additionally, implementation of a rigorous avian mortality survey and monitoring program, combined with adaptive management measures (Section 7.5.1), would help to identify and mitigate any (anticipated or unanticipated) impacts related to migratory birds and collisions, electrocution, or entrapment.

The study area is situated within a wildlife corridor that is considered part of the Sweetwater River linkage area. However, permanent impacts resulting from the proposed Project would be limited to 0.10 acre of coastal sage scrub

habitat and a maximum of 11.72 acres of open water (Sweetwater Reservoir) or approximately 1.3 percent of the Reservoir's surface area (at full capacity). Additionally, permanent impacts to coastal sage scrub habitat would occur at the edge of a patch of habitat that is adjacent to and surrounded by developed lands associated with the Perdue WTP and Reservoir infrastructure. Therefore, the proposed Project is not expected to affect the function of this area as a wildlife corridor. Areas that would be temporarily impacted are primarily paved or have been previously disturbed. A small area of open water would also be temporarily impacted. The remaining temporary impacts would occur to developed areas, which would not affect the wildlife corridor functions following the completion of the proposed Project. The impacts associated with the proposed Project would be considered an incremental (permanent impacts) and temporal (temporary impacts) loss but would not be considered a significant impediment to wildlife movement.

6.6 JURISDICTIONAL WATERS

The three systems of the proposed Project (AquaPhi™ Pilot, RES-BCT Alternative 1 and RES-BCT Alternative 2) would result in temporary and permanent impacts to jurisdictional waters. Temporary and permanent impacts are described below in Table 7 and shown in Figure 7.

Table 7. Impacts to Jurisdictional Waters

Impact	AquaPhi™ Pilot	RES-BCT Alternative 1	RES-BCT Alternative 2
Temporary Impacts to Open Water from Construction Activities	0.25	0.25	0.25
Permanent Impacts to Open Water from Solar Array(s) (acres)	0.33	9.42	11.72

Fill calculations based on assessment of proposed fill material below the Sweetwater Reservoir 239' elevation, as presented by the Authority, are summarized in Table 8.

Table 8. Summary of Fill Material Required for the Proposed Project

Infrastructure	Quantity[1]
AquaPhi™ Pilot	
AC DC Run with Floats	15.64 CY
RES-BCT Alternative 1	
AC DC Run with Floats	59.04 CY
Anchoring Cable	40,512 Linear Feet
Anchors	Awaiting Final Design
Alternative 1 Total	**59.04 CY plus anchors**
RES-BCT Alternative 2	
AC DC Run with Floats	59.04 CY

Notes: CY = cubic yards. [1] Fill quantities will be updated once final design is complete.

7 MITIGATION MEASURES AND RECOMMENDATIONS

7.1 VEGETATION COMMUNITIES

The three unique systems (AquaPhi™ Pilot, RES-BCT Alternative 1, and RES-BCT Alternative 2) of the proposed Project would all result in the same impacts to native habitats including permanent impacts to 0.10 acre of coastal sage scrub habitat. Permanent habitat loss to coastal sage scrub would require in-kind mitigation by conserving, restoring, and/or managing similar habitats. Suggested mitigation ratios are summarized in Table 9. Note that partial mitigation for the impact area has already occurred under the Perdue Water Treatment Plant Expansion

Master Plan. Coordination with the wildlife agencies will occur to ensure habitat impacts are mitigated appropriately.

Temporary impacts for each of the three systems would be equivalent. Temporary impacts would occur to 0.51 acre of coastal sage scrub and 1.58 acres of developed land. Temporary impacts to coastal sage scrub and areas of developed land where physical disturbance to vegetation occurs could be mitigated through on-site revegetation to pre-project conditions or better following construction. A habitat revegetation plan should be developed to lay forth methods for re-seeding and re-vegetating temporarily disturbed areas with suitable native species. Temporary impacts to vegetation within developed lands could be revegetated with a grassland or coastal sage scrub plant pallet, as appropriate and based on the finished site conditions and adjacent habitat types.

Table 9. Impacts and Mitigation for Vegetation Communities

Vegetation Community/ Classification	Permanent Impacts (acres)	Mitigation Ratio	Permanent Mitigation Credits	Temporary Impacts (acres)	Mitigation Ratio	Temporary Mitigation Credits (Revegetation Acres)
Coastal Sage Scrub	0.10	2:1	0.20	0.51	1:1	0.51
Developed (Existing Facilities/Managed Areas)	0	N/A	N/A	1.58	N/A	N/A

Notes: Temporary impacts to habitat would be mitigated at a 1:1 ratio as described above.

7.2 SPECIAL-STATUS SPECIES

Contractor education training by a qualified biologist (i.e., Project Biologist) and marking of construction boundaries would restrict impacts to the Project area. Pre-construction surveys should also be conducted by the Project Biologist within 14 days of work to evaluate presence/absence of sensitive species such as roosting bats, orange-throated whiptail, and other species in Table 3 that are known to occur or with potential to occur in the work areas. If present, they should be avoided by construction with an adequate non-disturbance buffer zone to be determined by the Project Biologist. The boundary of the access roads and work areas should be clearly marked with flagging, rope, or construction fencing and work areas inspected regularly by the Project Biologist to ensure compliance with avoidance and minimization measures. Populations of special-status plant species that can be avoided should be fenced off from construction activities and access. Special-status plants that cannot be avoided should be relocated to suitable locations outside of the impact area by the project biologist or other qualified personnel. Signage for Environmentally Sensitive Areas should be installed and maintained. These measures would minimize impacts to special-status plant species in the vicinity of the Project area.

Potential impacts to coastal California gnatcatcher and least Bell's vireo can be minimized by restricting Project activities during the breeding season (i.e., February 15 to August 31 for coastal California gnatcatcher, and March 15 to September 15 for least Bell's vireo) (see Section 7.3, *Nesting Birds*). Mitigation for permanent and temporary impacts to rare plants and habitat with potential for special-status wildlife would be provided through habitat-based mitigation (see Section 7.1, *Vegetation Communities*).

7.3 NESTING BIRDS

In order to avoid direct impacts to nesting birds, removal of vegetation shall occur outside of the nesting season for birds. Typically, this is January 15 to August 31 for large trees or wooded areas (i.e., for raptors), March 1 to September 15 for riparian and marsh birds, and February 15 to August 31 for upland scrub or grassland birds. If conducting vegetation removal during nesting season is unavoidable, a pre-construction nesting bird survey by a qualified biologist could determine if nesting birds are in the work area. Vegetation removal could occur during the

nesting season if no active nests or nesting activity is found by a qualified biologist within or immediately adjacent to the Project work area. Further, activities associated with the proposed Project shall not indirectly harm or preclude nesting bird activity. If a nest is found, the type of construction activity would be evaluated, and avoidance methods would be implemented as necessary. Methods would vary based on bird species, site conditions, and type of work to be conducted, but could consist of limited or reduced construction access; reduced vehicle speeds; noise attenuation; and/or a no-work buffer zone placed around the nest until the adults are no longer using it or the young have fledged. Any buffer width would be determined by the project biologist at the time of discovery, and constraint measures would be monitored to evaluate effectiveness.

Additionally, for this proposed Project, the presence of coastal California gnatcatcher further precludes the removal of vegetation from occupied habitat between February 15 and August 31. Prior to and during construction, access routes and active construction areas adjacent to nesting habitat for vireo and gnatcatcher may require additional buffers and noise attenuation during the nest season, as determined by a qualified biologist, in consultation with the Wildlife Agencies, during construction.

7.4 FEDERALLY DESIGNATED CRITICAL HABITAT

Temporary and permanent impacts to federally designated critical habitat for Otay tarplant (1.95 acres temporary and 0.10 acre permanent) and coastal California gnatcatcher (1.82 acres temporary and 0.10 acre permanent) would occur primarily in areas that are paved or have been previously disturbed. These impacts would be mitigated through habitat-based mitigation, as described in Section 7.1, and refined with coordination with the wildlife agencies. *Vegetation Communities*. Additionally, implementation of mitigation measures for special-status species (see Section 7.2, *Special-Status Species*) would ensure that impacts to critical habitat are minimized to the extent practicable.

7.5 POTENTIAL WILDLIFE IMPACTS RESULTING FROM SOLAR FACILITIES

7.5.1 AVIAN COLLISIONS, ELECTROCUTION, AND ENTRAPMENT

Impacts associated with avian collisions, electrocution, and entrapment could be minimized or avoided by incorporating the following measures into the Project design:

- Above-ground/Reservoir electrical transmission and distribution lines shall be designed using industry best practices to minimize bird electrocution hazards. These may include, but are not limited to, adequate phase-to-phase or phase-to-ground separation and/or appropriate insulation of components.
- Where insulation is not feasible near perching locations, bird deterrent materials may be used as an alternative.
- The solar units can be uniformly dark in color, coated to be non-reflective, designed with panels that have contrasting borders that may act to reduce the continuous mirror effect therefore reducing "lake effect", and designed to be highly absorptive of all light that strikes their glass surfaces, and do not appear like water from above.
- Avoid the use of guy wires to the extent practicable. If guy wires are necessary, permanent markers such as Bird-Flight™ Diverter could be used to increase their visibility.
- Regular avian mortality surveys, implemented by a qualified biologist(s), could be implemented to monitor the death of birds, potentially identify mortality causes, and inform adaptive management measures necessary to mitigate impacts. Frequency of surveys should be scaled such that they occur very frequently at the beginning of the monitoring phase (directly following project installation) to better understand the type, frequency, and severity of impacts occurring and then taper down over time as adaptive management strategies (e.g., best management practices [BMPs]) are employed to help reduce and/or prevent impacts. An example of a scaled survey schedule is: survey once per week for the first two years, then once every two weeks for the third year, and then monthly for the life of the project.
- Solar arrays could be designed with wider panel spacing to prevent/reduce the potential for collisions and/or entrapment of diving birds.

- Sweetwater Authority would adapt its approach to avian mortality avoidance according to results of regular avian monitoring and as new research and technologies become available.

7.5.2 AVIAN AND BAT ATTRACTANT

Impacts associated with roosting or nesting birds or bats could be minimized or avoided by incorporating the following measures to deter visitation to the solar arrays. A deterrent is an aversive, harmful, fearful, or noxious stimulus that elicits a defensive response in a particular animal. This stimulus must create enough real or perceived risk such that the costs of using a resource outweigh the foraging or use benefits. There are four general classes of deterrents including acoustic, tactile, visual, and chemosensory (Walston et al. 2015). Use of these deterrents has been documented at facilities with varying levels of success; however, there is little research regarding these deterrents and their specific use at solar facilities. Incorporating the use of these types of deterrents into the proposed Project could be helpful in avoiding and minimizing impacts to birds and bats. Another potential measure used to deter use of the solar arrays by birds is surrounding them with netting. Netting would need to be sufficiently durable to stay intact and visible enough to deter birds from a distance. Powerline marking devices or similar implements could be attached to the netting to ensure its visibility. Implementation of a rigorous avian mortality survey and monitoring program, combined with adaptive management measures (Section 7.5.1), would help to identify and mitigate any (anticipated or unanticipated) impacts related to birds and bats perching, roosting, or nesting on solar arrays. Installation of any deterrent should be done in coordination with the Wildlife Agencies, and a monitoring protocol should be developed to measure success of deterrent.

7.5.3 NON-NESTING AND AQUATIC BIRDS

Non-nesting and aquatic birds could be subject to impacts related to perching, roosting, or nesting on solar arrays; collisions, electrocution, or entrapment within solar arrays or associated equipment; and potentially other unanticipated impacts. Mitigation measures and BMPs described in Section 7.5.1 would help to minimize impacts to non-nesting and aquatic birds. Implementation of an avian mortality survey and monitoring program, combined with adaptive management measures (Section 7.5.1), would help to identify and mitigate any (anticipated or unanticipated) impacts related to non-nesting and aquatic birds.

7.6 JURISDICTIONAL WATERS

Impacts to jurisdictional waters would likely require mitigation, including the proposed permanent impacts associated with the installation of floating solar arrays on the reservoir surface. These impacts include the following permanent impacts to open water: 0.33 acre for the AquiPhi™ Pilot system, 9.42 acres for the RES-BCT Alternative 1 system, and 11.72 acres for the RES-BCT Alternative 2 system (see Table 10). Given that the impact will be on the surface of a human-made reservoir, it is assumed that WUS and waters of the State would be mitigated at a 1:1 ratio through restoration or enhancement of aquatic or wetland habitat on Authority lands. The specific area would be determined in coordination with the jurisdictional agencies (i.e., USACE, RWQCB, and CDFW, as necessary), but could include restoration or enhancement in the Sweetwater Reservoir Habitat Management Plan (HMP) or other areas where wetlands credits could be obtained. Restoring the functions and values of habitats temporarily impacted by Project activities in place at a 1:1 ratio to pre-project conditions would suffice as mitigation for temporary impacts and would be addressed in the revegetation plan for the proposed Project. Additional measures may be implemented, including invasive plant control or habitat improvements in nearby areas to mitigate for permanent and/or temporal impacts. A summary of impacts and proposed mitigation for jurisdictional waters is provided in Table 10.

Table 10. Impacts and Mitigation for Jurisdictional Waters

Vegetation Community/Classification	Permanent Impacts (acres)	Mitigation Ratio	Mitigation Acres	Temporary Impacts (acres)	Revegetation Acres (1:1)
AquiPhi™ Pilot					
Open Water	0.33	1:1	0.33	0.25	0.25
RES-BCT Alternative 1					
Open Water	9.42	1:1	9.42	0.25	0.25
RES-BCT Alternative 2					
Open Water	11.72	1:1	11.72	0.25	0.25

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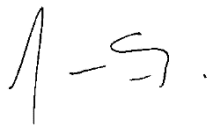
If you have questions, please do not hesitate to contact Jason Erlich at jason.erlich@wsp.com.

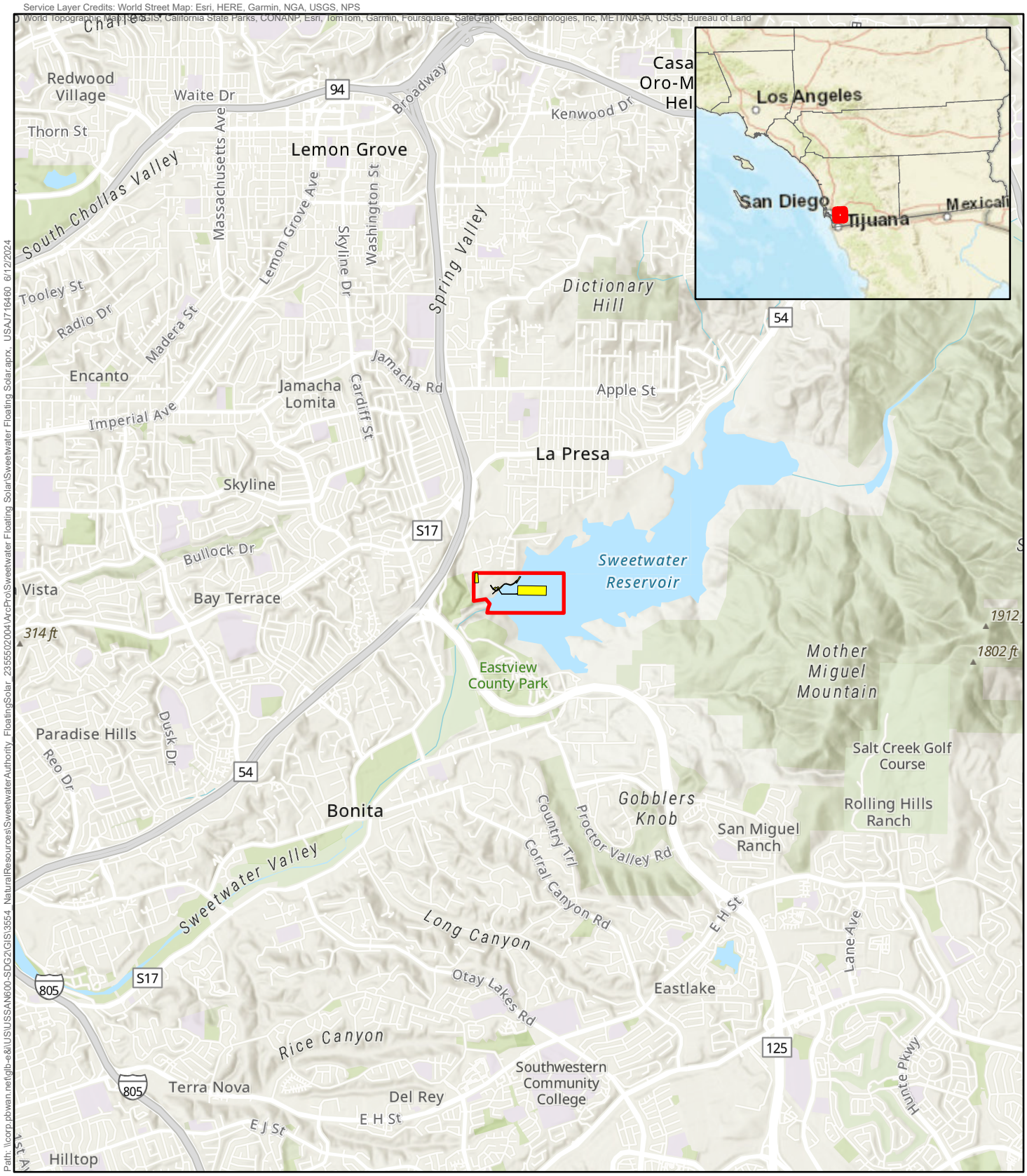
Respectfully submitted,



Jason Erlich
Senior Biologist
WSP USA, Inc.

Attachments:
Appendix A. Figures
Appendix B. Christmas Bird Count Data
Appendix C. Known Wildlife Species Table

APPENDIX A. FIGURES

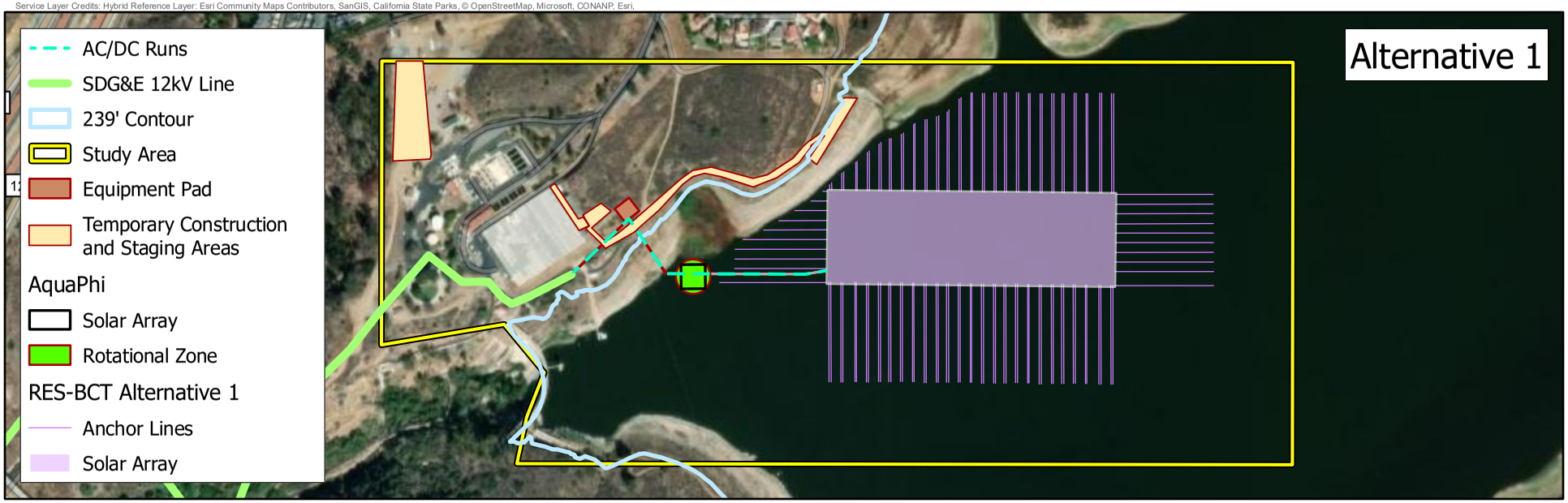


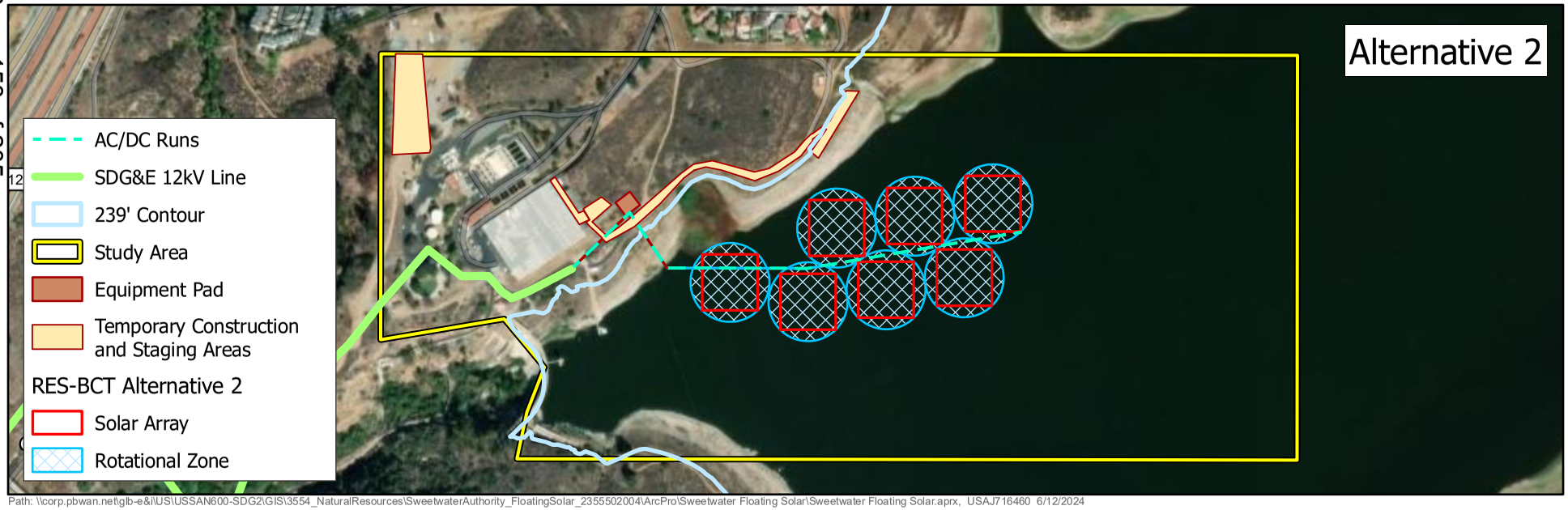
Study Area

Alternative 1

FIGURE 1

Project Region
Floating Solar Project
Sweetwater Authority
San Diego, CA





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1 inch =600 feet
0 300 600
Feet

wsp

FIGURE 2

Project Overview
Floating Solar Project
Sweetwater Authority
San Diego, CA

FIGURE 3

Soils Profile
Floating Solar Project
Sweetwater Authority
San Diego, CA

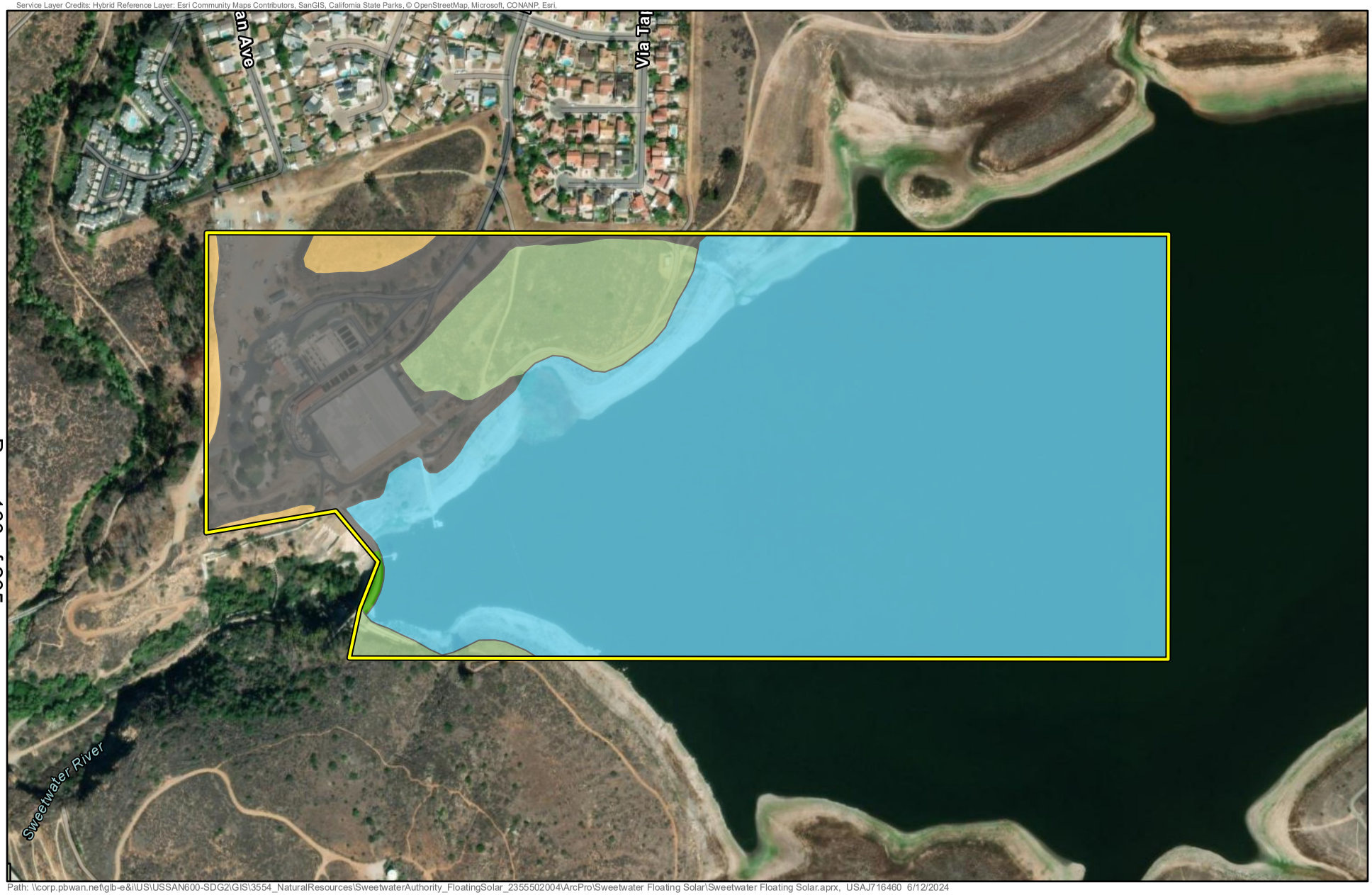

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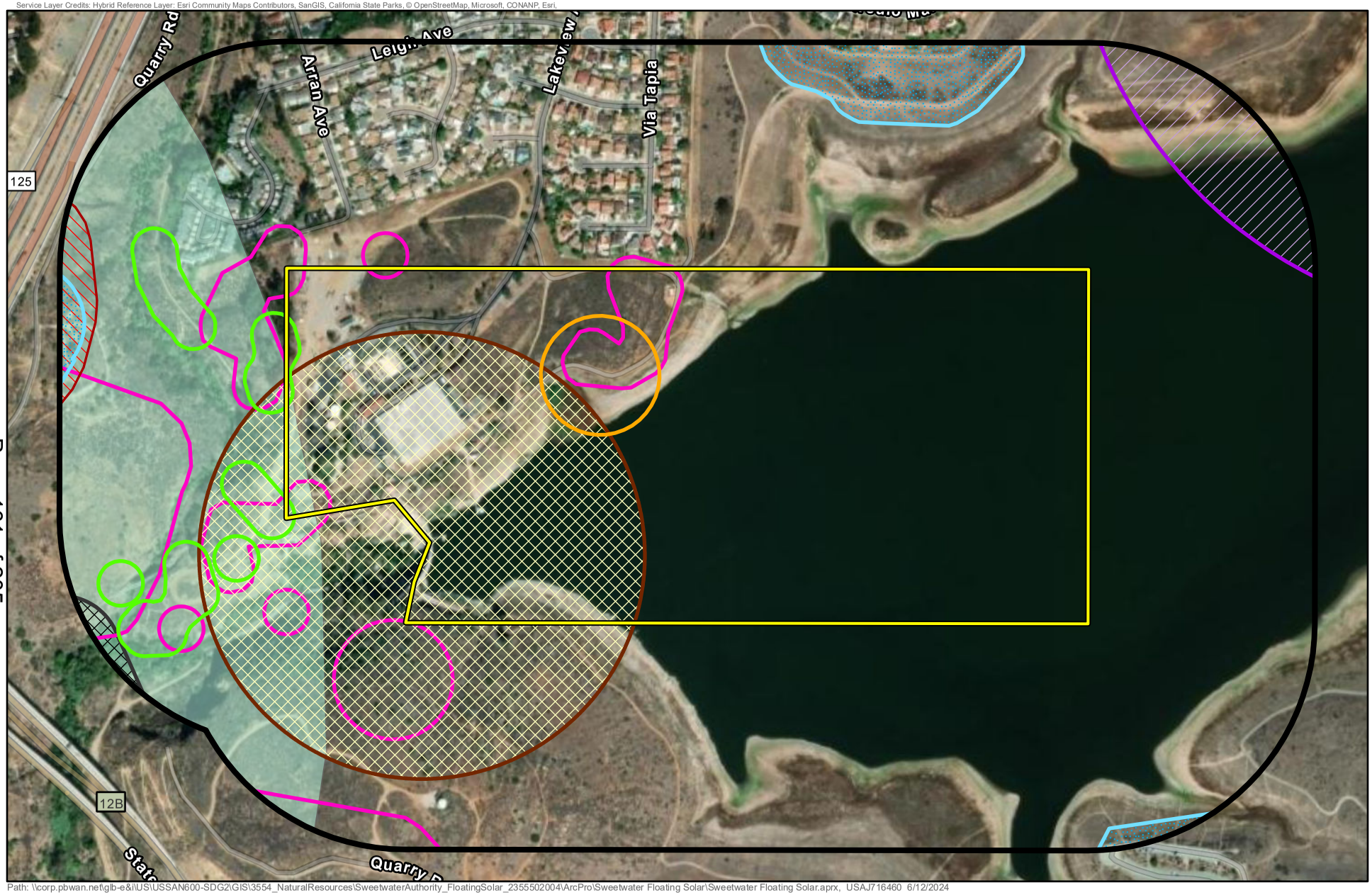
FIGURE 4

Vegetation Communities
Floating Solar Project
Sweetwater Authority
San Diego, CA



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Study Area
1000ft Buffer of Project

Plant Occurrences (CNDDB)
California adolphia
Decumbent goldenbush
Mud nama
Otay tarplant
Purple stemodia
San diego ambrosia
San diego barrel cactus
San diego marsh-elder
Maritime succulent scrub

1 inch =600 feet
0 300 600
Feet

FIGURE 5a

Historical Occurrences of Special Status Plants (CNDDB)
Floating Solar Project
Sweetwater Authority
San Diego, CA

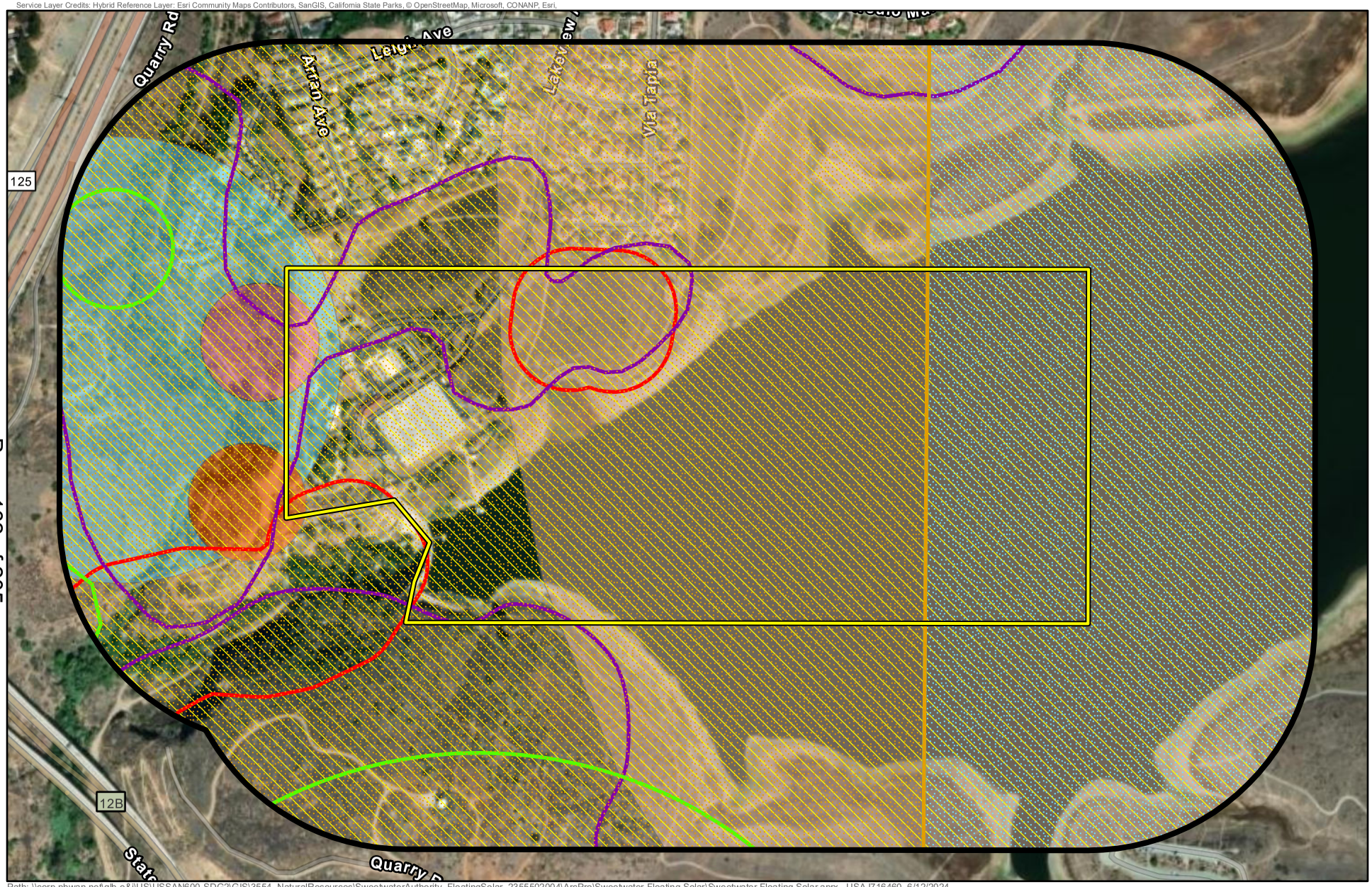
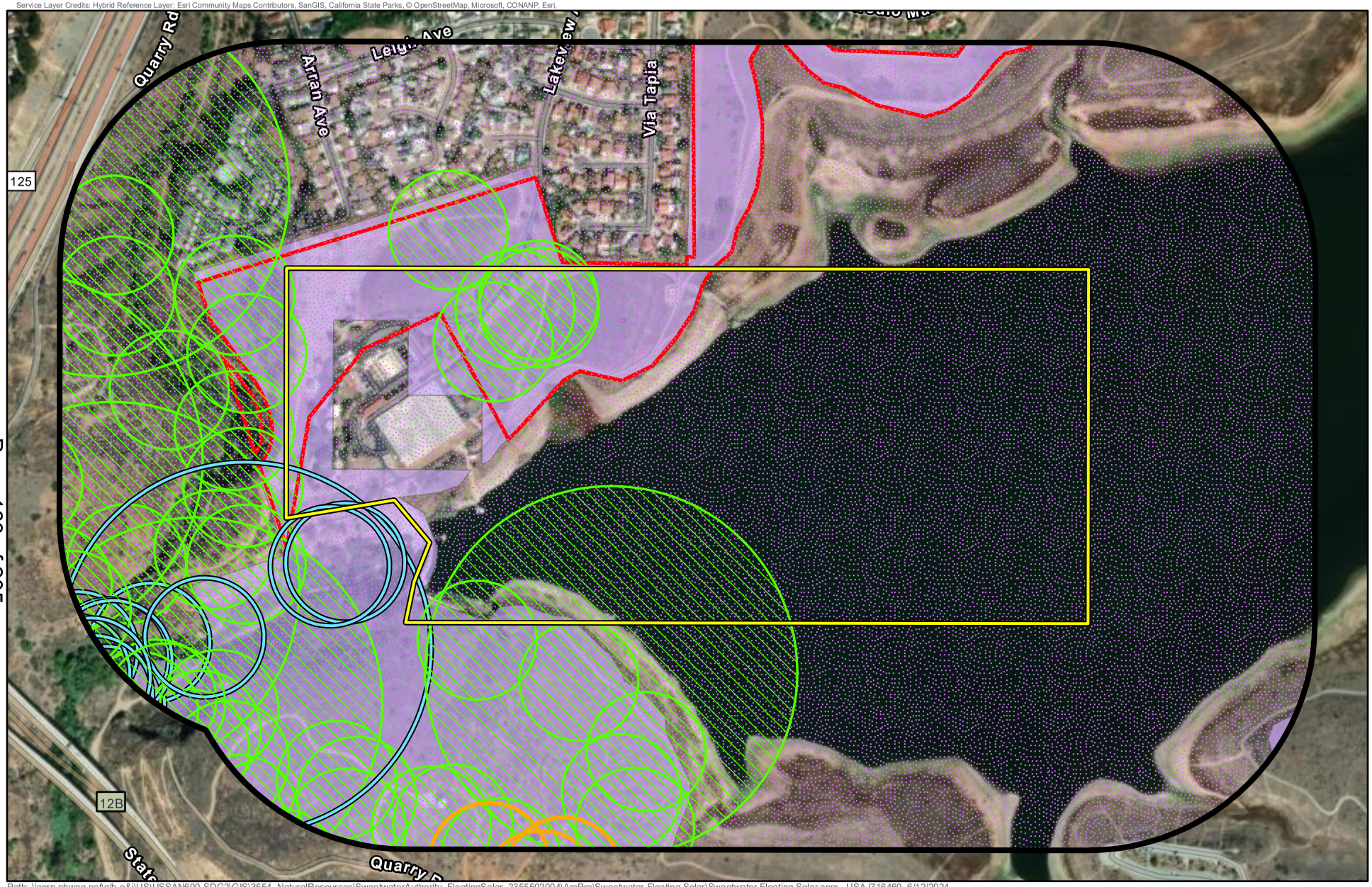


FIGURE 5b

Historical Occurrences of Special Status Wildlife (CNDDB)
Floating Solar Project
Sweetwater Authority
San Diego, CA



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Study Area

1000ft Buffer of Project

Critical Habitat (USFWS)

Coastal California gnatcatcher

Otay tarplant

Species Occurrences (USFWS)

Quino checkerspot butterfly

Cactus wren

Coastal California gnatcatcher

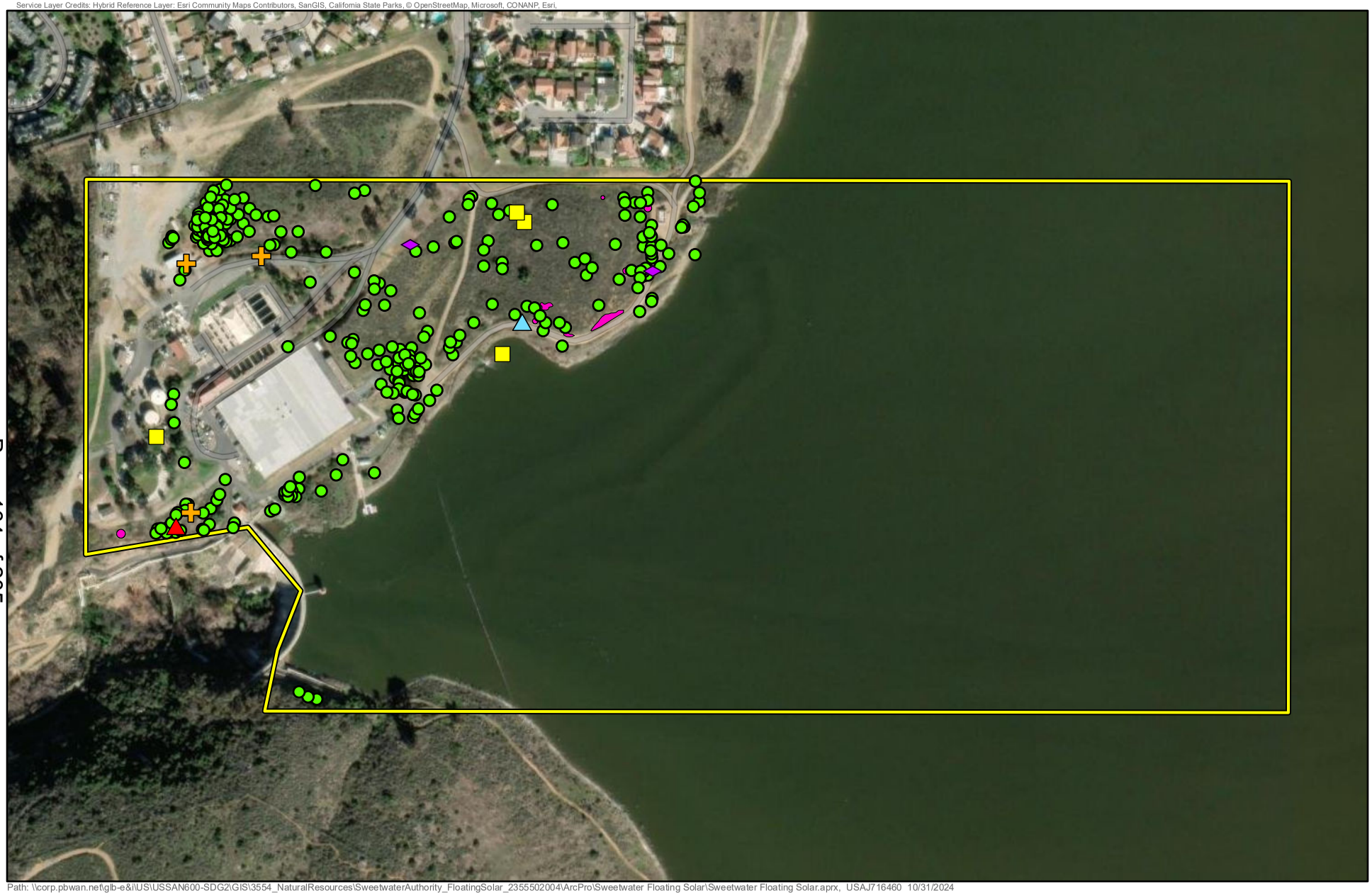
Least Bell's vireo

1 inch =600 feet

0 300 600 Feet

FIGURE 5c

Historical Occurrences of Special Status Species (USFWS)
Floating Solar Project
Sweetwater Authority
San Diego, CA



wsp

- Black-tailed jackrabbit
- Orange-throated whiptail
- Sage sparrow
- Least Bell's vireo
- California cactus wren
- Coastal California gnatcatcher
- San Diego Barrel Cactus
- Study Area

1 inch =400 feet
0 200 400 Feet

FIGURE 5d

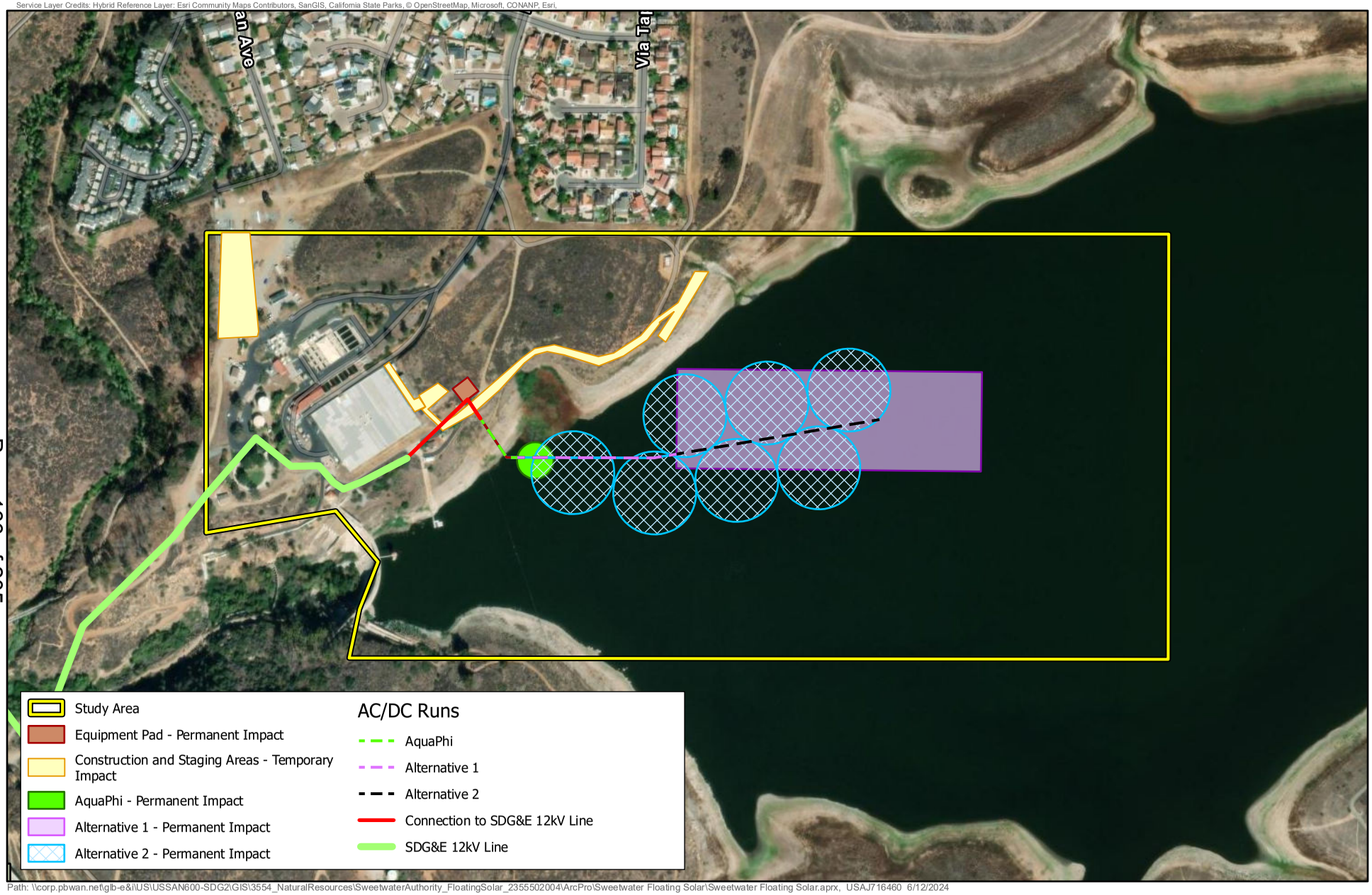
Historical Occurrences of
Special Status Plants and Wildlife (SWA)
Floating Solar Project
Sweetwater Authority, San Diego, CA

Study Area
Open Water
239-foot High Water Mark / U.S. Water Boundary

1 inch =500 feet
0 250 500
Feet

FIGURE 6

Jurisdictional Waters
Floating Solar Project
Sweetwater Authority
San Diego, CA



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1 inch =500 feet
0 250 500
Feet

wsp

FIGURE 7

Project Impacts
Floating Solar Project
Sweetwater Authority
San Diego, CA

APPENDIX B. CHRISTMAS BIRD COUNT DATA

Christmas Brid Count Data
San Diego Count Circle, Sweetwater Reservoir (Area 16)

Species	Code	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	AVERAGE	DETECTION FREQUENCY
Pied-billed grebe	PBGR	2	4	5	4	1	2		3	1	6	1	1	2	2	2	26		12	15	5			1	3				1	3.54	0.75
Eared grebe	EAGR		4					5	2		12	9	2	2	1	125	7	10	38	23	5	5	3	8	5	6	2	2	13	10.32	0.79
Western grebe	WEGR	100	750	600	900	900	900	975	1578	700	500	200	148	200	350	55	100	250	350	880	35	300	300	505	800	1000	1200	500	646	561.50	1.00
Clark's grebe	CLGR	20	1	200	500	300		325	326	200	250	100	61	33	100	33	40	80	150	300	20	50	115	100	50	200	200	100	216	145.36	0.96
**Aechmorphorus* grebe	WEGR/CLGR															258														9.21	0.04
Pacific loon	PALO													1																0.04	0.04
Common loon	COLO			1																										0.04	0.04
Double-crested cormorant	DCCO	15	15	14	30	47	3	12	49	10	25	45	15	26	150	9	56	12	192	38	15	4	7	10	13	20	20	4	101	34.18	1.00
American white pelican	AWPE	1					14	8	11	6	5							9	2	20	2	25	3	27	3	1	2			4.96	0.57
Brown pelican	BRPE																					1			1					0.07	0.07
Snowy egret	SNEG	2	2	5	16	5	10		5	3	6	2	3		9	10	4	3	4	5	1		1	2	2	2	15		3	4.29	0.86
Least bittern	LEBI										1																			0.04	0.04
Great-blue heron	GBHE	3	4	3	4	3	1		1	1	1		1	1		2	3	1		4	3	1	4	2	1	6	2	1	1	1.93	0.86
Great egret	GREG	4	7	2	5	3	4	2	5	5	4	6	3	2	3	9	7	1	6	6	4	3	8	6	5	5	9	2	3	4.61	1.00
Green heron	GRHE			1																									1	0.07	0.07
Black-crowned night heron	BCNH	3														1							1							0.18	0.11
White-faced ibis	WFIB															1								1		1				0.11	0.11
Turkey vulture	TUVU		1			4	1	1			1		1	1	2	2	2	5	3	6	1			6	1	3	1	1	2	1.61	0.71
Ruddy duck	RUDU	8	8		3	1	1	15	50	21	83	31	104	65	28	75	21	250	75	160	335	200	240	60	150	300	250	200	59	99.75	0.96
Greater white-fronted goose	WFGO		6		17						3	4					20					4		26			45	132	8	9.46	0.36
Snow goose	SNGO	5	9	2	7	11		6	2	1	5	8	5	2				3	26		2	5	2		3	6	1	1	1	4.04	0.79
Canada goose	CANG	450	600	178	477	806	75	532	746	759	718	632	523	677	605	102	300	260	350	180	470	85	350	122	212	350	250	200	353	405.79	1.00
Cackling goose	CAKGO														23		1						1			1		13		1.39	0.18
Cacking goose "minima"	CAKGO																												4	0.14	0.04
Cackling goose "Aleutian"	CAKGO																												1	0.04	0.04
Ross's goose	ROGO																							3						0.11	0.04
American wigeon	AMWI	20		3	4	10		14	386	60	86	19	35	250	19	2	5	80	18	30	10		17	35	60		30	140	234	55.96	0.86
Gadwall	GADW	2	10	5	8	8		10		10	8	21	10	32	11	16	8	25	10	38	7	15	27	30	14	6		50	94	16.96	0.89
Green-winged teal	GWTE	12	15	14	23				188	26	29	159	85	52	117	18	27	25	22	40	57	20	92	52	53	200		50	61	51.32	0.86
Mallard	MALL	100	50	17	3	7	2	2	25	20	20	8	8	71	2	25	4	40	2	3		8	12	3	14	3		250	19	25.64	0.93
Northern pintail	NOPI	60		5	2	2		252	18	170	12	38	307	119	51	32		80	12	30	5	10	10		7	1		15	20	44.93	0.82
Cinnamon teal	CITE			5	2										1					10			4	1	2	1		4	4	1.21	0.36
Northern shoveler	NOSH	200	400	35	683	530	6	1025	302	80	1809	700	135	720	410	2000	700	450	1250	315	307	1200	1600	1601	856	400	350	1200	1520	742.29	1.00
Canvasback	CANV				1			20	6		6		4						1	1	1	3	1	14		4	6	18		3.07	0.50
Redhead	REDH							1	2	21				2											9			2		1.32	0.21
Ring-necked duck	RNDU				10	60		6	10		4		9	8				6	5	1					20			15		5.50	0.43
Lesser scaup	LESC	40	10	2	1	27			20	20		8	2	3	6	6		2	4		12	3	2	3	2	2	4	2		6.46	0.79
Bufflehead	BUFF	8						2	1	5	20	20	7	3	3	23	8	6	9	7	3	4	40	1	13	9		10	4	7.36	0.79
Long-tailed duck	LTDU																						1							0.04	0.04
Hooded merganser	HOME															1								2						0.11	0.07
Common merganser	COME										1								3											0.14	0.07
Osprey	OSPR		1	1		1	1			2	2	3	1	1		1		1	1	1	1		1	1	1	1				0.79	0.64
White-tailed kite	WTKI	2		6	5			2	3	5	3	3	1	1	1	2	4	1		3		1	3	2	3	7		1	3	2.21	0.79
Bald eagle	BAEA							2											1		1			1	1		1	1		0.29	0.25
Norther harrier	NOHA	3	4	4	1	2		3	2	3	3	3	1	3	4	2	5	5	6	6	2	4	4	2	1	4	2	2	1	2.93	0.96
Sharp-shinned hawk	SSHA			1																			1					1		0.11	0.11
Cooper's hawk	COHA				2	1		2	2	1	1	1			1	1	1		1	1				1	1	2				0.68	0.54
Red-shouldered hawk	RSHA										1					2										1		1		0.18	0.14
Red-tailed hawk	RTHA	2	4	3	6	4	3	7	8	15	8	9	12	2	8	8	13	7	10	16	24	7	8	3	4	6	4	2	6	7.46	1.00
Rough-legged hawk	RLHA		1																											0.04	0.04
Golden eagle	GOEA																				1									0.04	0.04
American kestrel	AMKES	6	3	2	7	5	6	5	6	6	2	8	5	3	4	4	6	1	6	10	8	5	5	5	3	2		3	3	4.61	0.96
Merlin	MERL	1	1	1					1	1				1			1				2		1	1	1	1		1	1	0.54	0.50

P. Famolaro
Sweetwater Authority

Christmas Brid Count Data
San Diego Count Circle, Sweetwater Reservoir (Area 16)

Species	Code	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	AVERAGE	DETECTION FREQUENCY
Prarie falcon	PRFA		1	1				1		1		1					1	1			1	1	1	1						0.39	0.39
Peregrine falcon	PEFA	2	2		1	1	1		2		3		2	2	3	2	1	2	1		1	1	3	1	1	2		1	1	1.29	0.79
Virginia rail	VIRA																							1	1	2				0.14	0.11
Ring-necked pheasant	RNPH									1																				0.04	0.04
California quail	CAQU		5		1	40	100		17									3	25	3			12	1				3	33	8.68	0.43
Sora	SORA										1					2									1	1			1	0.21	0.18
Common moorhen	COMO				1										1															0.07	0.07
American coot	AMCO	240	250	85	186	91	28	107	121	252	312	541	67	241	169	135	500	135	300	147	230	120	380	401	350	200	200	150	575	232.61	1.00
Marbled godwit	MAGO												30			1				2	25	8				1				2.39	0.21
Long-billed curlew	LBCU							1	1									1		1						3			2	0.32	0.21
Greater yellowlegs	GRYE			2	5				4	1	3	2	2		2	1		4	1	2		1	8	1		6	1		3	1.75	0.64
Spotted sandpiper	SPSA	2	5	9	6	4	7	6	16	6	5	4	8	8	11	8	9	6	12	7	2	5	9	2	1	4	1		2	5.89	0.96
Long-billed dowitcher	LBDO	30	10		13	10			2		50	30	10		9	14		90	40		185	25	110	25		80	5		6	26.57	0.68
Wilson's snipe	WISN																					1			1					0.07	0.07
Western sandpiper	WESA	40	100	2	15	150			2			1	4	35	2				10		1	50	7			7			8	15.50	0.57
Least sandpiper	LESA	140	250	49	28	154			29		100	5	18	50	32	45	12	110	6		250	15	420	400	75	200	150		354	103.29	0.82
Dunlin	DUNL	10	10		5								6					5	5							1				1.50	0.25
*Peep Species											400					200														21.43	0.07
Semi-palmated plover	SPPL		2		2								1													1				0.21	0.14
Killdeer	KILL	20		7	7			16	4	11	2	7	14	9	19	80		15	40	22	30	2	58	25		25			8	15.04	0.75
Black-necked stilt	BNST										5	1			8			4	1		7	6	6			1				1.39	0.32
American avocet	AMAV	10	6			10					3	1	18					5	11	20	35	15				5				4.96	0.43
Ring-billed gull	RBGU	60	40	21	85				56	35	150	90	37	7	21	2	2	18	110	7	75	20	70	2	10	60	90	2	68	40.64	0.89
California gull	CAGU	10	15		55	200		525	75	430		5		1	1	25		1	50	6		2	27	1	10	7	20	25	33	54.43	0.79
Western gull	WEGU	10	40	60	40	100	200	200	14	400	40	119	37	38	31	32	15	20	70	7	30	50	80	3	50	40	50	75	60	68.25	1.00
Herring gull	HEGU	2		2		1		1		2	3	3	1	1									5	5	1	1				1.00	0.46
Bonaparte's gull	BOGU	6	15			1				5		7	3		5	1	4	5	4	3	20	10		3	9		1		2	3.71	0.64
Caspian tern	CATE										2				1															0.11	0.07
Forester's tern	FOTE		10			1				3												2		1						0.61	0.18
Domestic pigeon	DOPI			1	1		27									1	6					3				50				3.18	0.25
Eurasian collared dove																				1										0.04	0.04
Mourning dove	MODO	20	20	52	71	3	29	7	142	2	151	52	23	55	45	145	101	26	33	162	20	30	1	18	25	8	2	15	8	45.21	1.00
Greater roadrunner	GRRO																2		5		1					1		3	2	0.50	0.21
Barn owl	BAOW																						1							0.04	0.04
Great horned owl	GHOW		2								1														1	1				0.18	0.14
Burrowing owl	BUOW											1	2	3	1	1	1	1	1	3	2			1	1	1				0.68	0.46
Short-eared owl	SEOW													1										1		1				0.11	0.11
Vaux's swift	VASW												1			6														0.25	0.07
White-throated swift	WTSW	50	40			300	50	125	480		6	50	87	233				230	50	285	70	80		52	40	25		50		82.25	0.68
Black-chinned hummingbird	BCHU								1																					0.04	0.04
Anna's hummingbird	ANHU	10	15	5	5	12	27	9	16	7	17	6	7	8	29	6	11	1	18	19	18	6	7	12	7	6		4	6	10.50	0.96
Allen's hummingbird	ALHU																						2	1		1			2	0.21	0.14
Costa's hummingbird	COHU					1																								0.04	0.04
Selasphorus hummingbird	SELAS								1																					0.04	0.04
Belted kingfisher	BEKI			3	2	1	1			1	1	2	1			2	2		1	1	1					2	1		2	0.86	0.57
Red-breasted sapsucker	RBSA									1																				0.04	0.04
Nuttall's woodpecker	NUWO		1		1				1		2			1		1			1	1										0.32	0.29
Common flicker	COFL	1	1	2	3	2		2	3										1		1			1				1		0.64	0.39
Say's Phoebe	SAPH	6	35	11	15	11	7	8	11	7	24	17	5	11	16	4	19	8	13	25	34	14	14	12	20	12	4	6	14	13.68	1.00
Black phoebe	BLPH	6	35	9	11	7	6	4	13	8	21	11	7	7	10	5	19	6	13	14	11	15	12	11	15	7	3	3	5	10.50	1.00
Cassin's kingbird	CAKI	1	6	1		2	11	2	1	8	10	2	4	2	13	1	7		5	5	6	8	4	3	8	7	3	4	5	4.61	0.93
Loggerhead shrike	LOSH	1		2					1				1		1	1	3		1				1	1	1	3				0.61	0.43
Western scrub jay	WSJA						2																							0.07	0.04

P. Famolaro
Sweetwater Authority

Christmas Brid Count Data
San Diego Count Circle, Sweetwater Reservoir (Area 16)

Species	Code	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	AVERAGE	DETECTION FREQUENCY
American crow	AMCR		15			300	30	15	1		7		7	4	23	17	12		5	50	9	4	4	3	1	3	2	13	6	18.96	0.79
Common raven	CORA	20	8	6	19	17	13	16	20	18	32	29	18	7	17	50	26	25	30	38	16	10	72	14	75	100	80	20	88	31.57	1.00
Hermit thrush	HETH		1								1																			0.07	0.07
European starling	EUST	10	1	20			4	1		6	1	25			5	14	9	20	6	1	51	5	4		27	5				7.68	0.68
Northern mockingbird	NOMO	1	5	1	5	3	5	1	1	1	6	1			2	2	3		1	4	3	2	2	21	2	1	2	1	1	2.75	0.89
California thrasher	CATH		2			1			1	1				3	1	2	3		3	4		1	2	1	2	1			1	1.04	0.57
Cactus wren	CACWR	3	2	1			2	1				3	2	3		6	4	4	2	1	2	1	6	4	6	2		3	2	2.14	0.75
Rock wren	ROWR		1	1						1										3	2	2	3	2	3			2	1	0.75	0.39
Marsh wren	MAWR		2	2				1	3		1					1	1	1			1		1	1	1			1	2	0.68	0.50
Bewick's wren	BEWR		1		2	1	1		2		1		3		1		1		2	4			7	2	1			1	1	1.11	0.57
House wren	HOWR						1		4		2		1	2	1	1		1	3	2	1	1	2	1	1	2			2	1.00	0.61
Blue-grey gnatcatcher	BGGN	2	4		1	4	1	4	6		4	2	13		5	6	2	2	16	2	3	3	12	1	4			6	6	3.89	0.82
California gnatcatcher	CAGN	15	30	2	10	20	17	18	13	16	15	6	6	4	4	2	5	2	4	13	13	11	7	9	6	8		3	8	9.54	0.96
Bushtit	BUSH	10		7	2		25		25	2	35	1	29	12	12	25	43		40		3		32	22	1	15		25	11	13.46	0.75
Tree swallow	TRSW	4		100	12	50	200	300	200	4	820	500	300	13	251	1200	1580	30	65	13	175	50	350	301	10	500		100	5	254.75	0.93
Violet-green swallow	VGSW												3		10	2	16													1.11	0.14
Rough-winged swallow	RWSW														1		2				4	3		3						0.46	0.18
Barn swallow	BASW		2								4		1		12	3	2	3	12	3		20	4	3		3				2.57	0.46
Ruby-crowned kinglet	RCKI		7	3	2		2	3	1	1	3	6	2							5	1	2							3	1.46	0.50
Wrentit	WREN		2	1					2	3	2	4	2		2									1		1			2	0.79	0.39
Western bluebird	WEBL																						2		1			1		0.14	0.11
Mountain bluebird	MOBL																											2		0.07	0.04
Horned lark	HOLA	100								45									25					1						6.11	0.14
Nutmeg mannikin	NUMA																											3		0.11	0.04
American pipit	AMPI	40	400	41	392	750	200	822	220	272	210	150	144	108	130	70	50	260	150	132	10	60	6	180	56	39	12	6	55	177.32	1.00
American goldfinch	AMGO										1				1	1														0.11	0.11
Lesser goldfinch	LEGO				2	1	49	1	2		1		30	7		8	25		8	3		3		1	2				7	5.36	0.57
House finch	HOFI	50	50	17	230	95	155	30	131	11	188	29	21	266	53	165	30	270	16	11	12	35	15	6	50	16	8		43	71.54	0.96
Fox sparrow	FOSP							1																						0.04	0.04
Song sparrow	SOSP	1	15	7	13	4	2	30	28	6	23	3	2	20	11	4	4	2	13	4	15	5	6	1	9	10	1	2	1	8.64	1.00
Lincoln's sparrow	LISP		2						3	1	2	2				3		1				1			2	1			2	0.71	0.39
Dark-eyed junco	DEJU																						1							0.04	0.04
White-crowned sparrow	WCSP	80	700	28	13	93	163	87	52	52	199	56	23	30	156	30	61	70	330	72	96	65	90	12	57	133	12	25	86	102.54	1.00
Golden-crowned sparrow	GCSP	1																												0.04	0.04
Savannah sparrow	SAVSP	200	150	85	256	173	36	900	63	100	115	295	199	329	120	110	40	70	145	159	79	40	165	94	39	200	6	42	171	156.46	1.00
Lark sparrow	LASP																		2											0.07	0.04
Grasshopper sparrow	GRSP															2		1												0.11	0.07
Rufous-crowned sparrow	RCSP	1		2	1	1	1													1	4	1	2	3	1				1	0.68	0.43
Spotted towhee	SPTO						2		1			2								2			1	1	1	2		3	2	0.61	0.36
California towhee	CALT	30	20	9	11	13	25	5	11	10	20	14	19	21	12	15	10	3	13	7	20	9	6	3	6	14		3	8	12.04	0.96
Orange-crowned warbler	OCWA														1														1	0.07	0.07
Yellow-rumped warbler	YRWA	35	250	9	26	30	47	285	65	57	80	85	41	43	45	43	30	80	175	222	285	120	58	108	47	156	20	90	112	94.43	1.00
Yellow-rumped warbler (Myrtle's)	YRWA (Myrtle's)		1																											0.04	0.04
Palm warbler	WPWA											1																		0.04	0.04
Common yellowthroat	COYE	1	12	10	4	3	3	10	20	3	11	6	3	3	16	3	40	1	10	4	3	3	11	9	9	4		3	9	7.64	0.96
Red-winged blackbird	RWBL	15	15	113	2	11		125	9	27	140	50	122	201	169	23	70	100	46	30	65	27	40	100	130	30	40	6	162	66.71	0.96
Yellow-headed blackbird	YHBL																								2					0.07	0.04
Brown-headed cowbird	BHCO																						2	1						0.11	0.07
Western meadowlark	WEME		110	75	89	135	24	25	47	49	7	229	84	48	45	62	16	25	140	155	130	110	235	69	77	130	30	130	187	87.96	0.96
Great-tailed grackle	GTGR									8	2						6							1		4			6	0.96	0.21
	Total Species	**67**	**76**	**67**	**69**	**65**	**54**	**62**	**78**	**69**	**84**	**72**	**77**	**66**	**74**	**82**	**70**	**70**	**83**	**77**	**77**	**76**	**84**	**91**	**84**	**90**	**45**	**70**	**83**	**73.64**	

Christmas Brid Count Data
San Diego Count Circle, Sweetwater Reservoir (Area 16)

Species	Code	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	AVERAGE	DETECTION FREQUENCY

*Note: total species excludes Peeps and *Aechmorphorus* grebes

1996 team: W. Everett, P. Famolaro, V. Marquez, K. Parker
1997 team: P. Famolaro, F. Kuhr, V. Marquez, A. Mercieca
1998 team: T. Burr, W. Everett, P. Famolaro, V. Marquez, A. Mercieca, K. Parker
1999 team: P, Famolaro, A. Mercieca
2000 team: P. Famolaro, V. Marquez, A. Mercieca, D. Waller
2001 team: P. Famolaro, V. Marquez, A. Mercieca, D. Waller
2002 team: P. Famolaro, V. Marquez, A. Mercieca, D. Waller
2003 team: K. Bender, P. Famolaro, W. Haas, V. Marquez, A. Mercieca, C. Noddings, D. Waller
2004 team: P. Famolaro, V. Marquez, A. Mercieca, T. Murphree, D. Waller
2005 team: P. Famolaro, A. Mercieca, D. Thomson
2006 team: P. Famolaro, V. Marquez, A. Mercieca, D. Thomson, D. Waller
2007 team: P. Famolaro, V. Marquez, A. Mercieca, H. Morris, J. Morris, D. Thomson, D. Waller
2008 team: N. Famolaro, P. Famolaro, V. Marquez, A. Mercieca, N. Molsberry, H. Morris, J. Morris, D. Waller
2009 team: P. Famolaro, V. Marquez, A. Mercieca, N. Molsberry, J. Morris, D. Waller
2010 team: P. Famolaro (pre-count day), V. Marquez, A. Mercieca, J. Morris, D. Waller
2011 team: P. Famolaro, V. Marquez, A. Mercieca, J. Morris, D. Waller
2012 team: P. Famolaro, V. Marquez, A. Mercieca, J. Morris
2013 team: P. Famolaro, I. Marquez, V. Marquez, A. Mercieca, J. Morris, D. Waller
2014 team: C. Famolaro, P. Famolaro, V. Marquez, A. Mercieca, J. Morris, D. Waller
2015 team: C. Famolaro, P. Famolaro, V. Marquez, A. Mercieca, J. Morris, D. Waller
2016 team: C. Famolaro, N. Famolaro, P. Famolaro, A. Huie, D. Huie, J. Morris
2017 team: Tish Berge, Tom Berge, J. Famolaro, N. Famolaro, P. Famolaro, A. Huie, D. Hue, I. Kilpatrick, J. Morris
2018 team: Tish Berge, Tom Berge, C. Famolaro, M. Famolaro, P. Famolaro, A. Huie, D. Hue, I. Kilpatrick, J. Morris
2019 team: M. Famolaro, N. Famolaro, P. Famolaro, I. Kilpatrick, J. Morris
2020 team: P. Famolaro, J. Morris
2021 team: J. Morris
2022 team: P. Famolaro, J. Morris
2023 team: M. Cairns, P. Famolaro, C. Van Oosten

APPENDIX C. KNOWN WILDLIFE SPECIES TABLE

Aquatic Associate Wildlife, Sweetwater Reservoir, San Diego County, CA

CLASSIFICATION	SCIENTIFIC NAME	COMMON NAME(S)	AVIAN OCCURRENCE	NESTING	AVIAN ABUNDANCE (Year)	ORIGIN	FEDERAL / STATE STATUS
Fish	Dorosoma petenense	Threadfin shad				Non-native	
Fish	Notemigonus crysoleucas	Golden shiner				Non-native	
Fish	Ctenopharyngodon idella	Grass carp				Non-native	
Fish	Cyprinus carpio	Common carp				Non-native	
Fish	Ictalurus punctatus	Channel catfish				Non-native	
Fish	Ictalurus catus	White catfish				Non-native	
Fish	Ameiurus natalis	Yellow bullhead catfish				Non-native	
Fish	Ictalurus nebulus	Brown bullhead catfish				Non-native	
Fish	Gambusia affinis	Mosquitofish				Non-native	
Fish	Micropterus salmoides	Large-mouth bass				Non-native	
Fish	Pomoxis annularis.	White crappie				Non-native	
Fish	Pomoxis nigromaculatus	Black crappie				Non-native	
Fish	Lepomis cyanellus	Green sunfish				Non-native	
Fish	Lepomis macrochirus	Bluegill				Non-native	
Fish	Lepomis microlophus	Redear sunfish				Non-native	
Amphibian	Bufo boreas	Western toad					
Amphibian	Pseudacris regilla	Pacific tree frog					
Amphibian	Rana catesbeiana	Bullfrog				Non-native	
Reptile	Chelydra serpentina	Snapping turtle				Non-native	
Reptile	Actinemys marmorata	Westerrn pond turtle					FPT / SSC
Reptile	Chrysemys picta	Painted turtle				Non-native	
Reptile	Trachemys scripta elegans	Red-eared slider				Non-native	
Reptile	Trionyx spiniferus	Spiny softshell				Non-native	
Bird	Anser albifrons frontalis	White-fronted goose	Fall, Winter, Spring	No	Uncommon - Very Common		
Bird	Anser caerulescens caerulescens	Snow goose	Fall, Winter	No	Uncommon		
Bird	Anser rossii	Ross' goose	Winter	No	Rare		
Bird	Branta canadensis	Canada goose	Fall, Winter, Spring	No	Uncommon to Abundant		
Bird	Branta hutchinsii leucopareia	Cackling goose (Aleutian)	Fall, Winter	No	Rare to Uncommon		
Bird	Branta hutchinsii minima	Cackling goose (minima)	Fall, Winter	No	Rare		
Bird	Branta bernicla	Brant	Spring	No	Rare (2023)		
Bird	Cygnus columbianus	Whistling swan	Winter	No	Accidental (1919)		
Bird	Aix sponsa	Wood duck	Winter, Spring	No	Rare		
Bird	Anas strepera	Gadwall	Year round	Probable	Uncommon - Fairly Common		
Bird	Anas americana	American wigeon	Fall, Winter, Spring	No	Very Common		
Bird	Anas platyrhynchos	Mallard	Fall, Winter, Spring	Yes	Common - Very Common		
Bird	Anas discors	Blue-winged teal	Fall, Winter, Spring	No	Uncommon		
Bird	Anas cyanoptera	Cinnamon teal	Year round	Yes	Uncommon		
Bird	Anas clypeata	Northern shoveler	Fall, Winter, Spring	No	Very Common - Abundant		
Bird	Anas acuta	Northern pintail	Fall, Winter, Spring	No	Uncommon - Common		
Bird	Anas crecca	Green-winged teal	Fall, Winter, Spring	No	Fairly Common to Very Common		
Bird	Aythya valisineria	Canvasback	Fall, Winter, Spring	No	Uncommon		- / SSC (nesting)
Bird	Aythya americana	Redhead	Fall, Winter, Spring	No	Uncommon		- / SSC (nesting)
Bird	Aythya collaris	Ring-necked duck	Fall, Winter, Spring	No	Uncommon - Fairly Common		
Bird	Aythya affinis	Lesser scaup	Fall, Winter, Spring	No	Uncommon - Fairly Common		
Bird	Melanitta perspicillata	Surf scoter	Winter	No	Rare		
Bird	Clangula hyemalis	Long-tailed duck	Winter	No	Rare		
Bird	Bucephala albeola	Bufflehead	Fall, Winter, Spring	No	Uncommon - Fairly Common		
Bird	Bucephala clangula americana	Common goldeneye	Winter	No	Uncommon		

Compiled by P. Famolaro
Sweetwater Authority
7-23-2024

CLASSIFICATION	SCIENTIFIC NAME	COMMON NAME(S)	AVIAN OCCURRENCE	NESTING	AVIAN ABUNDANCE (Year)	ORIGIN	FEDERAL / STATE STATUS
Bird	Lophodytes cucullatus	Hooded merganser	Fall, Winter	No	Uncommon		
Bird	Mergus merganser	Common merganser	Fall	No	Rare		
Bird	Mergus serrator	Red-breasted merganser	Fall, Winter, Spring	No	Rare		
Bird	Oxyura jamaicensis	Ruddy duck	Year round	No	Fairly Common - Very Common		
Bird	Gavia stellata	Red-throated loon	Winter	No	Rare		
Bird	Gavia pacifica	Pacific loon	Spring	No	Accidental (2023)		
Bird	Gavia immer	Common loon	Winter	No	Rare		- / SSC (nesting)
Bird	Podilymbus podiceps	Pied-billed grebe	Year round	Yes	Uncommon - Fairly Common		
Bird	Podiceps auritus	Horned grebe	Winter, Spring	No	Uncommon		
Bird	Podiceps grisegena	Red-necked grebe	Winter	No	Accidental (1970)		
Bird	Podiceps nigricollis californicus	Eared grebe	Fall, Winter, Spring	Probable	Uncommon - Fairly Common		
Bird	Aechmophorus occidentalis	Western grebe	Year round	Yes	Very Common		BCC / -
Bird	Aechmophorus clarkii	Clark's grebe	Year round	Yes	Very Common - Abundant		BCC / -
Bird	Oceanodroma microsoma	Least storm-petrel	Summer	No	Accidental (2023)		
Bird	Pelecanus erythrorhynchos	American white pelican	Year round	No	Common - Very Common		- / SSC (nesting colony)
Bird	Pelecanus occidentalis californicus	California brown pelican	Year round	No	Uncommon to Common		F-Delisted / S-Delisted, CFP
Bird	Phalacrocorax auritus albociliatus	Double-crested cormorant	Year round	Yes	Farily Common - Very Common		- / WL (nesting colony)
Bird	Phalacrocorax brasilianus	Neotropic cormorant	Summer, Fall	No	Uncommon		
Bird	Anhinga anhinga	Anhinga	Year round	No	Accidental (1977-1980)		
Bird	Botaurus lentiginosus	American bittern	Winter, Spring, Summer	No	Rare		
Bird	Ixobrychus exilis hesperis	Least bittern	Summer, Fall	Probable	Uncommon		- / SSC (nesting)
Bird	Ardea herodias	Great blue heron	Year round	No	Uncommon - Fairly Common		
Bird	Casmerodius albus	Great egret	Year round	No	Uncommon - Fairly Common		
Bird	Egretta thula	Snowy egret	Year round	No	Uncommon - Fairly Common		
Bird	Egretta ibis ibis	Cattle egret	Fall, Winter, Spring	No	Rare		
Bird	Butorides virescens	Green heron	Year round	Yes	Uncommon		
Bird	Nycticorax nycticorax	Black-crowned night heron	Year round	No	Uncommon to Farily Common		
Bird	Plegadis chihi	White-faced ibis	Year round	No	Uncommon - Common		- / WL (nesting colony)
Bird	Pandion haliaetus carolinensis	Osprey	Year round	No	Uncommon		- / WL (nesting)
Bird	Haliaeetus leucocephalus	Bald eagle	Year round	Yes	Uncommon		F-Delisted, BGEPA / SE, CFP (nesting & wintering)
Bird	Circus cyaneus	Northern harrier	Year round	Yes	Uncommon		BCC / SSC (nesting)
Bird	Falco peregrinus	Peregrine falcon	Year round	No	Uncommon		F-Delisted / S-Delisted, CFP (nesting)
Bird	Rallus obsoletus levipes	Light-footed Ridgway's rail	Spring	No	Rare		FE / SE
Bird	Rallus limicola limicola	Virginia rail	Year round	Probable	Uncommon		
Bird	Porzana carolina	Sora	Year round	No	Uncommon		
Bird	Gallinula chloropus	Common gallinule	Year round	Yes	Uncommon		
Bird	Fulica americana	American coot	Year round	Yes	Abundant		
Bird	Pluvialis sqautarola	Black-bellied plover	Fall	No	Uncommon		
Bird	Charadrius semipalmatus	Semipalmated plover	Summer, Fall, Winter	No	Uncommon		
Bird	Charadrius vociferus	Killdeer	Year round	Yes	Uncommon to Fairly Common		
Bird	Himantopus mexicanus	Black-necked stilt	Year round	Yes	Uncommon		
Bird	Recurvirostra americana	American avocet	Year round	Yes	Uncommon to Fairly Common		
Bird	Tringa melanoleuca	Greater yellowlegs	Year round	No	Uncommon - Fairly Common		
Bird	Tringa flavipes	Lesser yellowlegs	Spring, Fall	No	Uncommon		
Bird	Tringa solitaria	Solitary sandpiper	Fall	No	Uncommon		
Bird	Actitis macularius	Spotted sandpiper	Year round	No	Uncommon - Fairly Common		
Bird	Numenius phaeopus	Whimbrel	Spring, Fall	No	Uncommon		
Bird	Numenius americanus	Long-billed curlew	Fall, Winter, Spring	No	Uncommon to Fairly Common		- / SSC

CLASSIFICATION	SCIENTIFIC NAME	COMMON NAME(S)	AVIAN OCCURRENCE	NESTING	AVIAN ABUNDANCE (Year)	ORIGIN	FEDERAL / STATE STATUS
Bird	Limosa fedoa	Marbled godwit	Spring, Summer, Fall	No	Uncommon to Fairly Common		
Bird	Arenaria interpres	Ruddy turnstone	Fall	No	Rare		
Bird	Calidris pusilla	Semipalmated sandpiper	Fall	No	Uncommon		
Bird	Calidris mauri	Western sandpiper	Fall, Winter, Spring	No	Common - Abundant		
Bird	Calidris minutilla	Least sandpiper	Fall, Winter, Spring	No	Very Common - Abundant		
Bird	Calidris bairdii	Baird's sandpiper	Fall	No	Uncommon		
Bird	Calidris melanotos	Pectoral sandpiper	Fall	No	Uncommon		
Bird	Calidris alpina pacifica	Dunlin	Fall, Winter	No	Uncommon		
Bird	Calidris himantopus	Stilt sandpiper	Fall	No	Rare		
Bird	Limnodromus griseus	Short-billed dowitcher	Summer, Fall	No	Uncommon		
Bird	Limnodromus scolopaceus	Long-billed dowitcher	Year round (not June)	No	Fairly Common to Common		
Bird	Gallinago delicata	Wilson's snipe	Fall, Winter, Spring	No	Uncommon		
Bird	Phalaropus tricolor	Wilson’s phalarope	Fall	No	Uncommon		
Bird	Phalaropus lobatus	Red-necked phalarope	Spring, Fall	No	Uncommon		
Bird	Larus atricilla	Laughing gull	Summer	No	Rare (2022)		
Bird	Larus pipixcan	Franklin’s gull	Winter, Spring	No	Rare		
Bird	Larus philadelphia	Bonaparte's gull	Fall, Winter, Spring	No	Uncommon		
Bird	Larus canus	Mew gull	Winter	No	Accidental (1963)		
Bird	Larus delawarensis	Ring-billed gull	Fall, Winter, Spring	No	Common - Very Common		
Bird	Larus californicus	California gull	Year round	No	Fairly Common to Common		BCC / WL
Bird	Larus argentatus smithsonianus	Herring gull	Fall, Winter, Spring	No	Uncommon		
Bird	Larus thayeri	Thayer's gull	Fall, Winter, Spring	No	Uncommon		
Bird	Larus occidentalis	Western gull	Year round	No	Common - Abundant		BCC / -
Bird	Larus glaucescens	Glaucus-winged gull	Winter	No	Rare		
Bird	Larus hyperboreus	Glaucus gull	Spring	No	Uncommon		
Bird	Rissa tridactyla pollicaris	Black-legged kittiwake	Spring	No	Accidental (1995)		
Bird	Sterna nilotica	Gull-billed tern	Summer	No	Rare		
Bird	Sterna caspia	Caspian tern	Year round	No	Uncommon		
Bird	Sterna elegans	Elegant tern	Spring, Summer	No	Uncommon		
Bird	Sterna hirundo	Common tern	Summer	No	Rare		
Bird	Sterna forsteri	Forster’s tern	Year round	No	Uncommon - Common		
Bird	Sterna antillarum	Least tern	Spring, Summer	No	Rare		FE / SE, CFP
Bird	Chlidonias niger	Black tern	Fall	No	Accidental (1958)		
Bird	Chaetura vauxi vauxi	Vaux’s swift	Fall, Winter, Spring	No	Uncommon - Common		- / SSC (nesting)
Bird	Aeronautes saxatalis	White-throated swift	Year round	Yes	Fairly Common - Abundant		
Bird	Ceryle alcyon	Belted kingfisher	Year round	Yes	Uncommon		
Bird	Progne subis	Purple martin	Spring	No	Rare		
Bird	Tachycineta bicolor	Tree swallow	Year round	Yes	Fairly Common - Abundant		
Bird	Tachycineta thalassina lepida	Violet-green swallow	Fall, Winter	No	Uncommon - Fairly Common		
Bird	Stelgidopteryx ruficollis	Northern rough-winged swallow	Winter, Spring, Summer	Yes	Uncommon - Very Common		
Bird	Riparia riparia	Bank swallow	Winter, Spring, Fall	No	Uncommon		
Bird	Petrochelidon pyrrhonota	Cliff swallow	Winter, Spring, Summer	Yes	Very Common - Abundant		
Bird	Hirundo rustica	Barn swallow	Year round	Yes	Uncommon - Common		
Mammal	Macrotus californicus	California leaf-nosed bat					- / SSC
Mammal	Choeronycteris mexicana	Mexican long-tounged bat					- / SSC
Mammal	Myotis yumanensis	Yuma myotis					
Mammal	Myotis evotis	Long-eared myotis					
Mammal	Myotis thysanodes	Fringed myotis					

Aquatic Associate Wildlife, Sweetwater Reservoir, San Diego County, CA

CLASSIFICATION	SCIENTIFIC NAME	COMMON NAME(S)	AVIAN OCCURRENCE	NESTING	AVIAN ABUNDANCE (Year)	ORIGIN	FEDERAL / STATE STATUS
Mammal	Myotis volans	Long-legged myotis					
Mammal	Myotis californicus	California myotis					
Mammal	Myotis liebii (=ciliolabrum)	Small-footed myotis					
Mammal	Pipistrellus hesperus	Western pipistrelle					
Mammal	Eptesicus fuscus	Big brown bat					
Mammal	Lasiurus frantzii	Western red bat					- / SSC
Mammal	Lasiurus cinereus	Hoary bat					
Mammal	Antrozous pallidus	Pallid bat					- / SSC
Mammal	Tadarida brasiliensis	Mexican free-tailed bat					
Mammal	Nyctinomops femorosaccus	Pocketed free-tailed bat					- / SSC
Mammal	Eumops perotis	Western mastiff bat					- / SSC

Avian occurrence records prepared in collaboration with P. Lehman using *Birds of Sweetwater Reservoir* (E.A. Copper, no date), *An Annotated List of the Birds of Sweetwater Reservoir* (compiled by W. T. Everett, no date), P. Famolaro field notes (1995-2024), and P. Lehman field notes (2015-2024)

AVIAN ABUNDANCE (modified from *Unitt. P. 1984. The Birds of San Diego County. San Diego National History Museum*)
Accidental: very rare occurrence, often associated with Pacific storm events
Rare: found on average less than once per day
Uncommon: 1 to 6 per day
Fairly Common: 7 to 20 per day
Common: 20 to 50 per day
Very Common: 50 to 200 per day
Abundant: over 200 per day

FEDERAL / STATE STATUS
BGEPA = Bald and Golden Eagle Protection Act
CFP = California Fully Protected
F = Federal
FE = Federally Endangered
FPT = Federally Proposed Threatened
S = State
SE = State Endangered
SSC = CDFW Species of Special Concern
WL = CDFW Watch List

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December 5, 2024

Mr. Israel Marquez
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Subject: Draft Technical Memorandum Assessing the Influence of Floating Solar Photovoltaic Systems on Water Quality in the Sweetwater Reservoir

As described in further detail below, the impacts of floating photovoltaic (FPV) systems on lake water parameters is an emerging research area. Sweetwater Reservoir has its own unique water quality parameters that likely differ from the available literature studies summarized herein, and while some impacts from FPV systems were observed in the literature, local conditions may result in different outcomes. However, as this relates to the CEQA question of whether this project would: "Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?", it is WSP's determination that there is a low potential for adverse water quality impacts to the Sweetwater Reservoir. The coverage of the proposed FPV system would not be enough to impact to lake hydrodynamics, internal cycling, or contribute levels of leachate at concentrations of concern. Nevertheless, in an abundance of caution, WSP has made several recommendations to ensure that impacts to water quality standards do not occur as result of the proposed FPV system, including: compliance with NSF-61 certification requirements; use of PFAS-free solar panels; development and implementation of a water quality monitoring plan; bio-foul and quagga mussel inspections; bird deterrents and/or maintenance program for bird droppings; and the development and implementation of a maintenance and monitoring program.

1 INTRODUCTION

The dual purpose of this technical memorandum is to assess the potential water quality impacts associated with the proposed Sweetwater Reservoir FPV System Project and to provide recommendations avoid or mitigation those impacts. After a thorough review of current peer-reviewed literature and the significant experience of WSP's Aquatic Science Group in monitoring water quality in lakes throughout Southern California, we have found several categories/issues that should be considered in the design and prior to the installation of the proposed FPV system. As the installation of FPV systems are still a burgeoning alternative to land based solar panels, there remains a knowledge gap in the potential for repercussions on surrounding environments. Study sites within the literature have a wide range of physical characteristics that make comparison difficult; however, most studies have concluded that, depending on the size of the FPV system as a percentage of the water body surface, FPV systems could alter water quality parameters to differing degrees. WSP categorized and reviewed available research into three general categories:

- Scalability
- Physical Parameters
- Metal Leaching

2 SCALABILITY

The Sweetwater River Watershed encompasses 230-square miles and includes the Sweetwater Reservoir and the Loveland Reservoir. Seasonally, in the winter and spring months, the Sweetwater River flows into the Sweetwater Reservoir from natural runoff and periodically from water transfers from Loveland Reservoir. Incoming water is held by Sweetwater Reservoir Dam. The capacity of the Sweetwater Reservoir extends to 239 feet above mean sea level (AMSL) with the elevation of the dam spillway at the western edge of the Reservoir. Annual rainfall in the area (measured from 1990 to 2019) averages 11.15 inches as registered at the El Cajon Station (U.S. Department of Agriculture [USDA] 2020 from Authority 2020). From the Sweetwater Reservoir Dam, water flows approximately 8.3 miles west through the Sweetwater River before discharging into San Diego Bay.

The study area receives water from the Sweetwater River flowing from the east and is periodically inundated based on storage capacity and water use needs of the Sweetwater Reservoir. The capacity of the Sweetwater Reservoir extends to 239 feet with the elevation of the dam spillway at the western edge of the Reservoir. Sweetwater Reservoir peak elevation data (1990-2023) is presented in Table 1 below as provided by the Sweetwater Authority (Authority 2024).

Table 1. Sweetwater Reservoir Annual Peak Elevations (1990-2024)

Year	Date of Annual Peak Elevation	Elevation (feet AMSL)
1990	May 1	220.0
1991	April 5	230.3
1992	March 30	223.3
1993	January 19	239.5
1994	January 1	231.4
1995	April 21	239.3
1996	January 14	231.3
1997	April 27	226.0
1998	May 19	239.1
1999	January 29	235.0
2000	March 6	226.1
2001	April 24	225.2
2002	May 1	213.2
2003	May 4	224.6
2004	May 29	223.5
2005	March 11	233.9
2006	March 5	231.7
2007	July 11	221.9
2008	March 24	223.8
2009	April 22	220.9
2010	April 14	229.0
2011	June 4	230.1
2012	February 16	231.8
2013	February 11	220.8

Table 1. Sweetwater Reservoir Annual Peak Elevations (1990-2024)

Year	Date of Annual Peak Elevation	Elevation (feet AMSL)
2014	April 11	198.6
2015	March 5	197.7
2016	February 1	197.0
2017	March 23	224.6
2018	January 1	213.1
2019	March 24	224.7
2023	June 16	229.19

Notes: Data provided by Authority 2024. AMSL = above mean sea level

At Sweetwater Reservoir, the Sweetwater Authority (Authority) is proposing to deploy the following FPV systems:

1. AquaPhi™ Pilot: A solar array that would provide autonomous tracking of the sun and would cover up to 0.25 acre of the reservoir surface.

2. Renewable Energy Self-Generation, Bill Credit Transfer (RES-BCT) System: The Authority is considering two potential alternative layouts for the RES-BCT System:

    a. Design Alternative 1: An approximately 9.4-acre array of solar panels attached to a buoyant high-density polyethylene (HPDE) racking system that would be fixed in place with cables and anchors; or

    b. Design Alternative 2: An approximately 7.4-acre array consisting of seven FPV islands that would use the AquaPhi™ autonomous thruster technology to track the sun.

As shown in Table 1, the reservoir level fluctuates significantly over the course of the year due to evaporation, water extraction for treatment, operational water transfers, and over the course of several years dependent upon annual seasonal rainfall. The AquaPhi™ Pilot would cover approximately 0.09 percent of the total reservoir surface area at minimum lake level and approximately 0.03 percent at maximum capacity. The RES-BCT system would cover between approximately 3.48 to 0.96 percent of the total reservoir surface area under Design Alternative 1, and between 2.74 to 0.76 percent for Design Alternative 2, at minimum lake level and maximum capacity, respectively.

Table 2. Surface Area of Proposed FPV System at Minimum Lake Level and Maximum Capacity

	Surface Area Minimum Lake Level	Surface Area Maximum Capacity
SWEETWATER RESERVOIR	270 acres	986 acres
	Reservoir area surface coverage percentage, minimum pool	Reservoir area surface coverage percentage, full reservoir
AQUAPHI PILOT (0.25 acre)	0.09%	0.03%

Table 2. Surface Area of Proposed FPV System at Minimum Lake Level and Maximum Capacity

	Surface Area Minimum Lake Level	Surface Area Maximum Capacity
RES-BCT - DESIGN ALTERNATIVE 1 (9.4 acres)	3.48%	0.96%
RES-BCT - DESIGN ALTERNATIVE 2 (7.4 acres)	2.74%	0.76%

Most of the published field-collected research data investigating the impact of FPV systems on waterbodies started at 2-percent surface coverage, while studies that utilized lake modeling started incrementally at 1-percent surface coverage. Haas et al. (2020) conducted a study to understand the effects of FPV systems on algal biomass. The findings suggest that if the water surface coverage is less than 40 percent, the FPV systems do not significantly impact the phytoplankton community. However, when the coverage ranged between 40 and 60 percent, there was a statistically significant reduction in algal biomass. Considering that even the maximum configuration of the RES-BCT system (i.e., Design Alternative 1 covering up to 9.4 acres), would only cover 3.48 percent of the Sweetwater Reservoir surface at minimum lake level, it is unlikely that the proposed FPV system would have significant impacts on algal biomass.

3 PHYSICAL PARAMETERS

Lake Maiwald, located in the Upper Rhine Valley, Southwest Germany, recently installed FPV systems and monitored their effects towards lake water temperature and stratification (Ilgen et al. 2023). At Lake Maiwald, 0.77 hectares (ha) of the 37 ha was covered by FPV systems, roughly a 2 percent coverage. They found that as a result of the FPV systems, there was a shorter thermal stratification during summer and a 73-percent reduction in irradiance on the lake surface beneath the panels, as well as a surface wind speed reduction of 23 percent. Hydrological modelling indicated that as FPV system coverage increased the thermocline would shift to lower depths which could have implications to overall lake thermal properties. However, it should be noted that Lake Maiwald is much smaller, with a surface area of 91 acres, than Sweetwater Reservoir, with a surface area of 986 acres at maximum capacity and 270 acres at minimum lake level. Therefore, potential impacts to the Sweetwater Reservoir would likely be reduced. Ilgen et al. (2023) indicated that during their 3-month study, the effects of the 2-percent FPV system coverage were concentrated near the surface (i.e., 0 to 5 meters) rather than deeper layers (i.e., 5 to 10 meters). Exley et al. (2022) used a model to simulate windspeed and solar radiation using an iterative lake surface coverage approach from 0 to 100 percent at 1-percent intervals. Assuming that surface coverage is negatively correlated with forcing variables (i.e., wind speed and solar radiation), they concluded that responses were extremely variable and nonlinear. The most common model result showed that temperatures were reduced, stratification shortened, and mixed depths became shallower as the percentage of FPV system coverage increased. Only when wind speed was reduced, and solar radiation increased substantially, was there a considerable effect on increasing surface temperatures. However, it was suggested that it would require significant coverage of the lake surface to disrupt the lake's normal cycles. The proposed FPV system at Sweetwater Reservoir is relatively smaller, covering up to just 3.48 percent of the water body surface. Due to the relatively small area of the FPV system as compared to the total reservoir area temperatures, stratification, and mixed depths within the reservoir would not be significantly impacted.

Yang et al. (2022) utilized a lake model in combination with field measurements to investigate the influence of a hypothetical 104-acre FPV system in a 643-acre shallow tropical reservoir in Singapore. Their model found that the

reservoir experienced changes to lake water quality where the FPV system was located due to a combination of convective heating from the panels and shading, when using 30 percent lake coverage. However, the model indicated that the temperature increase was only 0.3 degrees Celsius (°C) and only at the surface of the water immediately beneath the panels, likely due to convective heating radiating from the panels heating the space between the panels and the water. Field measurements from their 1-ha demonstration were consistent with the modeling, showing less mixing in the water column as a result of a more stable water conditions observed under the panels. Total nitrogen (TN) and total phosphorous (TP) concentrations increased by 10 percent and 30 percent, respectively underneath the panels. Samples of TN and TP were also collected outside of the FPV system shielding range and showed an increase of 5 percent TN and 20 percent TP during the same time period. Net total chlorophyll-a decreased under the panels by 20 percent at the surface and by 30 percent at the bottom compared to open water measurements. DO concentrations were slightly lower under the solar panels than in open water reference areas (i.e., 4.6 milligrams per Liter [mg/L] maximum under the FPV system as compared to 6.0 mg/L minimum in open water). Total organic carbon (TOC) values decreased by 15 percent under the FPV system, relative to the open water sites. Yang et. al (2022) attributed these differences to the decrease in light penetration as a result of shielding from the FPV system, resulting in decreased algal metabolism and nutrient uptake by algae. De Lima et al., (2021) recorded in-situ data before and after construction of FPV systems to understand how ecology and water quality were affected by FPV systems. Their results differed somewhat from Yang et al. (2022) but echoed other agency deployments with a slight decrease in surface water temperature directly underneath the FPV systems. The maximum recorded temperature for the reference site outside the influence of the FPV systems was 26.6°C, while only 25.3°C under the FPV systems. Temperature gradients were correlated with shading effects from blocked solar radiation. Within the next 2 years, Sweetwater Reservoir will have an aeration and destratification system, the project is currently going through the environmental permitting process. The aeration system will help achieve health DO levels, prevent reservoir stratification and subsequent fall turnover events, reduce the frequency of algal blooms, reduce TOC, and reduce nutrient levels (i.e. TN & TP). A water quality monitoring plan would also be developed and implemented to ensure other water quality parameters are not affected by the installation and operation of the FPV system at the Sweetwater Reservoir (see Section 5, *Conclusions and Recommendations*).

Another potential concern to consider is the impact of biofouling bivalves and birds can have on both water quality and FPV system efficiency. Observations from the study by De Lima et al. (2021) indicated that after only a few months, the submerged portions of the floatation blocks supporting the FPV system were covered in bivalves and biofouling. Sweetwater Reservoir is known to have Quagga mussels (*Dreissena bugensis*), which could pose a fouling issue. Maintenance of both the floatation blocks and solar panels should be considered when determining maintenance activity schedules and costs (see Section 5, *Conclusions and Recommendations*). With the introduction of a FPV system, there is also an opportunity to establish additional space for bird roosting. De Lima et al (2021) found that birds were taking advantage of a new resting place on the water, and it quickly became contaminated with bird droppings. The concentrated bird droppings underneath an FPV system could pose a threat to water quality in the immediate area with the high nutrient influx particularly after runoff from a rain event. There is also the potential of system efficiency loss as bird droppings accumulate on the panels. The Authority would consider bird deterrents (e.g., reflectors, ultrasonic devices, bird of prey decoys, etc.) may be considered as potential solutions (see Section 5, *Conclusions and Recommendations*). Ziar et al. (2020) took a closer look into efficient design of FPV systems to assist in developing concepts to produce maximum energy efficiency. They observed that one of major contributors to a reduction in short-term panel efficiency was the additional presence of birds and their droppings on the panels. However, despite the presence of bird nesting in their FPV system, their field water quality observations did not detect significant changes in parameters including TN, TP, chlorophyll-a, or cyanobacteria. There were however changes in plant biomass directly underneath the panels and an increase in frequency of DO concentrations lower than 6.0 mg/L.

The condition of the phytoplankton community is another potential concern. Exley et al. (2022) modeled the impacts of FPV systems on phytoplankton populations and other parameters across increasing FPV system coverage (10-percent increments) from 0 to 100 percent. Results of this model showed similar results of net cooling

of surface water and a shift to the lake's stratification regime. Median total chlorophyl-a was monitored in three different scenarios with varying water flow speeds. All scenarios resulted in an annual decrease in chlorophyl-a concentration as the percentage of FPV system son the surface increased. The relative proportion of phytoplankton was variable across the different scenarios; however, it was deduced that cooler temperatures due to shading effects from FPV systems slowed phytoplankton growth by reducing metabolic rates. Adjustments to wind sheltering and reduced solar radiation create a less stratified water column and could assist phytoplankton in accessing pools of nutrients in the lower water column, creating a trend towards the lower light tolerant species. In their modeling, cyanobacteria did not exhibit population changes across any of the FPV system coverage scenarios.

Given the size of the proposed FPV system in relation to the Sweetwater Reservoir, adverse impacts to physical parameters, such as temperature, may be insignificant. Many of the physical parameters discussed here in could be mitigated if the recommendations in Section 5, *Conclusions and Recommendations* are followed. However, close coordination with regulatory agencies is necessary during the preparation of any maintenance or monitoring plan. Proper implementation of maintenance activities would assist reducing any impacts to water quality from potential bio-fouling, quagga mussels, or bird droppings.

4 METAL AND PFAS LEACHING

Another consideration is the potential leaching of problematic contaminants from the panels and/or their supporting materials. Robinson et al. (2019) investigated soil beneath PV systems to determine if metals and metalloids were leaching. The study found that selenium, strontium, lithium, nickel, and barium levels were all higher in proximity to the PV system, while there were no significant differences in cadmium or lead concentrations. Results were compared against U.S. Environmental Protection Agency (USEPA) Ecological Soil Screening Level thresholds and were determined to be well below the wildlife risk threshold. This study was not conducted in an aquatic environment, and its authors warned that most leaching from PV systems occurs due to degradation of panels from water exposure. In another laboratory experiment conducted by Mathijssen et al. (2022), leaching of heavy metals from both the PV panels and flotation device were analyzed in a water exposure experiment. They found that at 20°C aluminum, copper, manganese and zinc were the only metals detected as leaching from the FPV system; however they were below the Dutch drinking water standards.

Research on the effects of per- and polyfluoroalkyl substances (PFAS) usage in solar infrastructure and end-of-life management is ongoing (USEPA 2021; Way 2018). While the USEPA has reported use of some PFAS in the development of solar infrastructure, compared to other consumer products and energy sectors (e.g., fossil fuels), studying the potential hazards of PFAS in the solar industry is considered low prioritization, and the use of PFAS has not been identified as a primary concern (Henry et al. 2018; Glüge et.al. 2020; Fernandez et al. 2021; USEPA 2021; Way 2018).

To date, comprehensive research studies have not been conducted to directly measure runoff from solar panels that contain PFAS. However, recent evidence suggests water runoff from solar panel installations does not contribute to the presence of PFAS in groundwater (New Hampshire Department of Environmental Services 2018; . Massachusetts Department of Environmental Protection 2021). Nevertheless, in an abundance of caution, WSP recommends the use of PFAS-free solar panels, which are readily available and would eliminate the potential for any potential leaching of PFAS into the Sweetwater Reservoir.

5 CONCLUSIONS AND RECOMMENDATIONS

The impacts of FPV systems on lake water parameters is an emerging research area. As more governing agencies look to utilize lake space for solar power efficiency, monitoring lake water quality changes will be important to understand. Sweetwater Reservoir has its own unique water quality parameters that likely differ from the available

literature studies covered here, and while some impacts from FPV systems were observed in the literature, local conditions may result in different outcomes. As this relates to the CEQA question of whether this project would: "Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?", it is WSP's determination that there would be minimal concerns with adverse water quality impacts to Sweetwater Reservoir with the size installation of the FPV system that is currently planned; there would be no violations in water quality because the currently proposed FPV system coverage would not be enough to result in an impact to lake hydrodynamics, internal cycling, or contribute levels of leachate at concentrations of concern. This is primarily based on the size of the FPV system.

Nevertheless, in an abundance of caution, the following recommendations are suggested, to ensure impacts to water quality standards do not occur as result of the proposed FPV system:

1. Recommendation No. 1. Comply with NSF-61 Requirements when applicable. To safeguard the water source from contamination, a FPV system must adhere to the NSF-61 certification requirements. The certification process begins with the full disclosure of all materials and substances incorporated in the product. Following this, a thorough engineering and chemical review is conducted to assess all used ingredients and materials. An inspection of all manufacturing facilities involved in the production of the certified product is also carried out. The product is then subjected to chemical leachate testing to confirm that it does not introduce any harmful contaminants to drinking water. A toxicology review of the chemicals leached from the product is performed. Lastly, every component of the FPV system that is in contact with the water must be certified. This certification is a testament to the safety of the FPV system, ensuring it poses low to no risk to the lake's potable water.

2. Recommendation No. 2. PFAS-Free Solar Panels. The Authority should consider the use of PFAS-free solar panels (e.g., Solarge's SOLO panels; see https://solarge.com/en/), and obtain them from a company that has performed PFAS soak tests on their panels, to determine possible leaching rates of any other constituents that may be harmful to water quality.

3. Recommendation No. 3. Develop Water Quality Monitoring Plan. It would be prudent to develop a water quality monitoring plan for the pilot project to inform efficacy and/or design of a larger FPV system. This program should consider measuring full water quality profiles of the water column at 1-meter intervals (pH, dissolved oxygen, specific conductivity, temperature, ORP), collection of water samples for metals, nutrients (total nitrogen, total phosphorus, ammonia, nitrate, nitrite, total kjeldahl nitrogen), fecal indicator bacteria (in the case of excessive bird roosting), PFAS, and chlorophyll-a at a minimum of one near-field and one far-field location relative to the FPV system location.

4. Recommendation No. 4. Bio-foul and Quagga Mussel Inspections. The floating devices for the panels will likely accumulate biofoul that could impact the functionality of the systems. If the larger RES-BCT system is installed there is also the possibility for Quagga Mussel infestation on the underwater floats and anchoring system. This would require regular maintenance, such as mechanical removal to keep the lines and floats clear of bio-foul and mussels. It is possible that the AquaPhi™ system might reduce the frequency of necessary cleaning as it is free-floating. Regardless of which design alternative is ultimately install, the Authority should include, as part of their operations and maintenance plan, inspections for bio-foul and quagga mussels on the system, should conduct scrapping as needed, and other maintenance activities as needed.

5. Recommendation No. 5. Bird Droppings Mitigation. Given the possibility of the FPV system developing into a place for bird roosting and becoming a source of excessive nutrients/bacteria to the lake, a plan should be developed to either have bird deterrent/exclusion devices installed, and/or a regular cleaning and maintenance program for the panels. The Plan should be developed in coordination of the applicable

regulatory and permitting agencies, to ensure compliance with existing water quality and migratory bird regulations.

6. Recommendation 6. Maintenance and Monitoring Program. A maintenance and monitoring program to maintain all the associated facilities and monitor any changes in water quality will be important to implement as the FPV system project moves forward. Authority staff should coordinate with the water quality and drinking water regulatory agencies during the preparation of such maintenance and monitoring program.

Thank you for your time and consideration of these comments. If you have questions, please contact John Rudolph at john.rudolph@wsp.com.

Sincerely,

John Rudolph
Senior Aquatic Scientist
WSP USA, Inc.

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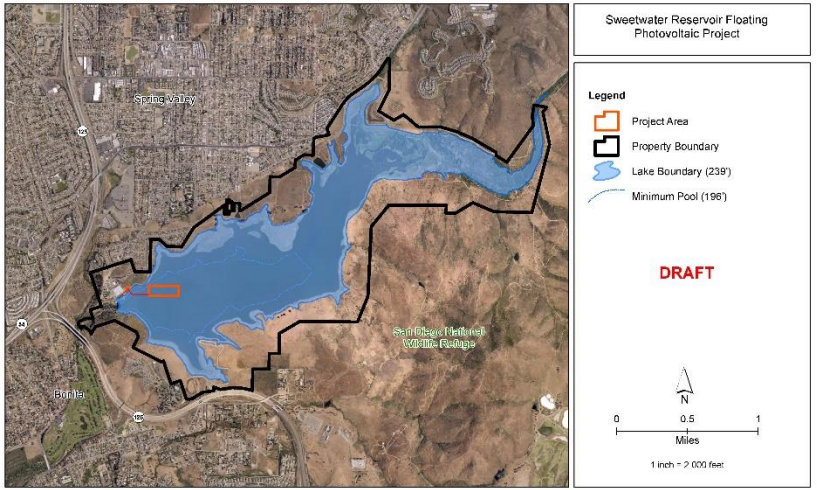
12/14/2024

Sweetwater Reservoir Floating Photovoltaic Project Next Steps

Israel Marquez, CPSWQ, QSD
Interim Engineering Manager – Water Resources and Environmental

Introduction

- SWA is studying the feasibility of a floating photovoltaic (FPV) system at Sweetwater Reservoir
- The Proposed FPV system would reduce approximately 66% of SWA's carbon footprint, and result in approximately $500,000 of savings to SWA, annually
- In collaboration with Noria Energy, two potential Design Alternatives and a Pilot Project were analyzed by WSP USA Environment and Infrastructure
- SWA staff is recommending the preparation of a CEQA-compliant Environmental Impact Report for the Proposed Project



Background

Benefits of Renewable Energy

- SWA and State of California sustainability goals
- Reducing carbon emissions from SWA's Operations
- Lowering energy costs
- Energy independence
- Clean energy job creation
- Environmental justice
- Cleaner air and water
- Climate change mitigation and adaptation
- Reduce resilience on fossil fuels
- Good for the planet and future generations!

Background (cont.)

Why Floating Solar at Sweetwater Reservoir?

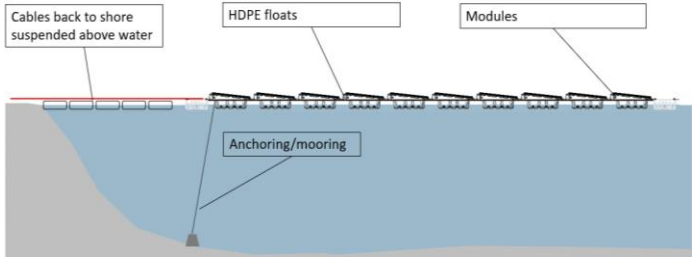
- FPV systems don't require the conversion of sensitive habitats or other undeveloped real estate into solar farms
- Depending on water levels, only **1.3% to 3.6%** of the surface area of the reservoir would be dedicated to the FPV system
- FPVs benefit from the water below as it provides a cooling effect, increasing efficiency of panels by approximately 15%
- May assist reducing evaporation ("water losses") within the covered area

Design Alternative 1 from the Sweetwater Summit Regional Park Community Room. Due to the elevation of the community room, the proposed FPV system is visible in the background. However, sweeping views of the lake and the hilly topography in the background remain.

Project Components

Design Alternative 1 – Rectangular FPV system

- Approximately 9.4 acres of FPVs
- FPVs to be attached to a buoyant HDPE racking system
- Multiple concrete-block anchors, to secure FPV system
- Cables back to shore, as needed, to secure FPV system
- Electrical conduits would be on floats, then buried (once above 239’ elevation)
- No digging, drilling, or other disturbance of the reservoir floor would be required



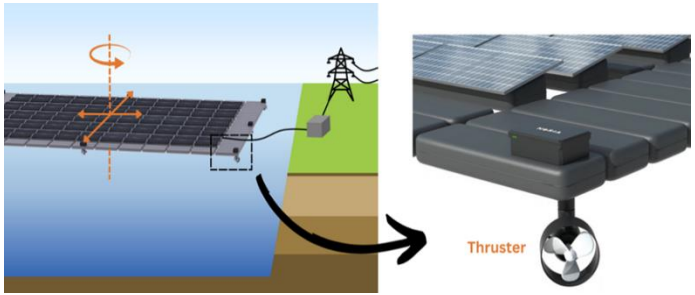
Project Components (cont.)

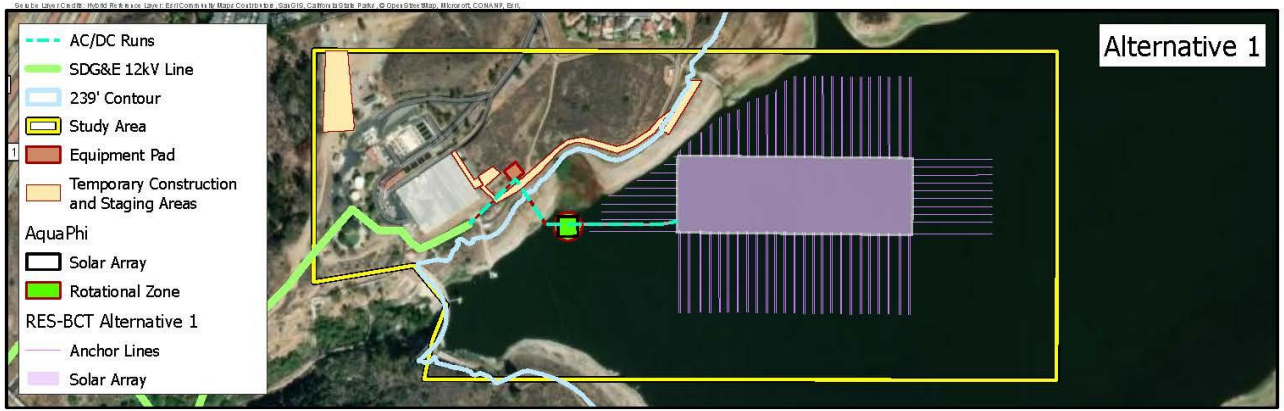
Design Alternative 2 - AquaPhi™ or Similar Rotating Technology

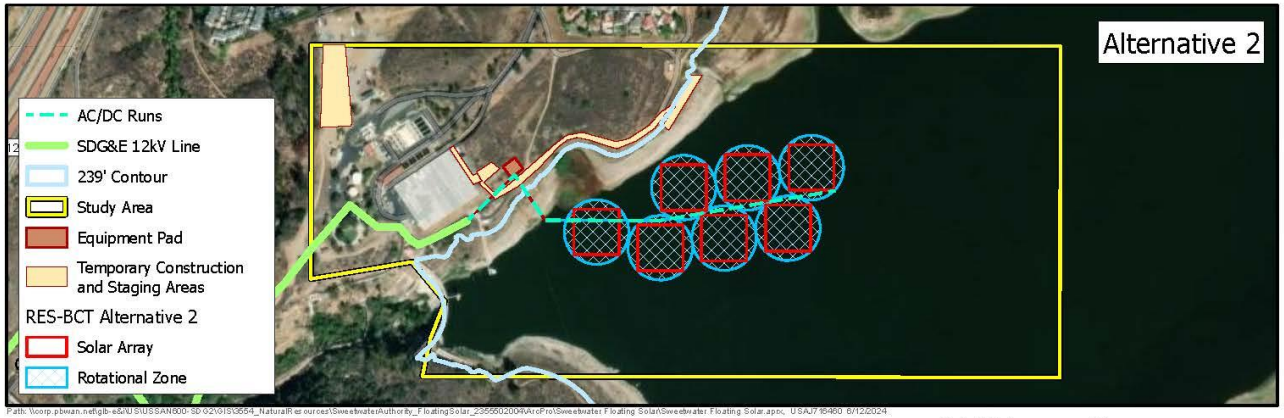
- Seven islands of rotating FPV systems, approximately 7.4 acres of FPVs
- Rotate to track the sun, producing approximately 17% more energy
- Utilizes autonomous thruster, replacing the need of traditional anchoring and mooring
- Two anchors holding each island to the reservoir ground

AquaPhi™ or Similar Technology Pilot

- A pilot 0.2-acre rotating FPV system







1 inch =600 feet
0 300 600 Feet

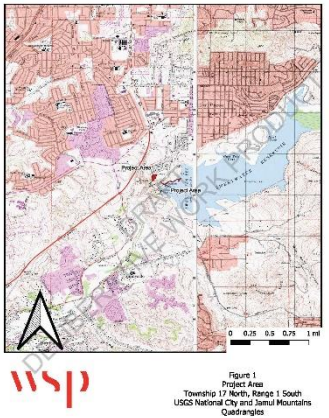
FIGURE 2

Project Overview
Floating Solar Project
Sweetwater Authority
San Diego, CA

Environmental Assessment

- Draft Initial Study
- Draft Aesthetics and Visual Resources Study
- Draft Biological Resources Technical Report
- Draft Cultural Resources Assessment
- Draft Water Quality Memorandum

Existing paved surfaces or previously disturbed areas would be used for construction staging and material storage during construction. A paved surface lot outside of the Perdue WTP would be used for material storage as well as dirt and paved roadways running along the shoreline. A temporary launch ramp would also be placed along the shoreline of the reservoir.



Environmental Assessment (cont.)

WSP identified environmental effects:

Biological Resources

Potential impacts to birds (avian collisions, electrocution, and entrapment), vegetation communities, and waters

- Mitigation measures identified, including avoiding using guy wires to the extent practicable, bird mortality surveys, spacing panels to prevent entrapment, installation of bird deterrents
- Mitigate aquatic resource loss at a 1:1 ratio through restoration or enhancement
- Mitigate vegetation losses at a ratio agreed with wildlife agencies

Cultural Resources / Tribal Resources

Potential impacts to archaeological and tribal resources

- Mitigation measures identified, including coordination and monitoring during construction activities

Aesthetics

Based on WSP assessment, the Draft Initial Study identified “less than significant impacts” to Aesthetics

Environmental Assessment (cont.)

Water Quality / Hydrology

Take a conservative approach and apply the following mitigation measures to ensure there are no impacts to water quality:

- Comply with NSF-61 Requirements when applicable
- Use PFAS-free solar panels
- Develop a Water Quality Monitoring Plan
- Conduct Bio-foul and Quagga Mussel inspections
- Bird dropping mitigation (deterrent/exclusion devices, regular cleaning, etc.)
- Implement a Maintenance and Monitoring Program
- Prepare and implement a Water Pollution Control Plan during construction
- Ensure proper engineering of anchoring devices and other facilities

Fiscal Impact

During FY 2023-24, WSP billed a total of $48,721.69 to Budget Expense Line 10-100-5650.

This FY 2024-25 Budget Expense Line 10-40-400-5650 includes a total of $125,000 for environmental tasks related to the Sweetwater Reservoir Floating Photovoltaic Project, and WSP is expected to bill to that expense account approximately $25,000 for services provided between July 2024 and December 2024.

Approximately an additional $100,000 would be necessary for the completion of the CEQA process. The available budget in expense line 10-40-400-5650 may be sufficient to complete an EIR; however, additional budget may be requested for the next Fiscal Year if necessary.

Options

1. Authorize the General Manager to request proposals from the Authority's on-call environmental consulting firms to assist with the preparation of an Environmental Impact Report for the Sweetwater Reservoir Floating Photovoltaic Project.

2. Authorize WSP USA Environment and Infrastructure to continue with the completion of the Initial Study and, assuming that nothing changes in terms of impact level on any of the environmental topics that would trigger the need for an Environmental Impact Report, circulate a Notice of Intent to Adopt a Mitigated Negative Declaration.

3. Other direction, as provided by the Governing Board.

Staff Recommendation

Option 1 - Authorize the General Manager to request proposals from the Authority's on-call environmental consulting firms to assist with the preparation of an Environmental Impact Report for the Sweetwater Reservoir Floating Photovoltaic Project.

Questions?

SWEETWATER AUTHORITY

Governing Board
December 14, 2024

Consideration to Reject Noria Energy's Proposals and Direct Staff to Issue a Request for Qualifications for a Renewable Energy Manager

RECOMMENDATION
Staff recommends that the Governing Board reject Noria Energy's proposals and direct staff to issue a Request for Qualifications for a Renewable Energy Manager.

OVERVIEW

The Authority and Noria Energy (Noria) signed a Term Sheet on July 5, 2023, allowing Noria an 18-month exclusivity period, along with other responsibilities by each one of the parties. A copy of the term sheet is provided as Attachment 1.

Noria's role was to support project development, including design, to facilitate the permitting and environmental review process. Unfortunately, Noria did not provide three key elements required for the CA Division of Drinking Water (DDW) approval:

1) A complete set of design and specifications
2) NSF-61 certification on all proposed project components
3) An Operations and Maintenance (O&M) plan.

The Term Sheet with Noria expires on January 4, 2025, and the Authority will no longer be able to rely on Noria to facilitate the pending items. Noria has indicated that they are willing to continue as partners but expect compensation if they are to continue to provide project support. Noria provided two options for the Authority's consideration:

Option 1: The Authority and Noria will amend the existing term sheet and extend exclusivity by an additional eighteen (18) months. In addition, the Authority commits to beginning Power Purchase Agreement (PPA) negotiations immediately after receiving board approval and executing the term sheet amendment. Both parties will negotiate in good faith and can extend exclusivity beyond the eighteen months to continue negotiations if required. Once a PPA between both parties is successfully executed, Noria will lead all development activities, including permitting and engineering, at no cost to the Authority. The Floating Photovoltaics (FPV) system will not begin construction until all necessary permits are obtained. However, if both parties are not able to come to an agreement on PPA terms, Noria will be paid in the amount of $250,000.

Option 2: Noria and the Authority will negotiate a new term sheet for a development services agreement that includes an additional three (3) years of exclusivity and a new scope of work with milestone payments associated with future development tasks. In this option, the Authority will not be required to negotiate a PPA with Noria. Additional tasks for the new scope of work can include the following for $325,000:

- Prepare preliminary Operation and Maintenance (O&M) plan to be submitted to CA DDW
- Prepare and manage permitting with CA DDW
- Advance Engineering Plans to 60 percent
- Manage SDG&E Design Upgrade

Instead of continuing to rely on Noria, the Authority would issue a Request for Qualifications to hire an energy renewable manager/consultant to continue the permitting process for the floating solar project and also to evaluate other renewable options to supplement the renewable energy portfolio for the Authority. Other options could include land-based solar panels, an increase in the size of the floating solar array to potentially provide energy to the San Diego Community Solar, etc. Any options developed by the Renewable Energy Manager would be presented to the Board at a future meeting.

Additionally, the Renewable Energy Manager would have public outreach responsibilities to ensure that any options developed are properly presented and shared with the community.

FISCAL IMPACT

Since a Request for Qualifications is expected, there are no exact costs at this point. The exact amount will be determined once a scope of work is negotiated with the selected firm. Any funds for this effort would be covered by the Consultant line item of the current FY 2024-25 Budget.

OPTIONS

1. Direct staff to reject Noria Energy's proposals and issue a Request for Qualifications to select a Renewable Energy Manager

2. Other direction as determined by the Governing Board

Staff Contact:
Carlos Quintero, General Manager

SUPPORTING INFORMATION

Attachment

Sweetwater Authority/Noria Energy Term Sheet

Strategic Plan

- Strategic Plan Goal No. 7 Environmental Stewardship
    - Objective ES2 – Develop Strategies to Achieve Carbon Neutrality

Past Board Actions

September 27, 2023	The Governing Board Approved Submitting and Application to SDGE for an Interconnection Study and to Prepare a CEQA Document for the Floating Solar Project.
June 28, 2023	The Governing Board Approved the Term Sheet between Sweetwater Authority and Noria Energy

SWEETWATER RESERVOIR FLOATING SOLAR PROJECT
Noria Energy Holdings LLC
Sweetwater Authority

Noria Energy obligations:

Noria will lead and manage all aspects of the SDG&E's Renewable Energy Self-Generation Bill Credit Transfer (RES-BCT) Program for floating solar system up to 5MWac and/or lease option(s) for Front-of-the meter projects, including:

- Creation of Special Purpose Vehicle(s): All contracts/documents will be housed within this SPV, which is industry standard and gives maximum flexibility for project finance (PPA or other)
- Prepare and submit all documents: Noria will need feedback/signatures from SWA during the process, but we will efficiently project manage process, timelines, etc.
- Design: System design as needed for submittal(s)
- Interconnection: Single line drawing, other technical analysis and work needed for submittal, including all engineering.
- Budget: Noria will manage budget/make payments throughout application process.
- Project Finance: Once project is accepted into RES-BCT program, Noria will present finance options and Noria and SWA will negotiate final system size/price to present to SWA board for approval.

- Noria Energy will provide technical support, information, or any preliminary design required as part of the RES-BCT process.
- Noria Energy will perform any required design, or preliminary design.
- Noria Energy will provide a project description and scope to assist in the CEQA process.
- Noria Energy will perform a cost savings analysis to assist in sizing the project.

Sweetwater Authority obligations:

- SWA will pay for the RES-BCT application fee.
- SWA will begin the CEQA process: Initial Study / Mitigated Negative Declaration
- SWA will take the lead in obtaining all required permits; Noria Energy will support, as required, with technical information, project descriptions, and any required preliminary design.
- SWA will provide Noria Energy with electricity load profile to assist in project sizing.
- SWA will provide Noria Energy with any topographical/bathymetrical data.
- SWA will provide Noria Energy with any required documentation to demonstrate site control to apply to SDG&E's system to enter into SDG&E's Renewable Energy Self-Generation Bill Credit Transfer (RES-BCT) Program for floating solar system up to 5MWac, community solar, and/or other potential options to be determined.

Joint (Noria Energy / SWA) obligations:

- Noria Energy and SWA will negotiate a Power Purchase Agreement once SDGE approves the RES-BCT application. The PPA will require Noria Energy to finance the construction and operation of the

project subject to negotiation of mutually acceptable price for energy delivered by the project to SWA.

- Noria Energy and SWA will negotiate a lease option (including lease cost and project size) for the Sweetwater Reservoir surface area to install additional floating solar panels to participate in the SD Community Choice Aggregation (CCA) or other Community Solar Program.
- The final deliverable includes a Financial Investment Decision ("FID") sign off. Noria will assist Sweetwater on signing off on FID for the system(s), including final stamped drawings and revised Pro-forma models.
- Noria Energy and SWA agree to begin development of pilot project (to be documented in an appropriate memorandum of understanding):
  a. Installation of 100kW pilot floating solar system utilizing Noria Energy AquaPhi autonomous anchoring & mooring solution. Pilot data in Phase I will be base for incorporating AquaPhi and/or other Water Management solution into Phase II - design, interconnection, and installation of Sweetwater RES-BCT 5MWac floating solar system and FOM projects.
  b. Noria Energy will be responsible for all costs and liability in connection with the pilot project.
  c. The pilot project will be removed by Noria Energy at its expense if the larger projects do not move forward to implementation.

Exclusivity clause:

a. Noria retains exclusivity for 18 months to achieve Notice to Proceed for the 5MWac RES-BCT Floating solar project, subject to RES-BCT approval by SDG&E and good faith negotiation of a PPA for the project on terms that are reasonably acceptable to the parties. Such period will terminate if the RES-BCT application or any required permit is denied or if there is an FID that is not acceptable to the parties.
b. SWA has the right to cancel project upon thirty (30) days notice, but will not develop the project with another developer in exclusivity period. SWA also has the option to purchase the project, including the SPV, from Noria for the lump sum of $110,700, which includes all contracts, permits, documents, etc. Upon purchase of the SPV, the exclusivity period will terminate. In no event will the purchase of the SPV require SWA to use equipment or technology of Noria Energy for the project.

Final Approval

a. The execution of any PPA or lease and the commencement of work on the project will remain subject to the final approval of the governing board of SWA and Noria Energy, each in its sole discretion.

Nature of Term Sheet:

This term sheet sets forth the intent of the parties with respect to the development of the floating solar project and the pilot project and the negotiation of the definitive project agreements described herein. Each party shall undertake its obligations under this term sheet at its own risk and expense until such definitive project agreements have been finalized and approved.

INWITNESSWHEREOF, SWA and Noria have executed this Term Sheet as of the date set forth next to SWA's signature below.

By: _____
Noria Energy Holdings LLC

July 5, 2023
Date

By: _____
Sweetwater Authority

July 5, 2023
Date