

“G”

Wastewater Feasibility Study

ONSITE WASTEWATER DISPOSAL FEASIBILITY STUDY

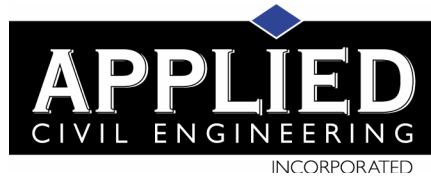
FOR THE

DRY CREEK – MT. VEEDER PROJECT

LOCATED AT:
Mt. Veeder Road
Napa, CA 94558
NAPA COUNTY APN 027-310-039

PREPARED FOR:
Oakville Winery LLC
Post Office Box 222
Oakville, CA 94562

PREPARED BY:



2074 West Lincoln Avenue
Napa, California 94558
Telephone: (707) 320-4968
www.appliedcivil.com

Job Number: 17-104



Michael R. Muelrath R.C.E. 67435

9/13/2017

Date

TABLE OF CONTENTS

LIST OF APPENDICES	iii
INTRODUCTION	1
SOILS INFORMATION.....	2
PREDICTED WASTEWATER FLOW	2
Winery Process Wastewater	2
Winery Sanitary Wastewater	3
Employees.....	3
Daily Tours and Tastings.....	3
Total Peak Winery Sanitary Wastewater Flow.....	3
Residential Sanitary Wastewater	4
RECOMMENDATIONS.....	4
Winery Sanitary and Process Wastewater and Residential Sanitary Wastewater Disposal Via Subsurface Drip Dispersal Field.....	4
Required Disposal Field Area.....	4
Available Disposal Field Area	4
Required Reserve Area	5
Available Reserve Area.....	5
Pretreatment and Septic Tank Capacity	5
CONCLUSION.....	5

LIST OF APPENDICES

APPENDIX 1: Site Topography Map.....	6
APPENDIX 2: Dry Creek – Mt Veeder Project Use Permit Conceptual Site Plans.....	8
APPENDIX 3: Site Evaluation Report and Test Pit Map.....	14

INTRODUCTION

Oakville Winery LLC is applying for a Use Permit to construct and operate a new winery at the property located at the southwest corner of the intersection of Mt. Veeder Road and Dry Creek Road in Napa County, California. The subject property is known as Napa County Assessor's Parcel Number 027-310-039.

The Use Permit application under consideration proposes the construction and operation of a new winery with the following characteristics:

- Wine Production:
 - 30,000 gallons of wine per year
 - Crushing, fermenting, aging and bottling

- Employees:
 - 4 employees

- Marketing Plan:
 - Daily Tours and Tastings by Appointment
 - 10 visitors per day maximum
 - Marketing Events
 - 10 per year
 - 30 guests maximum
 - Food prepared offsite by catering company
 - Release Events
 - 2 per year
 - 100 guests maximum
 - Food prepared offsite by catering company
 - Portable toilets brought in for guest use

A new one-bedroom residence is also planned for the property. There are no existing structures on the property however there are two groundwater wells. Please see the Oakville Winery Use Permit Conceptual Site Plans for approximate locations of existing and proposed features.

Oakville Winery LLC has requested that Applied Civil Engineering Incorporated (ACE) evaluate the feasibility of disposing of the winery process wastewater, the domestic sanitary wastewater that will be generated by the proposed winery and the domestic wastewater from the new house via a new onsite wastewater disposal system. The remainder of this report describes the onsite soil conditions, the predicted winery process and sanitary wastewater flows and outlines the conceptual design of an onsite wastewater disposal system.

SOILS INFORMATION

The United States Department of Agriculture Soil Conservation Service Soils Map for Napa County shows the following soil types mapped on the property:

- Sobrante loam, 5 to 30 percent slopes
- Lodo-Maymen-Felton association, 30 to 75 percent slopes,
- Felton gravelly loam, 30 to 50 percent slopes
- Felton gravelly loam, 50 to 75 percent slopes

A site specific soils analysis was conducted during a site evaluation performed by ACE on August 4, 2017. The site evaluation consisted of the excavation and observation of six test pits in the portion of the property that is mapped with Sobrante soils. The test pits revealed variable depths of acceptable soil ranging from 30 inches to 54 inches with the upper horizon having a USDA soil texture classification of clay loam. The limiting conditions that were observed were the presence of subsoils with very high clay content and subsoils with high gravel content.

Please refer to the Site Evaluation Report in Appendix 3 for additional details.

PREDICTED WASTEWATER FLOW

The onsite wastewater disposal system will be designed for the peak winery process wastewater flow, the peak sanitary wastewater flow from the proposed winery and the peak sanitary wastewater flow from the proposed residence.

Winery Process Wastewater

We have used the generally accepted standard that six gallons of winery process wastewater are generated for each gallon of wine that is produced each year and that 1.5 gallons of wastewater are generated during the crush period for each gallon of wine that is produced. Based on the size of the winery and our understanding that both red and white wines will be produced we have assumed a 45 day crush period. Using these assumptions, the average and peak winery process wastewater flows are calculated as follows:

$$\text{Annual Winery Process Wastewater Flow} = \frac{30,000 \text{ gallons wine}}{\text{year}} \times \frac{6 \text{ gallons wastewater}}{1 \text{ gallon wine}}$$

$$\text{Annual Winery Process Wastewater Flow} = 180,000 \text{ gallons per year}$$

$$\text{Average Daily Winery Process Wastewater Flow} = \frac{180,000 \text{ gallons}}{\text{year}} \times \frac{1 \text{ year}}{365 \text{ days}}$$

$$\text{Average Daily Winery Process Wastewater Flow} = 493 \text{ gallons per day (gpd)}$$

$$\text{Peak Winery Process Wastewater Flow} = \frac{30,000 \text{ gallons wine}}{\text{year}} \times \frac{1.5 \text{ gallons wastewater}}{1 \text{ gallon wine}} \times \frac{1 \text{ year}}{45 \text{ crush days}}$$

$$\text{Peak Winery Process Wastewater Flow} = 1,000 \text{ gpd}$$

Winery Sanitary Wastewater

The peak sanitary wastewater flow from the winery is calculated based on the number of winery employees, the number of daily visitors for tours and tastings and the number of guests attending private marketing events. In accordance with Table 4 of Napa County's "Regulations for Design, Construction, and Installation of Alternative Sewage Treatment Systems" we have used a design flow rate of 15 gallons per day per employee and 3 gallons per day per visitor for tours and tastings. Table 4 does not specifically address design wastewater flows for guests at marketing events. For marketing events that will have catered meals that are prepared offsite we have conservatively estimated 5 gallons of wastewater per guest. Based on these assumptions, the peak winery sanitary wastewater flows are calculated as follows:

Employees

Peak Sanitary Wastewater Flow = 4 employees X 15 gpd per employee

Peak Sanitary Wastewater Flow = 60 gpd

Daily Tours and Tastings

Peak Sanitary Wastewater Flow = 10 visitors per day X 3 gallons per visitor

Peak Sanitary Wastewater Flow = 30 gpd

Marketing Events with Catered Meals Prepared Offsite:

Peak Sanitary Wastewater Flow = 30 guests X 5 gallons per guest

Peak Sanitary Wastewater Flow = 150 gpd

Release and Wine Auction Events with Catered Meals Prepared Offsite:

Peak Sanitary Wastewater Flow = 100 guests X 5 gallons per guest

Peak Sanitary Wastewater Flow = 500 gpd

Total Peak Winery Sanitary Wastewater Flow

As previously noted, all events with more than 30 guests in attendance will utilize portable sanitary facilities to minimize the load on the septic system. Therefore, assuming that daily tours and tastings and a maximum of one marketing event may occur on the same day the total peak winery sanitary wastewater flow is based on employees, daily tours and tastings and a marketing event for 30 people and is calculated as follows:

Total Peak Winery Sanitary Wastewater Flow = 60 gpd + 30 gpd + 150 gpd

Total Peak Winery Sanitary Wastewater Flow = 240 gpd

Residential Sanitary Wastewater

The peak wastewater flow from the proposed residence is based on Napa County's standard design flow of 120 gpd per bedroom. The proposed residence will have one bedroom and therefore the peak wastewater flow is 120 gpd.

Peak Residential Sanitary Wastewater Flow = 120 gpd

RECOMMENDATIONS

Based on the proposed site configuration, onsite soil conditions and estimated wastewater flows we recommend that the winery process and sanitary wastewater and the residential sanitary wastewater be handled in a combined sanitary/process waste treatment and disposal system. A summary of the proposed wastewater system is presented in the following sections of this report.

Winery Sanitary and Process Wastewater and Residential Sanitary Wastewater Disposal Via Subsurface Drip Dispersal Field

Required Disposal Field Area

The disposal field area is calculated based upon the design hydraulic loading rate for the soil conditions and the proposed design flow. In accordance with Table 9 of Napa County's "Regulations for Design, Construction, and Installation of Alternative Sewage Treatment Systems" we have used a hydraulic loading rate of 0.6 gpd per square foot based on the findings of clay loam soils in the planned disposal field area. Since the slope of the natural ground surface in the area of the proposed disposal field is not over 20% no adjustment is required for slope.

Based on these design parameters, the required disposal field area is calculated as follows:

$$\text{Required Disposal Field Area} = \frac{\text{Peak Flow}}{\text{Soil Application Rate}}$$

$$\text{Require Disposal Field Area} = \frac{1,360 \text{ gpd}}{0.6 \text{ gpd per square foot}}$$

Required Disposal Field Area = 2,267 square feet, use 2,300 square feet

Available Disposal Field Area

Based on the proposed site layout we have determined that there is enough area to install approximately 2,300 square feet of subsurface drip disposal field in the vicinity of Test Pits #5 and #6. The conceptual layout of the disposal field is shown on the Oakville Winery Use Permit Conceptual Site Plans in Appendix 2.

Required Reserve Area

Napa County code requires that an area be set aside to accommodate a future onsite wastewater disposal system in the event that the primary system fails or the soil in the primary area is otherwise rendered unsuitable for wastewater disposal. For subsurface drip type septic systems, the reserve area must be 200% of the size of the disposal field area. Since portions of the reserve area have slopes over 20% a 1.5 slope factor is used to increase the required area. Based on these design parameters, the required reserve area is calculated as follows:

$$\text{Required Reserve Area} = 200\% \times \frac{\text{Peak Flow}}{\text{Soil Application Rate}} \times 1.5$$

$$\text{Required Reserve Field Area} = 200\% \times \frac{1,360 \text{ gpd}}{0.6 \text{ gpd per square foot}} \times 1.5$$

Required Reserve Area = 6,800 square feet

Available Reserve Area

Based on the proposed site plan we have determined that there is enough area to set aside for an additional 6,800 square feet of subsurface drip disposal field in the vicinity of Test Pits #1 & #2, as shown on the Oakville Winery Use Permit Conceptual Site Plans in Appendix 2.

Pretreatment and Septic Tank Capacity

Pretreatment must be provided to treat the winery process and sanitary wastewater streams to meet Napa County pretreated effluent standards (BOD < 30 mg/l, TSS < 30 mg/l). There are several options for pretreatment systems that are available to meet this requirement. The Applicant and Engineer will review options and select a suitable pretreatment system designed to meet this requirement prior to application for a sewage permit for the winery sanitary wastewater disposal system. Septic tanks will be sized in accordance with the requirements of the selected pretreatment system.

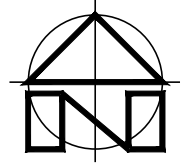
CONCLUSION

It is our opinion that the proposed winery and residential disposal needs can be accommodated onsite as previously described. Full design calculations and construction plans should be prepared in accordance with Napa County standards at the time of building permit application.

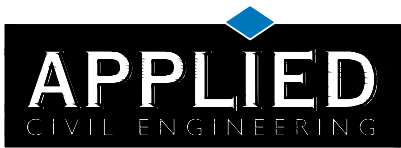
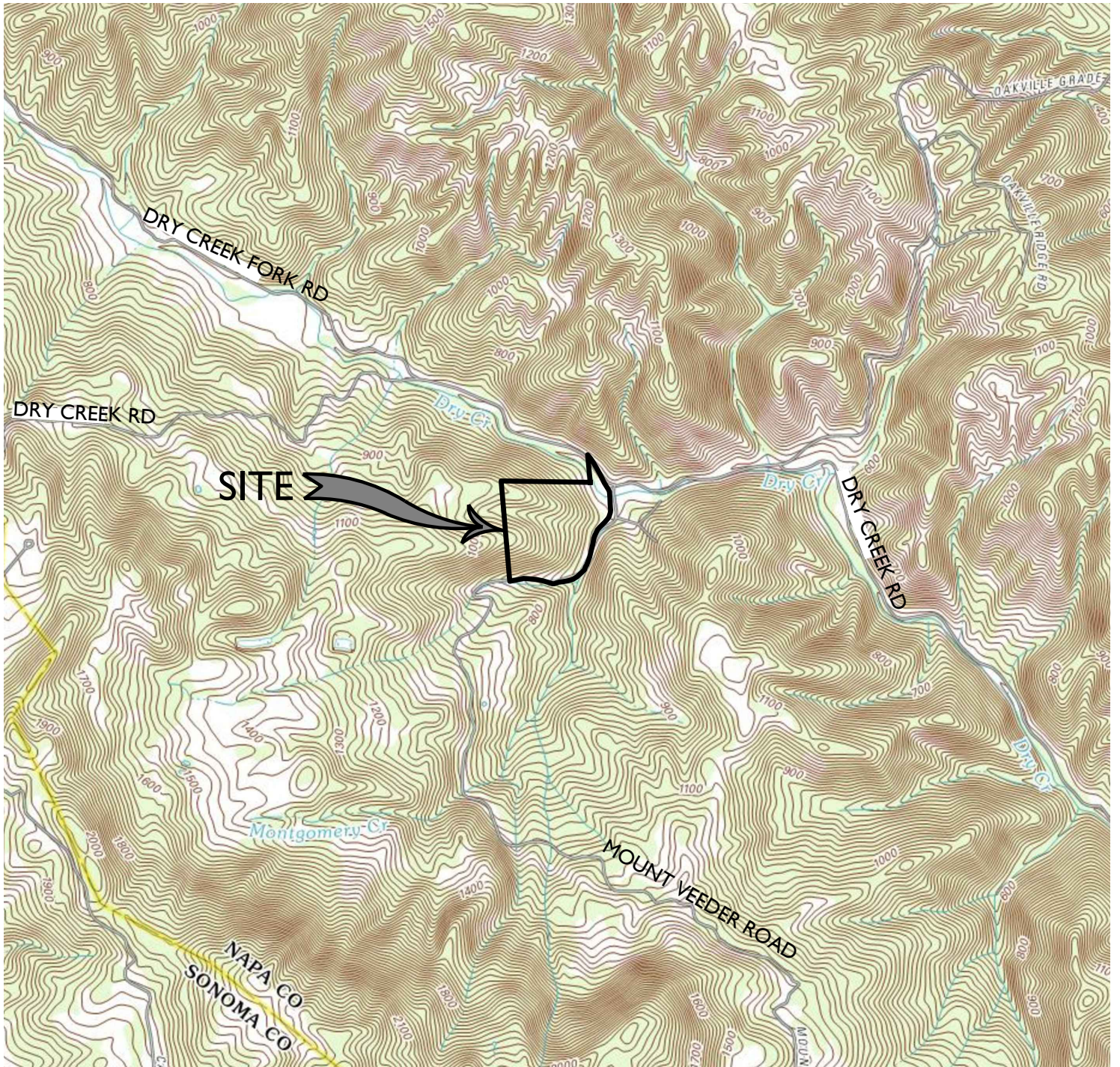
APPENDIX I: Site Topography Map

SITE TOPOGRAPHY MAP

REPRESENTS A PORTION OF THE
UNITED STATES GEOLOGICAL SURVEY 7.5 MINUTE QUADRANGLES
"SONOMA, CA AND RUTHERFORD, CA"



SCALE: 1" = 2,000'



INCORPORATED
2074 West Lincoln Avenue
Napa, CA 94558
(707) 320-4968 (707) 320-2395 Fax
www.appliedcivil.com

LANDS OF MORRIS

MOUNT VEEDER ROAD

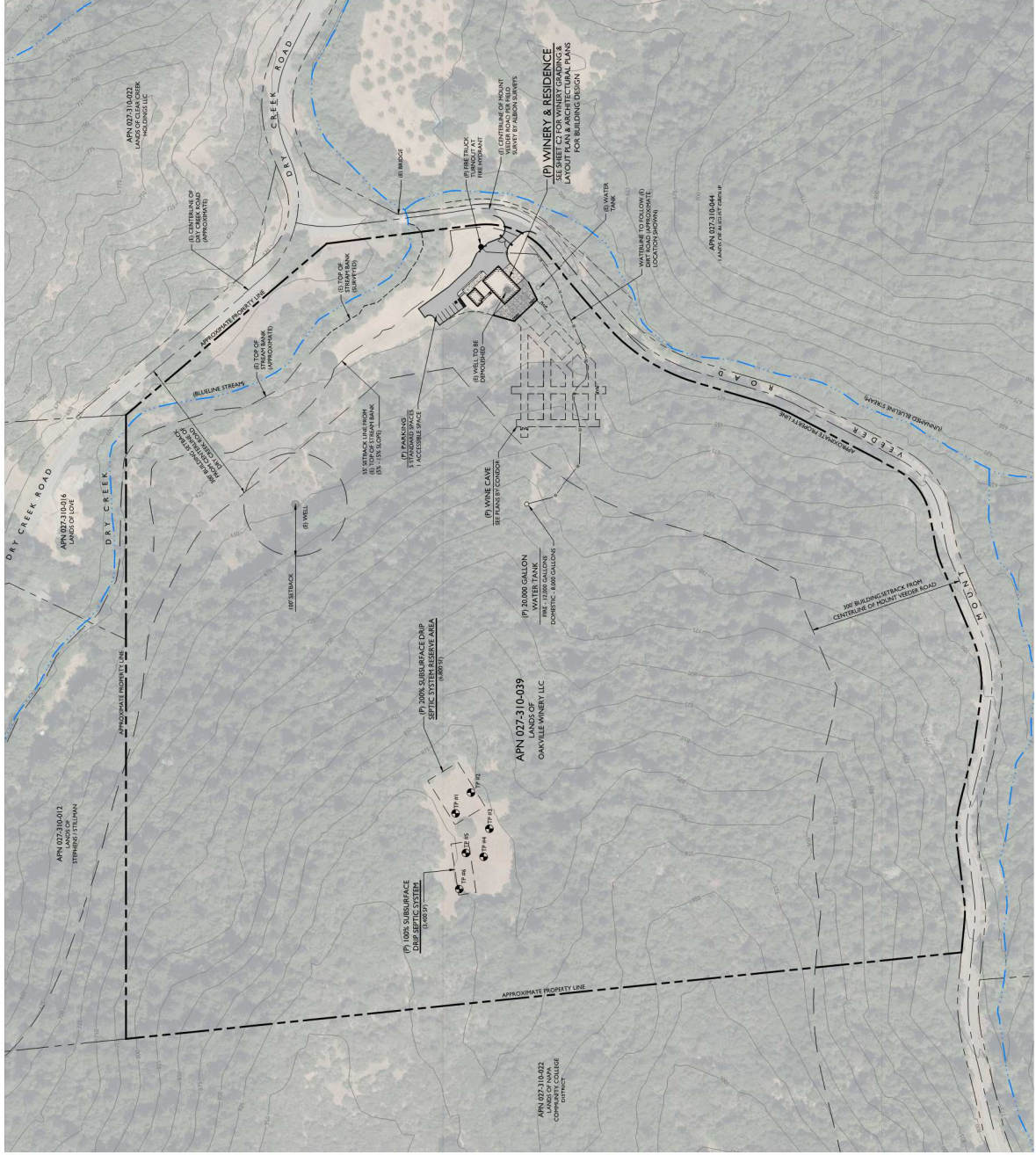
NAPA, CA 94558

APN 027-310-0

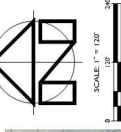
APPENDIX 2: Dry Creek – Mt Veeder Project Use Permit Conceptual Site Plans

DRY CREEK - MT. VEEDER PROJECT

USE PERMIT CONCEPTUAL SITE IMPROVEMENT PLANS



OVERALL SITE PLAN
SCALE 1" = 100'



LOCATION MAP

SCALE 1" = 1,000'

PROJECT OWNER & APPLICANT:

OAKVILLE WINERY LLC
P.O. BOX 222
OAKVILLE, CA 94562

SITE ADDRESS:

MOUNT VEEDER ROAD
NAPA, CA 94558

ASSESSOR'S PARCEL NUMBER:

027-310-039

PARCEL SIZE:

55.5 ± ACRES

PROJECT SIZE:

0.8 ± ACRES

ZONING:

AGRICULTURAL WATERSHED (AW)

DOMESTIC WATER SOURCE:

ONSITE WELL

FIRE PROTECTION WATER SOURCE:

STORAGE TANK

WASTEWATER DISPOSAL:

ONSITE TREATMENT AND DISPERSAL

SHEET INDEX:

- C1 COVER SHEET & OVERALL SITE PLAN
- C2 GRADING & LAYOUT PLAN
- C3 IMPERVIOUS SURFACE EXHIBIT
- C4 STORMWATER CONTROL PLAN EXHIBIT
- V1 OPPORTUNITIES & CONSTRAINTS SITE PLAN FOR VARIANCE REQUEST

FLOOD HAZARD NOTE:

THE PROJECT SITE IS NOT LOCATED IN A SPECIAL FLOOD HAZARD AREA.

NOTES:


1. TOPOGRAPHIC INFORMATION ON SHEET C1 WAS TAKEN FROM THE NAPA COUNTY GEOGRAPHIC INFORMATION SYSTEM DATABASE. OTHER TOPOGRAPHIC INFORMATION ON THIS SHEET WAS OBTAINED FROM THE NAPA COUNTY GEOGRAPHIC INFORMATION SYSTEM DATABASE. THE ACCURACY OF THIS INFORMATION IS NOT GUARANTEED BY THE APPLICANT OR THE ENGINEER.
2. AERIAL PHOTOGRAPHS WERE OBTAINED FROM THE SAN FRANCISCO ESTUARY INSTITUTE (SFEI) SAN FRANCISCO BAY AREA ORTHOPHOTOS DATABASE, DATED 2008. THE PHOTOGRAPHS WERE CORRECTED FOR CURRENT CONDITIONS.
3. CONTOUR INTERVAL: TWENTY FIVE (25) FEET
OTHER SHEETS: ONE (1) FOOT, HIGHLIGHTED EVERY FIVE (5) FEET
4. BENCHMARK: NVD 88
5. THE PROPERTY LINES SHOWN ON THESE PLANS DO NOT REPRESENT A BOUNDARY SURVEY. THEY ARE APPROXIMATE AND ARE PROVIDED FOR INFORMATIONAL PURPOSES ONLY. THE APPLICANT AND ENGINEER HAVE MADE EVERY EFFORT TO LOCATE THE EXACT LOCATION OF PROPERTY LINES BEFORE CONTAINING DESIGN AND BEFORE CONSTRUCTION PERMITS ARE APPLIED FOR.



DRY CREEK - MT. VEEDER PROJECT

USE PERMIT CONCEPTUAL SITE IMPROVEMENT PLANS

PREPARED UNDER THE DIRECTION OF



APPLIED ENGINEERING INCORPORATED
 2024 West Lincoln Avenue
 Suite 100
 Napa, CA 94938
 (707) 254-8688 (800) 320-2295 Fax
 www.appliedca.com

DATE: SEPTEMBER 13, 2017
 CHECKED BY: PRM
 DRAWN BY: SM

JOB NUMBER: P144
 FILE NAME: CONCE/CE/DRG
 ORIGINAL SIZE: 24" X 36"
 SHEET NUMBER: C3

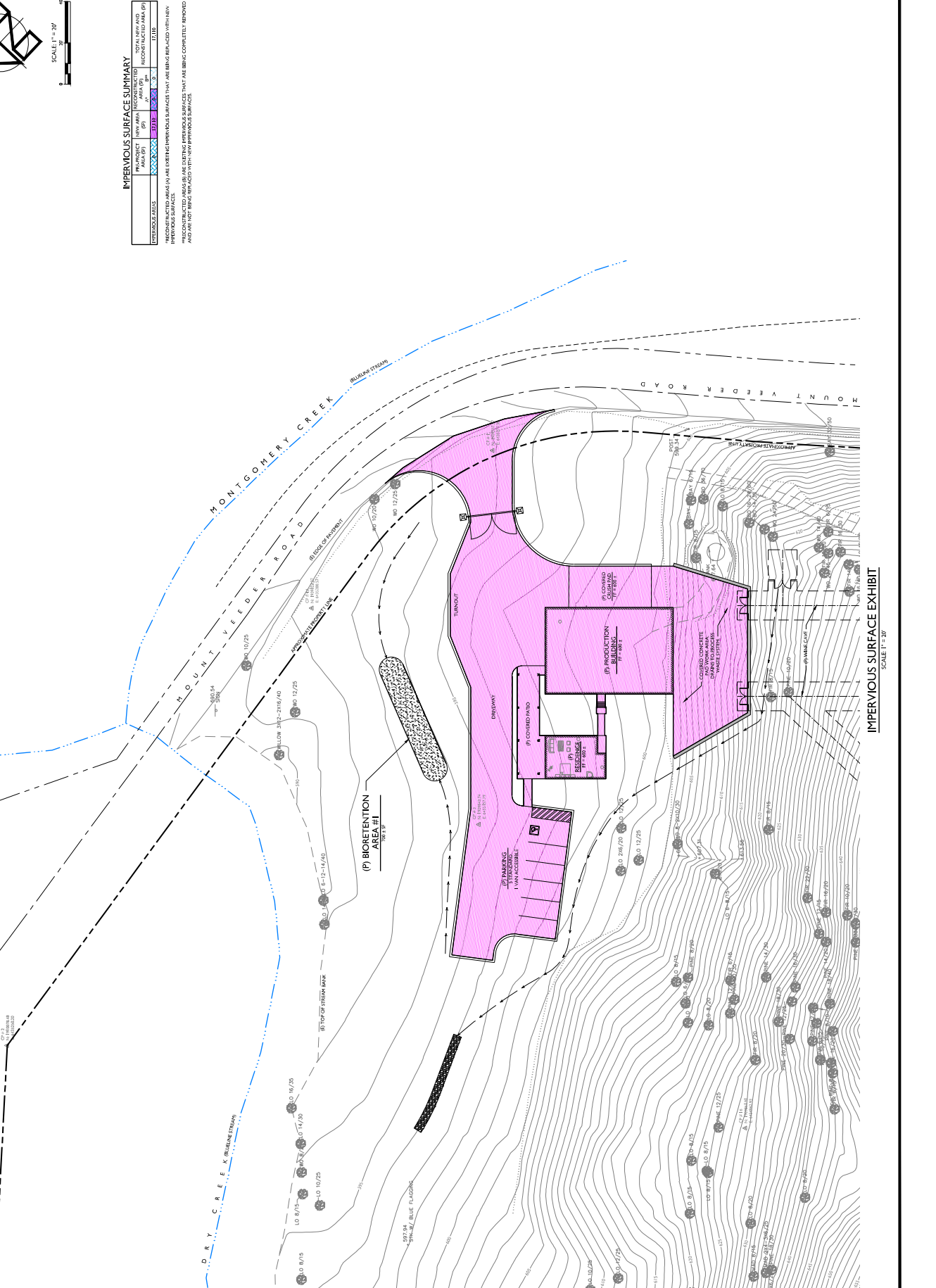
5 OF

IMPERVIOUS SURFACE SUMMARY

IMPERVIOUS SURFACE	EXISTING IMPERVIOUS SURFACE AREA (SQ. FT.)	RECONSTRUCTED IMPERVIOUS SURFACE AREA (SQ. FT.)	NEW IMPERVIOUS SURFACE AREA (SQ. FT.)	TOTAL NEW AND RECONSTRUCTED IMPERVIOUS SURFACE AREA (SQ. FT.)
ASPHALT	1,200	2,100	0	3,300
CONCRETE	0	0	0	0
GRAVEL	0	0	0	0
OTHER	0	0	0	0
TOTAL	1,200	2,100	0	3,300

RECONSTRUCTED AREAS ARE EXISTING IMPERVIOUS SURFACES THAT ARE REPAVED WITH NEW IMPERVIOUS SURFACES.
 NEW AREAS ARE NEW IMPERVIOUS SURFACES THAT ARE BEING COMPLETELY REPAVED AND ARE NOT BEING REPLACED WITH NEW IMPERVIOUS SURFACES.

SCALE: 1" = 30'



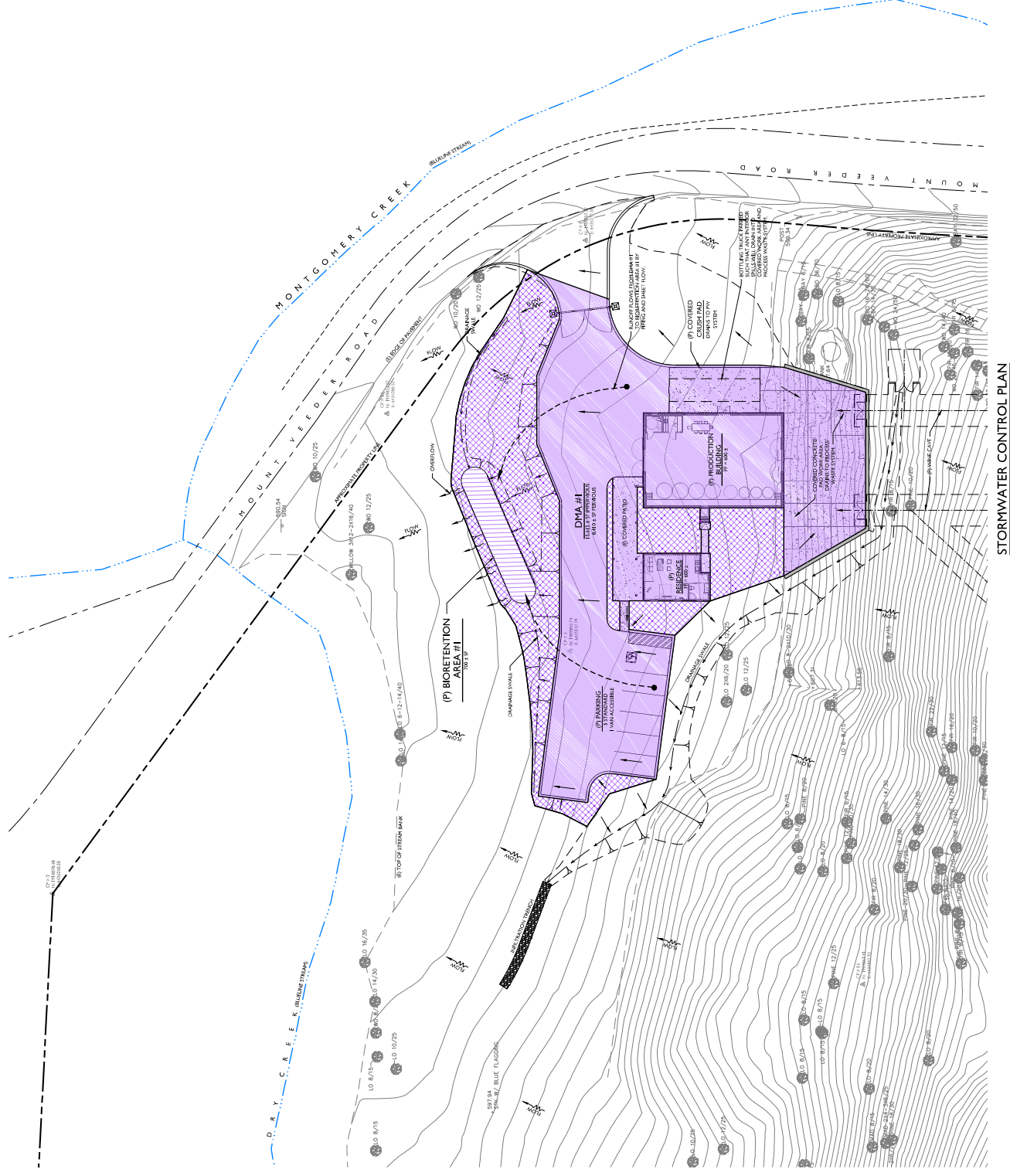
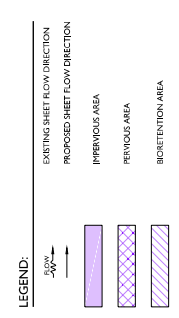
IMPERVIOUS SURFACE EXHIBIT
 SCALE: 1" = 30'

PREPARED UNDER THE
 DIRECTION OF



DRAWN BY: SM
 CHECKED BY: HSM
 DATE: SEPTEMBER 13, 2017
 REVISIONS: BY:

JOB NUMBER: 17104
 FILE: 17104CONCEPT.DWG
 ORIGINAL SIZE: 36" X 36"
 SHEET NUMBER:

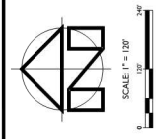


STORMWATER CONTROL PLAN
 SCALE: 1" = 30'



PREPARED UNDER THE DIRECTION OF:
 DRAWN BY: SM
 CHECKED BY: HRM
 DATE: SEPTEMBER 13, 2017
 REVISIONS: BY:

JOB NUMBER: 171104
 FILE: 17110403H_COP/DWG
 ORIGINAL SIZE: 24" X 36"
 SHEET NUMBER:

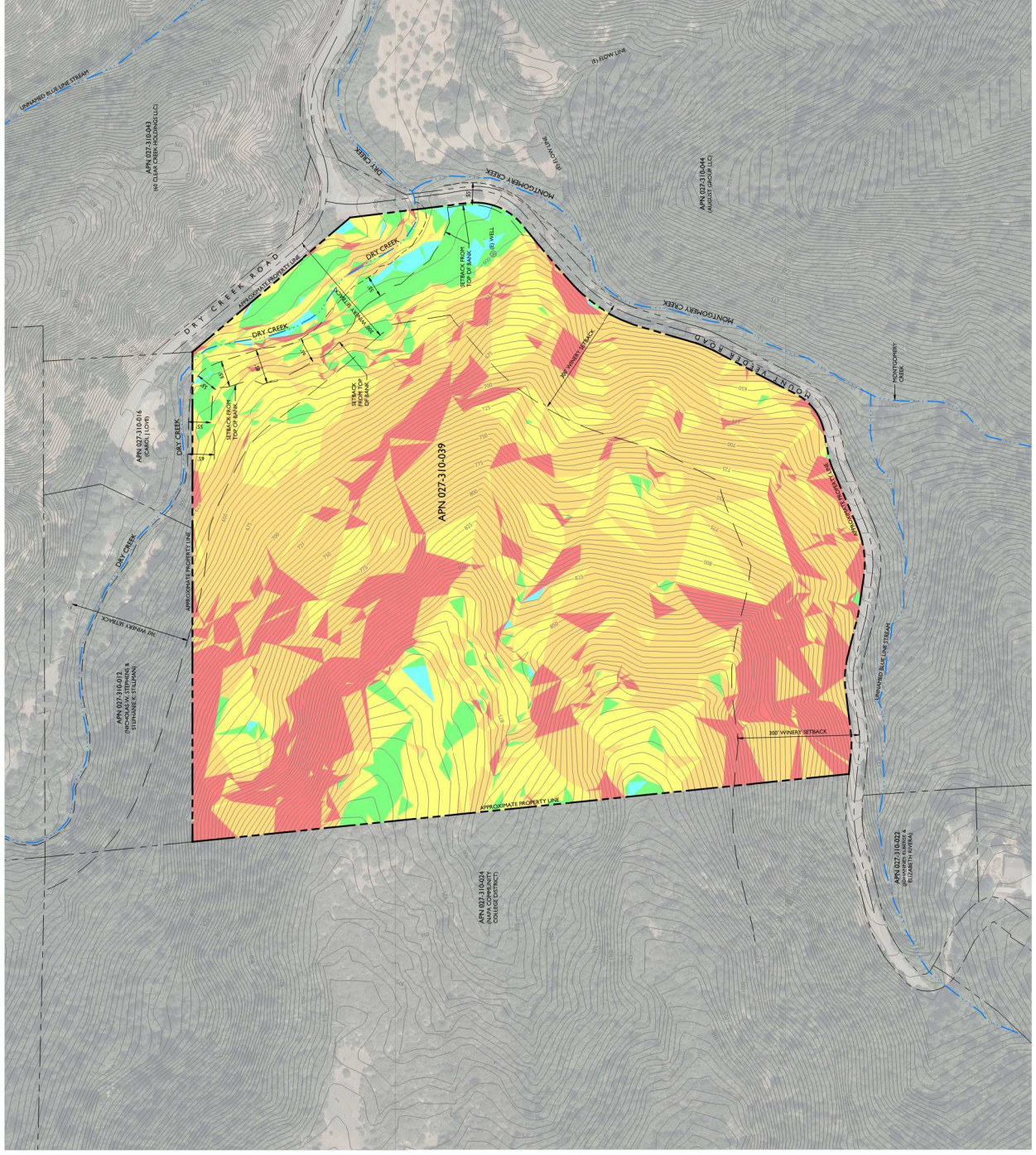


NOTES:

1. AERIAL PHOTOGRAPHS, SURVEYING, "SAT" DATA, "TOPOGRAHY" DATA, AND TOPOGRAPHIC INFORMATION WAS OBTAINED FROM THE NAVA COUNTY GEOGRAPHIC INFORMATION SYSTEM (GIS) DATABASE. APPLIED CIVIL ENGINEERING HAS CONDUCTED VISUAL VERIFICATION OF THE ACCURACY AND COMPLETENESS OF THE TOPOGRAPHIC INFORMATION.
2. AERIAL PHOTOGRAPHS WERE OBTAINED FROM THE SAN FRANCISCO ESTUARY AND COASTAL SCIENCE CENTER (SF ECC) GIS DATABASE, DATED JUNE 2010 AND MAY NOT REPRESENT CURRENT CONDITIONS.
3. CONTOUR INTERVAL FIVE (5) FEET, HIGHLIGHTED EVERY TWENTY FIVE (25) FEET.
4. BENCHMARK NAVD 88.
5. THE PROPERTY LINES SHOWN ON THESE PLANS DO NOT REPRESENT A BOUNDARY SURVEY. THEY ARE APPROXIMATE AND ARE PROVIDED FOR INFORMATIONAL PURPOSES ONLY.
6. ACCORDING TO FEMA FEMA COMMUNITY PANELS, MISSISSIPPI & ASSOCIATE THE SUBJECT PARCEL IS DETERMINED TO BE OUTSIDE OF THE FEMA FLOOD ZONE. SEE FEMA COMMUNITY PANELS, MISSISSIPPI & ASSOCIATE FOR MORE INFORMATION.

Slope Table

MINIMUM SLOPE	MAXIMUM SLOPE	COLOR
0%	5%	Blue
5%	15%	Green
15%	20%	Yellow
20%	30%	Orange
30%	40%	Red
40%	50%	Dark Red



APPENDIX 3: Site Evaluation Report and Test Pit Map

Test Pit #1

PLEASE PRINT OR TYPE ALL INFORMATION

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistence			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-30	G	15-30	CL	MSB	SH	FRB	SS	CF/CM	CM/FM	NONE
30-54	C	15-30	CL	MSB	SH	F	SS	CF/FM	FF	NONE
54+		>50								

Acceptable soil depth = 54"

Test Pit #2

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistence			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-42	C	0-15	CL	MSB	SH	F/FRB	SS	CF/CM	FF/FM	NONE
42+		0-15	C	SAB	H	VF	S	FF	FF	CMD

Acceptable soil depth = 42"

Test Pit #3

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistence			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-18	C	0-15	CL	MSB	SH	F/FRB	SS	CF/CM	FF/FM	NONE
18-48	C	0-15	C	SAB	H	VF	S	FF	FF/FM	NONE
48+		>50								

Acceptable soil depth = 48" (USING CLAY APPLICATION RATE ONLY)

Test Pit #4

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistence			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-30	C	0-15	CL	MSB	SH	F/FRB	SS	CF/CM	FF/FM	NONE
30+		>50								

Acceptable soil depth = 30"

Test Pit #5

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistence			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-54	C	0-15	CL	MSB	SH	FRB	SS	CF/CM	CF/CM	NONE
54+		>50								

Acceptable soil depth = 54"

Test Pit #6

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistence			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-30	C	0-15	CL	MSB	SH	FRB	SS	CF/CM	CF/CM	NONE
30+		>50								

Acceptable soil depth = 30"

LEGEND

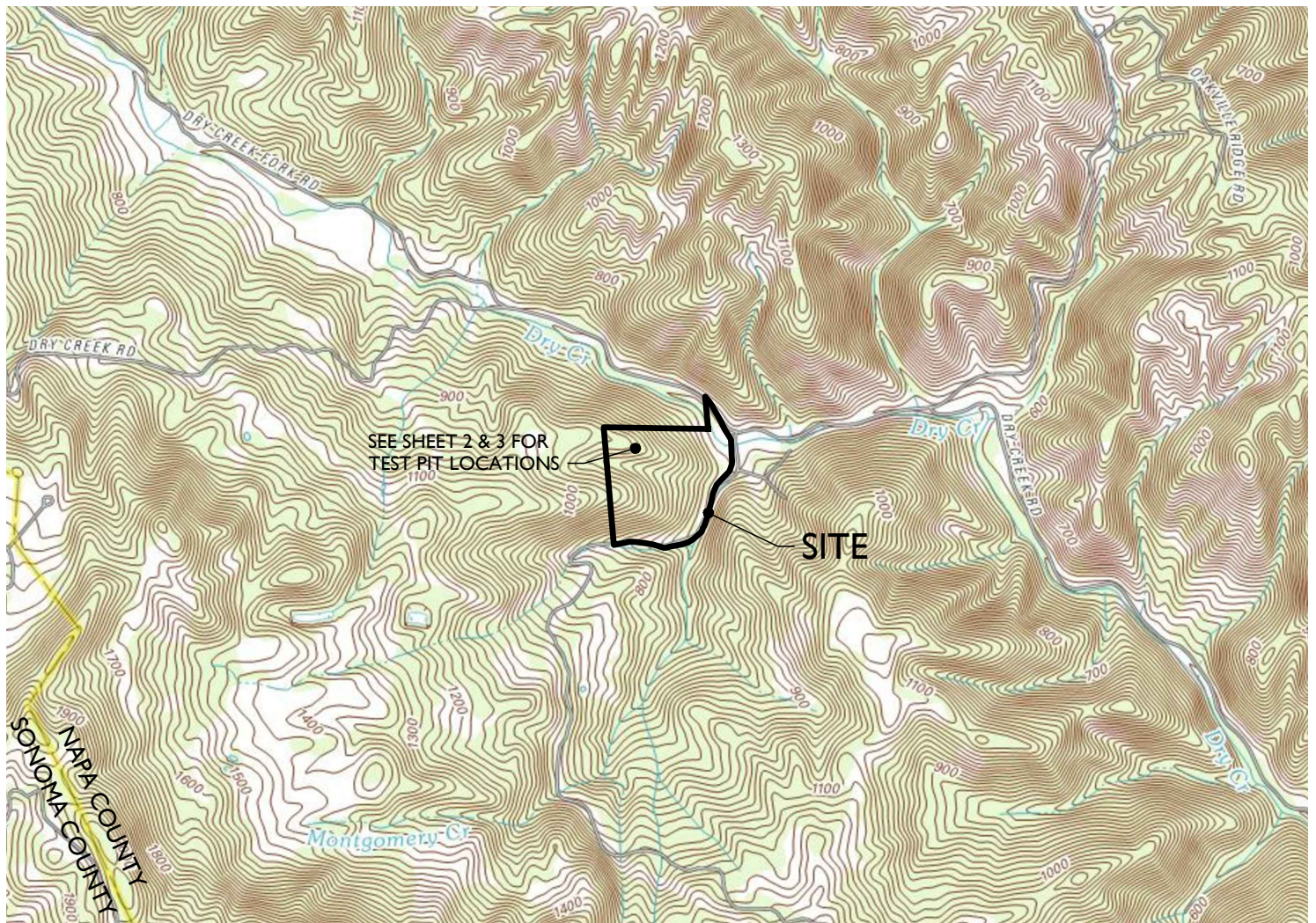
Boundary	Texture	Structure	Consistence			Pores	Roots	Mottling
			Side Wall	Ped	Wet	Quantity:	Quantity:	Quantity:
A =Abrupt <1"	S =Sand	W =Weak	L =Loose	L =Loose	NS =NonSticky	F =Few	F =Few	F =Few
C =Clear 1"-2.5"	LS =Loamy Sand	M =Moderate						
G =Gradual 2.5"-5"	SL =Sandy Loam	S =Strong	SH =Slightly Hard	FRB =Friable	S =Sticky	M =Many	M =Many	M =Many
D =Difuse >5"	SCL =Sandy Clay Loam	G =Granular	H =Hard	F =Firm	VS =Very Sticky	Size:	Size:	Size:
	SC =Sandy Clay	PI =Platy	VH =Very Hard	VF =Very Firm	NP =NonPlastic	VF =Very Fine	F =Fine	F =Fine
	CL =Clay Loam	Pr =Prismatic	ExH =Extremely Hard	ExF =Extremely Firm	SP =Slightly Plastic	F =Fine	M =Medium	M =Medium
	L =Loam	C =Columnar			P =Plastic	M =Medium	C =Coarse	C =Coarse
	C =Clay	B =Blocky			VP =Very Plastic	C =Coarse	VC =Very Coarse	VC =Very Coarse
	SiC =Silty Clay	AB =Angular Blocky				VC =Very Coarse	ExC =Extremely Coarse	ExC =Extremely Coarse
	SiCL =Silty Clay Loam	SB =Subangular Blocky						
	SiL =Silt Loam	M =Massive						Contrast:
	Si =Silt	SG =Single Grain						Ft =Faint
		CEM =Cemented						D =Distinct
								P =Prominent

Notes:

Structure is recorded as Modifier then Structure - for example, Moderate (M) Subangular Blocky (SB) is recorded as MSB

Pores and Roots are recorded as Quantity then Size – for example Few (F) Coarse (C) is recorded as FC

Mottling is recorded as Quantity then Size then Contrast – for example Few (F) Coarse (C) Distinct (D) is recorded as FCD



LOCATION MAP

SCALE: 1" = 2,000'

NOTES:

1. TEST PITS ONE THROUGH SIX (TP #1 - TP #6) WERE EXCAVATED BY THE PROPERTY OWNER AND WERE WITNESSED BY MIKE MUELRATH OF APPLIED CIVIL ENGINEERING INCORPORATED AND ARMEDA VAN DAM OF THE NAPA COUNTY PLANNING, BUILDING AND ENVIRONMENTAL SERVICES DEPARTMENT - ENVIRONMENTAL HEALTH DIVISION ON AUGUST 4, 2017.
2. FADED BACKGROUND REPRESENTS EXISTING TOPOGRAPHIC FEATURES. TOPOGRAPHIC INFORMATION WAS OBTAINED FROM THE NAPA COUNTY GEOGRAPHIC INFORMATION SYSTEM DATABASE.
3. CONTOUR INTERVAL: FIVE (5) FEET, HIGHLIGHTED EVERY TWENTY FIVE (25) FEET.
4. BENCHMARK: NAVD 88
5. AERIAL PHOTOGRAPHS WERE OBTAINED FROM THE SAN FRANCISCO ESTUARY INSTITUTE (SFEI) SAN FRANCISCO BAY AREA ORTHOPHOTOS DATABASE, DATED JUNE 2014 AND MAY NOT REPRESENT CURRENT CONDITIONS.
6. ACCORDING TO THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD INSURANCE RATE MAP (FIRM) MAP NUMBER 06097C0800E, EFFECTIVE DECEMBER 2, 2008, THE PROJECT SITE IS NOT LOCATED IN A SPECIAL FLOOD HAZARD AREA.
7. THE PROPERTY LINES SHOWN ON THESE PLANS ARE APPROXIMATE BASED ON NAPA COUNTY GIS DATA AND SHALL BE VERIFIED BY A LICENSED LAND SURVEYOR PRIOR TO ANY DESIGN OR CONSTRUCTION.



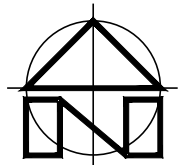
2074 West Lincoln Avenue
 Napa, CA 94558
 (707) 320-4968 (707) 320-2395 Fax
 www.appliedcivil.com

LANDS OF MORRIS

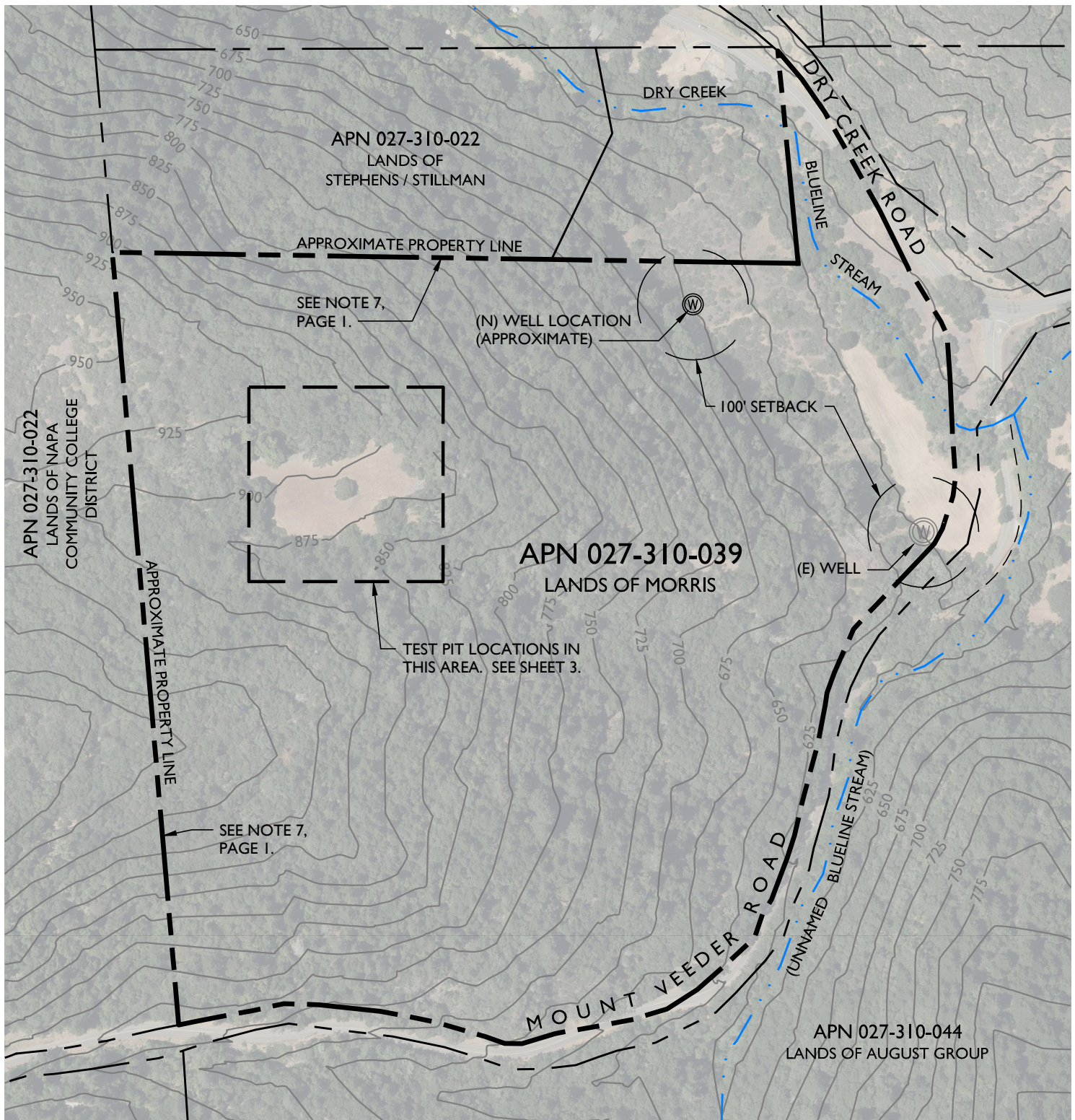
MOUNT VEEDER ROAD

NAPA, CA 94558

APN 027-310-039

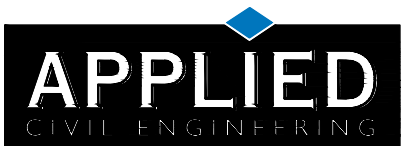


SCALE: 1" = 2,000'



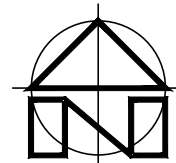
OVERALL SITE MAP

SCALE: 1" = 250'

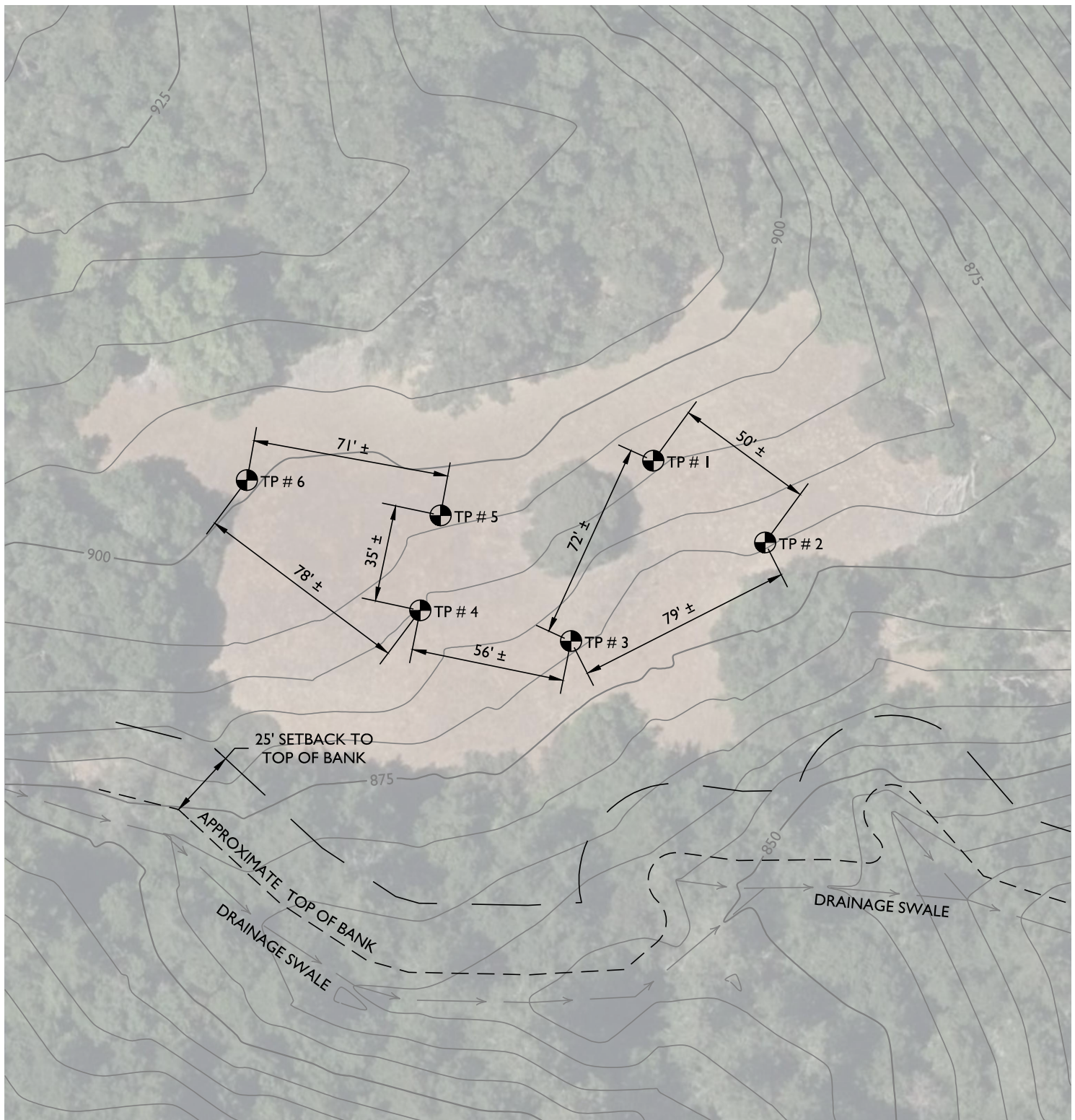


INCORPORATED
2074 West Lincoln Avenue
Napa, CA 94558
(707) 320-4968 (707) 320-2395 Fax
www.appliedcivil.com

LANDS OF MORRIS
MOUNT VEEDER ROAD
NAPA, CA 94558
APN 027-310-039



SCALE: 1" = 250'



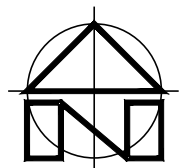
TEST PIT MAP

SCALE: 1" = 50'



INCORPORATED
 2074 West Lincoln Avenue
 Napa, CA 94558
 (707) 320-4968 (707) 320-2395 Fax
 www.appliedcivil.com

LANDS OF MORRIS
 MOUNT VEEDER ROAD
 NAPA, CA 94558
 APN 027-310-039



SCALE: 1" = 50'



Experience is the difference

July 20, 2017

Mr. Mike Muelrath
Applied Civil Engineering
2074 West Lincoln Ave.
Napa, CA 94558

Client: RGH Consultants
Project: Not Stated
Project #: 9260.31
Client Project #: 17-104

Sampled: Not Stated
Received: 7/11/2017
Reported: 7/20/2017

Dear Mr. Muelrath:

This letter transmits the results of our laboratory testing performed for the subject project. We performed a Soil Texture Analysis by the Bouyoucos Hydrometry Method with the following results:

Size/Density	TP-1 @ 6-18"
+ #10 Sieve	3.1%
Sand	34.4%
Clay	35.8%
Silt	29.8%
Db g/cc	--

We trust this provides the information required at this time. Should you have further questions, please call.

Regards,

RGH GEOTECHNICAL

Sean Flinn
Lab Technician



Experience is the difference

July 20, 2017

Mr. Mike Muelrath
Applied Civil Engineering
2074 West Lincoln Ave.
Napa, CA 94558

Client: RGH Consultants
Project: Not Stated
Project #: 9260.31
Client Project #: 17-104

Sampled: Not Stated
Received: 7/11/2017
Reported: 7/20/2017

Dear Mr. Muelrath:

This letter transmits the results of our laboratory testing performed for the subject project. We performed a Soil Texture Analysis by the Bouyoucos Hydrometry Method with the following results:

Size/Density	TP-6 @ Horizon 1
+ #10 Sieve	5.6%
Sand	39.2%
Clay	34.8%
Silt	26.0%
Db g/cc	--

We trust this provides the information required at this time. Should you have further questions, please call.

Regards,

RGH GEOTECHNICAL

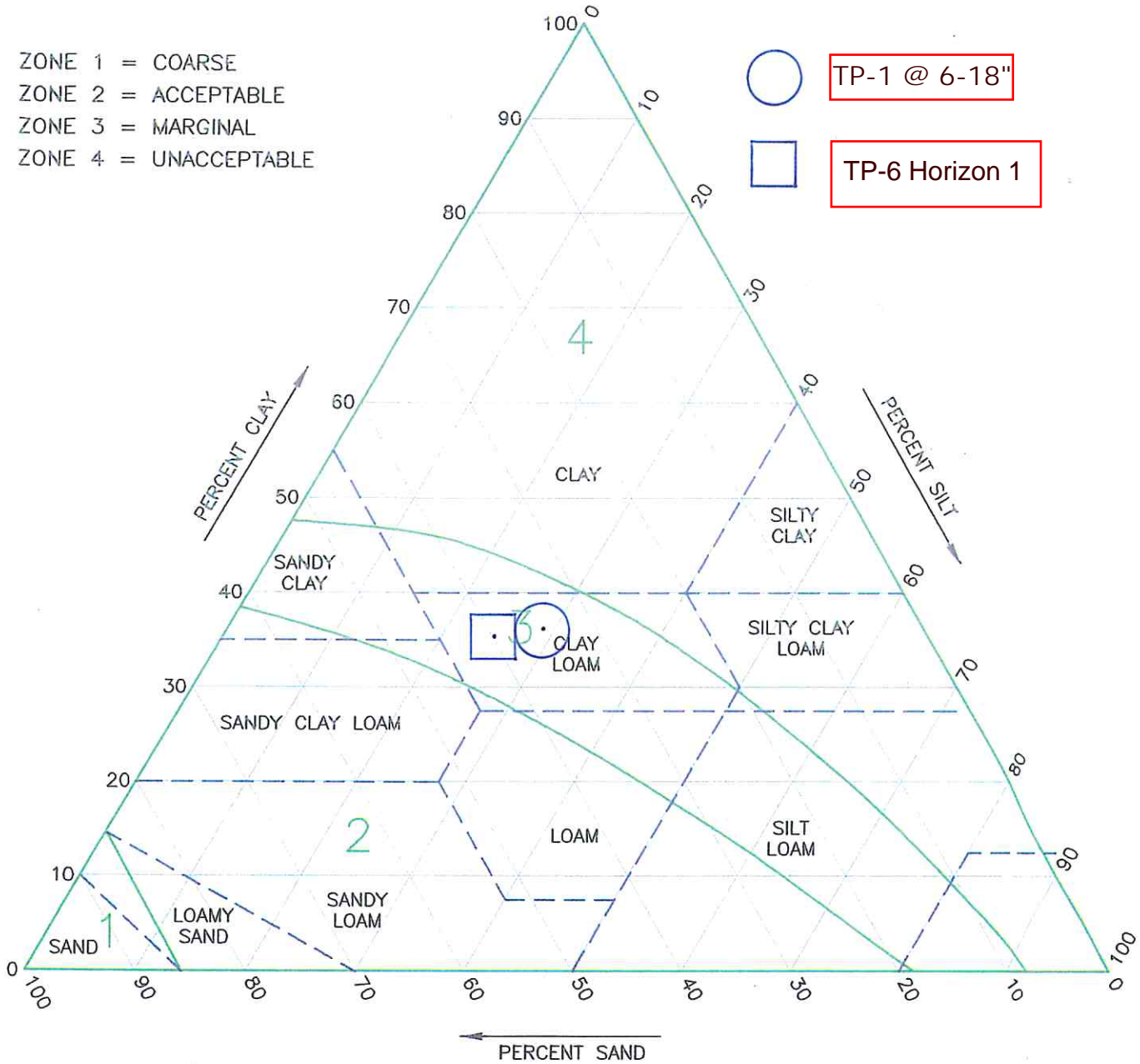
Sean Flinn
Lab Technician

SOIL PERCOLATION SUITABILITY CHART

- ZONE 1 = COARSE
- ZONE 2 = ACCEPTABLE
- ZONE 3 = MARGINAL
- ZONE 4 = UNACCEPTABLE

○ TP-1 @ 6-18"

□ TP-6 Horizon 1



Instructions:

1. Plot texture on triangle based on percent sand, silt, and clay as determined by hydrometer analysis.
2. Adjust for coarse fragments by moving the plotted point in the sand direction an additional 2% for each 10% (by volume) of fragments greater than 2mm in diameter.
3. Adjust for compactness of soil by moving the plotted point in the clay direction an additional 15% for soils having a bulk-density greater than 1.7 gm/cc.

Note:

For soils falling in sand, loamy sand or sandy loam classification bulk density analysis will generally not affect suitability and analysis not necessary.