Appendix G.4

Revised Water Demand Memorandum

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TECHNICAL MEMORANDUM

To:	James Whalen
From:	Trey Driscoll, PG, CHG, Kipp Vilker, PE
Subject:	Starlight Solar Revised Construction Water, Operations and Maintenance and Decommissioning Water Demand Estimate
Date:	June 23, 2025
cc:	Johanna Falzarano, Stuart Muerth

This technical memorandum evaluates revised estimated construction water demand for the Starlight Solar Project (Proposed Project) located near Boulevard, California. The revised estimated construction water demand is based on area of disturbance, volume of grading, daily dust control and additional miscellaneous items such as fire protection requirements and hydroseeding.

1 Background

The Groundwater Scoping: MPA 22-006 Starlight Solar Energy Storage Facility dated May 20, 2022 indicated that the MPA project description included total construction water demand to be 28 acre-feet primarily for dust suppression and 1.22 acre-feet per year for tracker washing excluding landscaping. The Groundwater Scoping requested a detailed water demand for construction demand, ongoing demand, and facility decommissioning/closure demand for the project site. The Groundwater Scoping also indicated that recently approved solar projects can be used as examples for the level of documentation needed. The Scoping letter requested the Proposed Project include water demand for any dust control (during initial clearing, grubbing, and grinding), mass grading, application of soil binding agent (if applicable), general daily dust control, concrete mixing (if applicable), gen-tie line, fire suppression, and noxious weed mitigation (pressure washers). In addition, water demand for any application/re-application of soil binder, tracker washing, potable water needs, and landscaping including vegetation should be included in the analysis.

2 Updated Construction Water Demand Estimate

Updated construction water demand is provided by construction phase. Water required for construction will be delivered to the Proposed Project site by 6,000-gallon capacity water trucks. Concrete used during construction will be imported from off-site and no concrete mixing will take place, and no water will be required. No pre-wetting of the ground surface prior to grading will take place and no water demand for noxious weed mitigation is assumed.

Phase 1

The first phase (Phase 1) includes 20 MW of Solar Photovoltaic and 17 MW Battery Storage with Onsite Substation and Ancillary Facilities. Phase 1 grading is scheduled for 65 days and Phase 1 building construction is scheduled for 130 days. Phase 1 will be constructed over 125 acres and includes 75,314

cubic yards of grading. The Phase 1 gen-tie line construction will disturb an additional 0.2 acres. Water used for hydroseeding will be applied at 2,500-gallons per acre to the disturbed area and daily dust control water will be applied.

Dust control rates will vary daily based on site soils, weather, and construction activity taking place. To estimate water demand for dust control, several assumptions were made:

1. Water use per acre, with or without tackifier, is assumed to be 3,300 gallons per acre. This application rate is based on the value used for the Desert Green Solar Farm Project, which is a project similar in scope also located in San Diego County (San Diego County 2015).

2. Half of the building construction area, which is 62.5 acres, will not be continuously disturbed, and one application of water with tackifier will be sufficient for dust suppression. This equals a water demand of 0.6 acre-feet.

3. Half of the building construction area, which is 62.5 acres, will be continuously disturbed and will require three applications per day. Tackifier will not be used in these areas. This equals a water demand of 1.9 acre-feet.

The Phase 1 construction water demand estimate is 14.8 acre-feet (Table 1).

Phase 2

The second phase (Phase 2) includes 80 MW of Solar Photovoltaic and 93 MW Battery Storage and Ancillary Facilities. Phase 2 grading is scheduled for 80 days and Phase 2 building construction is scheduled for 230 days. Phase 2 will be constructed over 436 acres and includes 274,686 cubic yards of grading. The Phase 2 gen-tie line construction will disturb an additional 0.2 acres. Water used for hydroseeding will be applied at 2,500-gallons per acre to the disturbed area and daily dust control water will be applied.

Dust control rates will vary daily based on site soils, weather, and construction activity taking place. To estimate water demand for dust control, several assumptions were made:

1. Water use per acre, with or without tackifier, is assumed to be 3,300 gallons per acre. This application rate is based on the value used for the Desert Green Solar Farm Project, which is a project similar in scope located in San Diego County (San Diego County 2015).

2. Half of the building construction area, which is 218 acres, will not be continuously disturbed, and one application of water with tackifier will be sufficient for dust suppression. This equals a water demand of 2.2 acre-feet.

3. Half of the building construction area, which is 218 acres, will be continuously disturbed and will require three applications per day. Tackifier will not be used in these areas. This equals a water demand of 6.6 acre-feet.

The Phase 2 construction water demand is 53.1 acre-feet (Table 2).

Table 1. Phase 1 - Preliminary Construction Water Demand Estimation Sheet

Project: Starlight Solar, San Diego County, California **Subject: Preliminary Estimate Construction Water Demand Prepared June 20, 2025**		
Phase 1 - Estimated Mass Grading		
Input quantity of on-site fill used to balance site	75,314	Cubic Yard
Input optimum moisture content	9.00	percent
Input observed moisture content	2.00	percent
Input dry unit weight of on-site fill	115	Pounds per Cubic Foot
Weight of water to reach saturation	8	Pounds per Cubic Foot
Water required to hydrate and gain compaction	29	Gallons per Cubic Yard
Input contingency to account for evaporation during summer months	1.667	
Water required to hydrate and gain compaction	48	Gallons per Cubic Yard
Water for grading	3,648,122	Gallons
Conversion to gallons per acre-foot	325,851	
Water required for grading	**11.2**	**Acre-feet**
Phase 1 - Daily Dust Control with Tackifier		
Water use per acre (includes use of tackifier)	3,300	Gallons/acre
Area where one application with tackifier is sufficient (half of construction area)	62.5	acres
Application times per day	1	
Water use for daily dust control where one application with tackifier is sufficient	206,250	Gallons
Total Water Use for Daily Dust Control with Tackifier	**0.6**	**Acre-feet**
Phase 1 - Daily Dust Control without Tackifier		
Water use per acre	3,300	Gallons/acre
Building construction area (half of construction area)	62.5	acres
Application times per day	3	
Water use for daily dust control for building areas	618,750	Gallons
Total Water Use for Daily Dust Control without Tackifier	**1.9**	**Acre-feet**
Phase 1 - Additional Miscellaneous Items		
Fire Protection Requirements	30,000	Gallons
Hydroseeding	312,500	Gallons
Additional Miscellaneous Items	**1.05**	**Acre-feet**
Phase 1 - Total Estimated Construction Demand		
Total Project Water Usage	4,815,622	Gallons
	14.8	**Acre-feet**

Note: CY= cubic yard; CF = cubic foot

Table 2. Phase 2 - Preliminary Construction Water Demand Estimation Sheet

Project: Starlight Solar, San Diego County, California		
Subject: Preliminary Estimate Construction Water Demand Prepared June 20, 2025		
Phase 2 - Estimated Mass Grading		
Input quantity of on-site fill used to balance site	274,686	Cubic Yard
Input optimum moisture content	9.00	percent
Input observed moisture content	2.00	percent
Input dry unit weight of on-site fill	115	Pounds per Cubic Foot
Weight of water to reach saturation	8	Pounds per Cubic Foot
Water required to hydrate and gain compaction	29	Gallons per Cubic Yard
Input contingency to account for evaporation during summer months	1.667	
Water required to hydrate and gain compaction	48	Gallons per Cubic Yard
Water for grading	13,305,469	Gallons
Conversion to gallons per acre-foot	325,851	
Water required for grading	**40.8**	**Acre-feet**
Phase 2 - Daily Dust Control with Tackifier		
Water use per acre (includes use of tackifier)	3,300	Gallons/acre
Area where one application with tackifier is sufficient (half of disturbed area)	218	acres
Application times per day	1	
Water use for daily dust control where one application with tackifier is sufficient	719,400	Gallons
Total Water Use for Daily Dust Control with Tackifier	**2.2**	**Acre-feet**
Phase 2 - Daily Dust Control without Tackifier		
Water use per acre	3,300	Gallons/acre
Building construction area (half of disturbed area)	218	acres
Application times per day	3	
Water use for daily dust control for building areas	2,158,200	Gallons
Total Water Use for Daily Dust Control without Tackifier	**6.6**	**Acre-feet**
Phase 2 - Additional Miscellaneous Items		
Fire Protection Requirements	30,000	Gallons
Hydroseeding	1,090,000	Gallons
Additional Miscellaneous Items	**3.4**	**Acre-feet**
Phase 2 - Total Estimated Construction Demand		
Total Project Water Usage	17,303,069	Gallons
	53.1	**Acre-feet**

Note: CY= cubic yard; CF = cubic foot

Total estimated Proposed Project construction water demand is **67.9 acre-feet**.

3 Updated Operations and Maintenance Water Demand Estimate

No landscaping irrigation is proposed for the operation and maintenance of the Proposed Project. During operation, the Proposed Project would require water for panel washing up to one time per year. Similar solar photovoltaic operations use approximately 0.3 gallons of water per square yard of panel. Based on the planned 20 MW capacity of the Proposed Project – Phase 1, approximately 50,700 panels at approximately 30.8 square feet per panel totaling 1,560,000 square feet (173,333 square yards) may be washed up to one time per year. The annual water demand for Phase 1 panel washing is approximately up to 0.16 acre-feet. Based on the planned 80 MW capacity of the Proposed Project – Phase 2, approximately 202,744 panels at approximately 30.8 square feet per panel totaling 6,383,440 square feet (709,271 square yards) may be washed up to one time per year. Annual water demand for Phase 2 panel washing is approximately up to 0.65 acre-feet. Total Proposed Project operations and maintenance water demand is 0.81 acre-feet.

4 Updated Decommissioning Water Demand Estimate

Activities associated with decommissioning would not include substantial earthmoving. It is estimated that the amount of water necessary to dismantle the solar facility would be less than that required for construction because there would be no need to use water to hydrate and compact on-site fills. The activities associated with decommissioning would not include grading.

The only water demand during decommissioning will be for dust suppression. It is assumed that two, 6,000-gallon water trucks will be needed per day for decommissioning for dust suppression. The number of days for decommissioning were assumed to be half the number of days required for building construction. Phase 1 will require 65 days and a water demand of 2.4 acre-feet for decommissioning and Phase 2 will require 115 days and a water demand of 4.2 acre-feet for decommissioning.

5 Proposed Project Water Demand Summary

A summary of the water demand for construction, operation and decommissioning for Phase 1 of the Starlight Solar Project can be found in **Table 3.** A summary of the water demand for construction, operation and decommissioning for Phase 2 of the Starlight Solar Project can be found in **Table 4.**

Table 3. Phase 1 - Water Demand Summary

Activity	Description	Total Estimated Water Demand (acre-feet)
Grading	Grading of 75,314 cubic yards. Uses estimate of on-site soil moisture and optimum soil moisture to gain compaction to determine required water input.	11.2
Dust Abatement	Water for dust suppression.	2.5
Other construction needs	Water necessary for other construction needs including filling tanks for fire protection and hydroseeding.	1.1
	Total Construction Water Use	**14.8**
Decommissioning	Assuming up to two 6,000-gallon water trucks would be on-site daily for 65 days to water the active construction work areas (i.e., demolition) as well as access roads.	**2.4**
O&M	Panel washing	**0.2**

Table 4. Phase 2 - Water Demand Summary

Activity	Description	Total Estimated Water Demand (acre-feet)
Grading	Grading of 274,686 cubic yards. Uses estimate of on-site soil moisture and optimum soil moisture to gain compaction to determine required water input.	40.8
Dust Abatement	Water for dust suppression.	8.8
Other construction needs	Water necessary for other construction needs including filling tanks for fire protection and hydroseeding.	3.4
	Total Construction Water Use	**53.1**
Decommissioning	Assuming up to two 6,000-gallon water trucks would be on-site daily for 115 days to water the active construction work areas (i.e., demolition) as well as access roads.	**4.2**
O&M	Panel washing	**0.7**

6 References

San Diego County. 2015. *Desert Green Solar Farm Project*. Accessed June 2025. https://www.sandiegocounty.gov/content/dam/sdc/pds/ceqa/Soitec-Documents/Record-Documents/2015-01-26-DonnaTisdale-email-Response-to-JimBennett-Re-Desert-Green-Construction-Water-Use.pdf