



Hydrology Report to Determine Area of Influence for Cultivation Irrigation Wells

for

Nina Star Farms

APN: 014-006-16

23180 Shady Grove Road
Middletown, CA 95461

September 6, 2021

Prepared for:

Lake County
Community Development Department
255 North Forbes Street
Lakeport, CA 95453





INTRODUCTION

The purpose of this study is to determine the area of influence on an existing well that will continue to be used for residential domestic supply and irrigation for proposed commercial cannabis. The “Project” is currently proposing 37,446 sf of commercial cannabis canopy area.

The parcels on which the Project is located is owned by Nina Star LLC and will be managed by Nina Bogdonava.

This report estimates the amount of water available and recharge rate during a drought year from the existing wells. In addition, this report estimates the zone of influence to the surrounding and to estimate the cumulative impacts where interference is with existing wells.

STUDY LIMITATIONS

The yield of wells cannot be estimated with precision because of all the uncertainty with the aquifer and the amount of rain percentage of rainfall that percolates through the ground. Therefore, conservative estimates and assumptions are used in this report.

This study is based on the following information and assumptions.

- Cooper - Jacob well equation
- Well Completion Reports obtained from Lake Co EHD, and CA State database.
- Well Yield Test and Drillers Reports by Jim’s Pumps
- Rainfall for a drought year is 20% of annual precipitation
- Aquifer is uniform throughout the area of well influence

WELL

There is only one (1) well that is proposed to be used for this project that is analyzed in this report. And two residential neighboring wells are analyzed as well. (See Surrounding Well Map in Appendix C). These wells are identified as follows:



WELL #1

- APN: 014-006-16, Nina Star Primary well for 2BR dwelling and proposed cultivation (37,446 sf canopy).
- Total drill depth of +43 feet below the surface.
- The capacity of the well is at least 16 gpm. (See Appendix A)
- Pump depth: 43 feet
- Unconfined aquifer with thickness of 33feet (10m) (no driller's log available – assumed from characteristics of Well #3 below)

WELL #2

- APN: 115-004-05. Owned by Kevin and Barbra Vallauri
- The total drill depth of 125 feet, screen at 30-70 depth(Appendix A – 8/4//1999)
- The capacity is only 1.5 gpm.
- Use: 3 BR dwelling unit
- Unconfined aquifer with thickness of 40 feet (12.2m)

WELL #3

- APN: 014-006-14 Owned HiCann LLC
- Total drill depth of 26 feet (Appendix A – 8/3/81)
- Capacity of at 10 gphr per well driller's report
- Use: 3BR Dwelling
- Unconfined aquifer with thickness of 11 feet (3.35m)
- Note: this property is proposing several acres of +/- 78 acres commercial cannabis canopy. However, the well proposed for cultivation is off site (Well#4) on apn 013-027-08. (Appendix C)

WELL #4

- APN: 013-027-08 Owned HiCann LLC
- Well depth of 716 feet (Appendix A – 9/21/2020)
- Capacity of at 10 gpm per well driller's report
- Use: Irrigation Well
- Confined aquifer with thickness of 280 feet (85m)



WELL RADIUS OF INFLUENCE

The well radius of influence (cumulative impact) is estimated by the Cooper-Jacob equation:

$$R_{(well)} = \sqrt{\frac{2.24584Tt}{S}}$$

Where,

$R_{(well)}$ = Radius of Influence (m)
t = time (seconds)
T = transmissivity (m² / day)
S = water storage capacity (%) unitless

$$T = K * b$$

Where,

K = 2.0 E-4 m/s for Basalt porosity
b = aquifer thickness, m
t = 1 day = 86,400 seconds
S = 0.15,

Therefore;

$R_{(1)}$ => 51 m = 167 feet
 $R_{(2)}$ => 56 m = 184 feet
 $R_{(3)}$ => 29 m = 97 feet
 $R_{(4)}$ => 148 m = 486 feet



Based on the locations and the calculated Radius of Influences the project Well, Well#1 does not intersect with the wells in the area.

WATER USAGE

The proposed project has water usage for proposed canopy of 0.86 acres (37,446sf) and 2BR Dwelling Unit. For the purposes of this analysis, in an abundance of caution, we have assumed a canopy of 1.0 acres and water usage for 4 employees.

WATER USAGE FROM WELLS #1

The total water usage of the canopy area is estimated by the square footage of the canopy multiplied by the in/year needed for a single cannabis plant. The in/yr is estimated to be similar to a tomato plant, which is 20in/year.

$$W_{\text{Irrigation}} = A * (\text{ft/yr})$$

$$\begin{aligned} W_{\text{Irrigation}} &= (1.0 \text{ acres}) * (43,560 \text{ sf/acres}) * (1.66 \text{ ft/year}) * (7.48 \text{ gal/cf}) \\ &= 540,875 \text{ gal/year} \end{aligned}$$

$$\begin{aligned} W_{\text{Domestic}} &= [(4 \text{ employees}) * (15 \text{ gals/employee/day}) * (0.7 \text{ days/week used})] + \\ & (2\text{BR}) * (1.5 \text{ person/BR}) * (75 \text{ gal/person/day}) * 365 \text{ days/year} \\ &= 97,455 \text{ gal/year} \end{aligned}$$

$$\begin{aligned} \text{Total Water Usage} &= W_{\text{Irrigation}} + W_{\text{Domestic}} \\ &= 638,330 \text{ gal/year} \end{aligned}$$

AQUIFER RECHARGE

The proposed project has an estimated total annual water usage of 638,330 gallons per year.

Calculation of Aquifer Recharge is based on the tributary area to the radius of influence of the well. Because of the location of the wells near St. Helena Creek,



the aquifer recharge is in two areas. Per map shown in Appendix D, the total recharge area is 277,989 sf.

Given: Annual Precipitation, P = 40 inches per year, assume a drought year is 20% of the annual precipitation, yields 8" (0.66ft) of rainfall. (Note: Rainfall of 2021 for lake county was 9" per NOAA)

Volume of water for recharge = Area x Drought Precipitation x Coefficient of Seepage.

$$V = (277,989 \text{ sf}) \times (0.66 \text{ ft/yr}) \times (7.48 \text{ gal/cf}) \times (0.7)$$

$$V = 960,663 \text{ gal/year}$$

960,663 > 638,330 therefore the well is adequate to handle the 1.0 acres of cultivation in a drought year.

CONCLUSION

Per our calculations and assumptions, the project does have an adequate water supply for the proposed irrigation use. However, the project must be limited to 1 acre of canopy and irrigated with dripline only. Canopy size exceeding 1 acre will require the development of a new well(s).

Through our calculations, review of available Well Completion Reports and Pump Yield Tests, the proposed use of the well onsite does not interfere with surrounding wells.

The well on the property (apn: 14-006-17) will not be impacted by the Nina Star Farm because the well's radius of influence do not intersect. The distance between the well radius of the project well, and the neighboring well is approximately 186' based on our theoretical calculations noted in this report. The neighboring well has pump yield test of 1.5 gpm which is very poor. Per conversations with the owner, the well is near dry and water is delivered to the site during drought years (currently).



Appendix

Well Completion & Test Results (A)

Well Area of Influence Map (B)

Surrounding Aerial Map (C)

Well Recharge Area (D)

Appendix

A

WELL PERFORMANCE TEST REPORT

Client Name: NinaStar LLC
Property Location: 23180 Shady Grove, Middletown, CA
Parcel Number: 014-006-16
Number of Wells Evaluated: One
Well Performance Test Completion Date: March 12, 2020
Water Samples Collected: No
Pump Technician: Jim Jackson

Location Description: 38.718582, -122.613146 (WGS84)
Total Depth: 43-feet below top of casing
Depth to Static Water Level: 10.33-feet below the top of casing
Diameter of well: 10-inches
Casing type: Steel
Test Duration: 2-hours
Test Type: Pump
Pumping Rate: 16-Gallons Per Minute (GPM)

Observations: JAK Drilling & Pump (JAK) performed a visual inspection of the well on March 12, 2020. The well is located on the northwest side of the access road that runs along the eastern edge of the property (see Well Location Map attached). There is an existing and operational ½-horse 230volt submersible pump, of unknown production specifications, installed in the well that is supplied power via connection to PG&E power supply.

Well Performance Pump Test: The four-hour pump test was conducted using the existing submersible pump and in accordance with industry standards. The static water level within the well was measured prior to the start of the test. Once the performance test began, the depth-to-water or pumping level was measured manually with a Powers Water Meter in the well every five minutes during the first half hour of the test and then every 10-minutes for the next hour of the test. The measurement interval was then increased to every 30-minutes for the remainder of the four-hour test. The pumping rate was measured by timing the flow into a volume verified 5-gallon bucket. The pumping rate was measured at the same intervals as the pumping level. Both the depth-to-water/pumping level and pumping rate measurements are summarized in the attached table.

The static water level was measured at 10.33-feet below the top of casing at the start of the performance test. The maximum drawdown of 1.5-feet at 11.83-feet below the top of casing was observed immediately after the start of the test. The pumping level remained constant at 11.83-feet below the top of casing for the duration of the test. The pumping rate, measured by timing



the flow into a volume verified 5-gallon bucket, remained a constant 16.0-GPM for the duration of the test. The performance test was concluded after the production rate and the pumping level remained constant for at least 2-hours.

After 2-hours of pumping, the well pump was shut off and the well was then allowed to rest and recharge. The depth-to-water was measured in the well after 10-minutes at 11.0-feet and then again after 30-minutes at 10.33-feet below the top of casing. The resulting recharge rate of 100% indicates the well has a strong recovery.

Disclaimer:

Observations made of the well(s) are strictly limited to the date and time that the test(s) was conducted and are in no way a guarantee of future conditions, including but not limited to the quantity and/or quality of the water produced by this well.

Please feel free to contact our office if there are any questions regarding the well test and/or well test report.

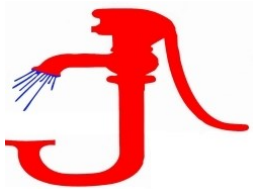
Sincerely,

Jessica Moreno
JAK Drilling & Pump

Attachments:

Well Location Map

Table 1: Well Performance Test Data



WELL LOCATION MAP
23180 Shady Grove
Middletown, CA



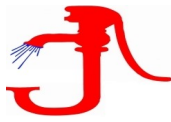


TABLE 1
WELL PERFORMANCE TEST DATA
23180 Shady Grove Rd, Middletown, CA
March 12, 2020

Time	Gallons Per Minute	Depth to Water In Feet Below Top of Casing
13:00	Static	10.33
13:05	16.00	11.83
13:10	16.00	11.83
13:15	16.00	11.83
13:20	16.00	11.83
13:25	16.00	11.83
13:30	16.00	11.83
13:40	16.00	11.83
13:50	16.00	11.83
14:00	16.00	11.83
14:10	16.00	11.83
14:20	16.00	11.83
14:30	16.00	11.83
15:00	16.00	11.83
15:10	RECHARGE	11.00
15:30	RECHARGE	10.33

Flow rate measured by timing flow into a volume confirmed 5-gallon bucket.

DWR USE ONLY - DO NOT FILL IN
10N/07W-15M
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Page of

Owner's Well No. JAN 03 2000

No. 713392

Date Work Began 8-3-99 Ended 8-4-99

Local Permit Agency Health Dept.

Permit No. WE-1638 Permit Date 12-22-98

GEOLOGIC LOG

WELL #2

ORIENTATION (∠) VERTICAL HORIZONTAL ANGLE (SPECIFY)
DRILLING METHOD air rotary FLUID

DEPTH FROM SURFACE		DESCRIPTION <i>Describe material, grain size, color, etc.</i>
Ft.	to Ft.	
0	10	Gravel
10	20	Sandstone
20	25	Shale
25	50	Sandstone
50	60	Shale
60	90	Sandstone
70	80	Shale
80	100	Sandstone
100	110	Shale
110	120	Sandstone
120	125	Shale

WELL LOCATION
Address 23250 Shady Grove Rd
City Middle town
County Lake
APN Book 14 Page 006 Parcel 17
Township 10N Range 7W Section 175
Latitude NORTH Longitude WEST
DEG. MIN. SEC. DEG. MIN. SEC.

LOCATION SKETCH
WEST NORTH EAST SOUTH
Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (∠)
 NEW WELL
MODIFICATION/REPAIR
 Deepen
 Other (Specify)
DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")
PLANNED USES (∠)
WATER SUPPLY
 Domestic Public
 Irrigation Industrial
TEST WELL
CATHODIC PROTECTION
HEAT EXCHANGE
DIRECT PUSH
INJECTION
VAPOR EXTRACTION
SPARGING
REMEDICATION
OTHER (SPECIFY)

WATER LEVEL & YIELD OF COMPLETED WELL
DEPTH TO FIRST WATER 50 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 35 (Ft.) & DATE MEASURED 8-4-99
ESTIMATED YIELD 142 (GPM) & TEST TYPE air lift
TEST LENGTH 2 (Hrs.) TOTAL DRAWDOWN (Ft.)
** May not be representative of a well's long-term yield.*

TOTAL DEPTH OF BORING 125 (Feet)
TOTAL DEPTH OF COMPLETED WELL 125 (Feet)

DEPTH FROM SURFACE Ft. to Ft.	BORE-HOLE DIA. (Inches)	CASING (S)					SLOT SIZE IF ANY (Inches)	DEPTH FROM SURFACE Ft. to Ft.	ANNULAR MATERIAL			
		TYPE (∠)	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	CEMENT (∠)			BENTONITE (∠)	FILL (∠)	FILTER PACK (TYPE/SIZE)	
0-20	9	X	PVC FUPD	4 1/2	160		0-20	X				
20-30	7	X	" "	" "	" "		20-125					3/16 Per
30-70	7	X	" "	" "	" "	1/8						
70-125	7	X	" "	" "	" "							

ATTACHMENTS (∠)
 Geologic Log
 Well Construction Diagram
 Geophysical Log(s)
 Soil/Water Chemical Analyses
 Other
ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT
I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
NAME Larry Herman Drilling
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
ADDRESS 13011 Hwy 99 Lower Lake Ca 95457
CITY STATE ZIP
Signed Larry Herman DATE SIGNED 8-4-99 465071
WELL DRILLER/AUTHORIZED REPRESENTATIVE C-57 LICENSE NUMBER

ORIGINAL
File with DWR

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
WATER WELL DRILLERS REPORT

WELL #3

Do not fill in

No. 094877

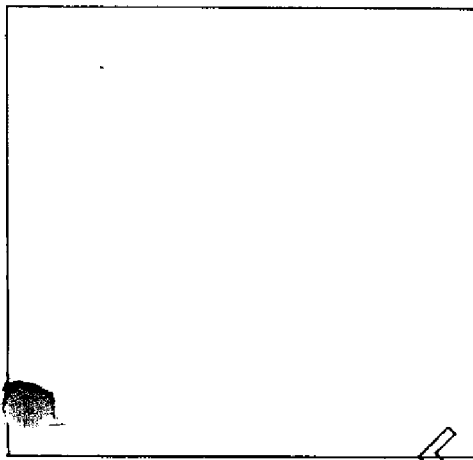
Notice of Intent No. _____
Permit No. or Date _____

A. P.

State Well No. ~~1041/1041~~
Other Well No. ~~10N/10TW-14~~

(1) ()
Address _____
City _____
Zip _____
(2) LOCATION OF WELL (See instructions):
County Lake Owner's Well Number _____
Well address if different from above 23320 Shady Grove Rd.
Township _____ Range _____ Section _____
Distance from cities, roads, railroads, fences, etc. _____

(12) WELL LOG: Total depth 26 ft. Depth of completed well _____ ft.
from ft. to ft. Formation (Describe by color, character, size or material)
XXXXXXXXXXXXXXXXXXXX
0 - 15 boulders
15 - 25 blue shale rock
25 - 26 hard rock



(3) TYPE OF WORK:
New Well Deepening
Reconstruction
Reconditioning
Horizontal Well
Destruction (Describe destruction materials and procedures in Item 12)
(4) PROPOSED USE:
Domestic
Irrigation
Industrial
Test Well
Stock
Municipal
Other

WELL LOCATION SKETCH

(5) EQUIPMENT: Rotary <input type="checkbox"/> Reverse <input type="checkbox"/> Cable <input checked="" type="checkbox"/> Air <input type="checkbox"/> Other <input type="checkbox"/> Bucket <input type="checkbox"/>				(6) GRAVEL PACK: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Size _____ Diameter of bore _____ Packed from _____ to _____			
(7) CASING INSTALLED: Steel <input checked="" type="checkbox"/> Plastic <input type="checkbox"/> Concrete <input type="checkbox"/>				(8) PERFORATIONS: Type of perforation or size of screen			
From ft.	To ft.	Dia. in.	Cage or Wall	From ft.	To ft.	Slot size	
0	26	6	10 3/4	6	26	.188	

(9) WELL SEAL:
Was surface sanitary seal provided? Yes No If yes, to depth _____ ft.
Were strata sealed against pollution? Yes No Interval _____ ft.
Method of sealing _____

(10) WATER LEVELS:
Depth of first water, if known _____ ft.
Standing level after well completion 15 ft.

(11) WELL TESTS:
Was well test made? Yes No If yes, by whom? _____
Type of test Pump Bailer Air lift
Depth to water at start of test _____ ft. At end of test 20 ft.
Discharge 10 gal/HR after 4 hours Water temperature _____
Chemical analysis made? Yes No If yes, by whom? _____
Electric log made? Yes No If yes, attach copy to this report

Work started 7/27/81 19 _____ Completed 7/30/81 19 _____
WELL DRILLER'S STATEMENT:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
SIGNED Ken Hansen
(Well Driller)
NAME Les Petersen Drlg. & Pump, Inc.
(Person, firm, or corporation) (Typed or printed)
Address 5434 Old Redwood Highway
City Santa Rosa, Ca. Zip 95401
License No. 261084 Date of this report 8/3/81

WELL NOT FOR PUBLIC USE SEC. 13752

WELL PRODUCTION REPORT

Client: HiCann LLC
Well Location: 22999 South State Highway 29, Middletown, CA
APN: 013-027-08
Location Description: 38.72181, -122.60500
Total Depth: 716-feet below ground surface (bgs)
Diameter of well: 5 inches
Casing type: PVC
Production Rate: 100-gallons per minute
Test Duration: 8-hours
Test Type: Airlifting
% Recharge: 100

Observations: JAK was retained by the client for the purpose of drilling and installing a new water well. The well has been drilled to a depth of 716-feet below ground surface using a mud-rotary style method of drilling. The well was cased to 716-feet using 5-inch PVC well casing with the annular space gravel packed and sealed per industry standards. As part of the well completion process, JAK airlifted the well for approximately 8-hours on November 28, 2020. Airlifting allows the driller to remove additional fines and sediments from the well that could potentially foul a submersible pump while also evaluating the production rate for the new well. Typically, when a pump test is completed, the pumping level (or water level) is measured in the well at set intervals for the duration of the test. However, due to the dynamic nature of airlifting it is impossible to measure the pumping level during the test therefore only the static water level and the recovery or recharge water level was measured. The water produced via airlifting was directed into a 5-inch discharge pipe temporarily connected to the well with the volume measured by timing the flow through a discharge weir.

Prior to airlifting, the static water level was measured at 46-feet below ground surface. The well was then airlifted for 8-hours and as expected, the volume of water produced from the well increased with the removal of the fine sediments. Initially the production rate of the well measured at 30-gallons per minute then as the clarity of the water improved the production rate increased to 100-gallons per minute. After 8-hours of airlifting the well was then allowed to rest and recharge. Following 30-minutes of inactivity the water level in the well was measured and at 44-feet below ground surface indicating that the well had fully recharged.

Disclaimer: Observations made of the well(s) are strictly limited to the date and time that the test(s) was conducted and are in no way a guarantee of future conditions, including but not limited to the quantity and/or quality of the water produced by this well.

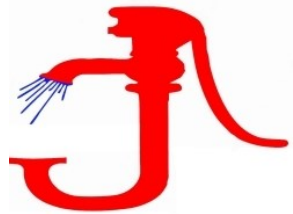
Please feel free to contact our office if there are any questions regarding the well test and/or well test report.

Sincerely,



Jessica Moreno
Operations Manager
JAK Drilling & Pump

Attachments:
Well Location Map



Well Location
22999 South State Highway 29
Middletown, CA



State of California
Well Completion Report
 Form DWR 188 Submitted 12/18/2020
 WCR2020-017295

WELL #4

Owner's Well Number 1 Date Work Began 09/21/2020 Date Work Ended 11/29/2020
 Local Permit Agency Lake County Health Services Department - Environmental Health Division
 Secondary Permit Agency Lake County Health Services Permit Number WP0003657 and WP0003559 Permit Date 12/03/2020

Well Owner (must remain confidential pursuant to Water Code 13752)	Planned Use and Activity
Name <u>HICANN LLC, Zarina Otchkova</u>	Activity <u>New Well</u>
Mailing Address <u>28592 N 68th Avenue</u>	Planned Use <u>Water Supply Irrigation - Agriculture</u>
City <u>Peoria</u> State <u>AZ</u> Zip <u>85383</u>	

Well Location	
Address <u>22999 S State Highway 29 HWY</u>	APN <u>013-027-08</u>
City <u>Middletown</u> Zip <u>95461</u> County <u>Lake</u>	Township _____
Latitude <u>38</u> <u>43</u> <u>18.5159</u> N Longitude <u>-122</u> <u>36</u> <u>18</u> W	Range _____
Deg. Min. Sec. Deg. Min. Sec.	Section _____
Dec. Lat. <u>38.72181</u> Dec. Long. <u>-122.605</u>	Baseline Meridian _____
Vertical Datum _____ Horizontal Datum <u>WGS84</u>	Ground Surface Elevation _____
Location Accuracy <u>Unknown</u> Location Determination Method <u>GPS</u>	Elevation Accuracy _____
	Elevation Determination Method _____

Borehole Information	
Orientation <u>Vertical</u> Specify _____	
Drilling Method <u>Other - Hammer followed by mud rotary drilling</u> Drilling Fluid <u>Bentonite</u>	
Total Depth of Boring <u>716</u> Feet	
Total Depth of Completed Well <u>716</u> Feet	

Water Level and Yield of Completed Well	
Depth to first water <u>42</u> (Feet below surface)	
Depth to Static _____	
Water Level <u>46</u> (Feet) Date Measured <u>11/28/2020</u>	
Estimated Yield* <u>100</u> (GPM) Test Type <u>Air Lift</u>	
Test Length <u>8</u> (Hours) Total Drawdown _____ (feet)	
*May not be representative of a well's long term yield.	

Geologic Log - Free Form		
Depth from Surface	Feet to Feet	Description
0	26	red dirt rock
26	42	dark rock
42	280	First water encountered at 42', red and black fractured rock, hole fell apart at 280- switch and finish hole via mud drilling
280	300	basalt with quartz
300	330	basalt
330	338	fractured rock change to possible shale layer
338	400	shale changes to hard rock, hole is very grabby and mud thinning
400	410	Blue gray clays
410	415	shale rock clay
415	420	clays
420	430	clays with possible water
430	460	clay with iron and quartz with some basalt
460	500	thin layers of sandstone intermixed with iron, quartz, possible water at 500

500	540	quartz with iron
540	560	blue shale, with iron, quartz = possible water
560	580	quartz with iron and some basalt
580	610	quartz and basalt - possible water
610	620	brown clay, basalt and quartz
620	660	iron, quartz, basalt
660	680	iron, quartz, shale, basalt - Possible Water
680	700	basalt, sandstone - possible water
700	716	basalt

Casings

Casing #	Depth from Surface Feet to Feet		Casing Type	Material	Casings Specificatons	Wall Thickness (inches)	Outside Diameter (inches)	Screen Type	Slot Size if any (inches)	Description
1	0	80	Blank	PVC	N/A	0.214	4.5			Well Casing
1	80	100	Screen	PVC	N/A	0.214	4.5	Milled Slots	0.032	Screen
1	100	120	Blank	PVC	N/A	0.214	4.5			SOLID
1	120	140	Screen	PVC	N/A	0.214	4.5	Milled Slots	0.032	screen
1	140	160	Blank	PVC	N/A	0.214	4.5			Well casing
1	160	180	Screen	PVC	N/A	0.214	4.5	Milled Slots	0.032	Well Casing
1	180	200	Blank	PVC	N/A	0.214	4.5			Well Casing
1	200	220	Screen	PVC	N/A	0.214	4.5	Milled Slots	0.032	well casing
1	220	240	Blank	PVC	N/A	0.214	4.5			well casing
1	240	260	Screen	PVC	N/A	0.214	4.5	Milled Slots	0.032	well casing
1	260	280	Blank	PVC	N/A	0.214	4.5			well casing
1	280	300	Screen	PVC	N/A	0.214	4.5	Milled Slots	0.032	Well Casing
1	300	320	Blank	PVC	N/A	0.214	4.5			Well Casing
1	320	340	Screen	PVC	N/A	0.214	4.5	Milled Slots	0.032	Well Casing
1	340	360	Blank	PVC	N/A	0.214	4.5			Well Casing
1	360	380	Screen	PVC	N/A	0.214	4.5	Milled Slots	0.032	Well Casing
1	380	400	Blank	PVC	N/A	0.214	4.5			Well Casing
1	400	420	Screen	PVC	N/A	0.214	4.5	Milled Slots	0.032	Well Casing
1	420	480	Blank	PVC	N/A	0.214	4.5			Well Casing
1	480	500	Screen	PVC	N/A	0.214	4.5	Milled Slots	0.032	Well Casing
1	500	520	Blank	PVC	N/A	0.214	4.5			Well Casing
1	520	540	Screen	PVC	N/A	0.214	4.5	Milled Slots	0.032	Well Casing
1	540	560	Blank	PVC	N/A	0.214	4.5			well casing
1	560	580	Screen	PVC	N/A	0.214	4.5	Milled Slots	0.032	well casing
1	580	600	Blank	PVC	N/A	0.214	4.5			WELL CASING
1	600	620	Screen	PVC	N/A	0.214	4.5	Milled Slots	0.032	well casing
1	620	640	Blank	PVC	N/A	0.214	4.5			
1	640	660	Screen	PVC	N/A	0.214	4.5	Milled Slots	0.032	well casing
1	660	680	Blank	PVC	N/A	0.214	4.5			well casing
1	680	700	Screen	PVC	N/A	0.214	4.5	Milled Slots	0.032	well casing
1	700	716	Blank	PVC	N/A	0.214	4.5			cellar

Annular Material

Depth from Surface Feet to Feet		Fill	Fill Type Details	Filter Pack Size	Description
25	716	Filter Pack	Other Gravel Pack	Pea Gravel	double washed pea gravel
0	25	Bentonite	Other Bentonite		hydrated bentonite sanitary seal

Other Observations:

Initially began drilling boring using air hammer, hole started falling a part around 280-feet and had to switch to mud-rotary style of drilling. Cleared hole and continued drilling to terminal depth of 716-feet below ground surface.

Borehole Specifications		
Depth from Surface Feet to Feet		Borehole Diameter (inches)
0	25	10.875
25	716	7.875

Attachments
Well Production Report 11.30.2020.pdf - Other

Certification Statement			
I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief			
Name	JAK DRILLING AND PUMP, Kharom Hellwege		
	Person, Firm or Corporation		
	PO Box 250	Middletown	CA 95461
	Address	City	State Zip
Signed	<i>electronic signature received</i>	12/18/2020	1013957
	C-57 Licensed Water Well Contractor	Date Signed	C-57 License Number

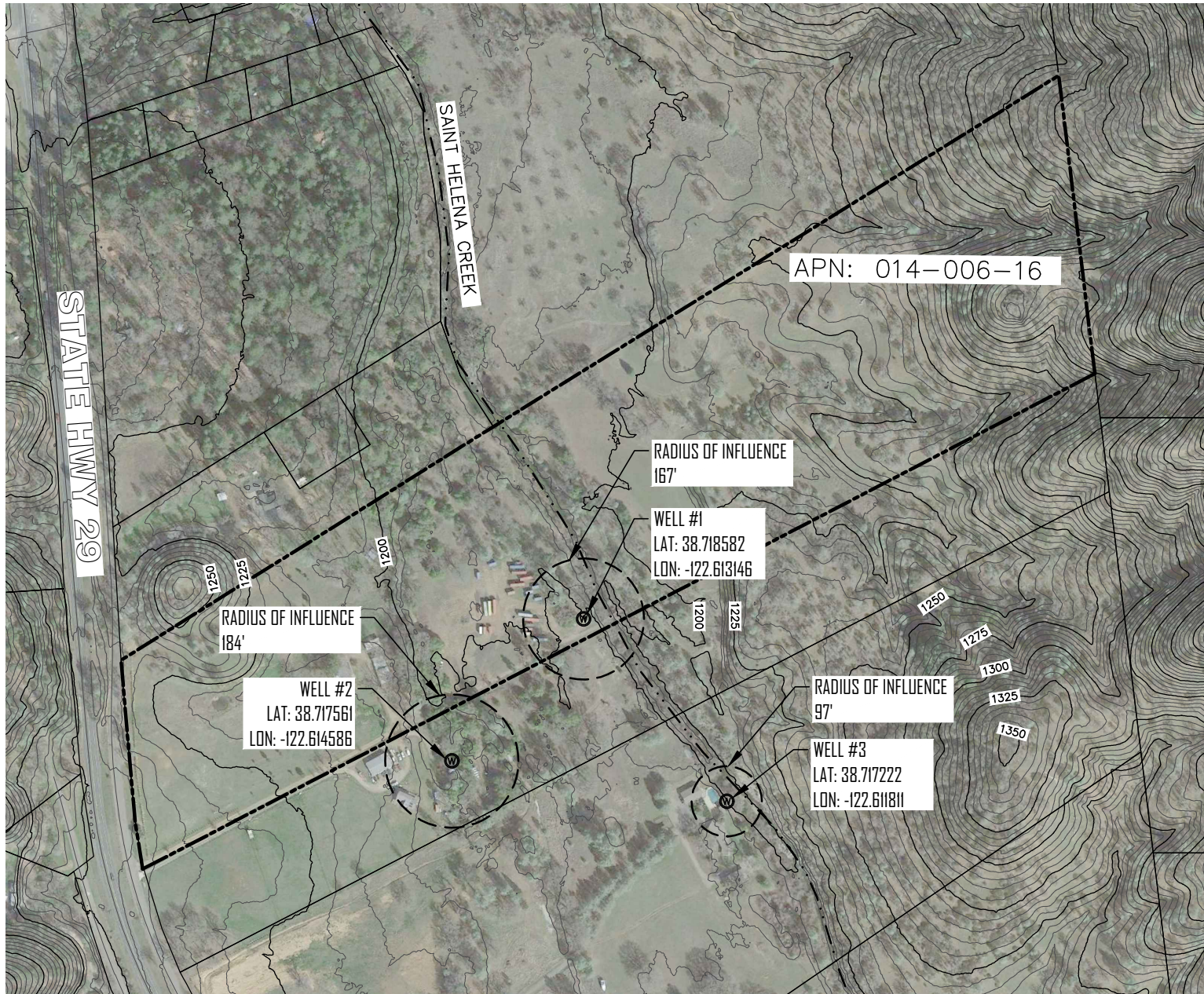
DWR Use Only			
CSG #	State Well Number	Site Code	Local Well Number
		N	W
Latitude Deg/Min/Sec		Longitude Deg/Min/Sec	
TRS:			
APN:			

Appendix

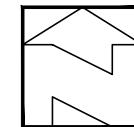
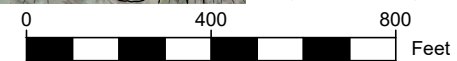
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Well Area of Influence Map

APPENDIX B



5' MINOR AND 25' MAJOR CONTOUR INTERVAL

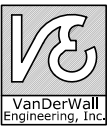


SUBMITTED TO:

LAKE COUNTY COMMUNITY
DEVELOPMENT DEPT.
COUNTY OF LAKE
LAKEPORT, CA

PO BOX 431
KELSEYVILLE, CA 95451
707-279-4887

VanderWall
Engineering, Inc.



WELL AREA OF INFLUENCE MAP
APN: 014-006-16
23180 SHADY GROVE
MIDDLETOWN, CALIFORNIA

VERIFY SCALE

BAR IS ONE INCH ON
ORIGINAL DRAWING.
0 1"

DATE SEPT 2021

PROJ 21-51

DWG

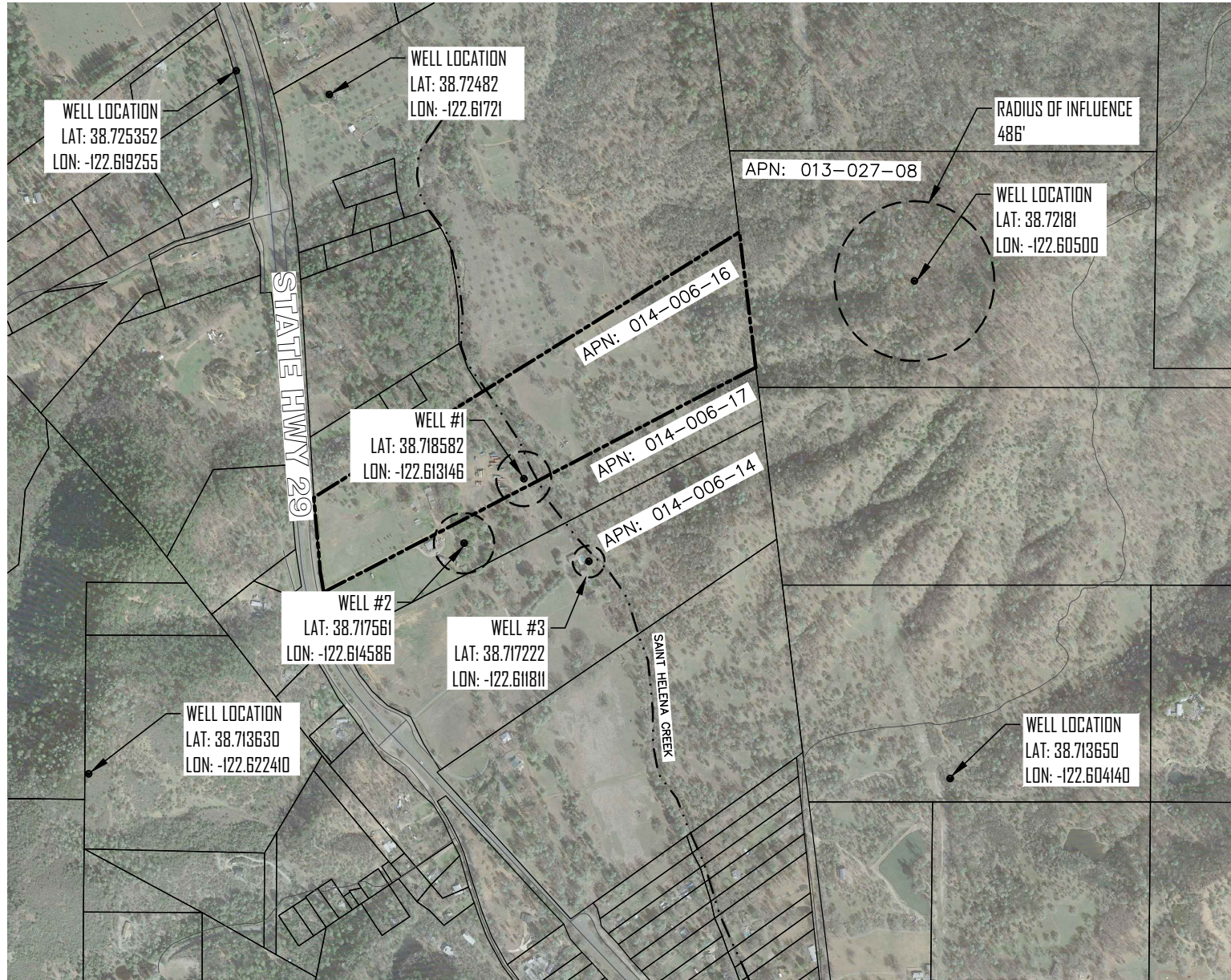
APPENDIX B

Appendix

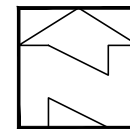
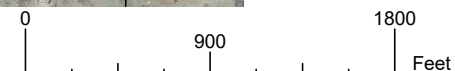
C

Surrounding Area Map

APPENDIX C



5' MINOR AND 25' MAJOR CONTOUR INTERVAL

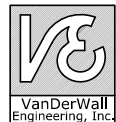


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COUNTY OF LAKE
LAKEPORT, CA

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KELSEYVILLE, CA 95451
707-279-4887

VanDerWall
Engineering, Inc.



SURROUNDING AREA MAP
APN: 014-006-16
23180 SHADY GROVE
MIDDLETOWN, CALIFORNIA

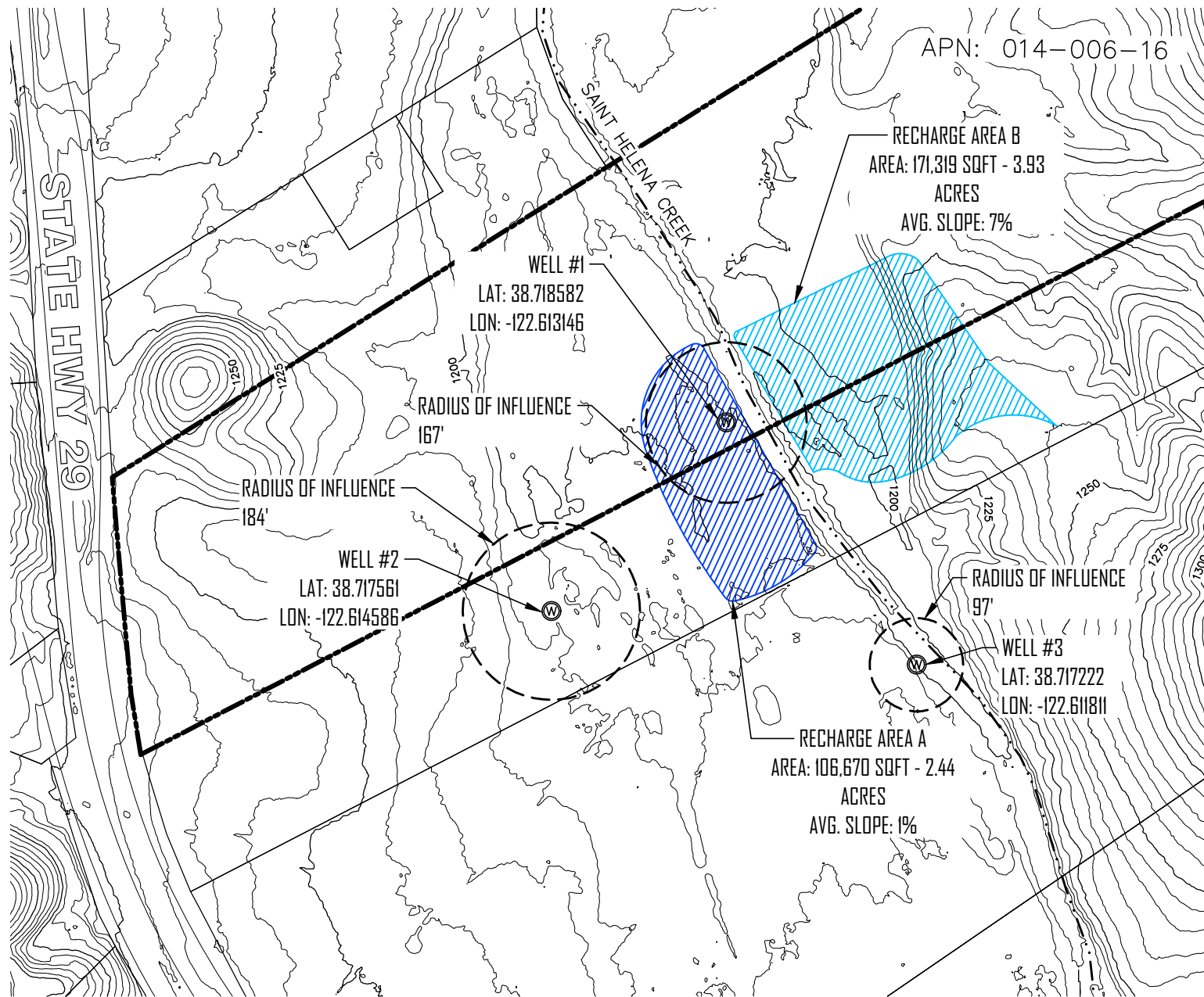
VERIFY SCALE	
BAR IS ONE INCH ON ORIGINAL DRAWING.	
DATE	SEPT 2021
PROJ	21-51
DWG	APPENDIX C

Appendix

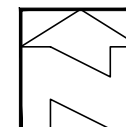
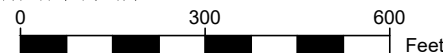
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Well Recharge Area Map

APPENDIX D



5' MINOR AND 25' MAJOR CONTOUR INTERVAL



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DEVELOPMENT DEPT.
COUNTY OF LAKE
LAKEPORT, CA

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VanderWall
Engineering, Inc.



WELL RECHARGE AREA MAP
APN: 014-006-16
23180 SHADY GROVE
MIDDLETOWN, CALIFORNIA

VERIFY SCALE

BAR IS ONE INCH ON
ORIGINAL DRAWING.
0 1"

DATE: SEPT 2021

PROJ: 21-51

DWG

APPENDIX D