



VINEYARD DESIGN
EROSION CONTROL
WATER DEVELOPMENT
DRAINAGE
PERMITTING
GPS/GIS

Exhibit C

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MEMORANDUM

Date: August 8, 2024

To: Engineering Division - Napa County Planning, Building, and Environmental Services

From: Matthew S. Bueno, P.E.
Rachel L. Rosasco, E.I.T.

Re: Constellation Wappo Hill Track I ECP
APNs 039-040-050 & -054
Soil Loss Analysis



This memo transmits the findings of a soil loss modeling analysis for the above-referenced Track I Erosion Control Plan (ECP). The Universal Soil Loss Equation (USLE) was used to predict pre-project and post-project soil loss from within the proposed vineyard development areas. A combination of topographic maps, aerial imagery, and a site visit were used to determine pre-project transect locations, slopes, and cover values. Pre-project and post-project cover values are consistent with the United States Department of Agriculture (USDA) – Natural Resource Conservation Service (NRCS) publication titled “The Universal Soil Loss Equation Special Applications for Napa County, California” (May 1994).

A site visit was conducted on August 17, 2023 by Matt Bueno and Rachel Rosasco of PPI Engineering to determine the pre-project cover values for each block and/or transect area. All proposed development areas were inspected, and the cover values used in this analysis represent existing conditions at the time of the site visit. Post-project cover values were calculated using the percent cover specified in the ECP. This analysis is limited to the proposed vineyard areas as well as vineyard avenues (18.5 gross acres).

The model, summarized on page 2 of the supporting documents (attached), predicts a net decrease of approximately 16.8 tons of soil loss per year for the project as a whole. The ECP has been designed to ensure compliance with Napa County policies requiring no-net-increase in soil loss for post-project conditions. Please see the following supporting documents that contain data tables, calculations, maps of transect locations, and results from the analysis.

**Constellation Wappo Hill ECP
USLE Calculation Sheets**

Constellation Wappo Hill ECP
 USLE Calculations
 PPI Engineering
 8/8/2024
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USLE Calculations - Block Summary Sheet

Proposed Block	Proposed Development Acres	Pre-Project Soil Loss (tons/year)	Post-Project Soil Loss (tons/year)	Net Increase/Decrease (tons/year)
1A	4.29	11.55	8.08	3.47
1B	1.92	7.77	4.20	3.57
1C	0.67	0.70	0.66	0.04
2	4.30	11.17	7.39	3.78
3A	2.11	6.58	3.15	3.43
3B	0.34	0.66	0.33	0.33
4	1.95	3.63	2.50	1.13
5A	1.71	1.78	1.22	0.55
5B	1.17	1.64	1.13	0.51
Totals	18.46	45.46	28.65	16.81

Note: Individual estimates may not add to the totals due to rounding

Constellation Wappo Hill ECP
 USLE Calculations
 PPI Engineering
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USLE Calculations - Transect Summary Sheet

Proposed Block Transect	Proposed Development Acres	Pre-Project Soil Loss (tons/year)	Post-Project Soil Loss (tons/year)	Net Increase/Decrease (tons/year)
1A.1	1.23	1.66	1.16	0.50
1A.2	3.06	9.89	6.92	2.97
1B	1.92	7.77	4.20	3.57
1C	0.67	0.70	0.66	0.04
2.1	1.80	5.01	3.32	1.70
2.2	2.50	6.15	4.07	2.08
3A	2.11	6.58	3.15	3.43
3B	0.34	0.66	0.33	0.33
4	1.95	3.63	2.50	1.13
5A	1.71	1.78	1.22	0.55
5B	1.17	1.64	1.13	0.51
Totals	18.46	45.46	28.65	16.81

Note: Individual estimates may not add to the totals due to rounding

Constellation Wappo Hill ECP
 USLE Calculations Pre-Project
 PPI Engineering
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Transect 1A.1, Pre-Project

Proposed Development Acres:	1.23
Soil Unit No. (100-182):	179
Soil Name:	Sobrante
K, Soil Erodibility:	0.32
T, Soil Loss Tolerance (tons/acre):	2
R, Rainfall:	45
Total Transect Length (ft):	133
Number of Segments:	1
Individual Segment Lengths (ft):	133
Segment:	
Gradient (%):	16
m:	
Individual LS:	2.98
Factor:	
Product:	
LS, Length and Steepness:	2.98
Total Transect Average Gradient (%):	16
Farming Practice:	Up & Down Hill
P, Practice Factor (Table 6) ¹ :	1.00
Vegetative Canopy:	No Canopy
Canopy Cover:	0%
Ground Cover:	70%
Percent Grass:	90%
Percent Weeds:	10%
C, Cover (Table 5) ¹ :	0.031
A, Soil Loss (tons/acre):	1.35
Soil Loss in Proposed Development (tons):	1.66

¹ Tables 5 & 6 - USLE Special Applications for Napa County

Constellation Wappo Hill ECP
 USLE Calculations Post-Project
 PPI Engineering
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Transect 1A.1, Post-Project

Proposed Development Acres:	1.23
Soil Unit No. (100-182):	179
Soil Name:	Sobrante
K, Soil Erodibility:	0.32
T, Soil Loss Tolerance (tons/acre):	2
R, Rainfall:	45
Total Transect Length (ft):	133
Number of Segments:	1
Individual Segment Lengths (ft):	133
Segment:	
Gradient (%):	16
m:	
Individual LS:	2.98
Factor:	
Product:	
LS, Length and Steepness:	2.98
Total Transect Average Gradient (%):	16
Farming Practice:	Up & Down Hill
P, Practice Factor (Table 6) ¹ :	1.00
Cover Strategy:	Permanent
Age of Development:	Over 3 Years
Ground Cover:	80%
C, Cover (Table 4) ¹ :	0.022
A, Soil Loss (tons/acre):	0.94
Soil Loss in Proposed Development (tons):	1.16

¹ Tables 4 & 6 - USLE Special Applications for Napa County

Constellation Wappo Hill ECP
 USLE Calculations Pre-Project
 PPI Engineering
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Transect 1A.2, Pre- Project

Proposed Development Acres:	3.06
Soil Unit No. (100-182):	179
Soil Name:	Sobrante
K, Soil Erodibility:	0.32
T, Soil Loss Tolerance (tons/acre):	2
R, Rainfall:	45
Total Transect Length (ft):	291
Number of Segments:	1
Individual Segment Lengths (ft):	291
Segment:	
Gradient (%):	23
m:	
Individual LS:	7.14
Factor:	
Product:	
LS, Length and Steepness:	7.14
Total Transect Average Gradient (%):	23
Farming Practice:	Up & Down Hill
P, Practice Factor (Table 6) ¹ :	1.00
Vegetative Canopy:	No Canopy
Canopy Cover:	0%
Ground Cover:	70%
Percent Grass:	90%
Percent Weeds:	10%
C, Cover (Table 5) ¹ :	0.031
A, Soil Loss (tons/acre):	3.23
Soil Loss in Proposed Development (tons):	9.89

¹ Tables 5 & 6 - USLE Special Applications for Napa County

Constellation Wappo Hill ECP
 USLE Calculations Post-Project
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Transect 1A.2, Post-Project

Proposed Development Acres:	3.06
Soil Unit No. (100-182):	179
Soil Name:	Sobrante
K, Soil Erodibility:	0.32
T, Soil Loss Tolerance (tons/acre):	2
R, Rainfall:	45
Total Transect Length (ft):	291
Number of Segments:	1
Individual Segment Lengths (ft):	291
Segment:	
Gradient (%):	23
m:	
Individual LS:	7.14
Factor:	
Product:	
LS, Length and Steepness:	7.14
Total Transect Average Gradient (%):	23
Farming Practice:	Up & Down Hill
P, Practice Factor (Table 6) ¹ :	1.00
Cover Strategy:	Permanent
Age of Development:	Over 3 Years
Ground Cover:	80%
C, Cover (Table 4) ¹ :	0.022
A, Soil Loss (tons/acre):	2.26
Soil Loss in Proposed Development (tons):	6.92

¹ Tables 4 & 6 - USLE Special Applications for Napa County

Constellation Wappo Hill ECP
 USLE Calculations Pre-Project
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Transect 1B, Pre-Project

Proposed Development Acres:	1.92
Soil Unit No. (100-182):	179
Soil Name:	Sobrante
K, Soil Erodibility:	0.32
T, Soil Loss Tolerance (tons/acre):	2
R, Rainfall:	45
Total Transect Length (ft):	602
Number of Segments:	1
Individual Segment Lengths (ft):	602
Segment:	
Gradient (%):	21
m:	
Individual LS:	9.11
Factor:	
Product:	
LS, Length and Steepness:	9.11
Total Transect Average Gradient (%):	21
Farming Practice:	Up & Down Hill
P, Practice Factor (Table 6) ¹ :	1.00
Vegetative Canopy:	Trees 13' Tall
Canopy Cover:	25%
Ground Cover:	70%
Percent Grass:	90%
Percent Weeds:	10%
C, Cover (Table 5) ¹ :	0.031
A, Soil Loss (tons/acre):	4.05
Soil Loss in Proposed Development (tons):	7.77

¹ Tables 5 & 6 - USLE Special Applications for Napa County

Constellation Wappo Hill ECP
 USLE Calculations Post-Project
 PPI Engineering
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Transect 1B, Post-Project

Proposed Development Acres:	1.92
Soil Unit No. (100-182):	179
Soil Name:	Sobrante
K, Soil Erodibility:	0.32
T, Soil Loss Tolerance (tons/acre):	2
R, Rainfall:	45
Total Transect Length (ft):	602
Number of Segments:	1
Individual Segment Lengths (ft):	602
Segment:	
Gradient (%):	21
m:	
Individual LS:	9.11
Factor:	
Product:	
LS, Length and Steepness:	9.11
Total Transect Average Gradient (%):	21
Farming Practice:	Up & Down Hill
P, Practice Factor (Table 6) ¹ :	1.00
Cover Strategy:	Permanent
Age of Development:	Over 3 Years
Ground Cover:	85%
C, Cover (Table 4) ¹ :	0.017
A, Soil Loss (tons/acre):	2.19
Soil Loss in Proposed Development (tons):	4.20

¹ Tables 4 & 6 - USLE Special Applications for Napa County

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 USLE Calculations Pre-Project
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Transect 1C, Pre-Project

Proposed Development Acres:	0.67	
Soil Unit No. (100-182):	179	
Soil Name:	Sobrante	
K, Soil Erodibility:	0.32	
T, Soil Loss Tolerance (tons/acre):	2	
R, Rainfall:	45	
Total Transect Length (ft):	83	
Number of Segments:	2	
Individual Segment Lengths (ft):	42	
Segment:	1	2
Gradient (%):	11	16
m:		
Individual LS:	1.41	2.35
Factor:	0.35	0.65
Product:	0.49	1.53
LS, Length and Steepness:	2.02	
Total Transect Average Gradient (%):	14	
Farming Practice:	Up & Down Hill	
P, Practice Factor (Table 6) ¹ :	1.00	
Segmented C-Value		
Segment:	1	2
Vegetative Canopy:	Trees 13' Tall	No Canopy
Canopy Cover:	75%	0%
Ground Cover:	70%	70%
Percent Grass:	50%	90%
Percent Weeds:	50%	10%
C, Cover (Table 5) ¹ :	0.044	0.031
Segment Factor:	0.35	0.65
Segmented C:	0.036	
A, Soil Loss (tons/acre):	1.04	
Soil Loss in Proposed Development (tons):	0.70	

¹ Tables 5 & 6 - USLE Special Applications for Napa County

Constellation Wappo Hill ECP
 USLE Calculations Post-Project
 PPI Engineering
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Transect 1C, Post-Project

Proposed Development Acres:	0.67	
Soil Unit No. (100-182):	179	
Soil Name:	Sobrante	
K, Soil Erodibility:	0.32	
T, Soil Loss Tolerance (tons/acre):	2	
R, Rainfall:	45	
Total Transect Length (ft):	83	
Number of Segments:	2	
Individual Segment Lengths (ft):	42	
Segment:	1	2
Gradient (%):	11	16
m:		
Individual LS:	1.41	2.35
Factor:	0.35	0.65
Product:	0.49	1.53
LS, Length and Steepness:	2.02	
Total Transect Average Gradient (%):	14	
Farming Practice:	Up & Down Hill	
P, Practice Factor (Table 6) ¹ :	1.00	
Cover Strategy:	Permanent	
Age of Development:	Over 3 Years	
Ground Cover:	75%	
C, Cover (Table 4) ¹ :	0.034	
A, Soil Loss (tons/acre):	0.99	
Soil Loss in Proposed Development (tons):	0.66	

¹ Tables 4 & 6 - USLE Special Applications for Napa County

Constellation Wappo Hill ECP
 USLE Calculations Pre-Project
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Transect 2.1, Pre-Project

Proposed Development Acres:	1.80		
Soil Unit No. (100-182):	179		
Soil Name:	Sobrante		
K, Soil Erodibility:	0.32		
T, Soil Loss Tolerance (tons/acre):	2		
R, Rainfall:	45		
Total Transect Length (ft):	202		
Number of Segments:	2		
Individual Segment Lengths (ft):	101		
Segment:	1	2	
Gradient (%):	20	24	
m:			
Individual LS:	4.95	6.28	
Factor:	0.35	0.65	
Product:	1.73	4.08	
LS, Length and Steepness:	5.82		
Total Transect Average Gradient (%):	22		
Farming Practice:	Up & Down Hill		
P, Practice Factor (Table 6) ¹ :	1.00		
Segmented C-Value			
Segment:	1	2	
Vegetative Canopy:	Trees 13' Tall	No Canopy	
Canopy Cover:	75%	0%	
Ground Cover:	70%	70%	
Percent Grass:	70%	90%	
Percent Weeds:	30%	10%	
C, Cover (Table 5) ¹ :	0.037	0.031	
Segment Factor:	0.35	0.65	
Segmented C:	0.033		
A, Soil Loss (tons/acre):	2.78		
Soil Loss in Proposed Development (tons):	5.01		

¹ Tables 5 & 6 - USLE Special Applications for Napa County

Constellation Wappo Hill ECP
 USLE Calculations Post-Project
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Transect 2.1, Post-Project

Proposed Development Acres:	1.80		
Soil Unit No. (100-182):	179		
Soil Name:	Sobrante		
K, Soil Erodibility:	0.32		
T, Soil Loss Tolerance (tons/acre):	2		
R, Rainfall:	45		
Total Transect Length (ft):	202		
Number of Segments:	2		
Individual Segment Lengths (ft):	101		
Segment:	1	2	
Gradient (%):	20	24	
m:			
Individual LS:	4.95	6.28	
Factor:	0.35	0.65	
Product:	1.73	4.08	
LS, Length and Steepness:	5.82		
Total Transect Average Gradient (%):	22		
Farming Practice:	Up & Down Hill		
P, Practice Factor (Table 6) ¹ :	1.00		
Cover Strategy:	Permanent		
Age of Development:	Over 3 Years		
Ground Cover:	80%		
C, Cover (Table 4) ¹ :	0.022		
A, Soil Loss (tons/acre):	1.84		
Soil Loss in Proposed Development (tons):	3.32		

¹ Tables 4 & 6 - USLE Special Applications for Napa County

Constellation Wappo Hill ECP
 USLE Calculations Pre-Project
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Transect 2.2, Pre-Project

Proposed Development Acres:	2.50	
Soil Unit No. (100-182):	179	
Soil Name:	Sobrante	
K, Soil Erodibility:	0.32	
T, Soil Loss Tolerance (tons/acre):	2	
R, Rainfall:	45	
Total Transect Length (ft):	178	
Number of Segments:	2	
Individual Segment Lengths (ft):	89	
Segment:	1	2
Gradient (%):	17	24
m:		
Individual LS:	3.74	5.90
Factor:	0.35	0.65
Product:	1.31	3.83
LS, Length and Steepness:	5.14	
Total Transect Average Gradient (%):	21	
Farming Practice:	Up & Down Hill	
P, Practice Factor (Table 6) ¹ :	1.00	
Segmented C-Value		
Segment:	1	2
Vegetative Canopy:	Trees 13' Tall	No Canopy
Canopy Cover:	75%	0%
Ground Cover:	70%	70%
Percent Grass:	70%	90%
Percent Weeds:	30%	10%
C, Cover (Table 5) ¹ :	0.037	0.031
Segment Factor:	0.35	0.65
Segmented C:	0.033	
A, Soil Loss (tons/acre):	2.46	
Soil Loss in Proposed Development (tons):	6.15	

¹ Tables 5 & 6 - USLE Special Applications for Napa County

Constellation Wappo Hill ECP
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Transect 2.2, Post-Project

Proposed Development Acres:	2.50	
Soil Unit No. (100-182):	179	
Soil Name:	Sobrante	
K, Soil Erodibility:	0.32	
T, Soil Loss Tolerance (tons/acre):	2	
R, Rainfall:	45	
Total Transect Length (ft):	178	
Number of Segments:	2	
Individual Segment Lengths (ft):	89	
Segment:	1	2
Gradient (%):	17	24
m:		
Individual LS:	3.74	5.90
Factor:	0.35	0.65
Product:	1.31	3.83
LS, Length and Steepness:	5.14	
Total Transect Average Gradient (%):	21	
Farming Practice:	Up & Down Hill	
P, Practice Factor (Table 6) ¹ :	1.00	
Cover Strategy:	Permanent	
Age of Development:	Over 3 Years	
Ground Cover:	80%	
C, Cover (Table 4) ¹ :	0.022	
A, Soil Loss (tons/acre):	1.63	
Soil Loss in Proposed Development (tons):	4.07	

¹ Tables 4 & 6 - USLE Special Applications for Napa County

Constellation Wappo Hill ECP
 USLE Calculations Pre-Project
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Transect 3A, Pre-Project

Proposed Development Acres:	2.11		
Soils Present:			
Soil Unit No. (100-182):	179	179	105
Soil Name:	Sobrante	Sobrante	Bale
R, Rainfall:	45		
Total Transect Length (ft):	210		
Number of Segments:	3		
Individual Segment Lengths (ft):	70		
Segment:	1	2	3
Segment Soil:	179	179	105
K, Soil Erodibility:	0.32	0.32	0.2
T, Soil Loss Tolerance (tons/acre):	2	2	5
Gradient (%):	24	29	27
m:			
Individual LS:	6.41	8.16	7.45
Farming Practice:	Up & Down Hill		
P, Practice Factor (Table 6)*:	1.00		
C-Values			
Segment:	1	2	3
Vegetative Canopy:	Trees 13' Tall	Trees 13' Tall	No Canopy
Canopy Cover:	75%	75%	0%
Ground Cover:	70%	70%	70%
Percent Grass:	70%	70%	90%
Percent Weeds:	30%	30%	10%
C, Cover (Table 5) ¹ :	0.037	0.037	0.031
Factor:	0.19	0.35	0.46
Individual C*K*(LS)*Factor:	0.01	0.03	0.02
Sum C*K*LS:	0.07		
A, Soil Loss (tons/acre):	3.12		
Soil Loss in Proposed Development (tons) ² :	6.58		

¹ Tables 5 & 6 - USLE Special Applications for Napa County

² Estimates may vary slightly due to rounding

Constellation Wappo Hill ECP
 USLE Calculations Post-Project
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Transect 3A, Post-Project

Proposed Development Acres:	2.11		
Soils Present:			
Soil Unit No. (100-182):	179	179	105
Soil Name:	Sobrante	Sobrante	Bale
R, Rainfall:	45		
Total Transect Length (ft):	210		
Number of Segments:	3		
Individual Segment Lengths (ft):	70		
Segment:	1	2	3
Segment Soil:	179	179	105
K, Soil Erodibility:	0.32	0.32	0.2
T, Soil Loss Tolerance (tons/acre):	2	2	5
Gradient (%):	24	29	27
m:			
Individual LS:	6.41	8.16	7.45
Factor:	0.19	0.35	0.46
Individual K*(LS)*Factor:	0.39	0.91	0.69
Sum K*LS:	1.99		
Farming Practice:	Up & Down Hill		
P, Practice Factor (Table 6) ¹ :	1.00		
Cover Strategy:	Permanent		
Age of Development:	Over 3 Years		
Ground Cover:	85%		
C, Cover (Table 4) ¹ :	0.017		
A, Soil Loss (tons/acre):	1.49		
Soil Loss in Proposed Development (tons) ² :	3.15		

¹ Tables 5 & 6 - USLE Special Applications for Napa County

² Estimates may vary slightly due to rounding

Constellation Wappo Hill ECP
 USLE Calculations Pre-Project
 PPI Engineering
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Transect 3B, Pre-Project

Proposed Development Acres:	0.34
Soil Unit No. (100-182):	179
Soil Name:	Sobrante
K, Soil Erodibility:	0.32
T, Soil Loss Tolerance (tons/acre):	2
R, Rainfall:	45
Total Transect Length (ft):	58
Number of Segments:	1
Individual Segment Lengths (ft):	58
Segment:	
Gradient (%):	29
m:	
Individual LS:	4.29
Factor:	
Product:	
LS, Length and Steepness:	4.29
Total Transect Average Gradient (%):	29
Farming Practice:	Up & Down Hill
P, Practice Factor (Table 6) ¹ :	1.00
Vegetative Canopy:	No Canopy
Canopy Cover:	0%
Ground Cover:	70%
Percent Grass:	90%
Percent Weeds:	10%
C, Cover (Table 5) ¹ :	0.031
A, Soil Loss (tons/acre):	1.94
Soil Loss in Proposed Development (tons):	0.66

¹ Tables 5 & 6 - USLE Special Applications for Napa County

Constellation Wappo Hill ECP
 USLE Calculations Post-Project
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Transect 3B, Post-Project

Proposed Development Acres:	0.34
Soil Unit No. (100-182):	179
Soil Name:	Sobrante
K, Soil Erodibility:	0.32
T, Soil Loss Tolerance (tons/acre):	2
R, Rainfall:	45
Total Transect Length (ft):	58
Number of Segments:	1
Individual Segment Lengths (ft):	58
Segment:	
Gradient (%):	29
m:	
Individual LS:	4.29
Factor:	
Product:	
LS, Length and Steepness:	4.29
Total Transect Average Gradient (%):	29
Farming Practice:	Cross Slope Without Strips
P, Practice Factor (Table 6) ¹ :	0.95
Cover Strategy:	Permanent
Age of Development:	Over 3 Years
Ground Cover:	85%
C, Cover (Table 4) ¹ :	0.017
A, Soil Loss (tons/acre):	0.98
Soil Loss in Proposed Development (tons):	0.33

¹ Tables 4 & 6 - USLE Special Applications for Napa County

Constellation Wappo Hill ECP
 USLE Calculations Pre-Project
 PPI Engineering
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Transect 4, Pre-Project

Proposed Development Acres:	1.95	
Soil Unit No. (100-182):	139	
Soil Name:	Forward	
K, Soil Erodibility:	0.17	
T, Soil Loss Tolerance (tons/acre):	3	
R, Rainfall:	45	
Total Transect Length (ft):	166	
Number of Segments:	2	
Individual Segment Lengths (ft):	83	
Segment:	1	2
Gradient (%):	36	27
m:		
Individual LS:	9.44	6.63
Factor:	0.35	0.65
Product:	3.30	4.31
LS, Length and Steepness:	7.61	
Total Transect Average Gradient (%):	32	
Farming Practice:	Up & Down Hill	
P, Practice Factor (Table 6) ¹ :	1.00	
Segmented C-Value		
Segment:	1	2
Vegetative Canopy:	Trees 13' Tall	No Canopy
Canopy Cover:	75%	0%
Ground Cover:	70%	70%
Percent Grass:	80%	90%
Percent Weeds:	20%	10%
C, Cover (Table 5) ¹ :	0.033	0.031
Segment Factor:	0.35	0.65
Segmented C:	0.032	
A, Soil Loss (tons/acre):	1.86	
Soil Loss in Proposed Development (tons):	3.63	

¹ Tables 5 & 6 - USLE Special Applications for Napa County

Constellation Wappo Hill ECP
 USLE Calculations Post-Project
 PPI Engineering
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Transect 4, Post-Project

Proposed Development Acres:	1.95		
Soil Unit No. (100-182):	139		
Soil Name:	Forward		
K, Soil Erodibility:	0.17		
T, Soil Loss Tolerance (tons/acre):	3		
R, Rainfall:	45		
Total Transect Length (ft):	166		
Number of Segments:	2		
Individual Segment Lengths (ft):	83		
Segment:	1	2	
Gradient (%):	36	27	
m:			
Individual LS:	9.44	6.63	
Factor:	0.35	0.65	
Product:	3.30	4.31	
LS, Length and Steepness:	7.61		
Total Transect Average Gradient (%):	32		
Farming Practice:	Up & Down Hill		
P, Practice Factor (Table 6) ¹ :	1.00		
Cover Strategy:	Permanent		
Age of Development:	Over 3 Years		
Ground Cover:	80%		
C, Cover (Table 4) ¹ :	0.022		
A, Soil Loss (tons/acre):	1.28		
Soil Loss in Proposed Development (tons):	2.50		

¹ Tables 4 & 6 - USLE Special Applications for Napa County

Constellation Wappo Hill ECP
 USLE Calculations Pre-Project
 PPI Engineering
 8/8/2024
 CP

Transect 5A, Pre-Project

Proposed Development Acres:	1.71	
Soil Unit No. (100-182):	139	
Soil Name:	Forward	
K, Soil Erodibility:	0.17	
T, Soil Loss Tolerance (tons/acre):	3	
R, Rainfall:	45	
Total Transect Length (ft):	137	
Number of Segments:	2	
Individual Segment Lengths (ft):	69	
Segment:	1	2
Gradient (%):	20	21
m:		
Individual LS:	4.07	4.34
Factor:	0.35	0.65
Product:	1.43	2.82
LS, Length and Steepness:	4.25	
Total Transect Average Gradient (%):	21	
Farming Practice:	Up & Down Hill	
P, Practice Factor (Table 6) ¹ :	1.00	
Segmented C-Value		
Segment:	1	2
Vegetative Canopy:	Trees 13' Tall	No Canopy
Canopy Cover:	75%	0%
Ground Cover:	70%	70%
Percent Grass:	80%	90%
Percent Weeds:	20%	10%
C, Cover (Table 5) ¹ :	0.033	0.031
Segment Factor:	0.35	0.65
Segmented C:	0.032	
A, Soil Loss (tons/acre):	1.04	
Soil Loss in Proposed Development (tons):	1.78	

¹ Tables 5 & 6 - USLE Special Applications for Napa County

Constellation Wappo Hill ECP
 USLE Calculations Post-Project
 PPI Engineering
 8/8/2024
 CP

Transect 5A, Post-Project

Proposed Development Acres:	1.71		
Soil Unit No. (100-182):	139		
Soil Name:	Forward		
K, Soil Erodibility:	0.17		
T, Soil Loss Tolerance (tons/acre):	3		
R, Rainfall:	45		
Total Transect Length (ft):	137		
Number of Segments:	2		
Individual Segment Lengths (ft):	69		
Segment:	1	2	
Gradient (%):	20	21	
m:			
Individual LS:	4.07	4.34	
Factor:	0.35	0.65	
Product:	1.43	2.82	
LS, Length and Steepness:	4.25		
Total Transect Average Gradient (%):	21		
Farming Practice:	Up & Down Hill		
P, Practice Factor (Table 6) ¹ :	1.00		
Cover Strategy:	Permanent		
Age of Development:	Over 3 Years		
Ground Cover:	80%		
C, Cover (Table 4) ¹ :	0.022		
A, Soil Loss (tons/acre):	0.72		
Soil Loss in Proposed Development (tons):	1.22		

¹ Tables 4 & 6 - USLE Special Applications for Napa County

Constellation Wappo Hill ECP
 USLE Calculations Pre-Project
 PPI Engineering
 8/8/2024
 CP

Transect 5B, Pre-Project

Proposed Development Acres:	1.17	
Soil Unit No. (100-182):	139	
Soil Name:	Forward	
K, Soil Erodibility:	0.17	
T, Soil Loss Tolerance (tons/acre):	3	
R, Rainfall:	45	
Total Transect Length (ft):	180	
Number of Segments:	2	
Individual Segment Lengths (ft):	90	
Segment:	1	2
Gradient (%):	24	23
m:		
Individual LS:	5.93	5.61
Factor:	0.35	0.65
Product:	2.08	3.65
LS, Length and Steepness:	5.72	
Total Transect Average Gradient (%):	24	
Farming Practice:	Up & Down Hill	
P, Practice Factor (Table 6) ¹ :	1.00	
Segmented C-Value		
Segment:	1	2
Vegetative Canopy:	Trees 13' Tall	No Canopy
Canopy Cover:	75%	0%
Ground Cover:	70%	70%
Percent Grass:	80%	90%
Percent Weeds:	20%	10%
C, Cover (Table 5) ¹ :	0.033	0.031
Segment Factor:	0.35	0.65
Segmented C:	0.032	
A, Soil Loss (tons/acre):	1.40	
Soil Loss in Proposed Development (tons):	1.64	

¹ Tables 5 & 6 - USLE Special Applications for Napa County

Constellation Wappo Hill ECP
 USLE Calculations Post-Project
 PPI Engineering
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Transect 5B, Post-Project

Proposed Development Acres:	1.17	
Soil Unit No. (100-182):	139	
Soil Name:	Forward	
K, Soil Erodibility:	0.17	
T, Soil Loss Tolerance (tons/acre):	3	
R, Rainfall:	45	
Total Transect Length (ft):	180	
Number of Segments:	2	
Individual Segment Lengths (ft):	90	
Segment:	1	2
Gradient (%):	24	23
m:		
Individual LS:	5.93	5.61
Factor:	0.35	0.65
Product:	2.08	3.65
LS, Length and Steepness:	5.72	
Total Transect Average Gradient (%):	24	
Farming Practice:	Up & Down Hill	
P, Practice Factor (Table 6) ¹ :	1.00	
Cover Strategy:	Permanent	
Age of Development:	Over 3 Years	
Ground Cover:	80%	
C, Cover (Table 4) ¹ :	0.022	
A, Soil Loss (tons/acre):	0.96	
Soil Loss in Proposed Development (tons):	1.13	

¹ Tables 4 & 6 - USLE Special Applications for Napa County