Earth Strata Geotechnical Services, Inc.
Geotechnical, Environmental and Materials Testing Consultants

October 11, 2021

Project No. 203414-11A
Confirmation No. PR 6846

Mr. Joseph and Mrs. Jasmine Wiens
c/o 4M Engineering and Development
41635 Enterprise Circle N.
Suite B
Temecula, CA 92590

Subject: **Onsite Wastewater Treatment System Report, Proposed Class II Winery, Assessor's Parcel Number 942-030-007, Located on the East Corner of Rancho California Road and Glen Oaks Road, Temecula, Riverside County, California**

Reference: County of Riverside, Community Health Agency, Department of Environmental Health, Onsite *Wastewater Treatment Systems, Technical Guidance Manual*, Version A, undated.

County of Riverside, Community Health Agency, Department of Environmental Health, *Local Agency Management Program for Onsite Wastewater Treatment Systems*, 2016.

Earth Strata Geotechnical Services, Inc. is pleased to present this onsite wastewater treatment system (OWTS) report for the proposed Class II Winery, referenced above. The purpose of our feasibility study was to determine the percolation rates and physical characteristics of the subsurface earth materials within the vicinity of the proposed leach lines. We have provided guidelines for the design of an onsite wastewater treatment system, where applicable. This evaluation is intended to provide adequate data to satisfy the County of Riverside, Community Health Agency, Department of Environmental Health and Local guidelines for single-family dwelling approval.

PROPERTY DESCRIPTION AND LOCATION

The subject property is located on the East Corner of Rancho California Road and Glen Oaks Road in the Temecula area of Riverside County, California (See Figure 1). The subject property consists of an undeveloped parcel of land with relatively flat terrain.

PROPOSED CONSTRUCTION

Based on information provided by you, the proposed development includes multiple buildings, complete with an onsite wastewater treatment system. The development will consist of a small winery testing room. The maximum effluent quantity will be limited to 1,200 gallons per day.

SUBSURFACE EXPLORATION AND PERCOLATION TESTING

SUBSURFACE EXPLORATION

Subsurface exploration of the subject site consisted of one (1) deep exploratory test hole to a depth of 20 feet, conducted on August 31, 2021. The deep exploratory test hole was excavated to interpret whether groundwater or impermeable soil layers were present. Earth materials encountered within the deep exploratory test hole were classified and logged using the guidelines of ASTM 2487. The approximate location of the deep exploratory test hole is shown on the attached Percolation Location Map, Plate 1. The exploratory log has been included within Appendix A.

PERCOLATION TESTING

A total of four (4) percolation tests were conducted on October 8, 2021 to evaluate the feasibility of utilizing leach fields for onsite wastewater treatment. The percolation tests were performed in general accordance with the referenced guidelines.

The percolation tests were performed at the bottom of 5 feet deep test pits in 8- inch diameter tests holes. The exploratory log and locations of the percolation test holes are indicated on the attached Percolation Location Map, Plate 1. The percolation and deep exploratory test holes were located by property boundary measurement on the site plan and by using geographic features. Percolation testing was performed per the referenced Riverside County Local Agency Management Program guidelines.

The final percolation test reading is summarized in the following table and the test data recorded in the field is included in Appendix B.

PERCOLATION TEST SUMMARY

TEST NUMBER	PERCOLATION HOLE DIAMETER (IN.)	HOLE DEPTH (FT.)	FINAL PERCOLATION RATE (MPI)	EARTH MATERIAL DESCRIPTION
P-1	8	5	24.0	Silty SAND
P-2	8	5	60.0	Silty SAND
P-3	8	5	60.0	Silty SAND
P-4	8	5	30.0	Silty SAND

FINDINGS

EARTH MATERIALS

A general description of the earth materials observed on site is provided below:

Topsoil (no map symbol): Residual topsoil, encountered in the upper 6 inches to 1 foot, blankets the site and underlying Quaternary Pauba Formation. These materials were noted to be generally light brown, silty sand which were very porous, dry and in a loose state.

Quaternary Pauba Formation (map symbol Qps): Pauba Formation bedrock was generally encountered below the topsoil to the full depth of our exploration. These materials primarily consisted of light brown to reddish brown, to gray to pale white, fine to coarse grained sand with varying amounts of silt and clay. These materials were generally noted to be dry to moist, medium dense to very dense. Typically, the upper 1 to 3 feet of this unit is slightly more weathered and not as dense.

GROUNDWATER

Groundwater was not observed within the deep exploratory hole (MW-1) excavated to a depth of 20 feet.

PERCOLATION TEST RESULTS

The final measured percolation test design rate is 60.0 minutes per inch (mpi), yielding a loading rate at 120 square feet per 100 gallons of septic tank capacity per day.

CONCLUSIONS AND RECOMMENDATIONS

GENERAL

Based on the data presented in this report and using the recommendations set forth, it is the judgment of this professional that there is sufficient area on the lot to support a primary and expansion OWTS that will meet the current standards of the Department of Environmental Health and the Regional Water Quality Control Board (RWQCB). The design system shall be located in natural undisturbed soil at the depth of the tests performed. The natural occurring body of minerals and organic matter at the proposed wastewater disposal area contains earthen materials having more than 50% of its volume composed of particles smaller than 0.08 inches (2mm) in size.

Based on the data presented in this report and the testing information accumulated, it is the judgment of this professional that the groundwater table will not encroach within the current allowable limit set forth by County and State requirements.

SEWAGE DISPOSAL DESIGN RECOMMENDATIONS

The proposed sewage disposal system should consist of leach lines utilizing plastic (polyolefin) Standard Infiltrator® chambers manufactured by Infiltrator® Systems, Inc. The areas for both a primary system and a 100 percent expansion system are required. Septic tanks should be located upslope from the leach fields to provide gravity flow from the septic tank to the leach lines. Descriptions of the general design and construction of the wastewater treatment systems is provided below.

Septic Tank Capacity: The minimum septic tank capacity is determined, in accordance with the referenced guidelines, by the total fixture count within the proposed design, whichever is greater.

Allowable Design Percolation Rate: To determine the approximate square footage of each leaching area, the individual percolation rate test for each area that meet the requirements may be used as a guideline.

Primary System: Primary systems consist of a 1,200 gallon septic tank and leach field composed of subsurface leach lines. The minimum leach field absorption area is based upon the proposed septic tank capacity and the percolation rate of the proposed leach field area. The dimensions for individual leach field absorption areas are based on the total trench bottom area only and the areas between the leach line trenches are not included. In addition, the total linear footage can be reduced by 20 percent for designs utilizing plastic Infiltrator® chambers, as long as each line is of equal length.

Trench Width, Depth, and Minimum Soil Cover: For leach field areas having a slope of 10 percent, a minimum soil cover of 1½ feet over the leach lines is required. This soil cover is required to maintain a 15 feet minimum horizontal distance from the slope face to any portion of the leach lines. In order to provide a ±1½ foot soil cover, the trenches should be excavated to a depth on the order of 3 to 3½ feet below the surface. It should be noted that the required depth of cover is greater for those areas where the slope is steeper than 10 percent.

Individual leach line trenches should be excavated along the contours of the property which will maintain approximately the same elevation at the top of the trench. The leach line trench should be 36 inches wide, with a minimum center to center spacing of 7 feet, respectively.

TANK SIZE (gal)	DESIGN RATE (mpi)	MIN FT^2/100 GALLONS	MIN SQUARE FEET	MIN LINEAR FEET	REDUCED BY 20% (feet)	TOTAL LENGTH OF LINES (feet)
1,200	60.0	120	1,440	480	96	384

As a result, the recommended leach field design consists of three hundred eighty four (384) feet long leach lines with Infiltrator® chambers per line for both the primary and expansion system disposal areas. The proposed location for each system shall provide sufficient areas for both primary and 100% expansion.

100 Percent Expansion System: Sufficient area must be set aside for future construction of a backup system of equal size in the event the primary system fails. The area required for the 100 percent expansion system is identical to that of the primary system.

ADDITIONAL DESIGN CONSIDERATIONS AND RECOMMENDATIONS

To encourage the maximum loss of sewage effluent through evaporation and transpiration, the leach lines should be installed at the recommended depth and as close to the ground surface as possible. As noted above, leach lines should also be installed within trenches excavated along ground contours of equal elevation to maintain a relatively consistent trench depth. The minimum center to center spacing between the leach line trenches is 7 feet for 36-inch wide trenches.

Backfill materials placed over the leach lines should not be compacted but slightly mounded to allow for settlement and to minimize infiltration of surface water. To prevent collapse or crushing of the chambers, cobbles and boulders should be removed from the backfill soils over the plastic Infiltrator® chambers.

A minimum horizontal clearance of 5 feet is required between the leach lines and property lines. A minimum horizontal clearance of 5 feet is also required between the septic tank and proposed structures. A minimum horizontal clearance of 8 feet is required between the leach lines and proposed structures.

In the event that future access to the 100 percent expansion area is compromised by development (ie., garden walls, etc.), consideration should be given to constructing the expansion system at the same time as the primary system. If the systems are not constructed concurrently, consideration should be given to accessibility of the 100 percent expansion area after all site improvements are constructed.

The leach line trenches should be observed by the geotechnical consultant during and after excavation, as well as before the placement of perforated pipe or plastic Infiltrator® chambers. The site observations are to verify the suitability of the exposed earth materials. Necessary revisions or modifications may be needed if unforeseen conditions exposed during construction, such as hard impermeable rock. Revisions could include adding additional lines or a redesign of the system that conforms to the site conditions.

The leach field areas should not be used for recreation, horse corrals or other uses that would compact the earth materials at the surface. The ground surface over the disposal areas should be seeded or sodded to mitigate erosion.

The property owners should take note that proper use and maintenance are crucial to extending the effective design life of the sewage disposal system. The use of excessive water, introduction of detergents or chemicals, and solid food waste from garbage disposals can cause premature system failures. Properly maintained sewage disposal systems can function for many years. However, a rest period of roughly 10 to 15 years is generally needed to promote bacterial decay and a chance to dry up. After this resting period, the primary system can often be reactivated and alternated with the 100 percent expansion system.

GRADING PLAN REVIEW AND CONSTRUCTION SERVICES

This report has been prepared for the exclusive use of **Mr. Joseph and Mrs. Jasmine Wiens** and their authorized representative. It likely does not contain sufficient information for other parties or other uses. Earth Strata Geotechnical Services, Inc. should be engaged to review the final design plans and specifications prior to construction. This is to verify that the recommendations contained in this report have been properly incorporated into the project plans and specifications. Should Earth Strata Geotechnical Services, Inc. not be accorded the opportunity to review the project plans and specifications, we are not responsibility for misinterpretation of our recommendations.

Earth Strata Geotechnical Services, Inc. should be retained to provide observations during construction to validate this report. In order to allow for design changes in the event that the subsurface conditions differ from those anticipated prior to construction.

Earth Strata Geotechnical Services, Inc. should review any changes in the project and modify and approve in writing the conclusions and recommendations of this report. This report and the drawings contained within are intended for design input purposes only and are not intended to act as construction drawings or specifications. In the event that conditions encountered during grading or construction operations appear to be different than those indicated in this report, this office should be notified immediately, as revisions may be required.

REPORT LIMITATIONS

Our services were performed using the degree of care and skill ordinarily exercised, under similar circumstances, by reputable soils engineers and geologists, practicing at the time and location this report was prepared. No other warranty, expressed or implied, is made as to the conclusions and professional advice included in this report.

Earth materials vary in type, strength, and other geotechnical properties between points of observation and exploration. Groundwater and moisture conditions can also vary due to natural processes or the works of man on this or adjacent properties. As a result, we do not and cannot have complete knowledge of the subsurface conditions beneath the subject property. No practical study can completely eliminate uncertainty with regard to the anticipated geotechnical conditions in connection with a subject property. The conclusions and recommendations within this report are based upon the findings at the points of observation and are subject to confirmation by Earth Strata Geotechnical Services, Inc. during construction. This report is considered valid for a period of one year from the time the report was issued.

This report was prepared with the understanding that it is the responsibility of the owner or their representative, to ensure that the conclusions and recommendations contained herein are brought to the attention of the other project consultants and are incorporated into the plans and specifications. The owners' contractor should properly implement the conclusions and recommendations during grading and construction, and notify the owner if they consider any of the recommendations presented herein to be unsafe or unsuitable.

Respectfully submitted,

EARTH STRATA GEOTECHNICAL SERVICES, INC.

Stephen M. Poole

Stephen M. Poole, PE 40219
President
Principal Engineer

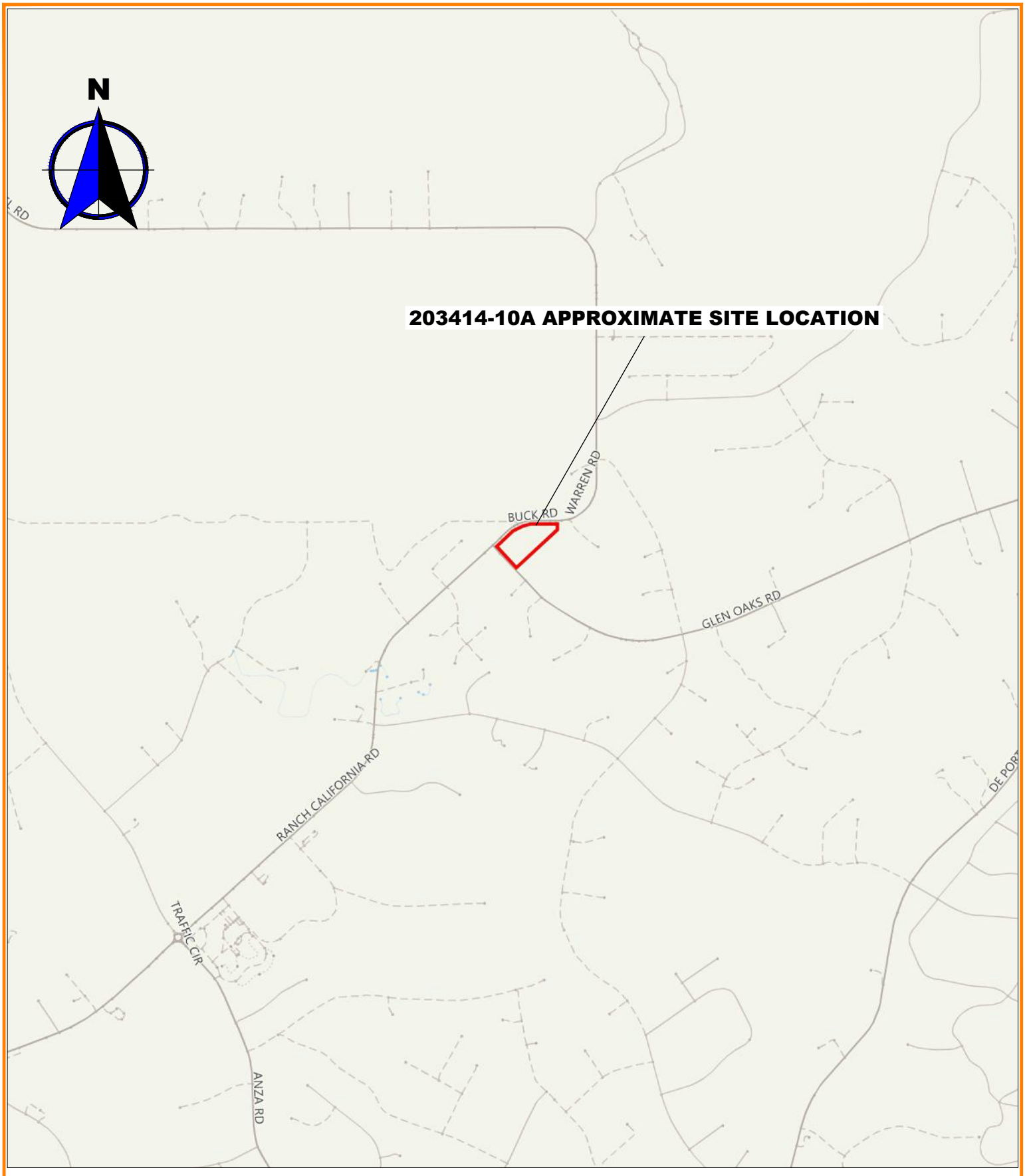
SMP/vh

Distribution: (2) Addressee

Attachments: Figure 1 – Vicinity Map *(Rear of Text)*
Appendix A – Exploratory Logs *(Rear of Text)*
Appendix B – Percolation Test Results *(Rear of Text)*
Plate 1 – Percolation Location Map *(Rear of Text)*

FIGURE 1

VICINITY MAP



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PROPOSED CLASS II WINERY	203414-10A
VICINITY MAP	SEE BAR SCALE
SEP 2021	FIGURE 1

APPENDIX A

EXPLORATORY LOGS

Geotechnical Monitoring Well Log MW-1

Date: August 31, 2021	**Project Name: Rancho Cal/Glen Oaks** **Page: 1 of 1**
Project Number: 203414-11A	**Logged By: JMR**
Drilling Company: Drilling It	**Type of Rig: B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; light brown, dry, loose, fine to coarse grain, trace organics
						Quaternary Pauba Formation (Qpfs):
					SM	Silty SAND; light brown, dry, medium dense, medium to coarse sand
5						
						Light to dark brown, slightly moist, dense, fine to medium grain, clay at 7.5 feet
10						
						Very dense, fine to coarse grain at 12 feet
15						
20						Total Depth: 20 feet
						No Groundwater
25						
30						

42184 Remington Avenue, Temecula, CA 92590

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APPENDIX B

PERCOLATION TEST RESULTS

PROJECT NAME: Glen Oaks& Rancho California PROJECT NO.: 203414-11A TEST TYPE (SP) (LL) (ATU)
DATE TESTED: 10/8/2021 TRACT: LOT NO.:
TESTED BY:

Test No. P-1 Depth 5

Time	Time Interval	Initial	Final	Drop	MPI	
9:09 9:39	30	25	27	2.0	15.0	
9:41 10:11	30	27	29	2.0	15.0	
10:15 10:45	30	26	28	2.0	15.0	
10:46 11:16	30	28	29.5	1.5	20.0	
11:17 11:47	30	29.5	30.5	1.0	30.0	
11:48 12:18	30	25	26.5	1.5	20.0	
12:19 12:49	30	26.5	28	1.5	20.0	
12:50 13:20	30	25	26.5	1.5	20.0	
13:21 13:51	30	34	25.5	8.5	3.6	
13:52 14:22	30	25.5	26.75	1.3	24.0	
14:23 14:53	30	24	25.25	1.3	24.0	
14:54 15:24	30	25.25	26.5	1.3	24.0	

Test No. P-2 Depth 5

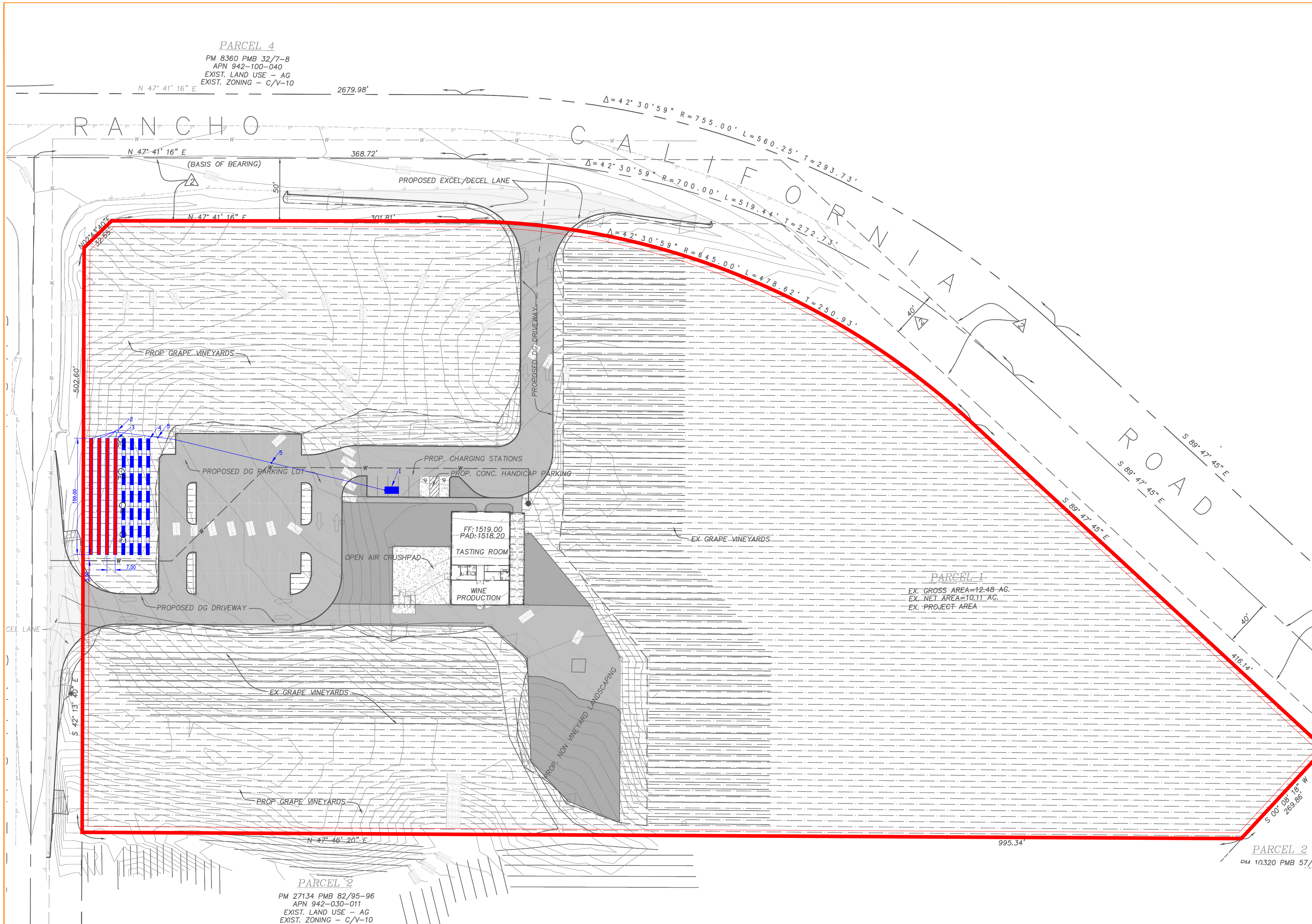
Time	Time Interval	Initial	Final	Drop	MPI	
9:10 9:40	30	26.5	27.5	1.0	30.0	
9:42 10:12	30	27.5	28.5	1.0	30.0	
10:16 10:46	30	24.5	25.5	1.0	30.0	
10:47 11:17	30	25.5	26.5	1.0	30.0	
11:18 11:48	30	26.5	27.75	1.3	24.0	
11:49 12:19	30	24	25	1.0	30.0	
12:20 12:50	30	25	25.75	0.8	40.0	
12:51 13:21	30	24	24.5	0.5	60.0	
13:22 13:52	30	24.5	25	0.5	60.0	
13:53 14:23	30	25	25.5	0.5	60.0	
14:24 14:54	30	22	22.5	0.5	60.0	
14:55 15:25	30	22.5	23	0.5	60.0	

Test No. P-3 Depth 5

Time	Time Interval	Initial	Final	Drop	MPI	
9:11 9:41	30	28	29.5	1.5	20.0	
9:43 10:13	30	29.5	30.5	1.0	30.0	
10:17 10:47	30	24.5	27	2.5	12.0	
10:48 11:18	30	27	29.5	2.5	12.0	
11:19 11:49	30	28	29.25	1.3	24.0	
11:50 12:20	30	27	28	1.0	30.0	
12:21 12:51	30	25	26	1.0	30.0	
12:52 13:22	30	26.5	27	0.5	60.0	
13:23 13:53	30	27.5	28	0.5	60.0	
13:54 14:24	30	25	25.5	0.5	60.0	
14:25 14:55	30	25.5	26	0.5	60.0	
14:56 15:26	30	25	25.5	0.5	60.0	

Test No. P-4 Depth 5

Time	Time Interval	Initial	Final	Drop	MPI	
9:12 9:42	30	30	31.5	1.5	20.0	
9:44 10:14	30	31.5	32.5	1.0	30.0	
10:18 10:48	30	29.5	30.5	1.0	30.0	
10:49 11:19	30	30.5	31.5	1.0	30.0	
11:20 11:50	30	31.5	32.5	1.0	30.0	
11:51 12:21	30	28	29.5	1.5	20.0	
12:22 12:52	30	27	28.25	1.3	24.0	
12:53 13:23	30	28.25	29.25	1.0	30.0	
13:24 13:54	30	27	28	1.0	30.0	
13:55 14:25	30	28	29	1.0	30.0	
14:26 14:56	30	25	26	1.0	30.0	
14:57 15:27	30	25	26	1.0	30.0	



LEGEND

Locations are Approximate

Symbols

- Limits of Report
- P-4 - Percolation Test Location
- MW-1 - Percolation Monitoring Well Location
- Primary Leach Lines
- 100% Expansion Leach Lines

NOTES:

- 1200 GALLON
- DESIGN RATE = 60 MPI
- LOADING RATE = 120 SQFT/ 100 GALLONS/ DAY
- TOTAL LENGTH = 480 FEET
- INFILTRATION CHAMBER (20% REDUCTION) = 384 FEET
- PRIMARY: 4 LINES @ 100 FEET LONG (INFILTRATION CHAMBERS)
- 100% EXPANSION: 4 LINES @ 100 FEET LONG (INFILTRATION CHAMBERS)

1. 1200 GALLON SEPTIC TANK
2. DISTRIBUTION BOX
3. PRIMARY LEACH LINES
4. 100% EXPANSION AREA
5. CLEAN OUT EVERY 100' MINIMUM

PERCOLATION MAP

LOCATED ON THE EAST CORNER OF RANCHO CALIFORNIA ROAD AND GLEN OAKS ROAD

CITY OF TEMECULA, RIVERSIDE COUNTY, CALIFORNIA

APN 942-030-007

PROJECT	PROPOSED SINGLE FAMILY RESIDENCE		
CLIENT	MR. JOSEPH AND MRS. JASMINE WEINS		
PROJECT NO.	203414-10A		
DATE	SEPTEMBER 2021		
SCALE	1" = 40'		
DWG XREFS			
REVISION			
DRAWN BY	JDG	PLATE	1 OF 1

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