DUBLIN SAN RAMON SERVICES DISTRICT

INITIAL SITE FEASIBILITY FOR SOLAR PV SYSTEMS

DSRSD Board Meeting
February 4, 2025

Dublin San Ramon Services District
Water, wastewater, recycled water

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INTRODUCTION

Overview

- ARC Alternatives developed a feasibility study for Dublin San Ramon Services District to analyze future savings from solar projects
- To complete this feasibility study, ARC Alternatives first analyzed the District's utility data, drafted layouts of the solar PV systems, and created a 20-year financial benefit projection
- Based on the financial modeling, with a PPA, the solar systems will generate an estimated benefit of approximately $6.5 million over the project's 20-year lifespan

UTILITY ANALYSIS

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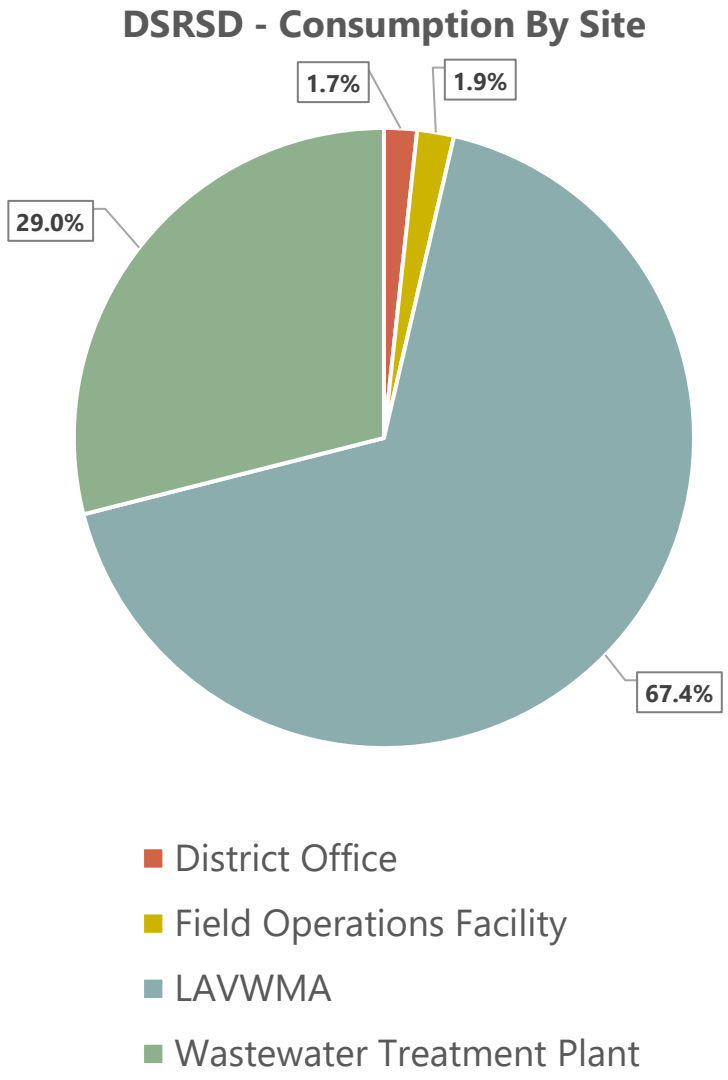
Utility Analysis

- Four sites within DSRSD show the greatest potential for solar development:
  - District Office
  - Field Operations Facility
  - Wastewater Treatment Plant (WWTP)
  - Livermore-Amador Valley Water Management Agency (LAVWMA)
- The District consumed 13 million kilowatt-hours in 2023 across the four sites analyzed
  - WWTP and LAVWMA collectively account for over 95% of this consumption



Solar System Sizing

- ARC developed preliminary solar layouts for each site with the goal of maximizing solar capacity while conforming to existing space constraints:
  - 1,771.6 kW total solar capacity for the DSRSD systems modeled
  - 2.7 million kWh generated in the first year of operation
  - 21% energy use offset expected across the four sites

Site Name	Total Annual Site Consumption (kWh)	Modeled System Size (kW)	ETB Modeled Solar Energy Production (kWh)	Solar Production Yield (kWh/kW)	Energy Use Offset
District Office	230,448	148.5	229,144	1,543.1	99%
Field Operations Facility	254,593	166.1	255,209	1,536.5	100%
LAVWMA	8,607,230	1,005.4	1,544,781	1,536.5	18%
Wastewater Treatment Plant	3,927,778	451.6	705,881	1,563.1	18%
Total	**13,020,049**	**1,771.6**	**2,735,015**	**1,543.8**	**21%**

SOLAR LAYOUTS

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District Office

Solar Layout

- Design involves a combination of a 3x1 carport array along with a 30° tilt roof-mounted arrays on the steeper blue rooftops

- Carport array will require some tree removal (indicated on layout)

Parameter Type	Value
Module Count	270
System Size (kW DC)	148.5
Shading impact	Minimal
Estimated Annual Solar Generation (kWh AC)	229,100
Modeled Yield (kWh/kW)	1,543
Energy Usage Offset	99%

Field Operations Facility

Solar Layout

- Design involves a combination of a large carport/shade structure and several smaller rooftop arrays with a 7° tilt
- Carport array will likely require some tree removal (indicated on layout)

Parameter Type	Value
Module Count	302
System Size (kW DC)	166.1
Shading impact	Minimal
Estimated Annual Solar Generation (kWh AC)	255,200
Modeled Yield (kWh/kW)	1,536
Energy Usage Offset	99%

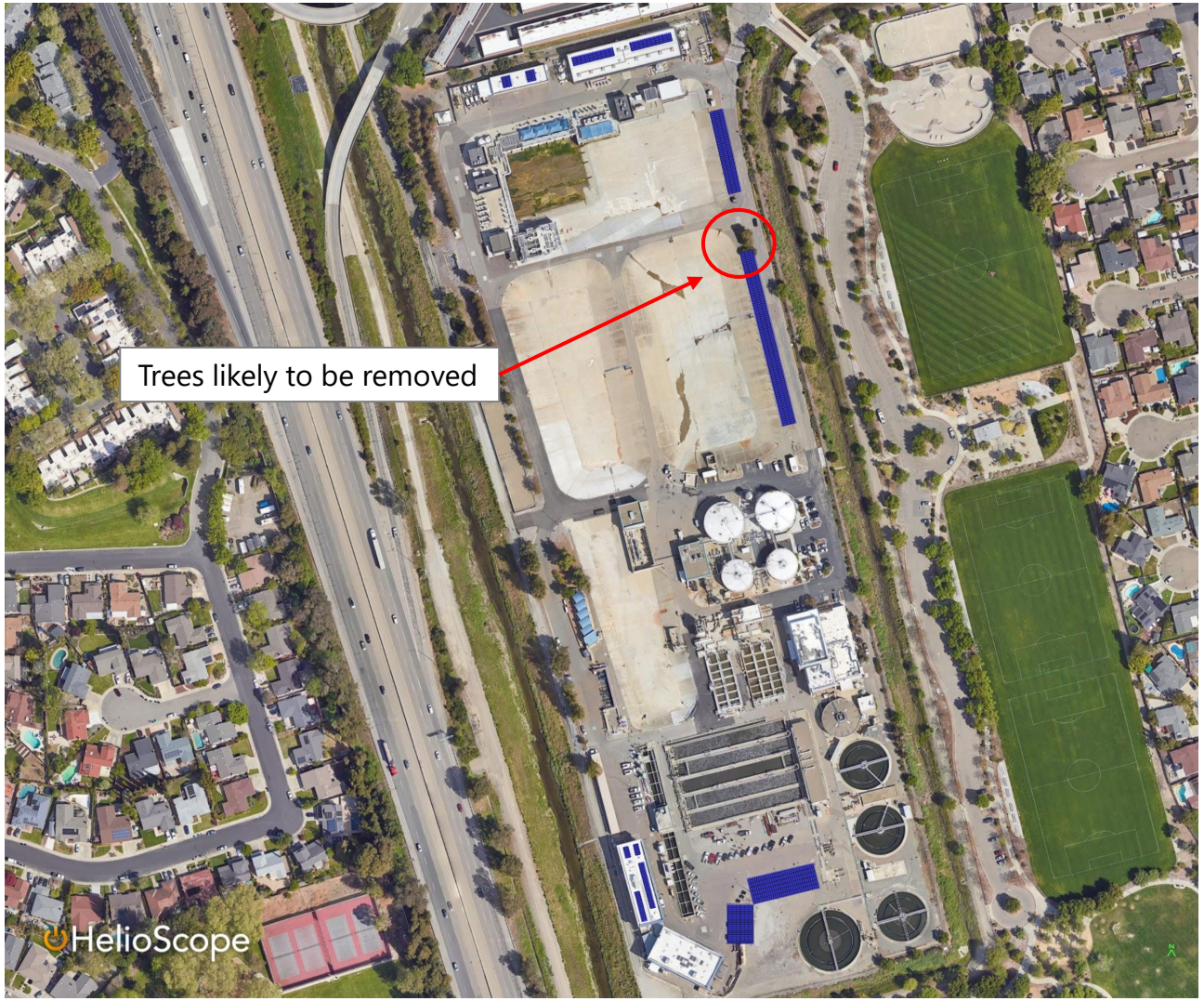
Wastewater Treatment Plant

Solar Layout

- Design involves a combination of four carport/shade structures and several smaller south and west-facing rooftop arrays with a 7° tilt

- Carport arrays will likely require some tree removal (indicated on layout)

Parameter Type	Value
Module Count	821
System Size (kW DC)	451.6
Shading impact	Minimal
Estimated Annual Solar Generation (kWh AC)	705,900
Modeled Yield (kWh/kW)	1,536
Energy Usage Offset	18%



Livermore-Amador Valley Water Management Agency

Solar Layout

- Design involves several south and west-facing ground mounted arrays with a 7° tilt
- Some arrays will require significant tree removal (indicated on layout)

Parameter Type	Value
Module Count	1,828
System Size (kW DC)	1,005.4
Shading impact	Minimal
Estimated Annual Solar Generation (kWh AC)	1,544,800
Modeled Yield (kWh/kW)	1,536
Energy Usage Offset	18%

LIVERMORE-AMADOR VALLEY WATER MANAGEMENT AGENCY

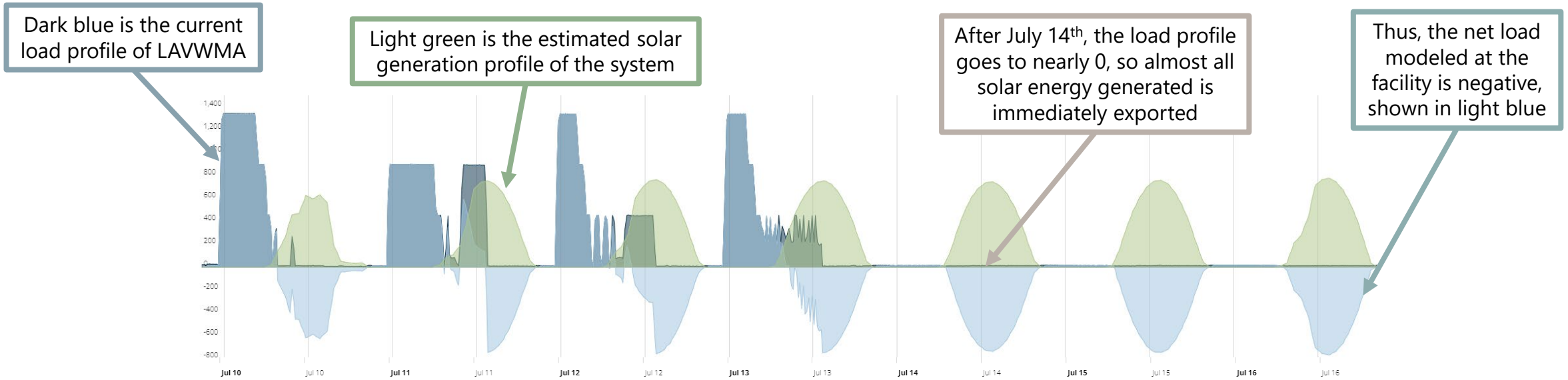
Existing Trees and Shrubs – Costco Parking lot looking east towards LAVWMA

LIVERMORE-AMADOR VALLEY WATER MANAGEMENT AGENCY

Existing Trees and Shrubs – LAVWMA looking west towards Costco

LAVWMA – Load Profile

- LAVWMA's load profile is sporadic, leading to a high amount of exported energy
  - On average, the facility consumes over 400,000 kWh per month on the meter connected to solar
  - August thru mid October 2023 measured under 20,000 kWh in each month, **a reduction of 95%**
  - Nearly all modeled solar energy generated in that period is exported
- Exported energy in NEM 3.0 has low value, so high exports reduces savings



LAVWMA – RES BCT

- PG&E's Renewable Energy Self-Generation Bill Credit Transfer (RES-BCT) program
  - Allows local government to generate at one location and receive credits at another location
  - Program is currently at capacity
  - Cap adjusted through state legislation

FINANCIAL MODELING RESULTS

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Financial Model

Power Purchase Agreement (PPA)

- District does not own the panels directly; instead, they are owned by a solar vendor
- District pays solar vendor for each kilowatt-hour of solar energy generated (called “PPA Rate”)
- Solar vendor is liable for maintaining the system and is only paid for energy produced by the systems

Financial Model Assumptions

To create the feasibility model analysis for the solar projects, several assumptions were made:

- 20- year useful life/term of the project
- 3.5% annual utility escalation rate
- 0.5% annual solar degradation rate
- $0.21 per kWh fixed power purchase cost

Financial Model Results

- Estimated net benefit is **$6.5 million** for the District over 20 years under a PPA

SITE NAME	PPA NET BENEFIT
DISTRICT ADMINISTRATIVE OFFICE	$150,000
FIELD OPERATIONS FACILITY	$610,000
WASTEWATER TREATMENT PLANT	$3,100,000
LAVWMA	$2,600,000
TOTAL	**$6,460,000**

RECOMMENDATION

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RECOMMENDATION

Staff recommends the following next steps:

- Release an RFP to solar PPA providers for implementation of the solar systems at all sites
- Partner with LAVWMA to further evaluate solar installation to minimize tree removal