



Sladden Engineering

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July 18, 2022

Project No. 544-22131
22-07-417

1.0 DESCRIPTION OF SITE AND PROPOSAL

1.1 Calvin & Adriana Clark
24703 Walnut Street
Newhall, California 91321

Project: Proposed Eco Dome Campground
57899 Linn Road
APN 0630-061-38
Landers Area
San Bernardino County, California

Subject: Percolation Testing for Onsite Sewage Disposal Feasibility

1.2. Location:

- a) The site is located at 57899 Linn Road in the Landers area of San Bernardino County, California. The site consists of one parcel that is formally identified by the County of San Bernardino as APN 0630-061-38.

1.3 Proposed Development:

- a) It is our understanding that the proposed project will consist of constructing a new Eco Dome Campground on the site. The proposed new campground will consist of five (5) dome living quarters, a communal dome, a bocce ball court, a horseshoe pit area, and solar canopy charging stations. Concrete flatwork, landscape areas and various associated site improvements are also anticipated. A private on-site sewage disposal system consisting of a septic tank and seepage pits are proposed to serve the new campground.

1.4 Description of Site and Surroundings:

- a) The project site is located at 57899 Linn Road in the Landers Area of San Bernardino County, California. The project site consists of a single parcel that is formally identified by the County of San Bernardino County as APN 0630-061-38. The parcel occupies approximately 2.50 acres of undeveloped land. At the time of our investigation, the subject parcel was covered in scattered low growth native vegetation as well as scattered Joshua Trees throughout the subject site. The site is near the elevation of the adjacent properties and roadways and is located at approximately 34.2944 degrees north latitude and -116.4000 degrees west longitude (Figure 1). The subject property is bounded by undeveloped parcels on the west, south and east and by Linn Road on the north.

- b) No natural ponding of water or surface seeps were observed at or near the site during our investigation conducted on April 18, 2022. Site drainage appears to be controlled via sheet flow and surface infiltration. A "blue line" stream is mapped near the western boarder of the property.
- c) It is assumed that the properties within the vicinity of the project site are utilizing individual on-site sewage disposal systems consisting of septic tanks and leach lines or seepage pits.
- d) At the time of our investigation no wells were identified on the property. The property is serviced by the Bighorn Desert View Water Agency.
- e) There are no known existing wells on the site. Based on our review of groundwater data through the California Department of Water Resources¹ the closest well is located approximately 0.25 miles southwest of the site.
- f) There are no rock outcrops on the site. No bedrock was encountered within our bores that extended to a maximum depth of 31.5 feet below existing grade or during the our field investigation
- g) Groundwater was not encountered within our bores. Information regarding the approximate depth to groundwater provided by the California Department of Water Resources online database indicates that the depth to groundwater is in excess of 45 feet below the existing ground surface in the vicinity of the site.
- h) Site geologic features are not expected have a significant impact on sewage disposal system design.
- i) It appears that there will be sufficient area for the new sewage disposal system and the required expansion areas on the subject property.

2.0 EQUIPMENT

- a) The test holes were excavated using a truck mounted hollow stem auger rig (Mobile B-61) equipped with 8-inch outside diameter hollow-stem augers.
- b) Tools used during testing consisted of an electronic water measuring device, a watch, and a water truck.

3.0 METHODOLOGY AND PROCEDURES

- 3.1 Locations were determined by a handheld Global Positioning System (GPS). The approximate locations of the test holes are indicated on the attached Exploration Location Plan (Figure 2).
- 3.2 The test results and soil conditions encountered within our bores indicated "Favorable" conditions. Percolation test rates were consistent with the sandy alluvial soil conditions observed. The surface gradients within the proposed disposal field area are less than 20 percent.
- 3.3 The soil encountered in our exploratory bores consisted primarily of fine-to coarse-grained sand (SW) and silty sand (SM).

3.4 Test procedures for seepage pits:

Seepage Pits:

- a) Two (2) percolation test holes were excavated on the project site. The test holes were excavated to approximate depths of 21.5 and 30 feet below existing grade.
- b) The tests bores were cased with perforated pipe and gravel packed to prevent sedimentation during testing.
- c) Each test hole was filled with water the ground surface. Since more than half of the wetted depth percolated through the test holes within two consecutive readings, percolation testing was initiated immediately.
- d) Percolation testing was performed by filling the test holes with water and recording the drop in the water surface with time. Testing was performed in accordance with San Bernardino County DEHS procedures.

3.5 Seepage Pit Test Results

- a) The following is a table of the results of the testing performed on the subject site.

**TABLE 1
SUMMARY OF TEST RESULTS**

Test Hole No.	Depth (Ft)	USCS	Q gal/sq. ft/day	Q gal/sq. ft/day (w/GPC)
BH-2/SP-1	21.5	SW/SM	50.9	28.0
BH-3/SP-2	30	SW/SM	51.4	28.3

4.0 DISCUSSION OF RESULTS

4.1 Testing indicates percolation rates ranging from 28.0 and 28.3 gallons per square foot per day as determined by San Bernardino County procedures.

4.2 Measurements were considered accurate and the consistency of the individual test results indicates accuracy. The rapid percolation rates are consistent with that expected for the sandy soil encountered throughout the depth of our bores.

5.0 DESIGN

5.1 Criteria:

- a) Seepage pits may be designed using 4.0 gallons per square foot of seepage pit area per day (Q) that is the maximum allowable application rate in accordance with San Bernardino County guidelines. A design rate of 25 square feet per 100 gallons of septic tank capacity should be utilized for design.

¹ California Department of Water Resources (CDWR), 2021, Historical Data by Well-Map Interface, available at: <https://wdl.water.ca.gov/waterdatalibrary/>

TABLE 2
DESIGN DEPTH BELOW INLET

Septic Tank Capacity	Pit Diameter	Number of Pits	Design Depth Below Inlet ¹
1,200 gallons	6 Ft.	1	16.00
1,500 gallons	6 Ft.	1	20.00
2,000 gallons	6 Ft.	2	14.00
2,500 gallons	6 Ft.	2	16.50
3,000 gallons	6 Ft.	2	20.00

¹ Septic tank capacity / Q x D x Π

6.0 SEE ATTACHED PLAN

7.0 GENERAL DISCUSSION AND CONCLUSIONS

7.1 Based on the data presented in the report and the plans supplied by the client, it is the judgment of this engineer that seepage pits may be used for the new on-site sewage disposal systems on this property.

7.2 Based on the data presented in the report and the tested information accumulated, it is the judgment of the engineer that the groundwater table should not encroach with the allowable limit set forth by County and State requirements, when the recommendations of this report are followed. Also, there will be sufficient area for future expansion.

7.3 All minimum setback distances shall be maintained for the proposed sewage disposal system in accordance with San Bernardino County guidelines². A maximum seepage pit depth of 30 feet is recommended.

8.0 GENERAL

The findings and recommendations presented in this report are based upon an interpolation of the soil conditions between bore locations and extrapolation of the conditions throughout the sewage disposal system area. Should conditions encountered during grading (or excavation) appear different than that indicated in this report, this office should be notified.

This report is considered applicable for use by the client for the specific site and project described herein. The use of this report by other parties or for other projects is not authorized. The recommendations of this report are contingent upon monitoring of the grading operations by a representative of Sladden Engineering. All recommendations are considered tentative pending our review of the construction operations and additional tests, if indicated. If others are employed to perform any soil tests, this office should be notified prior to such tests to coordinate any required site visits by our representative and to assure indemnification of Sladden Engineering.

² San Bernardino Public Health, Environmental Health Services, Percolation Testing and Reporting Standards for Onsite Wastewater Treatment Systems, Revised September 2019; Appendix D.

July 18, 2022

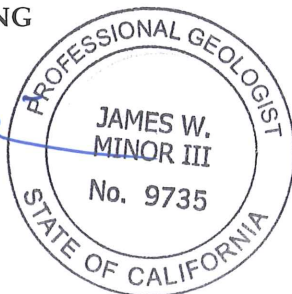
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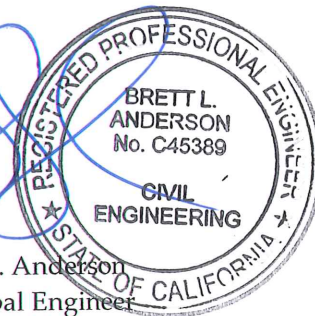
We appreciate the opportunity to provide service to you on this project. If you have any questions regarding this report, please contact the undersigned.

Respectfully submitted,
SLADDEN ENGINEERING


James W. Minor III
Senior Geologist




Brett L. Anderson
Principal Engineer



Perc/jm

Copies: 2/ Addressee

SITE LOCATION MAP
REGIONAL GEOLOGIC MAP
BOREHOLE LOCATION PLAN



USGS (2018)

SITE LOCATION MAP

FIGURE

1

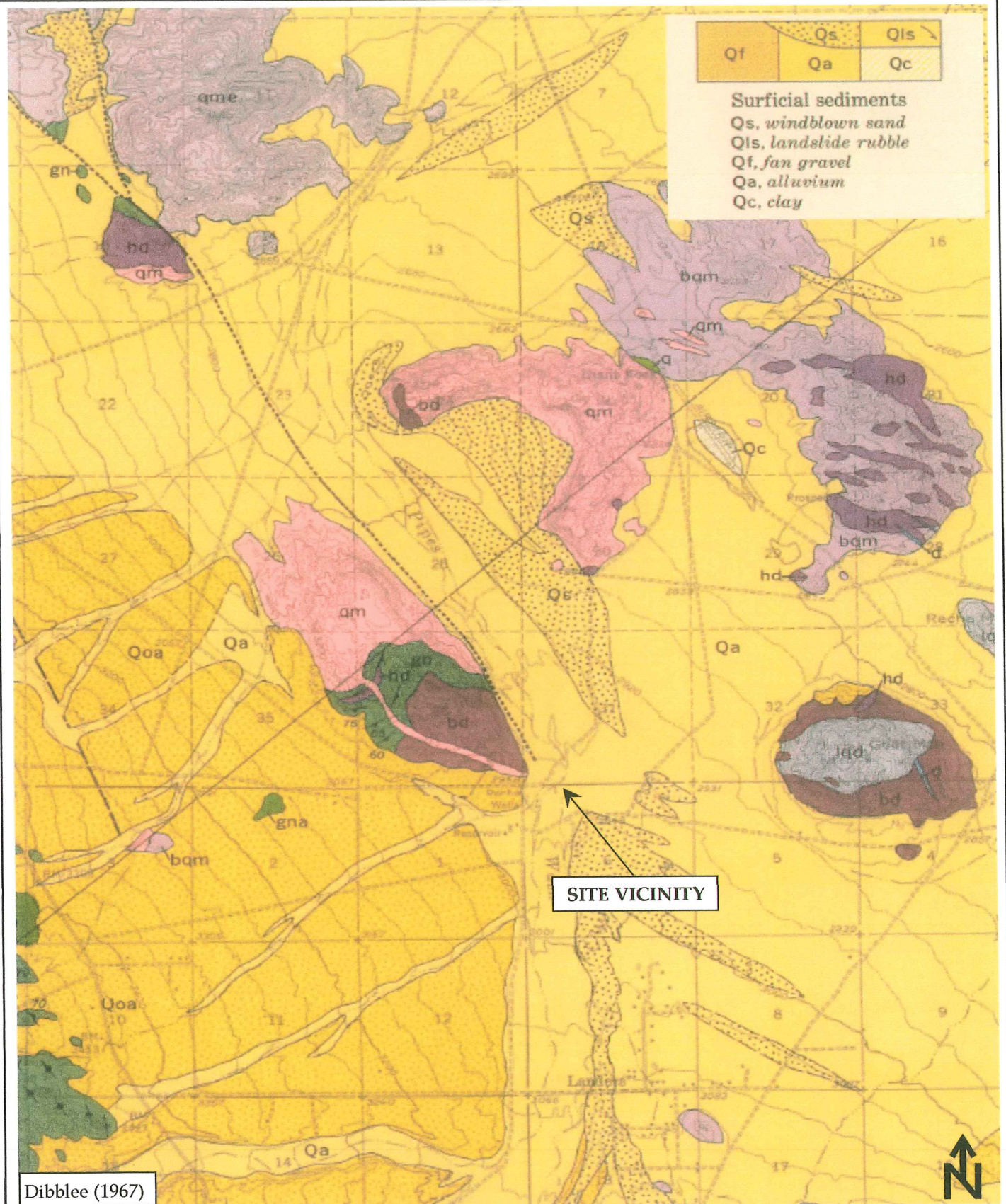


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Qf	Qs	Qls
	Qa	Qc

Surficial sediments
 Qs, windblown sand
 Qls, landslide rubble
 Qf, fan gravel
 Qa, alluvium
 Qc, clay



Dibblee (1967)



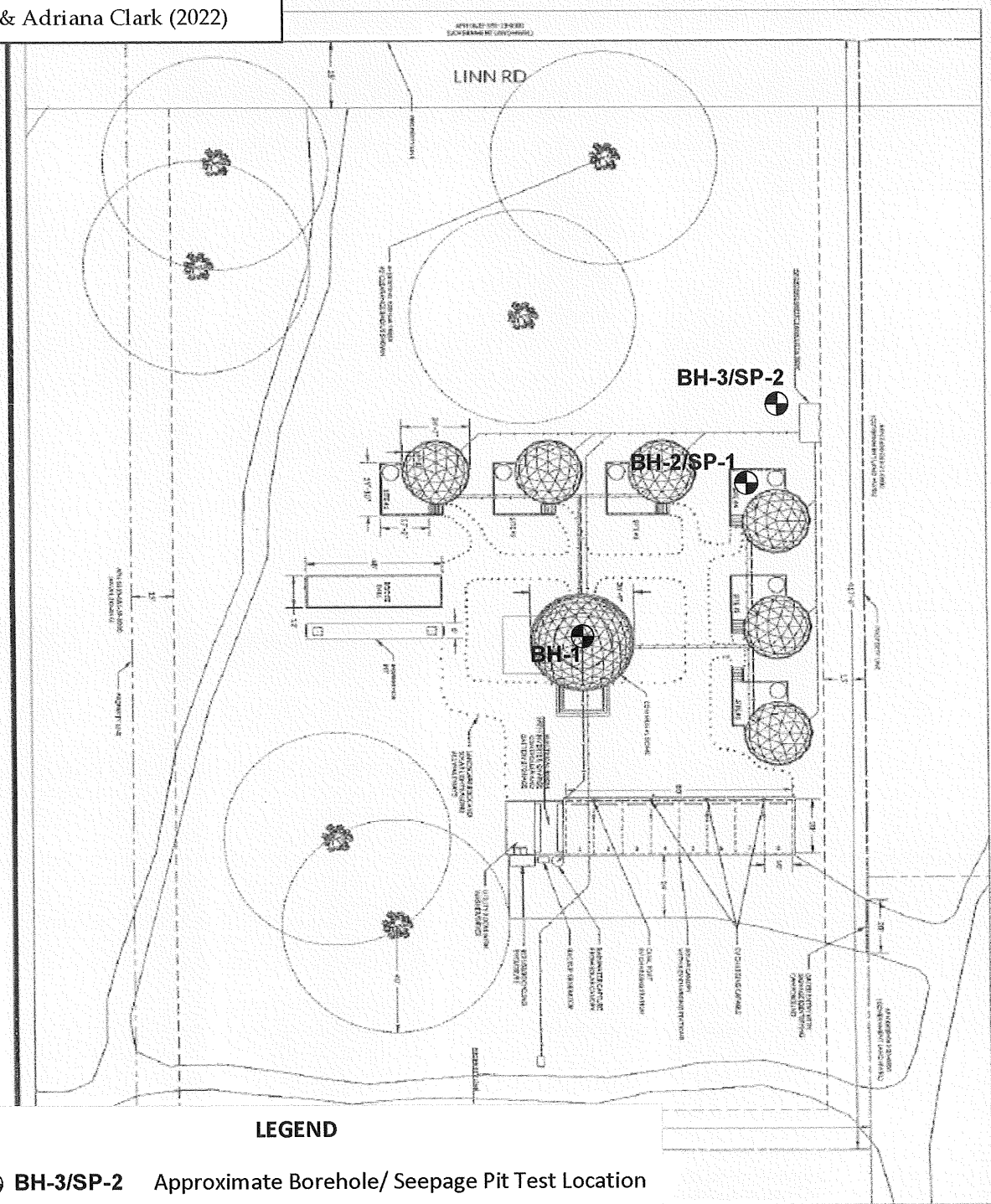
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REGIONAL GEOLOGIC MAP

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FIGURE

2



LEGEND

 **BH-3/SP-2** Approximate Borehole/ Seepage Pit Test Location

<p>Site Plan Date: 1/17/22 Scale: 1/8" = 1'-0"</p>	<p>800 Doheny Company 57899 Linn Rd Lafayette, CA 94595 415-965-5443 3842486</p>	<p>OWNER: CALVIN & ADRIANA CLARK OWNER: BURL DISE</p>	<p>North Arrow</p>	<p>Scale: 1/8" = 1'-0"</p>	<p>Sheet No. 3 of 3</p>
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BOREHOLE LOCATION PLAN

FIGURE

3



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BORELOGS



BORE LOG

Drill Rig: Mobile B-61

Date Drilled: 4/18/2022

Elevation: 2940 Ft (MSL)

Boring No: BH-1

Sample	Blow Counts	Bulk Sample	Expansion Index	% Minus #200	% Moisture	Dry Density	Depth (Feet)	Graphic Lithology	Description
	5/9/17	1	0	4.9	0.4	105.7	2		Gravelly Sand (SW/SM); yellowish brown, dry, fine- to coarse-grained (Disturbed).
	7/12/19						4		Gravelly Sand (SW/SM); yellowish brown, dry, medium dense, fine- to coarse-grained (Qa).
							6		No Recovery.
	12/13/21			7.4	0.6		10		Gravelly Sand (SW/SM); yellowish brown, dry, dense, fine- to coarse-grained (Qa).
	32/35/50			4.0	0.4		16		Gravelly Sand (SW/SM); yellowish brown, dry, very dense, fine- to coarse-grained (Qa).
	10/15/13			5.3	0.6		20		Gravelly Sand (SW/SM); yellowish brown, dry, medium dense, fine- to coarse-grained (Qa).
	19/34/50-5"			4.3	0.5	110.6	26		Gravelly Sand (SW/SM); yellowish brown, dry, very dense, fine- to coarse-grained (Qa).
	14/15/17			5.5	0.9		30		Gravelly Sand (SW/SM); yellowish brown, dry, dense, fine- to coarse-grained (Qa).
							32		
							34		
							36		Terminated at ~ 31.5 Feet bgs.
							38		No Bedrock Encountered.
							40		No Groundwater or Seepage Encountered.
							42		
							44		
							46		
							48		
							50		

Completion Notes:

PROPOSED ECO DOME CAMPGROUND
APN 0630-061-38

Project No: 544-22131

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Page

1



BORE LOG

Drill Rig:	Mobile B-61	Date Drilled:	4/18/2022
Elevation:	2940 Ft (MSL)	Boring No:	BH-2/SP-1

Sample	Blow Counts	Bulk Sample	Expansion Index	% Minus #200	% Moisture	Dry Density	Depth (Feet)	Graphic Lithology	Description
							2		Gravelly Sand (SW/SM); yellowish brown, dry, fine- to coarse-grained (Disturbed).
	7/10/14			6.3	0.7		4		Gravelly Sand (SW/SM); yellowish brown, dry, medium dense, fine- to coarse-grained (Qa).
	12/22/25			3.3	0.5		10		
	7/13/16			5.0	1.6		16		Gravelly Sand (SW/SM); yellowish brown, dry, medium dense, fine- to coarse-grained (Qa).
	17/29/44			4.8	1.0	112.4	20		Gravelly Sand (SW/SM); yellowish brown, dry, dense, fine- to coarse-grained (Qa).
									Terminated at ~ 21.5 Feet bgs. No Bedrock Encountered. No Groundwater or Seepage Encountered. Borehole Cased with Perforated Pipe for Seepage Pit Testing.
















Completion Notes:

PROPOSED ECO DOME CAMPGROUND
APN 0630-061-38



BORE LOG

Drill Rig:	Mobile B-61	Date Drilled:	4/18/2022
Elevation:	2940 Ft (MSL)	Boring No:	BH-3/SP-2

Sample	Blow Counts	Bulk Sample	Expansion Index	% Minus #200	% Moisture	Dry Density	Depth (Feet)	Graphic Lithology	Description
							2		Gravelly Sand (SW/SM); yellowish brown, dry, fine- to coarse-grained (Disturbed).
							4		Gravelly Sand (SW/SM); yellowish brown, dry, fine- to coarse-grained (Qa).
							6		
							8		
							10		
							12		
							14		
							16		
							18		
							20		
							22		
							24		
							26		
							28		
							30		
							32		
							34		
							36		
							38		
							40		
							42		
							44		
							46		
							48		
							50		

SEEPAGE PIT APPLICATION RATES

SEEPAGE PIT APPLICATION RATE CALCULATOR

Job No. 544-22131

Job Name: APN 0630-061-38

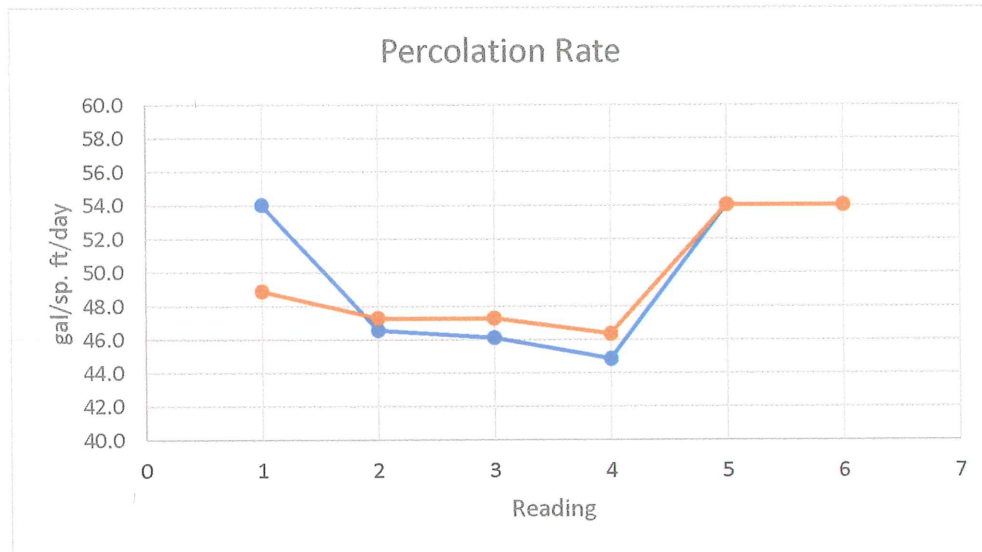
Report No. 22-07-417

Test Hole: BH-2/ SP-1

				GPC	0.55			Final Rate	28.0	gal./sq.ft./day
Reading No.	Db (ft) Hole Depth	Di (ft) Depth	Df (ft) Depth	F (ft) Drop	Wet Depth Lavg (ft)	Time T (hr)	D -Hole Dia. (ft)	Q gal./sq. ft./day	Pit mpi	
A	21.5	0	21.5	21.5	10.75	0.50	0.50	18.0	10.0	
B	21.5	0	21.5	21.5	10.75	0.50	0.50	18.0	10.0	
1	21.5	0	21.5	21.5	10.75	0.17	0.50	54.0	3.3	
2	21.5	0	19.9	19.9	11.55	0.17	0.50	46.5	3.9	
3	21.5	0	19.8	19.8	11.6	0.17	0.50	46.1	3.9	
4	21.5	0	19.5	19.5	11.75	0.17	0.50	44.8	4.0	
5	21.5	4	21.5	17.5	8.75	0.17	0.50	54.0	3.3	
6	21.5	4	21.5	17.5	8.75	0.17	0.50	54.0	3.3	
7										
8										
9										
10										
11										
12										

Test Hole: BH-3/SP-2

				GPC	0.55			Final Rate	28.3	gal./sq.ft./day
Reading No.	Db (ft) Hole Depth	Di (ft) Depth	Df (ft) Depth	F (ft) Drop	Wet Depth Lavg (ft)	Time T (hr)	D -Hole Dia. (ft)	Q gal./sq. ft./day	Pit mpi	
A	30	0	30	30	15	0.50	0.50	18.0	10.0	
B	30	0	30	30	15	0.50	0.50	18.0	10.0	
1	30	0	28.5	28.5	15.75	0.17	0.50	48.9	3.7	
2	30	0	28	28	16	0.17	0.50	47.3	3.8	
3	30	0	28	28	16	0.17	0.50	47.3	3.8	
4	30	0	27.7	27.7	16.15	0.17	0.50	46.3	3.9	
5	30	4	30	26	13	0.17	0.50	54.0	3.3	
6	30	4	30	26	13	0.17	0.50	54.0	3.3	
7										
8										
9										
10										
11										
12										



PERCOLATION TESTING NOTIFICATION SHEET



Public Health
Environmental Health Services
PERCOLATION TEST NOTIFICATION

www.SBCounty.gov
www.sbcounty.gov/dph/dehs
 Phone: (800) 442-2283



Please email form to EHS.CustomerService@dph.sbcounty.gov or fax to 909.387.4323 at least two (2) working days before testing.

THIS SECTION TO BE COMPLETED BY QUALIFIED PROFESSIONAL				
QUALIFIED PROFESSIONAL INFORMATION				
Firm Name Sladden Engineering			Date 4/18/2022	
Firm Address 45090 Golf Center Parkway		City Indio	State Ca	Zip 92201
Firm Contact Person James Minor	Email(s) jminor@sladdenengineering.com		Phone Number (760) 863-0713	
SITE INFORMATION				
Owner's Name Calvin & Adriana Clark		Assessor's Parcel Number (APN) 0630-061-38		
Site Address 57899 Linn Road		City Landers	State CA	Zip 92285
Email(s) calvinjclark@gmail.com		Phone Number 818-447-3623		
BILLING INFORMATION				
Environmental Health Services may need to be onsite to observe percolation testing. This will be billed at the current hourly professional rate. Provide billing information below or check one of the following:				
<input checked="" type="checkbox"/> Same as Qualified Professional Information			<input checked="" type="checkbox"/> Same as Site Information	
Billing Name				
Billing Address		City	State	Zip
Email(s)			Phone Number	
PROJECT INFORMATION				
Disposal field	<input type="checkbox"/> Leach Lines		<input checked="" type="checkbox"/> Seepage Pits	<input type="checkbox"/> Alternative Treatment System
Exploratory Boring(s)	Boring Date(s) 4/18/2022	Boring Time 8:00am	Number of Borings 3	Depth of Boring(s) in ft. 30
Testing	Test Date(s) 5/2/2022	Test Time 8:00am	Number of Tests 2	Depth of Test Hole(s) in ft. 20'&30'
Project Type	<input checked="" type="checkbox"/> Single Family Residence Lot Size (ft ² /acres)		<input type="checkbox"/> Multi Family Residential Number of Units Lot Size (ft ² /acres)	
	<input type="checkbox"/> Commercial Lot Size (ft ² /acres) Estimated Flow			
	Please select one of the following <input type="checkbox"/> Tentative Tract (TT) # >50 ft <input type="checkbox"/> Tentative Parcel Map (TPM) # >50 ft			
	Number of Proposed Lots	Original Lot Size (ft ² /acres) >50 ft	Average New Lot Size (ft ² /acres)	
A sewer connection will be required if a sewer is available within 200 ft. of the nearest property line (add 100 ft. for each additional lot). A "sewer will not serve" letter may be required prior to submittal of the percolation report.				
Site Conditions	Historic groundwater level in feet >50 ft		Slope in disposal area (%) < 30%	
	Source of Water <input checked="" type="checkbox"/> Private Well <input type="checkbox"/> Water Purveyor			
	<input type="checkbox"/> Check box if parcel is on Forest Service Land <input type="checkbox"/> Check box if lot is within 100 feet of a river/stream			
For Office Use Only For Office Use Only For Office Use Only For Office Use Only For Office Use Only				
Fee:	FA Number:	Record ID:		PE Number:
Late Fee: <input type="checkbox"/> Y <input type="checkbox"/> N	Designated Employee:	Received By:		Date:
Check One: <input type="checkbox"/> New <input type="checkbox"/> Transfer <input type="checkbox"/> Reactivate			Changes (please specify):	