Exhibit C

NAPA COUNTY RESOURCE CONSERVATION DISTRICT							
USLE LAYOUT AND PRACTICE ALTERNATIVES							
FOR:	Quantum Limit Vineyards	Precipitation (inches)	1.65	(2)			
Block:	V	Existing	0.3	acres			
USER:	OR	Latitude:	38°19'25"N				
DATE:	25-Oct-19	Longitude:	122°07'57"W				
Soil Type	Bressa_Dibble Complex						
T	Natural Soil Loss Factor (tons/acre)	3	(1)	3	(1)	3	(1)
K	Soil Erodibilty Factor	0.43	(1)	0.43	(1)	0.43	(1)
Transect		1	(site plan)	2	(site plan)	3	(site plan)
FACTOR:	DESCRIPTION						
R	Rainfall and Runoff Factor	47.5	(3)	47.5	(3)	47.5	(3)
	Slope length (ft)	35	(site plan)	13	(site plan)	26	(site plan)
S	Slope Gradient (%)	27	(site plan)	26	(site plan)	27	(site plan)
LS	Calculated LS	3.04		1.77		2.62	
C	Crop/Vegetation Management Factor	0.040	(4)	0.040	(4)	0.040	(4)
P	Support Practice Factor	1	(5)	1	(5)	1	(5)
							Average
A	Soil loss, tons/acre	2.48		1.44		2.14	2.02
	Soil loss, tons	0.75		0.43		0.64	0.61
Equations:				A = Average annual soil loss (tons per acre)			
Universal Soil Loss Equation (USLE)				R = Rainfall and Runoff Factor			
				K = Soil Erodibility Factor			
A = R x K x LS x C x P				LS = Slope Length-Gradient Factor			
				C = Crop/Vegetation and Management Factor			
				P = Support Practice Factor			

for slopes of 9% or flatter

$LS = ((L/72.6 \times cos(arctan(s))^m) \times ((65.41 \times (sin(arctan(s)))^2) + 4.56 \times sin(arctan(s)) + 0.065)$

where:	L = length in feet along slope				
s = slope gradient in %/100			m = 0.2	for s<1%	
m= slope exponent			m = 0.3	for 1%<s<3.5%	
			m = 0.4	for 3.6%<s<4.5%	
			m = 0.5	for s>4.5%	

for slopes steeper than 9%

$LS = ((L/72.6 \times cos(arctan(s)))^{.5}) \times ((sin(arctan(s))/(sin5.143radians))^{1.4}$

where: L = length in feet along slope
s = slope gradient in %/100

References:
1) Web Soil Survey (https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm)
2) NOAA Atlas 14, Volume 6, Version 2 Isopluvials for 2yr - 6hr storm event
3) Table A-1 "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1996, pg. A-3
4) Table 10: "Predicting Rainfall Erosion Losses", USDA Handbook No. 537. (50% Tree Cover, 60% Grass Cover).
5) Table 4: "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1991 pg. 11. (Up/Down Hill).

NAPA COUNTY RESOURCE CONSERVATION DISTRICT							
USLE LAYOUT AND PRACTICE ALTERNATIVES							
FOR:	Quantum Limit Vineyards	Precipitation (inches)	1.65	(2)			
Block:	V	Temporary	0.3	acres			
USER:	OR	Latitude:	38°19'25"N				
DATE:	25-Oct-19	Longitude:	122°07'57"W				
Soil Type	Bressa_Dibble Complex						
T	Natural Soil Loss Factor (tons/acre)	3	(1)	3	(1)	3	(1)
K	Soil Erodibilty Factor	0.43	(1)	0.43	(1)	0.43	(1)
Transect		1	(site plan)	2	(site plan)	3	(site plan)
FACTOR:	DESCRIPTION						
R	Rainfall and Runoff Factor	47.5	(3)	47.5	(3)	47.5	(3)
	Slope length (ft)	35	(site plan)	13	(site plan)	26	(site plan)
S	Slope Gradient (%)	27	(site plan)	26	(site plan)	27	(site plan)
LS	Calculated LS	3.04		1.77		2.62	
C	Crop/Vegetation Management Factor	0.043	(4)	0.043	(4)	0.043	(4)
P	Support Practice Factor	0.9	(5)	0.9	(5)	0.9	(5)
							Average
A	Soil loss, tons/acre	2.40		1.40		2.07	**1.96**
	Soil loss, tons	0.72		0.42		0.62	**0.59**
Equations:				A = Average annual soil loss (tons per acre)			
Universal Soil Loss Equation (USLE)				R = Rainfall and Runoff Factor			
				K = Soil Erodibility Factor			
A = R x K x LS x C x P				LS = Slope Length-Gradient Factor			
				C = Crop/Vegetation and Management Factor			
				P = Support Practice Factor			
for slopes of 9% or flatter							
LS = ((L/72.6 x cos(arctan(s))^m) x ((65.41 x (sin(arctan(s)))^2)+4.56 x sin(arctan(s))+0.065)							
where:	L = length in feet along slope						
s = slope gradient in %/100			m = 0.2	for s<1%			
m= slope exponent			m = 0.3	for 1%<s<3.5%			
			m = 0.4	for 3.6%<s<4.5%			
			m = 0.5	for s>4.5%			
for slopes steeper than 9%							
LS = ((L/72.6 x cos(arctan(s)))^.5) x ((sin(arctan(s))/(sin5.143radians))^1.4							
where:	L = length in feet along slope						
s = slope gradient in %/100							
References:							
1) Web Soil Survey (https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm)							
2) NOAA Atlas 14, Volume 6, Version 2 Isopluvials for 2yr - 6hr storm event							
3) Table A-1 "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1996, pg. A-3							
4) Table 8: "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1991, pg. C-9. (75% Cover, All Rows Tilled).							
5) Table 4: "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1991 pg. 11. (Terrace with Tilling).							

NAPA COUNTY RESOURCE CONSERVATION DISTRICT							
USLE LAYOUT AND PRACTICE ALTERNATIVES							
FOR:	Quantum Limit Vineyards	Precipitation (inches)	1.65	(2)			
Block:	V	Permanent	0.3	acres			
USER:	OR	Latitude:	38°19'25"N				
DATE:	25-Oct-19	Longitude:	122°07'57"W				
Soil Type	Bressa_Dibble Complex						
T	Natural Soil Loss Factor (tons/acre)	3	(1)	3	(1)	3	(1)
K	Soil Erodibilty Factor	0.43	(1)	0.43	(1)	0.43	(1)
Transect		1	(site plan)	2	(site plan)	3	(site plan)
FACTOR:	DESCRIPTION						
R	Rainfall and Runoff Factor	47.5	(3)	47.5	(3)	47.5	(3)
	Slope length (ft)	35	(site plan)	13	(site plan)	26	(site plan)
S	Slope Gradient (%)	27	(site plan)	26	(site plan)	27	(site plan)
LS	Calculated LS	3.04		1.77		2.62	
C	Crop/Vegetation Management Factor	0.034	(4)	0.034	(4)	0.034	(4)
P	Support Practice Factor	0.45	(5)	0.45	(5)	0.45	(5)
							Average
A	Soil loss, tons/acre	0.95		0.55		0.82	0.77
	Soil loss, tons	0.29		0.17		0.25	0.23

Equations:			A = Average annual soil loss (tons per acre)
Universal Soil Loss Equation (USLE)			R = Rainfall and Runoff Factor
			K = Soil Erodibility Factor
A = R x K x LS x C x P			LS = Slope Length-Gradient Factor
			C = Crop/Vegetation and Management Factor
			P = Support Practice Factor

for slopes of 9% or flatter

$LS = ((L/72.6 \times \cos(\arctan(s))^m) \times ((65.41 \times (\sin(\arctan(s)))^2) + 4.56 \times \sin(\arctan(s)) + 0.065)$

where:	L = length in feet along slope		
s = slope gradient in %/100		m = 0.2	for s<1%
m= slope exponent		m = 0.3	for 1%<s<3.5%
		m = 0.4	for 3.6%<s<4.5%
		m = 0.5	for s>4.5%

for slopes steeper than 9%

$LS = ((L/72.6 \times \cos(\arctan(s)))^{.5}) \times ((\sin(\arctan(s))/(\sin 5.143 radians))^{1.4}$

where: L = length in feet along slope
s = slope gradient in %/100

References:
1) Web Soil Survey (https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm)
2) NOAA Atlas 14, Volume 6, Version 2 Isopluvials for 2yr - 6hr storm event
3) Table A-1 "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1996, pg. A-3
4) Table 8: "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1991, pg. C-9. (75% Cover, No-Till).
5) Table 4: "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1991 pg. 11. (Terrace No-Tilling).

NAPA COUNTY RESOURCE CONSERVATION DISTRICT							
USLE LAYOUT AND PRACTICE ALTERNATIVES							
FOR:	Quantum Limit Vineyards	Precipitation (inches)	1.65	(2)			
Block:	W	Existing	0.1	acres			
USER:	OR	Latitude:	38°19'25"N				
DATE:	25-Oct-19	Longitude:	122°07'57"W				
Soil Type	Bressa_Dibble Complex						
T	Natural Soil Loss Factor (tons/acre)	3	(1)	3	(1)	3	(1)
K	Soil Erodibilty Factor	0.43	(1)	0.43	(1)	0.43	(1)
Transect		1	(site plan)	2	(site plan)	3	(site plan)
FACTOR:	DESCRIPTION						
R	Rainfall and Runoff Factor	47.5	(3)	47.5	(3)	47.5	(3)
	Slope length (ft)	50	(site plan)	75	(site plan)	79	(site plan)
S	Slope Gradient (%)	16	(site plan)	26	(site plan)	30	(site plan)
LS	Calculated LS	1.82		4.24		5.21	
C	Crop/Vegetation Management Factor	0.041	(4)	0.041	(4)	0.042	(5)
P	Support Practice Factor	1	(6)	1	(6)	1	(6)
							Average
A	Soil loss, tons/acre	1.53		3.55		4.47	3.18
	Soil loss, tons	0.15		0.36		0.45	0.32

Equations:

A = Average annual soil loss (tons per acre)

Universal Soil Loss Equation (USLE)

R = Rainfall and Runoff Factor

K = Soil Erodibility Factor

A = R x K x LS x C x P

LS = Slope Length-Gradient Factor

C = Crop/Vegetation and Management Factor

P = Support Practice Factor

for slopes of 9% or flatter

LS = ((L/72.6 x cos(arctan(s))^m) x ((65.41 x (sin(arctan(s)))^2)+4.56 x sin(arctan(s))+0.065)

where: L = length in feet along slope

s = slope gradient in %/100

m = 0.2 for s<1%

m= slope exponent

m = 0.3 for 1%<s<3.5%

m = 0.4 for 3.6%<s<4.5%

m = 0.5 for s>4.5%

for slopes steeper than 9%

LS = ((L/72.6 x cos(arctan(s)))^.5) x ((sin(arctan(s))/(sin5.143radians))^1.4

where: L = length in feet along slope

s = slope gradient in %/100

References:

1) Web Soil Survey (https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm)

2) NOAA Atlas 14, Volume 6, Version 2 Isopluvials for 2yr - 6hr storm event

3) Table A-1 "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1996, pg. A-3

4) Table 10: "Predicting Rainfall Erosion Losses", USDA Handbook No. 537. (25% Tree Cover, 60% Grass Cover).

5) Table 10: "Predicting Rainfall Erosion Losses", USDA Handbook No. 537. (0% Tree Cover, 60% Grass Cover).

6) Table 4: "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1991 pg. 11. (Up/Down Hill).

NAPA COUNTY RESOURCE CONSERVATION DISTRICT						
USLE LAYOUT AND PRACTICE ALTERNATIVES						
FOR:	Quantum Limit Vineyards	Precipitation (inches)	1.65	(2)		
Block:	W	Temporary	0.1	acres		
USER:	OR	Latitude:	38°19'25"N			
DATE:	25-Oct-19	Longitude:	122°07'57"W			
Soil Type	Bressa_Dibble Complex					
T	Natural Soil Loss Factor (tons/acre)	3	(1)	3	(1)	3	(1)
K	Soil Erodibilty Factor	0.43	(1)	0.43	(1)	0.43	(1)
Transect		1	(site plan)	2	(site plan)	3	(site plan)
FACTOR:	DESCRIPTION					
R	Rainfall and Runoff Factor	47.5	(3)	47.5	(3)	47.5	(3)
	Slope length (ft)	26	(6)	42	(6)	45	(6)
S	Slope Gradient (%)	16	(site plan)	26	(site plan)	30	(site plan)
LS	Calculated LS	1.31		3.17		3.94	
C	Crop/Vegetation Management Factor	0.043	(4)	0.043	(4)	0.043	(4)
P	Support Practice Factor	1	(5)	1	(5)	1	(5)
						Average
A	Soil loss, tons/acre	1.15		2.79		3.46	**2.47**
	Soil loss, tons	0.12		0.28		0.35	**0.25**

Equations: A = Average annual soil loss (tons per acre)

Universal Soil Loss Equation (USLE)   R = Rainfall and Runoff Factor

K = Soil Erodibility Factor

A = R x K x LS x C x P   LS = Slope Length-Gradient Factor

C = Crop/Vegetation and Management Factor

P = Support Practice Factor

for slopes of 9% or flatter

$LS = ((L/72.6 \times \cos(\arctan(s))^m) \times ((65.41 \times (\sin(\arctan(s)))^2) + 4.56 \times \sin(\arctan(s)) + 0.065)$

where: L = length in feet along slope

s = slope gradient in %/100   m = 0.2 for s<1%

m= slope exponent   m = 0.3 for 1%<s<3.5%

m = 0.4 for 3.6%<s<4.5%

m = 0.5 for s>4.5%

for slopes steeper than 9%

$LS = ((L/72.6 \times \cos(\arctan(s)))^{.5} \times ((\sin(\arctan(s))/(\sin 5.143 \text{radians}))^{1.4}$

where: L = length in feet along slope

s = slope gradient in %/100

References:

1) Web Soil Survey (https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm)

2) NOAA Atlas 14, Volume 6, Version 2 Isopluvials for 2yr - 6hr storm event

3) Table A-1 "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1996, pg. A-3

4) Table 8: "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1991, pg. C-9. (75% Cover, All Rows Tilled).

5) Table 4: "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1991 pg. 11. (Up/Down Hill).

6) Inclusion of straw roll for first year only and/or permanent cross slope diversions.

NAPA COUNTY RESOURCE CONSERVATION DISTRICT							
USLE LAYOUT AND PRACTICE ALTERNATIVES							
FOR:	Quantum Limit Vineyards	Precipitation (inches)	1.65	(2)			
Block:	W	Permanent	0.1	acres			
USER:	OR	Latitude:	38°19'25"N				
DATE:	25-Oct-19	Longitude:	122°07'57"W				
Soil Type	Bressa_Dibble Complex						
T	Natural Soil Loss Factor (tons/acre)	3	(1)	3	(1)	3	(1)
K	Soil Erodibilty Factor	0.43	(1)	0.43	(1)	0.43	(1)
Transect		1	(site plan)	2	(site plan)	3	(site plan)
FACTOR:	DESCRIPTION						
R	Rainfall and Runoff Factor	47.5	(3)	47.5	(3)	47.5	(3)
	Slope length (ft)	50	(site plan)	75	(site plan)	79	(site plan)
S	Slope Gradient (%)	16	(site plan)	26	(site plan)	30	(site plan)
LS	Calculated LS	1.82		4.24		5.21	
C	Crop/Vegetation Management Factor	0.034	(4)	0.034	(4)	0.034	(4)
P	Support Practice Factor	1	(5)	1	(5)	1	(5)
							Average
A	Soil loss, tons/acre	1.27		2.95		3.62	2.61
	Soil loss, tons	0.13		0.29		0.36	0.26
Equations:				A = Average annual soil loss (tons per acre)			
Universal Soil Loss Equation (USLE)				R = Rainfall and Runoff Factor			
				K = Soil Erodibility Factor			
A = R x K x LS x C x P				LS = Slope Length-Gradient Factor			
				C = Crop/Vegetation and Management Factor			
				P = Support Practice Factor			

for slopes of 9% or flatter

$LS = ((L/72.6 \times \cos(\arctan(s))^m) \times ((65.41 \times (\sin(\arctan(s)))^2) + 4.56 \times \sin(\arctan(s)) + 0.065)$

where:	L = length in feet along slope				
s = slope gradient in %/100			m = 0.2	for s<1%	
m= slope exponent			m = 0.3	for 1%<s<3.5%	
			m = 0.4	for 3.6%<s<4.5%	
			m = 0.5	for s>4.5%	

for slopes steeper than 9%

$LS = ((L/72.6 \times \cos(\arctan(s)))^{.5}) \times ((\sin(\arctan(s))/(\sin 5.143 \text{radians}))^{1.4}$

where:	L = length in feet along slope
s = slope gradient in %/100	

References:
1) Web Soil Survey (https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm)
2) NOAA Atlas 14, Volume 6, Version 2 Isopluvials for 2yr - 6hr storm event
3) Table A-1 "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1996, pg. A-3
4) Table 8: "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1991, pg. C-9. (75% Cover, No-Till).
5) Table 4: "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1991 pg. 11. (Up/Down Hill).

NAPA COUNTY RESOURCE CONSERVATION DISTRICT							
USLE LAYOUT AND PRACTICE ALTERNATIVES							
FOR:	Quantum Limit Vineyards	Precipitation (inches)	1.65	(2)			
Block:	X2	Existing	0.5	acres			
USER:	OR	Latitude:	38°19'25"N				
DATE:	25-Oct-19	Longitude:	122°07'57"W				
Soil Type	Bressa_Dibble Complex						
T	Natural Soil Loss Factor (tons/acre)	3	(1)	3	(1)	3	(1)
K	Soil Erodibilty Factor	0.43	(1)	0.43	(1)	0.43	(1)
Transect		1	(site plan)	2	(site plan)	3	(site plan)
FACTOR:	DESCRIPTION						
R	Rainfall and Runoff Factor	47.5	(3)	47.5	(3)	47.5	(3)
	Slope length (ft)	93	(site plan)	176	(site plan)	168	(site plan)
S	Slope Gradient (%)	18	(site plan)	13	(site plan)	26	(site plan)
LS	Calculated LS	2.91		2.58		6.35	
C	Crop/Vegetation Management Factor	0.041	(4)	0.041	(4)	0.041	(4)
P	Support Practice Factor	1	(5)	1	(5)	1	(5)
							Average
A	Soil loss, tons/acre	2.44		2.16		5.32	**3.31**
	Soil loss, tons	1.22		1.08		2.66	**1.65**
Equations:				A = Average annual soil loss (tons per acre)			
Universal Soil Loss Equation (USLE)				R = Rainfall and Runoff Factor			
				K = Soil Erodibility Factor			
A = R x K x LS x C x P				LS = Slope Length-Gradient Factor			
				C = Crop/Vegetation and Management Factor			
				P = Support Practice Factor			
for slopes of 9% or flatter							
LS = ((L/72.6 x cos(arctan(s))^m) x ((65.41 x (sin(arctan(s)))^2)+4.56 x sin(arctan(s))+0.065)							
where:	L = length in feet along slope						
s = slope gradient in %/100			m = 0.2	for s<1%			
m= slope exponent			m = 0.3	for 1%<s<3.5%			
			m = 0.4	for 3.6%<s<4.5%			
			m = 0.5	for s>4.5%			
for slopes steeper than 9%							
LS = ((L/72.6 x cos(arctan(s)))^.5) x ((sin(arctan(s))/(sin5.143radians))^1.4							
where:	L = length in feet along slope						
s = slope gradient in %/100							
References:							
1) Web Soil Survey (https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm)							
2) NOAA Atlas 14, Volume 6, Version 2 Isopluvials for 2yr - 6hr storm event							
3) Table A-1 "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1996, pg. A-3							
4) Table 10: "Predicting Rainfall Erosion Losses", USDA Handbook No. 537. (25% Tree Cover, 60% Grass Cover).							
5) Table 4: "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1991 pg. 11. (Up/Down Hill).							

NAPA COUNTY RESOURCE CONSERVATION DISTRICT							
USLE LAYOUT AND PRACTICE ALTERNATIVES							
FOR:	Quantum Limit Vineyards	Precipitation (inches)	1.65	(2)			
Block:	X2	Temporary	0.5	acres			
USER:	OR	Latitude:	38°19'25"N				
DATE:	25-Oct-19	Longitude:	122°07'57"W				
Soil Type	Bressa_Dibble Complex						
T	Natural Soil Loss Factor (tons/acre)	3	(1)	3	(1)	3	(1)
K	Soil Erodibilty Factor	0.43	(1)	0.43	(1)	0.43	(1)
Transect		1	(site plan)	2	(site plan)	3	(site plan)
FACTOR:	DESCRIPTION						
R	Rainfall and Runoff Factor	47.5	(3)	47.5	(3)	47.5	(3)
	Slope length (ft)	45	(6)	100	(6)	75	(6)
S	Slope Gradient (%)	18	(site plan)	13	(site plan)	26	(site plan)
LS	Calculated LS	2.03		1.94		4.24	
C	Crop/Vegetation Management Factor	0.043	(4)	0.043	(4)	0.043	(4)
P	Support Practice Factor	1	(5)	1	(5)	1	(5)
							Average
A	Soil loss, tons/acre	1.78		1.71		3.73	2.40
	Soil loss, tons	0.89		0.85		1.86	1.20

Equations:

Universal Soil Loss Equation (USLE)

A = Average annual soil loss (tons per acre)

R = Rainfall and Runoff Factor

K = Soil Erodibility Factor

$A = R \times K \times LS \times C \times P$

LS = Slope Length-Gradient Factor

C = Crop/Vegetation and Management Factor

P = Support Practice Factor

for slopes of 9% or flatter

$LS = ((L/72.6 \times \cos(\arctan(s))^m) \times ((65.41 \times (\sin(\arctan(s)))^2) + 4.56 \times \sin(\arctan(s)) + 0.065)$

where: L = length in feet along slope

s = slope gradient in %/100   m = 0.2 for s<1%

m= slope exponent   m = 0.3 for 1%<s<3.5%

m = 0.4 for 3.6%<s<4.5%

m = 0.5 for s>4.5%

for slopes steeper than 9%

$LS = ((L/72.6 \times \cos(\arctan(s)))^{.5} \times ((\sin(\arctan(s))/(\sin 5.143 \text{radians}))^{1.4}$

where: L = length in feet along slope

s = slope gradient in %/100

References:

1) Web Soil Survey (https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm)

2) NOAA Atlas 14, Volume 6, Version 2 Isopluvials for 2yr - 6hr storm event

3) Table A-1 "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1996, pg. A-3

4) Table 8: "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1991, pg. C-9. (75% Cover, All Rows Tilled).

5) Table 4: "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1991 pg. 11. (Up/Down Hill).

6) Inclusion of straw roll for first year only and/or permanent cross slope diversions and/or permanent waterbars.

NAPA COUNTY RESOURCE CONSERVATION DISTRICT							
USLE LAYOUT AND PRACTICE ALTERNATIVES							
FOR:	Quantum Limit Vineyards	Precipitation (inches)	1.65	(2)			
Block:	X2	Permanent	0.5	acres			
USER:	OR	Latitude:	38°19'25"N				
DATE:	25-Oct-19	Longitude:	122°07'57"W				
Soil Type	Bressa_Dibble Complex						
T	Natural Soil Loss Factor (tons/acre)	3	(1)	3	(1)	3	(1)
K	Soil Erodibilty Factor	0.43	(1)	0.43	(1)	0.43	(1)
Transect		1	(site plan)	2	(site plan)	3	(site plan)
FACTOR:	DESCRIPTION						
R	Rainfall and Runoff Factor	47.5	(3)	47.5	(3)	47.5	(3)
	Slope length (ft)	93	(6)	176	(6)	168	(6)
S	Slope Gradient (%)	18	(site plan)	13	(site plan)	26	(site plan)
LS	Calculated LS	2.91		2.58		6.35	
C	Crop/Vegetation Management Factor	0.034	(4)	0.034	(4)	0.034	(4)
P	Support Practice Factor	1	(5)	1	(5)	1	(5)
							Average
A	Soil loss, tons/acre	2.02		1.79		4.41	**2.74**
	Soil loss, tons	1.01		0.90		2.20	**1.37**
Equations:				A = Average annual soil loss (tons per acre)			
Universal Soil Loss Equation (USLE)				R = Rainfall and Runoff Factor			
				K = Soil Erodibility Factor			
A = R x K x LS x C x P				LS = Slope Length-Gradient Factor			
				C = Crop/Vegetation and Management Factor			
				P = Support Practice Factor			
for slopes of 9% or flatter							
LS = ((L/72.6 x cos(arctan(s))^m) x ((65.41 x (sin(arctan(s)))^2)+4.56 x sin(arctan(s))+0.065)							
where:	L = length in feet along slope						
s = slope gradient in %/100			m = 0.2	for s<1%			
m= slope exponent			m = 0.3	for 1%<s<3.5%			
			m = 0.4	for 3.6%<s<4.5%			
			m = 0.5	for s>4.5%			
for slopes steeper than 9%							
LS = ((L/72.6 x cos(arctan(s)))^.5) x ((sin(arctan(s))/(sin5.143radians))^1.4							
where:	L = length in feet along slope						
s = slope gradient in %/100							
References:							
1) Web Soil Survey (https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm)							
2) NOAA Atlas 14, Volume 6, Version 2 Isopluvials for 2yr - 6hr storm event							
3) Table A-1 "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1996, pg. A-3							
4) Table 8: "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1991, pg. C-9. (75% Cover, No-Till).							
5) Table 4: "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1991 pg. 11. (Up/Down Hill).							

NAPA COUNTY RESOURCE CONSERVATION DISTRICT							
USLE LAYOUT AND PRACTICE ALTERNATIVES							
FOR:	Quantum Limit Vineyards	Precipitation (inches)	1.65	(2)			
Block:	X3	Existing	0.03	acres			
USER:	OR	Latitude:	38°19'25"N				
DATE:	25-Oct-19	Longitude:	122°07'57"W				
Soil Type	Bressa_Dibble Complex						
T	Natural Soil Loss Factor (tons/acre)	3	(1)	3	(1)	3	(1)
K	Soil Erodibilty Factor	0.43	(1)	0.43	(1)	0.43	(1)
Transect		1	(site plan)	2	(site plan)	3	(site plan)
FACTOR:	DESCRIPTION						
R	Rainfall and Runoff Factor	47.5	(3)	47.5	(3)	47.5	(3)
	Slope length (ft)	15	(site plan)	10	(site plan)	9	(site plan)
S	Slope Gradient (%)	10	(site plan)	24	(site plan)	10	(site plan)
LS	Calculated LS	0.52		1.40		0.41	
C	Crop/Vegetation Management Factor	0.040	(4)	0.040	(4)	0.040	(4)
P	Support Practice Factor	1	(5)	1	(5)	1	(5)
							Average
A	Soil loss, tons/acre	0.43		1.14		0.33	0.63
	Soil loss, tons	0.01		0.03		0.01	0.02
Equations:				A = Average annual soil loss (tons per acre)			
Universal Soil Loss Equation (USLE)				R = Rainfall and Runoff Factor			
				K = Soil Erodibility Factor			
A = R x K x LS x C x P				LS = Slope Length-Gradient Factor			
				C = Crop/Vegetation and Management Factor			
				P = Support Practice Factor			
for slopes of 9% or flatter							
LS = ((L/72.6 x cos(arctan(s))^m) x ((65.41 x (sin(arctan(s)))^2)+4.56 x sin(arctan(s))+0.065)							
where:	L = length in feet along slope						
s = slope gradient in %/100			m = 0.2	for s<1%			
m= slope exponent			m = 0.3	for 1%<s<3.5%			
			m = 0.4	for 3.6%<s<4.5%			
			m = 0.5	for s>4.5%			
for slopes steeper than 9%							
LS = ((L/72.6 x cos(arctan(s)))^.5) x ((sin(arctan(s))/(sin5.143radians))^1.4							
where:	L = length in feet along slope						
s = slope gradient in %/100							
References:							
1) Web Soil Survey (https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm)							
2) NOAA Atlas 14, Volume 6, Version 2 Isopluvials for 2yr - 6hr storm event							
3) Table A-1 "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1996, pg. A-3							
4) Table 10: "Predicting Rainfall Erosion Losses", USDA Handbook No. 537. (50% Tree Cover, 60% Grass Cover).							
5) Table 4: "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1991 pg. 11. (Up/Down Hill).							

NAPA COUNTY RESOURCE CONSERVATION DISTRICT							
USLE LAYOUT AND PRACTICE ALTERNATIVES							
FOR:	Quantum Limit Vineyards	Precipitation (inches)	1.65	(2)			
Block:	X3	Temporary	0.03	acres			
USER:	OR	Latitude:	38°19'25"N				
DATE:	25-Oct-19	Longitude:	122°07'57"W				
Soil Type	Bressa_Dibble Complex						
T	Natural Soil Loss Factor (tons/acre)	3	(1)	3	(1)	3	(1)
K	Soil Erodibilty Factor	0.43	(1)	0.43	(1)	0.43	(1)
Transect		1	(site plan)	2	(site plan)	3	(site plan)
FACTOR:	DESCRIPTION						
R	Rainfall and Runoff Factor	47.5	(3)	47.5	(3)	47.5	(3)
	Slope length (ft)	15	(site plan)	10	(site plan)	9	(site plan)
S	Slope Gradient (%)	10	(site plan)	24	(site plan)	10	(site plan)
LS	Calculated LS	0.52		1.40		0.41	
C	Crop/Vegetation Management Factor	0.043	(4)	0.043	(4)	0.043	(4)
P	Support Practice Factor	0.9	(5)	0.9	(5)	0.9	(5)
							Average
A	Soil loss, tons/acre	0.41		1.10		0.32	0.61
	Soil loss, tons	0.01		0.03		0.01	0.02
Equations:				A = Average annual soil loss (tons per acre)			
Universal Soil Loss Equation (USLE)				R = Rainfall and Runoff Factor			
				K = Soil Erodibility Factor			
A = R x K x LS x C x P				LS = Slope Length-Gradient Factor			
				C = Crop/Vegetation and Management Factor			
				P = Support Practice Factor			

for slopes of 9% or flatter

$LS = ((L/72.6 \times cos(arctan(s))^m) \times ((65.41 \times (sin(arctan(s)))^2) + 4.56 \times sin(arctan(s)) + 0.065)$

where:	L = length in feet along slope						
s = slope gradient in %/100				m = 0.2	for s<1%		
m= slope exponent				m = 0.3	for 1%<s<3.5%		
				m = 0.4	for 3.6%<s<4.5%		
				m = 0.5	for s>4.5%		

for slopes steeper than 9%

$LS = ((L/72.6 \times cos(arctan(s)))^{.5}) \times ((sin(arctan(s))/(sin 5.143 radians))^{1.4}$

where: L = length in feet along slope

s = slope gradient in %/100

References:
1) Web Soil Survey (https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm)
2) NOAA Atlas 14, Volume 6, Version 2 Isopluvials for 2yr - 6hr storm event
3) Table A-1 "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1996, pg. A-3
4) Table 8: "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1991, pg. C-9. (75% Cover, All Rows Tilled).
5) Table 4: "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1991 pg. 11. (Terrace with Tilling).

NAPA COUNTY RESOURCE CONSERVATION DISTRICT							
USLE LAYOUT AND PRACTICE ALTERNATIVES							
FOR:	Quantum Limit Vineyards	Precipitation (inches)	1.65	(2)			
Block:	X3	Permanent	0.03	acres			
USER:	OR	Latitude:	38°19'25"N				
DATE:	25-Oct-19	Longitude:	122°07'57"W				
Soil Type	Bressa_Dibble Complex						
T	Natural Soil Loss Factor (tons/acre)	3	(1)	3	(1)	3	(1)
K	Soil Erodibilty Factor	0.43	(1)	0.43	(1)	0.43	(1)
Transect		1	(site plan)	2	(site plan)	3	(site plan)
FACTOR:	DESCRIPTION						
R	Rainfall and Runoff Factor	47.5	(3)	47.5	(3)	47.5	(3)
	Slope length (ft)	15	(site plan)	10	(site plan)	9	(site plan)
S	Slope Gradient (%)	10	(site plan)	24	(site plan)	10	(site plan)
LS	Calculated LS	0.52		1.40		0.41	
C	Crop/Vegetation Management Factor	0.034	(4)	0.034	(4)	0.034	(4)
P	Support Practice Factor	0.45	(5)	0.45	(5)	0.45	(5)
							Average
A	Soil loss, tons/acre	0.16		0.44		0.13	**0.24**
	Soil loss, tons	0.00		0.01		0.00	**0.01**

Equations:

Universal Soil Loss Equation (USLE)

A = R x K x LS x C x P

A = Average annual soil loss (tons per acre)
R = Rainfall and Runoff Factor
K = Soil Erodibility Factor
LS = Slope Length-Gradient Factor
C = Crop/Vegetation and Management Factor
P = Support Practice Factor

for slopes of 9% or flatter

$LS = ((L/72.6 \times cos(arctan(s))^m) \times ((65.41 \times (sin(arctan(s)))^2) + 4.56 \times sin(arctan(s)) + 0.065)$

where: L = length in feet along slope

s = slope gradient in %/100

m= slope exponent

m = 0.2 for s<1%
m = 0.3 for 1%<s<3.5%
m = 0.4 for 3.6%<s<4.5%
m = 0.5 for s>4.5%

for slopes steeper than 9%

$LS = ((L/72.6 \times cos(arctan(s)))^{.5}) \times ((sin(arctan(s))/(sin5.143radians))^{1.4}$

where: L = length in feet along slope

s = slope gradient in %/100

References:

1) Web Soil Survey (https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm)

2) NOAA Atlas 14, Volume 6, Version 2 Isopluvials for 2yr - 6hr storm event

3) Table A-1 "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1996, pg. A-3

4) Table 8: "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1991, pg. C-9. (75% Cover, No-Till).

5) Table 4: "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1991 pg. 11. (Terrace No-Tilling).

NAPA COUNTY RESOURCE CONSERVATION DISTRICT
USLE LAYOUT AND PRACTICE ALTERNATIVES

FOR:	Quantum Limit Vineyards	Precipitation (inches)	1.65	(2)					
Block:	X1	Existing	3.1	acres					
USER:	OR	Latitude:	38°19'25"N						
DATE:	17-Dec-20	Longitude:	122°07'57"W						

Soil Type	Bressa_Dibble Complex								
T	Natural Soil Loss Factor (tons/acre)	3	(1)	3	(1)	3	(1)	3	(1)
K	Soil Erodibilty Factor	0.43	(1)	0.43	(1)	0.43	(1)	0.43	(1)
Transect		1	(site plan)	2	(site plan)	3	(site plan)	4	(site plan)
FACTOR:	DESCRIPTION								
R	Rainfall and Runoff Factor	47.5	(3)	47.5	(3)	47.5	(3)	47.5	(3)
	Slope length (ft)	158	(site plan)	481	(site plan)	243	(site plan)	79	(site plan)
S	Slope Gradient (%)	13	(site plan)	22	(site plan)	16	(site plan)	28	(site plan)
LS	Calculated LS	2.44		8.65		4.02		4.78	
C	Crop/Vegetation Management Factor	0.041	(4)	0.041	(4)	0.041	(4)	0.041	(4)
P	Support Practice Factor	1	(5)	1	(5)	1	(5)	1	(5)
									Average
A	Soil loss, tons/acre	2.05		7.24		3.37		4.01	4.17
	Soil loss, tons	6.34		22.45		10.43		12.42	12.91

Equations:		A = Average annual soil loss (tons per acre)	
Universal Soil Loss Equation (USLE)		R = Rainfall and Runoff Factor	
		K = Soil Erodibility Factor	
A = R x K x LS x C x P		LS = Slope Length-Gradient Factor	
		C = Crop/Vegetation and Management Factor	
		P = Support Practice Factor	

for slopes of 9% or flatter
LS = ((L/72.6 x cos(arctan(s))^m) x ((65.41 x (sin(arctan(s)))^2)+4.56 x sin(arctan(s))+0.065)

where:	L = length in feet along slope		
s = slope gradient in %/100		m = 0.2	for s<1%
m= slope exponent		m = 0.3	for 1%<s<3.5%
		m = 0.4	for 3.6%<s<4.5%
		m = 0.5	for s>4.5%

for slopes steeper than 9%
LS = ((L/72.6 x cos(arctan(s)))^.5) x ((sin(arctan(s))/(sin5.143radians))^1.4

where: L = length in feet along slope
s = slope gradient in %/100

References:
1) Web Soil Survey (https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm)
2) NOAA Atlas 14, Volume 6, Version 2 Isopluvials for 2yr - 6hr storm event
3) Table A-1 "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1996, pg. A-3
4) Table 10: "Predicting Rainfall Erosion Losses", USDA Handbook No. 537. (25% Tree Cover, 60% Grass Cover).
5) Table 4: "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1991 pg. 11. (Up/Down Hill).

NAPA COUNTY RESOURCE CONSERVATION DISTRICT								
USLE LAYOUT AND PRACTICE ALTERNATIVES								
FOR:	Quantum Limit Vineyards	Precipitation (inches)	1.65	(2)				
Block:	X1	Temporary	3.1	acres				
USER:	OR	Latitude:	38°19'25"N					
DATE:	17-Dec-20	Longitude:	122°07'57"W					
Soil Type	Bressa_Dibble Complex							
T	Natural Soil Loss Factor (tons/acre)	3	(1)	3	(1)	3	(1)	3	(1)
K	Soil Erodibilty Factor	0.43	(1)	0.43	(1)	0.43	(1)	0.43	(1)
Transect		1	(site plan)	2	(site plan)	3	(site plan)	4	(site plan)
FACTOR:	DESCRIPTION							
R	Rainfall and Runoff Factor	47.5	(3)	47.5	(3)	47.5	(3)	47.5	(3)
	Slope length (ft)	75	(6)	150	(6)	95	(6)	40	(6)
S	Slope Gradient (%)	13	(site plan)	22	(site plan)	16	(site plan)	28	(site plan)
LS	Calculated LS	1.68		4.83		2.51		3.40	
C	Crop/Vegetation Management Factor	0.043	(4)	0.043	(4)	0.043	(4)	0.043	(4)
P	Support Practice Factor	1	(5)	1	(5)	1	(5)	1	(5)
								Average
A	Soil loss, tons/acre	1.48		4.24		2.21		2.99	2.73
	Soil loss, tons	4.58		13.15		6.84		9.27	8.46

Equations:
Universal Soil Loss Equation (USLE)

A = R x K x LS x C x P

A = Average annual soil loss (tons per acre)
R = Rainfall and Runoff Factor
K = Soil Erodibility Factor
LS = Slope Length-Gradient Factor
C = Crop/Vegetation and Management Factor
P = Support Practice Factor

for slopes of 9% or flatter
LS = ((L/72.6 x cos(arctan(s))^m) x ((65.41 x (sin(arctan(s)))^2)+4.56 x sin(arctan(s))+0.065)
where: L = length in feet along slope
s = slope gradient in %/100
m= slope exponent

	m = 0.2	for s<1%
m = 0.3	for 1%<s<3.5%
m = 0.4	for 3.6%<s<4.5%
m = 0.5	for s>4.5%

for slopes steeper than 9%
LS = ((L/72.6 x cos(arctan(s)))^.5) x ((sin(arctan(s))/(sin5.143radians))^1.4
where: L = length in feet along slope
s = slope gradient in %/100

References:
1) Web Soil Survey (https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm)
2) NOAA Atlas 14, Volume 6, Version 2 Isopluvials for 2yr - 6hr storm event
3) Table A-1 "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1996, pg. A-3
4) Table 8: "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1991, pg. C-9. (75% Cover, All Rows Tilled).
5) Table 4: "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1991 pg. 11. (Up/Down Hill).
6) Inclusion of straw roll for first year only and/or permanent cross slope diversions and/or permanent waterbars.

NAPA COUNTY RESOURCE CONSERVATION DISTRICT								
USLE LAYOUT AND PRACTICE ALTERNATIVES								
FOR:	Quantum Limit Vineyards	Precipitation (inches)	1.65	(2)				
Block:	X1	Permanent	3.1	acres				
USER:	OR	Latitude:	38°19'25"N					
DATE:	17-Dec-20	Longitude:	122°07'57"W					
Soil Type	Bressa_Dibble Complex							
T	Natural Soil Loss Factor (tons/acre)	3	(1)	3	(1)	3	(1)	3	(1)
K	Soil Erodibilty Factor	0.43	(1)	0.43	(1)	0.43	(1)	0.43	(1)
Transect		1	(site plan)	2	(site plan)	3	(site plan)	4	(site plan)
FACTOR:	DESCRIPTION							
R	Rainfall and Runoff Factor	47.5	(3)	47.5	(3)	47.5	(3)	47.5	(3)
	Slope length (ft)	158	(site plan)	185	(site plan)	243	(site plan)	79	(site plan)
S	Slope Gradient (%)	13	(site plan)	22	(site plan)	16	(site plan)	28	(site plan)
LS	Calculated LS	2.44		5.36		4.02		4.78	
C	Crop/Vegetation Management Factor	0.034	(4)	0.034	(4)	0.034	(4)	0.034	(4)
P	Support Practice Factor	1	(5)	1	(5)	1	(5)	1	(5)
								Average
A	Soil loss, tons/acre	1.70		3.73		2.79		3.32	2.88
	Soil loss, tons	5.26		11.55		8.65		10.30	8.94

Equations:

Universal Soil Loss Equation (USLE)

A = R x K x LS x C x P

A = Average annual soil loss (tons per acre)
R = Rainfall and Runoff Factor
K = Soil Erodibility Factor
LS = Slope Length-Gradient Factor
C = Crop/Vegetation and Management Factor
P = Support Practice Factor

for slopes of 9% or flatter

$LS = ((L/72.6 \times cos(arctan(s))^m) \times ((65.41 \times (sin(arctan(s)))^2) + 4.56 \times sin(arctan(s)) + 0.065)$

where: L = length in feet along slope
s = slope gradient in %/100
m = slope exponent

m = 0.2 for s<1%
m = 0.3 for 1%<s<3.5%
m = 0.4 for 3.6%<s<4.5%
m = 0.5 for s>4.5%

for slopes steeper than 9%

$LS = ((L/72.6 \times cos(arctan(s)))^{.5}) \times ((sin(arctan(s))/(sin5.143radians))^{1.4}$

where: L = length in feet along slope
s = slope gradient in %/100

References:

1) Web Soil Survey (https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm)
2) NOAA Atlas 14, Volume 6, Version 2 Isopluvials for 2yr - 6hr storm event
3) Table A-1 "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1996, pg. A-3
4) Table 8: "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1991, pg. C-9. (75% Cover, No-Till).
5) Table 4: "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1991 pg. 11. (Up/Down Hill).

NAPA COUNTY RESOURCE CONSERVATION DISTRICT						
USLE LAYOUT AND PRACTICE ALTERNATIVES						

FOR:	Quantum Limit Vineyards	Precipitation (inches)	1.65	(2)		
Block:	Y	Existing	0.1	acres		
USER:	OR	Latitude:	38°19'25"N			
DATE:	15-May-20	Longitude:	122°07'57"W			

Soil Type	Bressa_Dibble Complex					
T	Natural Soil Loss Factor (tons/acre)	3	(1)	3	(1)	3	(1)
K	Soil Erodibilty Factor	0.43	(1)	0.43	(1)	0.43	(1)
Transect		1	(site plan)	2	(site plan)	3	(site plan)
FACTOR:	DESCRIPTION						
R	Rainfall and Runoff Factor	47.5	(3)	47.5	(3)	47.5	(3)
	Slope length (ft)	45	(site plan)	63	(site plan)	28	(site plan)
S	Slope Gradient (%)	30	(site plan)	19	(site plan)	27	(site plan)
LS	Calculated LS	3.94		2.58		2.72	
C	Crop/Vegetation Management Factor	0.042	(4)	0.042	(4)	0.042	(4)
P	Support Practice Factor	1	(5)	1	(5)	1	(5)
							Average
A	Soil loss, tons/acre	3.38		2.21		2.33	2.64
	Soil loss, tons	0.34		0.22		0.23	0.26

Equations:

Universal Soil Loss Equation (USLE)

A = Average annual soil loss (tons per acre)
R = Rainfall and Runoff Factor
K = Soil Erodibility Factor

$A = R \times K \times LS \times C \times P$

LS = Slope Length-Gradient Factor
C = Crop/Vegetation and Management Factor
P = Support Practice Factor

for slopes of 9% or flatter

$LS = ((L/72.6 \times \cos(\arctan(s)))^m) \times ((65.41 \times (\sin(\arctan(s)))^2) + 4.56 \times \sin(\arctan(s)) + 0.065)$

where: L = length in feet along slope

s = slope gradient in %/100

m= slope exponent

m = 0.2 for s<1%
m = 0.3 for 1%<s<3.5%
m = 0.4 for 3.6%<s<4.5%
m = 0.5 for s>4.5%

for slopes steeper than 9%

$LS = ((L/72.6 \times \cos(\arctan(s)))^{.5}) \times ((\sin(\arctan(s))/(\sin 5.143 radians))^{1.4}$

where: L = length in feet along slope

s = slope gradient in %/100

References:

1) Web Soil Survey (https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm)

2) NOAA Atlas 14, Volume 6, Version 2 Isopluvials for 2yr - 6hr storm event

3) Table A-1 "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1996, pg. A-3

4) Table 10: "Predicting Rainfall Erosion Losses", USDA Handbook No. 537. (0% Tree Cover, 60% Grass Cover).

5) Table 4: "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1991 pg. 11. (Up/Down Hill).

NAPA COUNTY RESOURCE CONSERVATION DISTRICT
USLE LAYOUT AND PRACTICE ALTERNATIVES

FOR:	Quantum Limit Vineyards	Precipitation (inches)	1.65	(2)			
Block:	Y	Temporary	0.1	acres			
USER:	OR	Latitude:	38°19'25"N				
DATE:	15-May-20	Longitude:	122°07'57"W				
Soil Type	Bressa_Dibble Complex						
T	Natural Soil Loss Factor (tons/acre)	3	(1)	3	(1)	3	(1)
K	Soil Erodibilty Factor	0.43	(1)	0.43	(1)	0.43	(1)
Transect		1	(site plan)	2	(site plan)	3	(site plan)
FACTOR:	DESCRIPTION						
R	Rainfall and Runoff Factor	47.5	(3)	47.5	(3)	47.5	(3)
	Slope length (ft)	45	(site plan)	63	(site plan)	28	(site plan)
S	Slope Gradient (%)	30	(site plan)	19	(site plan)	27	(site plan)
LS	Calculated LS	3.94		2.58		2.72	
C	Crop/Vegetation Management Factor	0.043	(4)	0.043	(4)	0.043	(4)
P	Support Practice Factor	0.95	(5)	0.95	(5)	0.95	(5)
							Average
A	Soil loss, tons/acre	3.28		2.15		2.27	2.57
	Soil loss, tons	0.33		0.22		0.23	0.26

Equations:
Universal Soil Loss Equation (USLE)

A = R x K x LS x C x P

A = Average annual soil loss (tons per acre)
R = Rainfall and Runoff Factor
K = Soil Erodibility Factor
LS = Slope Length-Gradient Factor
C = Crop/Vegetation and Management Factor
P = Support Practice Factor

for slopes of 9% or flatter
LS = ((L/72.6 x cos(arctan(s))^m) x ((65.41 x (sin(arctan(s)))^2)+4.56 x sin(arctan(s))+0.065)
where: L = length in feet along slope
s = slope gradient in %/100   m = 0.2 for s<1%
m= slope exponent   m = 0.3 for 1%<s<3.5%
                                                     m = 0.4 for 3.6%<s<4.5%
                                                     m = 0.5 for s>4.5%

for slopes steeper than 9%
LS = ((L/72.6 x cos(arctan(s)))^.5) x ((sin(arctan(s))/(sin5.143radians))^1.4
where: L = length in feet along slope
s = slope gradient in %/100

References:
1) Web Soil Survey (https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm)
2) NOAA Atlas 14, Volume 6, Version 2 Isopluvials for 2yr - 6hr storm event
3) Table A-1 "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1996, pg. A-3
4) Table 8: "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1991, pg. C-9. (75% Cover, All Rows Tilled).
5) Table 4: "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1991 pg. 11. (Cross-slope with Tilling).

NAPA COUNTY RESOURCE CONSERVATION DISTRICT						
USLE LAYOUT AND PRACTICE ALTERNATIVES						
FOR:	Quantum Limit Vineyards	Precipitation (inches)	1.65	(2)		
Block:	Y	Permanent	0.1	acres		
USER:	OR	Latitude:	38°19'25"N			
DATE:	15-May-20	Longitude:	122°07'57"W			
Soil Type	Bressa_Dibble Complex					
T	Natural Soil Loss Factor (tons/acre)	3	(1)	3	(1)	3	(1)
K	Soil Erodibilty Factor	0.43	(1)	0.43	(1)	0.43	(1)
Transect		1	(site plan)	2	(site plan)	3	(site plan)
FACTOR:	DESCRIPTION					
R	Rainfall and Runoff Factor	47.5	(3)	47.5	(3)	47.5	(3)
	Slope length (ft)	45	(site plan)	63	(site plan)	28	(site plan)
S	Slope Gradient (%)	30	(site plan)	19	(site plan)	27	(site plan)
LS	Calculated LS	3.94		2.58		2.72	
C	Crop/Vegetation Management Factor	0.034	(4)	0.034	(4)	0.034	(4)
P	Support Practice Factor	0.77	(5)	0.67	(5)	0.73	(5)
						Average
A	Soil loss, tons/acre	2.10		1.20		1.38	1.56
	Soil loss, tons	0.21		0.12		0.14	0.16

Equations:
Universal Soil Loss Equation (USLE)

$A = R \times K \times LS \times C \times P$

A = Average annual soil loss (tons per acre)
R = Rainfall and Runoff Factor
K = Soil Erodibility Factor
LS = Slope Length-Gradient Factor
C = Crop/Vegetation and Management Factor
P = Support Practice Factor

for slopes of 9% or flatter
LS = ((L/72.6 x cos(arctan(s))^m) x ((65.41 x (sin(arctan(s)))^2)+4.56 x sin(arctan(s))+0.065)
where: L = length in feet along slope
s = slope gradient in %/100   m = 0.2 for s<1%
m= slope exponent   m = 0.3 for 1%<s<3.5%
          m = 0.4 for 3.6%<s<4.5%
          m = 0.5 for s>4.5%

for slopes steeper than 9%
LS = ((L/72.6 x cos(arctan(s)))^.5) x ((sin(arctan(s))/(sin5.143radians))^1.4
where: L = length in feet along slope
s = slope gradient in %/100

References:
1) Web Soil Survey (https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm)
2) NOAA Atlas 14, Volume 6, Version 2 Isopluvials for 2yr - 6hr storm event
3) Table A-1 "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1996, pg. A-3
4) Table 8: "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1991, pg. C-9. (75% Cover, No-Till).
5) Table 4: "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1991 pg. 11. (Cross-slope No Tilling).

P Factors for Erosion Control Practices. Source: Table 4 "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1991, pg.11

Slope	Vineyard Practices - P factor				
	Up & Down Hill	Cross-slope[1] with tilling	Terrace[2] with tilling	Cross-slope, no tilling	Terrace, no tilling
2 – 7%	1	0.75	0.5	0.37	0.25
7.1 – 12%	1	0.8	0.6	0.45	0.3
12.1 – 18%	1	0.9	0.8	0.6	0.4
18.1 - 24%	1	0.95	0.9	0.67	0.45

[1] Must be near perpendicular to fall line to qualify.
[2] Terraces assumed to be cut or graded, not disked.

Slope (ft/ft)	P Factor
0.25	0.70
0.26	0.71
0.27	0.73
0.28	0.74
0.29	0.76
0.30	0.77
0.31	0.79
0.32	0.80
0.33	0.81
0.34	0.83
0.35	0.84
0.36	0.85
0.37	0.86
0.38	0.88
0.39	0.89
0.40	0.90
0.41	0.91
0.42	0.92
0.43	0.93
0.44	0.94
0.45	0.95
0.46	0.96
0.47	0.97
0.48	0.98
0.49	0.99
0.50	1.00

For slopes greater than 24%, cross slope no tilling practice factor shall be calculated from the following equation:

$$P = (-1.4462 \times s^2) + (2.2994 \times s) + (0.2114)$$

where s = slope, in feet per feet